



**RESEARCH
DIALOGUES**



2017

TUES, APRIL 11, 8am–5pm

WED, APRIL 12, 8am–7pm

UTC University Center

UTC RESEARCH DIALOGUES
Acknowledgements

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Madeline Hankins, Graphic Design Intern

THANK YOU!

UTC RESEARCH DIALOGUES

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UTC *RESEARCH* DIALOGUES

Schedule of Events

TUESDAY, APRIL 11, 2017 UNDERGRADUATE STUDENT & FACULTY SHOWCASE

8:00 AM

Registration

UC Tennessee Room Atrium

9:00 AM - 10:00 AM

Plenary Session - Breakfast & Remarks

UC Chattanooga Room

10:00 AM - 2:00 PM

Poster & Display Presentations

UC Tennessee Room

10:00 AM - 4:00 PM

Podium & Panel Presentations

UC Breakout Rooms

10:30 AM - 12:00 PM

Undergraduate Lightning Presentations

UC Auditorium

12:00 - 5:00 PM

Performance Presentations

UC Auditorium

UTC RESEARCH DIALOGUES

Plenary Breakfast

UC Chattanooga Room

Tuesday, April 11 - Undergraduate Student & Faculty Showcase

Breakfast Sponsor: College of Arts & Sciences

Remarks

Dr. Joanne Romagni
Vice Chancellor for Research

Dr. Steven Angle
Chancellor

Dr. Jeffery Elwell
Dean, College of Arts & Sciences

Plenary Speaker

Dr. Dan Kennedy
Baylor School Department of Mathematics
“Two Mathematical Magic Tricks”

UTC RESEARCH DIALOGUES

Poster & Display Presentations

Tuesday, April 11 - Undergraduate Student & Faculty Showcase

Allen, Garrett

“The Cognitive Benefits of Outdoor Exercise Versus Indoor Exercise”

Honors College (Health & Human Performance)

Research Advisor: Dr. Andrew Bailey

Co-presenters: Christian Demastus, Josh Herndon

Abstract: It has been known for some time that exercise is beneficial not only for physical wellbeing, but also for levels of cognition. However, recent studies have seemed to show that exercise could be more beneficial outdoors as compared to indoors. The present study has been designed to test this theory. Twenty college students will begin by wearing mobile EEGs (electroencephalograms), which are used to measure the fluctuations of brainwave frequencies. While wearing the mobile EEGs, they will take two cognitive tests designed to measure focus and short term memory retrieval, which are the Stroop Test and the Backward Digit Span Task. The participants will continue to wear the mobile EEGs, walk inside for thirty minutes, and then take the tests again. Each participant will also come back another day and complete the same procedure, but instead will walk outside for thirty minutes. The brainwave patterns of each participant when walking inside and when walking outside will then be analyzed and compared against each other, as will the results of the cognitive tests. The working hypothesis is that after walking indoors, the participants will perform worse on the cognitive tests than when outdoors, and will also show less calm brainwaves.

Allen, Hannah

“Context and Implementation Intentions in Prospective Memory Tasks: An Eye Tracking Experiment”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Jill Shelton

Co-presenter: Tyrone James

Abstract: Prospective memory (PM), or remembering to perform future intentions, plays an integral role in everyday life. An implementation intention (II) is an encoding strategy that has been found to bolster PM; however, the mechanisms responsible for observed benefits are unclear. The purpose of this research was to examine the role of context in IIs' beneficial role in PM. We hypothesized that IIs would only benefit PM performance in a task in which the context of the PM target event could be predicted; conversely, no II benefit was anticipated in a task that had minimal contextual certainty associated with the PM target event. Furthermore, we predicted that providing a simple contextual cue (e.g., a particular sound) at encoding would benefit PM even more than IIs. Participants completed two PM tasks an eye-tracking task with a high level of contextual certainty and a behavioral task with a low level of contextual certainty, and participants were randomly assigned to either a standard encoding, II encoding, or context cue condition. The results supported the hypotheses by demonstrating no II benefit in a contextually ambiguous task and Strategic monitoring processes were evaluated using both behavioral and eye-tracking measures.

Allen, Tatiana, Ph.D.

“Novel Amorphous Fe-Tb-Dy-O Thin Films:
Electrical Conductivity Evolution under Thermal Cycling”

College of Arts and Sciences (Chemistry & Physics)

Co-presenters: Alexandra Waters (undergraduate student, Physics program, UTC),
Humaira Taz, Ramki Kalyanaraman (Department of Material Science and Engineering, UT-
Knoxville), Tamil Sakthivel, Sudipta Seal (Materials Science and Engineering Department,
University of Central Florida)

Abstract: Amorphous ternary oxides (Me)₂O₃ with primary metal (Me) being Iron, along with two Lanthanides, Terbium and Dysprosium, were recently reported to show a combination of very high optical transparency, electrical conductivity, and Hall mobility. The Hall mobility values observed in this material are comparable to the best indium-based transparent conductive oxides and an order of magnitude better than in amorphous silicon. That makes the material a potential candidate for a wide range of electronic applications.

Thin films of Fe-Tb-Dy-O were prepared by electron beam co-evaporation technique with different Iron content measured by Iron to Lanthanides ratios (in at %) derived from energy dispersive x-ray analysis (EDS). The film structure was amorphous which was confirmed by the glancing incidence x-ray spectroscopy. As deposited, films with lowest Iron concentration exhibited semiconductor-like optical and electronic properties, while films with high iron content were metallic. The evolution of the transport properties of the Iron-rich films was studied in-situ during repeated heating-cooling cycles in the temperature range from 290 to 700 K under low vacuum of 5 mTorr. With continued oxidation of the material, temperature de

Aqqad, N. N.

“BMI Comparisons Between Child Athletes and Non-athletes”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Kara Hamilton

Co-presenters: C.S. Coleman, K.L. Peyer, E.D. Hathaway, K.C. Hamilton

Abstract: The purpose of this study was to compare BMI levels in child athletes versus non-athletes. Organized sport participation was determined by survey in 10-11 yr-old male and female athletes (male, n=9; female, n=4) and non-athletes (male, n=11; female, n=15) at a low socioeconomic, rural school. Height and weight were measured and age- and sex-specific BMI percentiles (BMI%) were calculated. BMI% were categorized as normal weight (BMI%<85th percentile) or overweight (BMI%≥85th percentile). Sport participation and BMI% categories were compared by using the chi-square test for proportions. A significant relationship existed between sport participation and BMI category, $\chi^2(1, N=39) = 4.3, p=0.04$. Less than 42% (41.7%) of athletes were categorized as having an unhealthy BMI compared to 69.2% of non-athletes. Children who participated in organized sports had a greater proportion of healthier BMIs compared to those not involved in sports. More opportunities to participate in organized sport programs may lead to increases in overall physical activity levels and reduced BMI.

Arnett, Lori

“Leadership and Group Talk”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Ralph Hood

Abstract: Leadership and group talk is an interesting topic. There are some individuals who believe that independent work is best. There are some groups who support team work only. There are also researchers that support identifying an individual's true self, or personality. These researchers find it necessary to identify what they believe a person should be, according to their research. The question is, "Can groups benefit from individual work and group work?" Is there evidence to support both claims? Three main objectives will be discussed. 1. Positive leadership in group settings

can be beneficial to the entire organization. It is necessary to motivate, encourage, and praise each other and the self in all settings. 2. Group talk and participation can lead to success, achievements, and a greater sense of mental health, and growth for all. 3. Leadership and group talk will not discriminate on personality, race, clothing, gender, kind, or liking. It doesn't matter your status, or situation in life, we will work as one to get you where you want to be! We will solve problems together! Research will provide evidence and examples on how leadership and group talk can be beneficial for everyone involved and how assessing personality is not necessary.

Asemota, Christine

“Concurrent Validity of the MyMo Physical Activity Monitor”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Karissa Peyer

Abstract: Community-based programs aim to increase physical activity and are using objective monitors, such as the Mymo physical activity monitor, to quantify the amount of activity that children achieve through their programs. However, the Mymo has not been validated. Therefore, the purpose of this study was to test the validity of the Mymo physical activity monitor. Nine 5th grade students wore both the Actigraph GT3x-BT and Mymo monitors for one week. Children wore both monitors during all waking hours except times when the monitors would get wet. Steps and active minutes (> 120 steps per minute) captured by both monitors and correlations and paired t-tests were used to evaluate agreement between the monitors. Strong correlations were found for both Steps ($r = 0.94$) and Active Minutes ($r = 0.67$). Average step counts were overestimated by the Mymo (8552 steps) compared to Actigraph (7087 steps) ($p = 0.02$). Daily active minutes was significantly underestimated by the Mymo (3.8 minutes) compared to the Actigraph (115 minutes) ($p < 0.001$). The Mymo may be an appropriate device for counting steps/day but the 120 steps/minute threshold for active minutes should be lowered to more accurately capture activity.

Baker, Charles

“Demographic Predictors Drug Use Implications for Policy, Practice, and Research”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Abstract: The purpose of this research study has been to examine whether there are demographic characteristics that serve as a predictor for the use of drugs, specifically legally available drugs, illegal drugs, or both legal and illegal drugs, as well as predictors of treatment. This quantitative study will employ a secondary data analysis using data from the National Household Survey on Drug Use and Health 2013, which is published by Inter-university Consortium for Political and Social Research. The sample that the data was collected from was made up of civilians residing in the United States, aged twelve or older that were not institutionalized or living in group homes. Other institutionalized settings that were not included in the survey were college dormitories, group homes, shelters, rooming houses, and civilians dwelling on military installations. The entire test sample size consists of 67,838 people.

Baker, Matthew

“The Use of a Puzzle Box as Animal Enrichment for a Captive Red Fox”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Preston Foerder

Co-presenters: Alexandria Miles, Dr. Preston Foerder

Abstract: In recent times, there has been an increase in concern over the behavioral welfare of captive animals. Environmental enrichment has been used in numerous studies to enhance animal welfare through the application of stimulating activity that promotes choice and variety in the animal's environment. We created an enrichment apparatus for one red fox (*Vulpes vulpes*) at the Reflection Riding Arboretum and Nature Center in Chattanooga, TN. We constructed a large enclosed puzzle box with various shaped holes at different heights between chambers that required

the fox to enter the box and maneuver around to locate food. The box had one clear plastic side to enable observation and was placed in a nearby enclosure to the fox's home cage. The fox was transported to that enclosure for enrichment sessions. Using an ethogram devised for this research, we collected data for four weeks: ~2 week baseline without the enrichment device, ~1 week with the environment enrichment, and ~1 week post-enrichment (again without the enrichment device). Behavioral observations were collected at 15s intervals using a scan sampling procedure. During the enrichment period, an increase was seen in foraging and locomotion, and a decrease in resting.

Battles, Marty

“Time Lapse Videography of Select Microbiology Tests”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. David K. Giles

Co-presenter: Evan Sorenson

Abstract: Bacterial identification, differentiation and characterization involves the employment of numerous phenotypic, metabolic, biochemical and enzymatic tests that are utilized during the laboratory portion of Principles of Microbiology. While students participate in the inoculation and interpretation of these tests, they never witness the developments leading up to the final product. Our goal in this project was to develop time-lapse videos of several microbiology tests. Using a GoPro camera mounted within an incubator equipped with interior lighting, we have captured several videos documenting the progression of bacterial growth and response to tests carried out in diverse inoculating methods and media composition. These videos may contribute to student learning by serving as instructional supplements. Alternatively, they may highlight as-yet-unseen differences between bacteria.

Black, Luke

“Post-Disturbance Species Richness and Abundance in Red Mangrove Prop Root Biota of Oyster Pond in San Salvador Bahamas”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Dawn Ford

Abstract: Over the past 4 years, studies of interior pond biota have been conducted by UTC on San Salvador, Bahamas. In 2015, Hurricane Joaquin hit the island and disturbed the mangrove vegetation, pond biota, and sediment of many of the interior ponds. The recovery of the Red Mangrove (*Rhizophora mangle*) and pond biota after Hurricane Joaquin is currently being investigated with a focus on macroalgae, fish, and invertebrates. In 2016, it was discovered that there was less diversity and abundance of biota on the prop roots of the red mangroves approximately 6 months following the disturbance as compared to pre-hurricane conditions. However, a few new species were found. In March 2017, the biotic survey will be conducted again and will be expanded to include new areas of the pond that have not been sampled before. It is my hypothesis that there will be a higher species richness and abundance of biota on Red Mangrove prop roots in Oyster Pond as compared to both pre-hurricane conditions and 6-month post hurricane. Findings from the March 2017 sampling will be presented in this poster.

Boeger, Reed

“Physiological and behavioral adaptations of *Vibrio cholerae* to fatty acids in a continuous culture (bioreactor) model”

College of Engineering and Computer Science (Civil & Chemical Engineering)

Research Advisor: Dr. Bradley Harris

Abstract: *Vibrio cholerae*, a Gram-negative bacterium, is the pathogen responsible for the acute intestinal infection known as cholera. This infection is a recurring concern in developing countries and is particularly deadly for children. Thriving in oceanic and brackish environments, *V. cholerae* is able to adapt and survive within the human host. Previous work has shown that *V. cholerae* possesses specific cellular machinery for incorporating environmental fatty

acids into its cellular membrane, an ability that may contribute to its environmental survival and persistence. Here, we propose to cultivate this bacterium in a bioreactor and study the effects of environmental conditions on bacterial behavior associated with fatty acid uptake and utilization. This will include assessment of how parameters such as temperature, pH, and salinity impact bacterial growth, membrane permeability, biofilm formation, and motility depending upon fatty acid availability. This work will further our understanding of how bacteria sense and respond to fatty acids, and could provide new insights relevant to the prevention and treatment of disease. The theory, method, and progress of this work will be discussed.

Brocco, Cameron

“An Analysis of Prevalence of Chytrid Fungus in an Amphibian Assemblage in Tennessee”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Thomas P. Wilson

Co-presenters: Cameron Brocco, Dr. Ethan Carver, Dr. Jose Barbosa, Brad Reynolds, Team Salamander, and Dr. Thomas P. Wilson

Abstract: It has been known for some time that exercise is beneficial not only for physical wellbeing, but also for levels of cognition. However, recent studies have seemed to show that exercise could be more beneficial outdoors as compared to indoors. The present study has been designed to test this theory. Twenty college students will begin by wearing mobile EEGs (electroencephalograms), which are used to measure the fluctuations of brainwave frequencies. While wearing the mobile EEGs, they will take two cognitive tests designed to measure focus and short term memory retrieval, which are the Stroop Test and the Backward Digit Span Task. The participants will continue to wear the mobile EEGs, walk inside for thirty minutes, and then take the tests again. Each participant will also come back another day and complete the same procedure, but instead will walk outside for thirty minutes. The brainwave patterns of each participant when walking inside and when walking outside will then be analyzed and compared against each other, as will the results of the cognitive tests. The working hypothesis is that after walking indoors, the participants will perform worse on the cognitive tests than when outdoors, and will also show less calm brainwaves.

Cahoon, Emily

“Outed: A Look at Modern Social Constraints of Male Homosexuality”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Zibin Guo

Abstract: The purpose of this study is to use ethnographic methods to explore self-perceived views of male homosexuality and its acceptability in Chattanooga, TN. Among a small sample of males between the ages of 18 to 26 who identify as gay or straight, the researcher attempts to answer the question: "What are some of the major changes in social constraints that male homosexuals between the ages of 18 to 26 endure in Chattanooga compared to the years prior to the legalization of same-sex marriage?"

Carmichael, Sandra Jean

“Burning Down the House: How the industrialization of American Medicine burns out its best and brightest in the field of Emergency Medicine”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Zibin Guo

Abstract: This paper addresses the issues contributing to the increasing rate of "burn out" in Emergency Medicine, among doctors, et. al. Most suffer from it in some form, whether it is outright suicide, among the highest of physician

sub-specialties, to other means of coping such drinking, etc. Why so much dysfunction among a group of healers? Often, it is their high opinion of their adaptability, the team-oriented approach, and their pride which leads them to overestimate their powers. The traits used to select them are used against them ““ their hyperactive, curious, and caring attitude. They cannot possibly fulfill the expectations of the Federal Government, the non-medical administrators, the insurance companies, and their patients' expectations. And they form the medical safety net for half of the U.S., and all those without insurance. Finally, only in smaller E.D.s, where they see some patients repeatedly, they rarely know outcomes. They get no feedback as to whether they did a good job except from complainers or administrators telling them, again, they fall below some imaginary line of excellence. This breeds dissatisfaction with themselves, a job they love, and with a system that treats them as cogs and their patients as meat

Carroll, Andrew, PG, GISP

“Acquisition of High Accuracy Geospatial Data for Environmental and Natural Resource Management Using Light Detection and Ranging (LiDAR) Sensor Equipped Unmanned Aerial Systems (UAS)”

Administration (IGT Lab and Office of Vice Chancellor for Research)

Abstract: Light Detection and Ranging (LiDAR) sensors are commonly used in geospatial data acquisition for natural resource and environmental management. LiDAR sensors are fully capable of vegetation and ground cover penetration for accurate terrain surface measurement, as compared to more common, less obstruction tolerant, photogrammetric methods. Recent advances for inertial measurement unit devices, global navigation satellite system receivers, and regulatory authorizations have increased the deployment of unmanned aerial systems (UASs) for geospatial data acquisition. Comparably, commercially manufactured LiDAR sensor payloads are available in smaller form factors and weights. Results from recent field mapping missions and LiDAR sensor evaluations, indicate increased mobility, reduction of safety hazards, and high data quality results from LiDAR enabled UAS platforms. In addition, UAS systems offer potential time and cost savings, versus traditional survey or manned aircraft acquisitions.

Clark, Stephen

“How do metric proficiency, confidence in science, and scientific understanding relate?”

College of Engineering and Computer Science (Computer Science & Engineering)

Research Advisor: Dr. Hong Qin

Abstract: The daily life in the U.S.A. is based on customary units separated from the international systems of units (metric system) that are taught in sciences. Does this daily routine influence people's acceptance and views of science? To answer these questions a survey was designed with 24 questions about people's backgrounds, understanding of basic scientific concepts, confidence in science, and proficiency with the metric system. The questions about personal background included age range, gender, education, and country where the respondent grew up. An example of a question measuring the respondent's confidence in science is "My religious views are more important than scientific views." The survey had 4 of these questions. An example of a question measuring the respondent's understanding of basic scientific concepts is "The center of the earth is very hot." The survey had 11 of these questions. An example of a question measuring the respondent's proficiency with the metric system is "145 mm = ___ m." The survey had 5 of these questions. We will use RStudio to analyze the survey results of the survey and gain insight into the relationship between these factors.

Conklin, Jessica

“Social Work Students' Mental Well-Being, Mental Health Knowledge, and Motivation to Pursue a Career in Social Work”

College of Health, Education, and Professional Studies (Social Work)

Research Advisors: Dr. Morgan Cooley, Dr. Amy Doolittle

Co-presenters: Alexandria Wilga, Danielle Marking

Abstract: The focus of this research project is to explore whether there is a connection between the mental well-being and the mental health knowledge of social work students and student outcomes, relationships, and the decision to pursue a career in social work. Mental health influences many aspects of a college student's life, as well as their perceived outcomes. We are conducting this research because social work student mental health is an important issue being that social work students and social workers function in a high stress environment and face many challenges while performing their daily activities. The knowledge gained from this research can assist universities and individuals in creating programs and services that will better the needs of social work students. The research questions guiding this study are: 1. Do social work students deal with challenges to their well-being? 2. Does the mental well-being and mental health knowledge of social work students related to and impact their academic success, relationships, and career readiness? 3. How do social work students manage their mental well-being and prepare for a career in social work? We are extremely excited about this research, and are looking forward to the end result.

Cowan, Kay W., Ph.D.

“The Role of the Arts in Cognition and Student Performance”

College of Health, Education, and Professional Studies (Education)

Co-presenters: McKenzie G. Fox, Katie S. Howell, Kaitlyn M. Macri, Jessica M. Dickerson

Abstract: The poster presentation, The Role of the Arts in Cognition and Student Performance, will capture highlights of a longitudinal, qualitative study that focused on the function of the arts to foster higher-order reasoning. This study has been joined by two graduate and two undergraduate UTC students who are preparing arts-based literacy materials to address instructional delivery through the use of a range of art forms. The materials being prepared by the UTC students are to be shared with five area school systems this spring and summer and will be implemented in reading, science, social studies, and math classes next fall. The poster presentation will be grounded in constructivist, arts-based literacy research and will connect that research to the findings of the National Reading Panel Report. The presentation will include findings from earlier parts of the study that demonstrate the power of the arts to foster metaphorical and analogical reasoning. Connecting this work to the National Reading Panel Report, the presentation will showcase the UTC students' work with arts-based strategies to foster key elements of comprehension, vocabulary, fluency, comprehension/metacognition, phonological awareness, and phonics.

Craft, Arden

“Art: The Struggle to Create Original Work in a World Dominated by Global Media”

College of Arts and Sciences (Art)

Research Advisor: Professor Katie Hargrave

Abstract: Through my poster presentation, I want to display two original pieces of art depicting how the interplay between modern technology and media threatens to corrupt the creative aspects of society. The two pieces act as a diptych, meaning they take influence from each other. Both are done in charcoal and drawn on newsprint. One piece depicts a silhouette of a man holding an iPhone looking down unaware of the surrounding world, and the other is a hand shackled to an iPhone being thrust into the air. Traditionally presenting this type of art on a poster would not be ideal, but I plan to cover the poster with media as well to further relay my message. Speaking from my own creative process as an artist it has become increasingly more difficult to find and create truly original work. This largely being

caused by various influences all relating back to the globalization of media. Concepts such as print and social media, television, movies and the internet have made it almost impossible to not be indirectly influenced. I find that my own mind is so clouded by the presence of these various types of media, it is difficult to come up with concepts or ideas that are truly my own. As a result of my frustrations, I created these two pieces.

Cunningham, Christopher

“Analyzing How the Age of Star Clusters Affect the Formation of New Stars”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. Robert Marlowe

Co-presenters: Jake Stark, Jake Downey

Abstract: Whenever you look up at the stars what do you see? Intuitively you would say light from the stars. Our goal is to teach the public that light isn't all they are seeing, but actually a whole world of science waiting to be known. Our SPS research team will analyze the spectral emissions from globular and open star clusters looking for correlations between the age of the cluster and its elemental composition of newly formed stars. The public will be right there with us through all of this; we will employ Facebook live-streams using astrophotography and weekly observatory presentations about all our findings.

Danos, Jennifer, MFA

“Lethologica: UTC Sculpture Majors Exhibition at UGA”

College of Arts and Sciences (Art)

Abstract: On January 27, 2017 UTC Sculpture majors exhibited their artwork at the Glass Gallery at the Lamar Dodd School of Art at the University of Georgia at Athens. This was part of an exhibition exchange with the sculpture students at UGA, coordinated by Professor Jennifer Danos of UTC and Professor Mike Calway-Fagen of UGA. "Lethologica" featured recent sculptural work by Stephanie Loggans, Christopher Pickering, Bonnie Buffington, Lawrence Chien, Taylor Vance, Paige Warner, and Andrew Choyce. This project was generously supported by Dr. Joanne Romagni and a High Impact Practices Grant through the Walker Center for Teaching and Learning.

Daugherty, Ashlyn

“Detecting Suboptimal Effort in Undergraduate Research Participants Using the Wisconsin Card Sorting Task”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Amanda Clark

Co-presenters: Kaila Rogers, Amanda Clark

Abstract: Determining if individuals are exerting optimal levels of effort in neuropsychological testing is essential because if poor effort is exerted researchers may make incorrect conclusions about their results. While stand-alone measures of effort exist, a more efficient approach is to determine if there are ways of detecting sub-optimal effort within neuropsychological assessments that are already being used in testing. The present research uses the popular neuropsychological measure, the Wisconsin Card Sorting Test (WCST), to measure levels of performance and effort in undergraduate research participants. Participants in the study are undergraduate and graduate students at the University of Tennessee at Chattanooga. Half of our sample was randomly selected to be in a Simulating Brain Injury (SBI) subgroup while the other half were assigned to the Do Your Best (DYB) subgroup. Those in the SBI subgroup were given information about the symptoms of brain injury and were encouraged to perform the neuropsychological assessments as if they were pretending to have those symptoms. Those in the DYB subgroup read an anecdote describing why it is always best to try one's best when doing one's job. Though research is ongoing and results are not yet analyzed, performance on various embedded measures of the WCST will be compared between the SBI and DYB

subgroups. We anticipate finding that frequency of errors on WCST will significantly differ between the subgroups such that error frequency can be used to detect sub-optimal effort in those who simulate brain injury.

Day, S. C.

“Perceived Cultural Competence of College Students”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: Essence S. Mosley, Victoria A. Maffett, Kemeisha Ladner, Cameisha Mallory

Abstract: The purpose of this research is to explore perceptions of cultural competency among college students. There is growing concern over supporting diversity on college campuses, as well as the work force. However, it is uncertain whether students are aware of cultural competence on a regular basis. Cultural competence is a multifaceted concept that does not have a single definition. In general, it may include congruent behaviors, attitudes, and values that help people interact and work among cross-cultural persons and in cross-cultural settings. Research Questions: (1) Do college students know what cultural competence is? (2) How do college students rate their level of cultural competence? (3) Do college students believe that cultural competence is important? (4) Do college students perceive cultural competence to be beneficial to their personal or professional life?

Dean, Patrick

“Development of Low Cost Catalysts Involving Homogeneous Cobalt Complexes for the Selective Oxidation of Hydrocarbons to Alcohols”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. John P. Lee

Abstract: Several new Co(III) complexes with phosphite ligands and a phosphine ligand have been prepared that are designed to facilitate the catalytic partial oxidation of C-H bonds to alcohols. Complexes of the type $[\text{Co}(\text{Cp}^*)(\text{L})(\text{I})_2]$, where Cp^* = pentamethylcyclopentadienyl, L = 1,3,5-triaza-7-phosphaadamantane (1), trimethylolpropane phosphite (2), and tris(2,2,2-trifluoroethyl) phosphite (3), are readily prepared via direct ligand substitution of the CO ligand on $[\text{Co}(\text{Cp}^*)(\text{CO})(\text{I})_2]$ for the phosphite and phosphine ligands. All complexes have been characterized by elemental analysis, UV-Vis spectroscopy, and multi-nuclear NMR spectroscopy. Furthermore, complexes 1 and 2 have been characterized by single-crystal X-ray diffraction where the Co-P bond increases from 2.129 (3) Å... for 2 to 2.203 (2) Å... for 1 while the I-Co-I bond angle decreases from 96.18° (3) for 1 to 95.10° (4) for 2. The ^{31}P NMR spectrum of each complex is noteworthy as the typical readily observable nucleus required longer scan times in each complex due to broadening resonances, which likely is due to the one bond coupling to the quadrupolar cobalt-59 ($I = 7/2$) nucleus. Details on the preparation, characterization, and future direction for these complexes will be presented.

Dempsey, Margaret

“The Use of a Pond as Environmental Enrichment for Captive Sandhill Cranes”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Preston Foerder

Co-presenters: Colten Marcum, Victoria Noyes, Megan Whisman, Sarah Farnsley, Dr. Hope Klug, Dr. Preston Foerder

Abstract: Environmental enrichment (EE) benefits captive animals by augmenting the enclosure with ecological stimuli necessary for the animal's behavioral welfare by providing the animal with choice and variety. This study observes the effects of EE on two captive sandhill cranes (*Grus canadensis*). Based on previous enrichment studies and the natural history of *G. canadensis*, we built a structure that mimicked the animals' natural environment and provides feeding opportunities to increase foraging behaviors. We constructed a shallow pond filled with various substrates: pebbles,

soil, sand. We observed behaviors and space usage of the cranes for one hour/day at intervals of one minute using scan sampling. Results showed that foraging behaviors doubled and sleeping decreased tremendously after the introduction of the enrichment for both cranes. This suggests that the use of EE can aid in the welfare of captive animals and allow visitors to see animals engaging in naturalistic behaviors.

Dewaele, Alyssa

“Race, Gender, Disability, & Personhood”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. H. Lyn Miles

Abstract: The concept of "personhood" is socially constructed and does not always include all categories of human being at all times and under all conditions. Undergraduate students at UTC were asked in a written survey to rate the degree of personhood of 100 items in 5 different categories: humans of various races, genders, and occupations; humans or partial humans with illnesses, disabilities, or special conditions; primates such as great apes; other animals; high technology, imaginary, or spirit entities. Sample items include: a black woman, an autistic boy, chimpanzee who shows emotions, parrot who counts to seven, and God. Results show that race, gender, and disability are factors in determining one's personhood and resulting in a lower mean score of personhood. This confirms reports of individuals in these categories that they are not treated fully as persons in their society.

Dooley, Jared

“Rational or Intuitive Reasoning: A Comparison between Nursing Students and Faculty”

College of Arts and Sciences (Nursing)

Research Advisor: Dr. Kate Kemplin

Co-presenters: Maria Snyder, Cameron Cox, Tyler Minch, Ryan McKendrick

Abstract: The purpose of our research is to identify whether or not students are more rational or intuitive thinkers as compared to the faculty that instructs them. Pretz & Folse (2011) found that intuition increased with experience. We hypothesized from this information that the faculty would use a more intuitive thought process and the students would use a more rational thought process. Ruth-Sahd & Hendy (2003) further backed up this assumption with their study which found that intuitive thought processes were used more in older and more experienced nurses. We believe this study is important because if we find students are more rational thinkers and the faculty rely more on intuition there might be a disconnect in the way material is being delivered to the students. The findings could indicate a need for further investigation into teaching methodologies. In a similar study, Walker et. al (2016) found that paramedic students were more rational thinkers and found that the information had potential in developing better continuing education material and clinical support information. In order to carry out the study, our group will be using a quantitative non-experimental research design utilizing the REI-40 survey.

Dugger, Brittany

“Quality Improvement Study of Antibiotic Timing”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Joseph McCauley

Abstract: In respect to post-operative efforts to obstruct any post-operative infection, monthly chart reviews of elective surgery patients were taken to be analyzed in their antibiotic treatment effectiveness. The results proved an importance in antibiotic timing in both pre-operative and post-operative efforts. The data shows a strong correlation with patient post-operative health and timely antibiotic distribution. In the study, a relationship between patient post-operative health and timely antibiotic distribution is investigated.

Eckelmann Berghel, Susan, Ph.D.

“Why Must There Be War?”

College of Arts and Sciences (History)

Abstract: In their written correspondence with the White House between 1963 and 1968, well over 1,200 children and adolescents ages 5 to 17 across the United States and abroad debated the U.S. deployment during the Vietnam war, the ideological conflict against communism, and American public policy addressing environmental issues, class inequality, and civil rights campaigns. Cold War conflicts and LBJ’s Great Society programs politicized American teenagers’ daily life beyond the electorate. Letter correspondence offers a window into the world of 1960s youth, illustrates the significance and impact of presidential leadership, and highlights the ways in which children and teenagers exercised their rights as citizens during one of the most formative decades in U.S. history. Letter writing allowed youth to engage with the adult world on their own terms as “loyal citizens,” “friends,” and “advisors.” In their letters, child and adolescent letter writers addressed adults’ age prejudices and rejected assumptions about adult influence. In a letter to President Johnson, Rebecca Spooner, a high school freshman from Tempe, Arizona, maintained, “... this is my thinking only and not my friends or parents. If I was old enough to vote, I would vote for you.” Letters like these implicitly or explicitly challenged adult notions about child and adolescent fitness as citizens. Performing their ableness, youth sought the direct engagement with the president to express their ideas, air their grievances, and influence public policies and military decisions.

Elliott, Louie, Ph.D.

“UTC Design for Independence”

College of Engineering and Computer Science (Mechanical Engineering)

Co-presenter: Dr. Cecelia Wigal

Abstract: The purpose of the UTC Design for Independence project was for freshmen engineering students enrolled in Introduction to Engineering Design (ENGR 1850) to collaborate with Signal Center's Assistive Technology Center to develop new or improve existing technologies that can positively affect the lives of persons with physical and mental disabilities ranging in age from toddlers to adults. The students working in teams of four to five, met with the clients to establish the need statement and identify the objectives, functions, and constraints of the desired solution. Through the design process, the teams brainstormed several solutions and applied a decision methodology to choose the design that best meets the needs of the clients. The teams then designed and fabricated the proposed solution culminating in a prototype design installed at the client facility. In addition to team building, oral presentations, technical writing, budget, and design communication skills, the students illustrated critical thinking and experiential learning in physical disabilities and prototype construction.

Engel, Taylor

“Exploring the Relationship Between Socioeconomic Status and Health as it Affects Men and Women”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Abstract: This project explored socioeconomic status and the ways in which it adversely affects the physical and mental health of men and women within that vulnerable population. Additionally, the research had special focus on the gender differences, as they concern physical and mental health outcomes. This secondary data analysis utilized a sample of 125 adults taken from a primary care clinic in Northern Florida that serves individuals of lower socioeconomic status. Physical health measures used in the study included the RAND36 item general health self-report survey and the Body Mass Index scale. The mental health measures used included self-report surveys and questionnaires, such as the five-item Overall Anxiety Severity and Impairment Scale, Alcohol Use Disorders Identification Test, and the Inventory of Depressive Symptomology. The socioeconomic disparities noted and their impact on health with respect to gender differences highlight the importance of this study. It also suggests that there is a

need for focused strategies to combat the disparities. The primary purpose of the study is to identify the health and gender differences for the population, as well as to explore the implications for future policy, practice, and research.

Firat, Connor

“Silurian-Devonian Boundary Location Narrowed at Mustoe, VA Outcrop on the basis of Stromatoporoids”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Ann E. Holmes

Abstract: Stromatoporoids dominate the invertebrate fauna in the upper Silurian-lower Devonian Keyser Formation's Upper Limestone Member/Jersey Shore Member at an outcrop on County Road 607 near Mustoe, Highland County, Virginia. This slightly folded exposure contains a bioherm capped by a wave-cut surface and two overlying biostrome layers. Above these two units is a laminated and bimodally cross-bedded micritic unit contains nodular stromatoporoids in the lower portion. This micritic unit is recognized as the LaVale Member. These Keyser beds are all overlain by the calcarenitic New Creek limestone. Stromatoporoids were first sampled in 1978 by one of the authors and resampled in 2016 specifically from the two biostrome layers and the fossiliferous portion of the micrite. This was undertaken to identify stromatoporoid genera and species from these units. Preliminary identification of lower biostrome species include 3 specimens of *Parallelostroma keyserense*, and 1 specimen of *Densastroma pexisum*. Upper biostrome species includes 1 specimen of *Parallelostroma longicolumnum*. 2 specimens of *Habrastro centrotum* are found in the...

Ford, Dawn M., Ph.D.

“Does Study Abroad Matter? The Impacts of a Bahamas Field Experience on Student Participants, 1977-present”

Administration Studies (Academic Affairs)

Abstract: Fieldwork is an essential component of the natural sciences and provides the opportunity for knowledge, skills, and attitudes to be integrated into a hands-on experience. The measures of success of fieldwork, particularly in an international setting, have been mostly anecdotal in nature, resulting in little quantifiable evidence of the importance of fieldwork on student professional development and future employment. The purpose of this study was to measure the impacts of student participation in a Bahamas field course on professional and personal development and international perspective. A Qualtrics survey of 25 questions was administered online between November 2015 and March 2016 to former students of the Bahamas field course at Miami University and the University of Tennessee at Chattanooga. A total of 455 former students were contacted and 148 responses were received for a 33% response rate. Respondents overwhelmingly agreed that the international field course had a high impact on their personal and professional development and their international perspective. These survey results provide useful information to university administrators for decision-making related to financial and infrastructure support for such programs.

Freeman, Danny

“Identifying Writers using Markov Chains”

College of Engineering and Computer Science

Research Advisor: Dr. Craig Tanis

Abstract: When consuming information on the internet we don't have a good way of knowing the actual author of what we are reading. Since we cannot always rely who an author claims to be, we can instead try to identify how the content they created is structured and written. This research attempts to do just that by representing text as a Markov Chain, a state machine which describes the transition from one word to another with a probability. By creating and storing Markov Chains for known writers, it should be possible to identify the writer of new text by finding the probability that new text can be represented in a known Markov Chain. This research will explore various methods of creating Markov

Chains for different types of written work, and use a number of comparison methods to determine the best way to identify unknown writers. Multiple sources of text will be used for this research, but the primary source will be text from a popular social media site, Twitter. There are some practical applications of this work, including the identification of plagiarism and ghost writers. It could even be helpful in identifying spam bots, which sometimes use a related Markov Chain approach to generating new text.

Frye, Connor

“Nanostructures based on perpendicular arrangements of carbon nanotubes and molecular linkers: nano-hashtag”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. Tom Rybolt

Abstract: Molecular mechanics calculations were used to study the interactions between carbon nanotubes (CNTs) and molecular linkers. Carbon nanotubes are straw-like structures that have many unique properties including: high conductivity, high strength, and high length to diameter ratio. These and other unique CNT properties may allow them to have applications as ultrathin cables, electronic nanowires, molecular storage devices, medical delivery systems, filters, etc. However, groups of CNTs tend to form tight, parallel bundles (IIII). To achieve more open structures that might be important building blocks for filters or storage devices, molecular linkers were introduced into our models to stabilize an alternate arrangement of perpendicular carbon nanotubes. We designed a set of linkers built around a central molecule with two pincers (act like molecular pliers) that extend in opposite directions from the center of the linker. A number of molecular linkers were created, modified, and optimized so the two arms of a pincer could close together, then grab and hold a carbon nanotube. The pincers on each linker could hold two CNTs in a perpendicular arrangement that allowed us to create model hashtag CNT arrangements (#).

George, Olivia

“Wash Coat, Viscosity, and Effective Catalytic Substrates”

College of Engineering and Computer Science (Civil & Chemical Engineering)

Research Advisor: Larry Campbell

Abstract: In chemical catalysis, the wash coat, a primer of sorts, plays arguably the most important role in creating a functioning catalytic substrate. The metal substrate, often described as a "honeycomb", is the foundation of the catalyst. It is completely useless without the wash coat, which primes the surface so the expensive precious metal catalyst properly binds to the substrate. The important nature of the wash coat led us to investigate its property of viscosity. When viscosity is too low, the wash coat is too runny to stick to the substrate; when it is too high, the wash coat can flake off or even clog the substrate. Thus, we examined the viscosity under various forms of stress, measuring the effects of adding specific chemicals versus wash coat age. In general, we found that adding viscosity-raising chemicals did not benefit the adhesion of the wash coat to the substrate. Although these chemicals could improve the viscosity, it was difficult to add precisely the drops needed without going past the practical limit. We found time to be the largest factor affecting viscosity. The viscosity raises as the wash coat ages, so we concluded that wash coat that has been static for more than 10 minutes should be shaken before use.

Grandberry, Samaria

“Agriculture Future of America: Food Institute”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Shewanee Howard-Baptiste

Abstract: The Agriculture Future of America is a national organization that provides leader and career development for students. Through a competitive selection process AFA selects 70 individuals nationwide to attend the 3 day food institute held in Chicago, IL. The itinerary will provide students with the access to interact with food sector individuals and hands on experience in food manufacturing plants. It also includes discussion and training on topics such as food

sustainability, food deserts and nutrition. There are panels led by industry professionals on issues and trends facing the food industry. The institute provides awareness amongst students about the process of food from production to retail to the plate. It also enhances essential networking opportunities between students as well as professionals for the mutual benefit of future careers.

Guven, Emine, Ph.D.

“The Impact of Humidity on Gene Expression in the Human Skin”

College of Engineering and Computer Science (Computer Science & Engineering)

Co-presenters: Dr. Hong Qin, Jianming Zhang

Abstract: As the largest organ in the human body, the skin can directly sense environmental humidity changes, and adjust itself by either losing or absorbing moisture. Consequently, humidity changes are commonly observed to influence the morphological and physiological condition of the skin, such as skin wrinkles, ageing lines and stem cell activities. The goal of this research is to investigate the impact of room humidity on human skin by profiling the genome-wide gene expression. This study aims to determine whether there is a common pattern of regulation of gene expression under different humidity stress in human skin. We invented an ex-vivo model system to investigate the molecular cell response of human skin under various dryness conditions (from relative humidity 20% to 100%) for 8 hours ex vivo culture. One specific set of genes involved in the *Staphylococcus aureus* infection pathway from the KEGG classification showed significant responses to relative humidity changes. More interestingly, several genes in this pathway also regulate hair follicle development besides the function of immune response.

Hahn, Kori

“Gender Disparity in Physical Activity: When Does it Start?”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Kara Hamilton

Co-presenters: K. Hahn, M. Burkhalter, K.L. Peyer, E.D. Hathaway, K.C. Hamilton

Abstract: Research has consistently shown higher physical activity levels among adolescent males compared to adolescent females, but the age at which this shift begins and the major contributing factors have yet to be determined. The purpose of this study was to ascertain when associated patterns begin to develop. Moderate to vigorous physical activity (MVPA) (Actigraph accelerometer wGT3X-BT, Pensacola FL) was assessed in rural, 10-11 yr-old males (n=20) and females (n=19) over six days. Accelerometer data was classified into validated wear and non-wear intervals (wear time $\hat{\approx}$ 10 hrs, minimum of 3 weekdays and 1 weekend day). Only accelerometer validated wear time was included in the analysis [males (n=14), females (n=15)]. An independent t-test was used to determine gender MVPA differences. Male MVPA (34.6 $\hat{\pm}$ 5 min) was significantly higher (p=0.005) than female MVPA (19.3 $\hat{\pm}$ 2 min). This study suggests that gender differences in physical activity occurs even before adolescence. Such information could contribute to more effective physical activity interventions.

Hale, Christine

“The Effects of E-cigarette Exposure on Cell Viability and Gene Expression”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Margaret Kovach

Abstract: Studies show the tobacco alkaloids, anabasine, cotinine, myosmine, and nicotine, to be within e-cigarette filler solution. These tobacco alkaloids were tested within this study for their in vitro effects on cell proliferation and gene expression using a panel of lung cell cultures distinguished by differences in sex and disease status. We hypothesize that alkaloid exposure of lung cells is associated with abnormal proliferation and gene expression, and predict that cellular response to the alkaloids will present in a sex-specific manner. Alkaloid exposure of each cell line was evaluated at 1, 10 and 100 ug/mL concentrations in a 10-day time course. Cellular proliferation was recorded daily

by the CellTiter Glo® luminescent viability assay. RNA was isolated after 48 and 96 hours for gene expression analysis of cancer biomarkers by qRT-PCR. Initial findings indicate cotinine and nicotine can have both an inhibitory and stimulatory effect on cell growth. Anabasine and myosmine display primarily an inhibitory effect. Variances in exposure response and proliferation were observed among the tested lung cell lines. Notably, the cancer cell line demonstrated a greater degree of variability among replicates, which we attribute to the non-clonal nature of this cell line.

Hall, Zachariah

“Machiavelli In His Time: How Renaissance Italy Affects Our Understanding of His Works”

College of Arts and Sciences (Political Science & Public Service)

Research Advisor: Dr. Michelle Deardorff

Abstract: Reading Niccolo Machiavelli outside of the context of Renaissance Florence greatly alters our perception of his works, particularly *The Prince* and *Discourses on Livy*. Through an analysis of his biographical life, paired with an analysis of his primary texts, we can gain a better understanding of what it was that Machiavelli was concerned with. Living in an Italy that was fragmented into city-states vying for power, alongside a church which degraded its moral authority to gain temporal power, shapes Machiavelli's thought around one goal: security. Machiavelli is famous for his presentation of a cold and amoral Prince, but when we delve into his time we find someone concerned with more than just writing a handbook on ruling. He presents his readers with a call to arms, a vision for a unified Italy which could stop the violence occurring between cities and defend Italy from external threats such as the French or Spanish. His vision for *The Prince* is to clearly explain what a Prince would need to do in order to bring about a unification of the Italian city-states. His apparent advocacy of violence and amoral rule hinges on our understanding of the greater violence caused by the warring factions in Italy, and his desire for stability.

Hamilton, Helen

“The Stereotypical Culture of Age Discrimination: The Subtle Cues of Ageism in Hiring Practices”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Shawn A. Trivette

Abstract: How do small businesses compare to large businesses in attitudes that account for age discrimination in hiring practices? This research attempts to identify important cues that relate to age attitudes in company policies toward hiring and comparing how these attitudes differ or appear similar between younger and older applicant cohorts. The Age Discrimination in Employment Act of 1967 was enacted to combat ageism but it is difficult to assess because of vague language. This research is not an attempt to identify companies that do discriminate, but is an attempt to open dialogue in company meetings that can prevent such discrimination. By asking survey questions directed to persons in charge of hiring, the data gathered show comparisons in attitudes toward the Baby Boom cohort, (in this project this includes workers and potential workers age 48 and older) and Millennials, (those workers and potential workers age 30 and younger). My survey looks at the age of the person filling out the survey and the size of the company and presents findings based on questions presenting 16 various attributes. Demographics are also presented concerning company size, ownership of the company and education proportion of current employees.

Hanson, Abigail

“Introverts Unite!”

College of Arts and Sciences (Psychology)

Research Advisor & Co-presenter: Dr. Kate Rogers

Abstract: Much research on the interpersonal (IP) perception and impression formation depends on the use of informant reports (IR) of personality, or information about an individual's personality from a close other (friends/family members). Examination of personality is associated with differential obtainment of IR. Little research has been done to see if certain traits could influence others to provide information on participant's personality. A total of 193 undergrads at the University of Tennessee at Chattanooga participated in a study aimed at understanding first impressions. Participants completed self-reports of personality (Saucier, 1994) and contact information for up to five close others. Of those participants 67% had at least one IR of personality (Mdn=1, range 0-5). We expected to find that individuals who scored higher on extraversion and agreeableness would receive more IR. However, results indicate that individuals who scored lower on extraversion actually received more IR and no relationship was seen with agreeableness. These findings provide insight to the quality of IP relationships in individuals with specific traits. Discussion focuses on implications for research on first impressions and potential future directions.

Harden, William

“Surgical irrigation in the plastic surgery operating room for breast augmentation/reconstruction, triple antibiotic vs. chlorhexidine gluconate solutions: a comparison of the efficacy against potential target bacteria that can lead to infection.”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Henry Spratt

Co-presenters: Maddison V. Melchionna, William R. Harden, Jonathan A. Gunn, Mark A. Brzezienski, Mathew T. Epps, David Levine, Henry Spratt

Abstract: Breast augmentation is one of the most popular plastic surgical cosmetic procedures performed today. In 2006, a surgical wash was developed to try to reduce post-operative infections (Adam's solution, containing the antibiotics cefazolin, bacitracin, and gentamycin). This wash is used to irrigate the cavity formed to accept the breast prosthesis during surgery. The antiseptic agent chlorhexidine gluconate (CHD) has also been used to irrigate these cavities. Here we investigate the antimicrobial efficacy of the Adam's solution compared against CHD in the killing of some bacteria found to cause surgical site infections (e.g., Staphylococcus epidermidis, Methicillin resistant S. aureus [MRSA], and E. coli). Our experimental protocol involved the use of a sterile test tube as the breast "cavity", to which known quantities of target bacteria were added. These bacteria were challenged with either solution for 1 minute, followed by rapid dilution and transfer to a bacterial growth medium. Results of our comparisons suggest that for S. epidermidis, the CHD solution worked best (killed all replicates), while for E. coli and MRSA, variable killing was found for the Adams and CHD solutions (E. coli was killed in 2 of 3 replicates for CHD, while there was no killing of E. coli in the Adams solution; all replicates of MRSA survived in both antiseptic solutions). These data suggest that the CHD solution could outperform the Adams solution in these surgeries. Further studies of potential unwanted side effects due to CHD will continue in the near future.

Harlan, Katherine

“Modeling carbon surface adsorption of organic molecules as a first step to compute anticancer molecule retention on carbon nanotubes”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. Tom Rybolt

Co-presenters: Connor Frye

Abstract: In work by other researchers (H. Dai et al., 2007) it has been shown that carbon nanotubes (CNTs) loaded with the anticancer agent doxorubicin could be selectively transported into tumor cells, release doxorubicin, and cause cell death. Our overall interest is the computational molecular modeling of doxorubicin-CNT interactions along with other anticancer drugs. Loading and release can depend on the CNT length and diameter of these straw-like structures. We wish to predict the amounts of anticancer agents that might be loaded on CNTs based on calculated values such as molecule size, functional groups, solubility, and molecule-surface binding energies. We use molecular mechanics software to model molecule and carbon surfaces. The initial portion of our work is to correlate the carbon surface adsorption of molecules from solution with computed molecular properties. The amount of various organic molecules that can be adsorbed onto a carbon surface determines the effectiveness of materials such as carbon nanotubes to hold and deliver these medicinal molecules. We are using an experimental data set with the values of the carbon surface adsorption for 102 diverse organic molecules in order to correlate solution phase adsorption.

Harris, Cullen

“The Status and Conservation of the eastern hellbender (*Cryptobranchus alleganiensis*): Directions for the Future”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Thomas P. Wilson

Co-presenters: Cullen Harris, Paul-Erik Bakland, Joanna Elmore, David Hedrick, Nyssa Hunt, Austin Vanover, Team Salamander, Dr. Thomas Wilson

Abstract: The eastern hellbender (*Cryptobranchus alleganiensis*) is a species of giant salamander that is native to the United States. Adult hellbenders can grow up to 300-740mm and live their entire life in cool and fast flowing streams. They require extremely high-quality aquatic habitats, and their presence indicates good ecological health. Giant salamanders have existed for 65 MY and their populations have declined in the last 20-30 years. Habitat alteration and poor water quality are the leading causes for their decline. We have compiled a comprehensive meta-analysis that identifies the status of the eastern hellbender by state, and reviews current threats in an effort to make sound conservation decision and elucidate data gaps. Beyond this, we have communicated with state DNR biologists to identify conservation priorities. Lastly, we have taken a deeper look into the conservation efforts of associated zoos, aquariums, and conservation institutes. Once implemented, our meta-analysis would be a tool for research professionals who are interested in applying adaptive conservation and management strategies to the eastern hellbender.

Harvey, Jamie, Ed.D

“High School Football Officials' instructional and educational video from the perspective of the high school official”

College of Health, Education, and Professional Studies (Health & Human Performance)

Co-presenters: Students: Caden Ricketts, Brandon Pratt, Emilie Sloan

Abstract: Did you realize a referee is the only football official who wears a white hat or that the umpire stands behind the defensive line? The world of a high school football official is in constant motion on the football field during a game. A football crew on the field of play consists of a referee, back judge, head linesman, line judge and umpire.

Each position has a collective and individual duty to officiate within guidelines and rules for the safety and sportsmanship of the competitive game. Health and Human Performance undergraduate students in HHP 2010/Introduction to teaching health and physical education K-12 created the script that describes each official's responsibilities to the football crew and the players. Students attended a high school game, interviewed a specific official and collected descriptors from sources. This instructional and educational video offers information to a new official or recruits someone interested who may consider officiating. The perspective from the football official's field position is viewed and described in this 4 minute production. A collaboration from several university departments made this possible: Health and Human Performance, Library, ARC, Athletics and Communications.

Hayes, Loren, Ph.D.

“Intraspecific variation in carnivore social organization”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Loren Hayes

Co-presenters: Reysheaun Calloway, Kayla Chrisman, Dimitria Crutcher, Roderick DeBerry, Chloe Dente, Ariel Frauwirth, Shannah Hattaway, Shelby Hay, Brandi Hearn, Roman Hughes, Brandon Johns, Christopher McNair, Thomas Parker, Cameron Quillen, McKinley Tidwell, Bradford Whitaker, Maia Yerka

Abstract: Carnivores exhibit a wide range of social organizations. We determined the extent to which female-male social organizations varied in terrestrial carnivores (intraspecific variation in social organization, IVSO). Data on the number of males and females per social unit were collected from the primary literature during Biol 4999L (Behavioral Ecology) lab meeting times. We compared our database to two previously published databases and information collected from an encyclopedia of mammals. Preliminary data suggest that carnivores exhibit greater IVSO than previously thought. Our database based on the primary literature differed greatly from published databases. We discuss implications of IVSO for evolutionary and social theory. We also discuss the importance of using primary data and not secondary sources of data when preparing data bases on social organization.

Helums, Morgan

“Cohesiveness in Nursing”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Kate Kemplin

Co-presenters: Jo Beth Wilson, Brittany Parrish, Myah Mukes, Viktoriya Malashiy

Abstract: The purpose of this research project is to evaluate the cohesiveness of undergraduate level students, graduate level students, and faculty within different cohorts of the School of Nursing at The University of Tennessee at Chattanooga. We have collected our data via UTK Qualtrics using the modified Group Cohesiveness Scale. This research project will hopefully provide insight to whether cohesiveness positively or negatively affects academic and professional success in Nursing.

Hill, Brittany

“Parental Views of the Internet and Its Effect on Their Children”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Abstract: The research explores caregivers' views of their children's Internet behaviors, knowledge of the Internet, attitudes toward the Internet, strategies for monitoring their children's Internet behaviors, and perceptions of support from schools and/or the community for curbing riskier problematic Internet use. The current school-age children's generation is called the "Internet Generation", this is because they have never lived in a world without Information Communication Technology (Valke, 2010). The Internet is now a critical part of school learning and also home life.

In the past, parents have used strategies like monitoring software, co-viewing, and only having computers in common areas to curb Internet behaviors (Warren, 2002). Strategies are becoming outdated because technology is evolving rapidly. Parents are in need of new strategies, new support, and have different attitudes as these changes are being made. The online survey for this research project will provide up-to-date data on how parents are dealing with these issues and how strategies continue to evolve with the Internet.

Humphries, Jocelyn

“Mocs Bikes Together”

College of Arts and Sciences (Art)

Research Advisor: Dr. Andrew Bailey

Co-presenters: Jessica Leath, Olivia George, Morgan Mckenna

Abstract: In our 2016-2017 Innovations in Honors lab, we were tasked with developing a creative way to improve Chattanooga's existing outdoor health and well being. After much deliberation, our group of four decided to pursue a partnership with the Chattanooga bike share system, with the ultimate dream of including their bike memberships into our tuition fees. We believe that this addition to our campus will make a positive impact on students' physical and mental well being, while also adding to the overall appeal of UTC as a university.

Ide, David

“Study of the Photoacoustic Effect on C₂H₄ at High Concentrations, at Trace Detects in N₂, and Detect Concentrations of Gas in Fruit”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. Han Jung Park

Co-presenters: Jo Beth Wilson, Brittany Parrish, Myah Mukes, Viktoriya Malashiy

Abstract: Ethene (C₂H₄), which is produced in plants as they mature, was used to study its photoacoustic properties using Photoacoustic Spectroscopy. Detection of trace amounts, with N₂ gas, of the C₂H₄ gas was also applied. The gas was tested in various conditions-temperature, concentration of the gas, gas cell length, and power of the laser-to determine their effect on the photoacoustic signal, the ideal conditions to detect trace gas amounts, and concentration of C₂H₄ produced by an Avocado and Banana. A detection limit of 10 ppm was determined for pure C₂H₄. A detection of 5% and 13% (by volume) concentration of C₂H₄ produced for a ripening avocado and banana, respectively, were determined in closed space.

Jacobs, Kaetlyn

“Self-reported codependency measures in a selected sample of nursing students and clinicians”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Kate Kemplin

Co-presenters: Haley Edmondson, Heather Stevens, Christie Cox, Hunter Bogits, Haylee Simpson

Abstract: The purpose of studying codependency trends in the nursing profession is to gain awareness for the issue. There is little research regarding codependency in the nursing profession. With codependency being such a widespread problem, this study can be a groundbreaking milestone for the future of nursing. By discussing codependent characteristics and educating nurses on recognizing negative aspects of their relationships, an improvement can be made inside the hospital and outside in their personal lives. This is a descriptive cross-sectional study of a sample of 45 nursing students and clinicians. There will be a 65 question survey, modified from Friel's

Codependency Assessment Inventory, sent through social media and within the UTC School of Nursing. Data will be collected into Qualtrics and analyzed through SPSS pending IRB approval.

Klug, Hope, Ph.D.

“Collaborative UTC-TN Aquarium Research to Conserve an Endangered Fish”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Co-presenters: Sarah Farnsley, Elijah Reyes

Abstract: Researchers at the University of TN at Chattanooga (UTC) and the TN Aquarium Conservation Institute (TNACI) have conducted collaborative research to conserve the Barrens Topminnow, a small fish that is endangered in part due to the introduction of an invasive predator. This presentation will highlight the collaborative work that has taken place over the past five years. Specifically, we will focus on research that aims to teach Barrens Topminnow individuals to avoid predation. In addition, we will briefly discuss other collaborative research that is taking place between scientists at UTC and TNACI.

Korshun, Alexandra

“Photoacoustic Microscopy with Carbon Black: Sound Generation by Pure Elemental Carbon”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. Han Park

Abstract: Photoacoustic microscopy was performed using carbon black phantoms in order to observe the acoustic behavior of samples and evaluate the feasibility of the method. Carbon black phantoms made from agarose powder were irradiated with pulsed Nd:YAG laser. The diameter of the laser beam was 2 mm, and it allowed to scan sample every 2 mm in x and y directions using the moving stage. Signals from each scanned point were captured with the ultrasonic transducer. Photoacoustic signals were proportional to the opaqueness of the sample. Optically transparent areas produced very low signals due to the low absorptivity, and vice versa. All photoacoustic data was collected in two dimensions, making it possible to convert data to the 2-D graphs and 3-D diagrams using mathematical software.

Leach, Sara

“Implementing an Honors College Orientation with a Focus on Diversity”

Honors College (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Courtney Crittenden

Co-presenters: Mallory Burman, TriDereka Hall, and Queenie Webb

Abstract: Since August 2015, we have conducted preliminary research and collaborated with community partners to help establish an Honors College orientation for the incoming freshmen of 2017-2018. With the overall goal to establish this orientation, four subgroups were formed: community, relationships, diversity and self awareness. This group had the focus on diversity, with the goal of reaching out to minority groups on campus to discover how they would like to be represented in the orientation. The campus organizations we reached out to on campus include the Women's Center, UTC SPECTRUM, the LGBTQQIA association, and the Multicultural center. This community engagement helped set the foundation for the orientation to include student familiarity of the campus resources and events to help students become educated and involved on campus.

Leisenring, Lauren

“PAWS: Postsecondary Awareness in Elementary Schools”

College of Health, Education, and Professional Studies (Center for Community Career Education)

Research Advisor: Sandy Cole

Co-presenters: Bernadette Smith

Abstract: The Center for Community Career Education has been analyzing the impact of postsecondary awareness for elementary school students for the past ten years. We believe that through our after-school program, PAWS, postsecondary awareness could be effective for our elementary students. The program aims to expose this information early because this age group is well equipped to explore and consider multiple aspects of school and career options. We intend to "plant the seed" in children as early as possible so that they may become aware of their postsecondary potential before their self-concepts and perceived place in society become barriers to their goals and future successes. Our research examines the academics and behavior of our students participating in the program. Along with this, we review pre and post test surveys to view their attitudes and perceptions of different postsecondary options while they attend the program.

Levine, David, PT, Ph.D., DPT

“The Effects of Photobiomodulation on Quadriceps Muscle Endurance”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Bobbi Dodson, Chaz McCormick, Chris Newsom, Andrew Thompson

Abstract: The purpose of this study was to examine whether photobiomodulation induced via laser therapy between sets of isokinetic exercise improves muscle endurance. Laser therapy was applied to the quadriceps between sets of isokinetic, concentric knee extension. Differences between laser and placebo were examined for all variables (peak torque [Nm], peak torque normalized by body mass [Nm/kg], average torque [Nm], total work [J], and power [W]). Twenty healthy subjects participated in a double blind, cross-over study, approved by the UTC IRB. Subjects were trained and tested using the BIODEX System 3 isokinetic dynamometer. The protocol consisted of a 5 minute warm-up on a stationary bike followed by testing. During testing, subjects performed 4 sets of 30 isokinetic, concentric knee extensions with laser or placebo laser applied between sets 1-2, 2-3, and 3-4. Each repetition was performed through a 75 degree arc at 75 °/s. There was a 4 minute standardized recovery period between each set, during which laser was applied. Data analysis was performed using a factorial analysis of variance (set X last X type). A significant difference ($p < .01$) was found between laser and placebo laser suggesting a potential ergogenic effect.

Lindsay, Emily

“Creating an Honors College Program to Educate Students on Relationship Violence, Community, and Self-Awareness”

Honors College (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Christina PolICASTRO

Co-presenters: Rachel Emond, Lauren Greenspoon, Savannah Camp

Abstract: Sexual assault and relationship violence is a prevalent issue on college campuses that universally suffers a lack of resources and student education. Even here at UTC, while resources do exist, many students do not know about them and the services that they offer. For this project, we're using research on various other programs pertaining to sexual assault and relationship violence that are in use at other universities in order to create a program for the UTC Honors College about how to thrive in a new community. Our contribution to the program will focus on self-awareness and educating students about how to handle your own emotions, as well as the resources to use if you find yourself in a dangerous relationship or situation. The program that we are striving to create will provide Honors College students with a form of education intended to teach them not only how to integrate themselves into the Honors College community, but also how to react behaviorally to others around them and be self-aware. By using

successful programs from other universities as models for our own, we hope to formulate the best design that will be the most beneficial to students and provide the most useful information in a practical format.

Locke, James

“Utilization of brainwave data for better instruction and coaching in an outdoor setting”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Andrew Bailey

Co-presenters: Matthew Somers

Abstract: An exploration into the fascinating world of the brain. Rock climbing, rappelling, and mountain biking are exciting activities to participate in, but we wanted to know why. In this workshop, we explore what our brains are doing when participating in various experiential education related activities. Our research uses an electroencephalogram or EEG to look at specific brain activity during the three forementioned activities. EEG scanners, which measure electrical activity and record brain waves, were attached to participants during the activity. The participants were also recorded with a GoPro so that we were able to cross reference footage and the data we were receiving from the scanners and match them second-by-second. As the video rolls across the screen, our brain data is moving at the same rate so we are able to see exactly what the brain is doing. We will share this data allowing you to see the brain waves and video recordings, and we will explain what the brain is doing throughout the activity. By knowing the way the brain reacts to different situations allows instructors to accurately coach individuals, learn new teaching tools, and assess someone's cognitive state. Much can be achieved in the classroom of experience that

Loudenslager, Alexis

“Strengths and areas of improvement of Comfort Care Homes for the Indigent”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: Rick Durham, Chris Precise

Abstract: The purpose of our study is to explore the strengths and weaknesses of comfort care homes, which are hospice facilities that serve homeless individuals who are dealing with a terminal illness and are at the end of their life. We have been approached by a local comfort care home to help them collect the information needed for this research. This study will address the following research questions:

- (1) What obstacles or needs do comfort care homes experience in serving the homeless population?
- (2) What are the benefits of comfort care homes? How are they useful or helpful to clients and the community?
- (3) What are some specific strategies or ways to improve comfort care homes?

The purpose of this research study is to conduct a qualitative project to investigate how comfort care homes for the homeless or otherwise disadvantaged can become better. The participants will include residents, administrators, employees and volunteers. There will be a formal interview with the questions outlined below. These questions and answers will allow current and future homeless comfort care homes to understand where they are lacking as an organization and ways the participants feel they can make it better.

Love, Tiffany

“The Health Status of Refugees at Bridge Refugee Services”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: Hannah Jordan, Skyler Winkler

Abstract: The purpose of this study is to learn more about the health status and receipt of services for refugees coming to the United States. Bridge Refugee Services works with a diverse group of refugee clients that come to the United States with many health-related problems that need to be addressed. Physical and mental health difficulties can be combated with stable resettlement and social support. These are the goals of refugee service agencies and their volunteers and partners. It is important for these agencies to be aware of these concerns so that the most effective services can be provided to both children and adults. The information from this study will be used to help Bridge evaluate current services and improve on them for the future.

Research Questions:

What are the most common health problems among refugees?

Does the number of health problems or type of health problems differ among populations (e.g., geographically, age, gender, etc.)?

Loveless, Daniel, Ph.D.

“An Interdisciplinary CubeSat Research and STEM Education Platform (UTChattSat)”

College of Engineering and Computer Science (Electrical Engineering)

Co-presenters: A. Patel, M. Joplin

Abstract: UTChattSat designs and develops low-cost small-satellite systems for space-infrastructure needs, researches emerging technological problems related to the space sciences and develops 3D-printed satellite models and electronics systems for middle and high school instruction as well as research in cyber-physical systems. The satellite technology is currently being used for the development of science and engineering curriculum, research on robust electronics for space systems, high-altitude balloon projects, and general IoT sensor applications.

Malone, Dominique

“Disenfranchisement of Rape Victims”

Honors College (Social, Cultural, & Justice Studies)

Research Advisor: April Bennett

Abstract: A trending topic in the criminal justice system, as of now, is how rape victims have become increasingly disenfranchised by the system that is supposed to protect them. The initial steps that a victim endures to report their cases superficially seems simple; however, after further investigation the sources become murky and unhelpful. After the long process of filing, the victims are faced with invasive questions that only pertain to choices they made, rather than questions about the perpetrator's actions. Through my presentation, I intend to show many of the obstacles that rape victims face to receive justice, beginning with the incident and ending with the trials

Martin, Melanie

“#RelationshipGoals”

Honors College (Psychology)

Research Advisors: Dr. Courtney Crittenden, Dr. Christina Policastro

Co-presenters: Cintly Guzman, Caroline Waldron, AJacia Wash

Abstract: Have you ever heard the term, "#RelationshipGoals," or someone say, "They are goals," referring to a couple? Too often, those phrases are thrown around without really understanding what kind of characteristics should be included in any relationship: platonic, family, romantic, even academic. In this world that is oversaturated with media there are unhealthy relationships being presented as what a relationship should look like but those relationships are toxic in the real world. Young people today are barely taught that boundaries, listening to another person, and respecting anyone's decision to say no are important in any relationship. When college students first arrive on campus there is little commonality between them and the person right next to them. This can be a confusing time for them trying to navigate all kinds of relationships that they will experience during their time at a university. It can be difficult for anyone to recognize signs of an unhealthy relationship and deal with conflict in a healthy manner without previous knowledge. For these reasons, our iLab group is working on a discussion style training program to present to incoming honors freshmen that deals with what healthy and unhealthy relationships look like.

McKinley, Cecilia

“Merleau-Ponty: Is the Phenomenology of Perception a Universal Project?”

College of Arts and Sciences (Philosophy & Religion)

Research Advisor: Dr. Tamara Welsh

Abstract: Maurice Merleau-Ponty discusses how one perceives movement and how one's intentions affect one's movement in the physical world. Merleau-Ponty studies special cases in order to uncover how different aspects of sense and perception affect experience.

In addition to discussing perception through movement and intentionality, Merleau-Ponty describes phenomenology as a style for its fluidity throughout history, arguing that this shared reality we perceive is constantly created and recreated with history and one's setting. It is possible to reach general laws or common characteristics of the phenomenology of perception. However, the view of Merleau-Ponty that phenomenology is a fluid style means that each person's schema and intentionality affects others and responds to the same fabric of reality.

He describes phenomenology as "style" for its fluidity based on its participants: it is something being constantly created and recreated. A similar experience is attached to a different story arc, but for the same purpose. People want to participate, and they want their world to make sense, but this fluidity is another reason that the phenomenology of perception must be described in more general characteristics, like intentionality.

McPherson, Grace

“Computer Science Mentorship in Hamilton County Schools”

College of Engineering and Computer Science

Co-presenters: Katie Rouse, Morgan Sanborn, Stephanie Honore

Abstract: Computer Science suffers from a gender gap. A mere 15% of computer science graduates are women. Experts on the Computer Science Gender Gap often point to the lack of opportunities and lack of role models during school as the cause of the leaky pipeline. At UTC the computer science clubs, Geeks and CompUTC, have taken initiatives in Hamilton County schools to combat these issues by leading hands-on workshops in classrooms. In this presentation we will showcase examples of the curriculum

Melnik, Laurie, MFA

“Southeast Center for Education in the Arts: Transforming Education in and through the Arts”

College of Arts and Sciences (Southeast Center for Education in the Arts)

Co-presenters: Dr. Joel Baxley, Director of Visual Art Education; Michele Mummert, Teaching and Learning through the Arts Program Coordinator

Abstract: The Southeast Center for Education in the Arts (SCEA) celebrates 30 years of transforming education in and through the arts across the southeast region. From early learning to K-12 education to professional training, SCEA continues to make a positive impact through their quality programs. Highlighted programs include From STEEEP to STEEPPER: Investigating Visual Art Analysis and Drama-Based Praxis in Physician Training; the Chattanooga Arts Area Needs Assessment (2017 CRISP Grantee), I COME FROM A PLACE: A cross-generational storytelling project (2017 Arts, Innovation, and Activation Grantee), Early Learning in the Arts, and Sherwood Elementary: An Arts360 School.

Miles, Chelsey

“Foster Parents' Experiences with Guardians ad Litem”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: Harlee Milligan, Sayvion Whitaker

Abstract: The purpose of this research project was to conduct a qualitative methods research study to examine foster parent experiences with their foster child/children's Guardian ad Litem or assigned legal advocate. The project was intended to fill the gaps in research regarding: (a) foster parents' initial perceptions and understanding of the role of GALs; (b) foster parents' overall experiences with GALs; (c) the accessibility and availability of the GAL to the foster parents during the fostering process; (d) after working with a GAL, any changes from the initial perceptions that foster parents have regarding a GAL's role, and (e) information regarding whether or not foster parents are provided sufficient education about the functions, boundaries, and purpose of a GAL prior to working with a GAL. This study employed cross-sectional survey methodology utilizing a purposive snowball sample of licensed foster parents over the age of 21 recruited through word of mouth, social media, and foster family focused agency advertisement of the survey. The benefit of this study is that it broadens the availability of research that might greater inform, support, and strengthen foster parents, will in turn strengthen foster children and thus, society.

Miles, Alexandra

“The Use of a Puzzle Box as Animal Enrichment for a Captive Red Fox”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Joseph McCauley

Co-presenters: Matthew Baker, Alexandra Miles, Rachel Fuller, Melanie Mardon, Sarah Farnsley, Dr. Hope Klug, Dr. Preston Foerder

Abstract: Environmental enrichment has been used in numerous studies to enhance animal welfare through the application of stimulating activity that promotes positive and rewarding experiences. We chose to concentrate on one red fox (*Vulpes vulpes*) at the Reflection Riding Arboretum and Nature Center in Chattanooga, TN. We constructed an enclosed puzzle box with various shaped holes at different heights between chambers that required the fox to maneuver around in order to locate food. The box had one clear plastic side to enable observation and was placed in a nearby enclosure to the fox's home cage. The fox was transported to that enclosure for enrichment sessions. Using an ethogram devised for this research, we collected data for three weeks: ~1 week baseline without the enrichment device, ~1 week with the environment enrichment, and ~1 week post-enrichment (again without the enrichment device). Behavioral observations were collected at 30s intervals using a scan sampling procedure. The data was

analyzed to compare the three observation periods and investigate behavioral changes over the three observation periods. The Reflection Riding Nature Center intends on using the enrichment puzzle box for other species to encourage behavior.

Miller, Alyson

“Examining the Needs of Refugees and Refugee Service Providers: A Case File Examination”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Abstract: This project is a quantitative evaluation project examining the services of a refugee resettlement agency in southeast Tennessee by examining client case files. The research questions will include: (1) What are the needs of the clients of this refugee resettlement agency, (2) what is the amount of financial assistance that clients receive and the length of time they receive this assistance, (3) what is the average length of time it takes clients to achieve self-sufficiency, (4) does the amount of assistance that refugees receive and the time to self-sufficiency vary by demographic information. The amount of time to self-sufficiency will be determined by the employment status of the clients within the first six months after the date of arrival to the United States. I will review information such as clients' country of origin, ethnicity, gender, age, family dynamic and living situation, religion, age, level of education, and other aspects of culture. I will use descriptive statistics and correlation to complete my analysis. I will discuss the implications of this study in regards to policy, social work practice, and what future research is needed regarding this population.

Mitchell, Ashton

“A Biotic Survey of Outcroppings and *Pinctada longisquamosa* in Oyster Pond One Year After Hurricane Joaquin Located in San Salvador, Bahamas”

College of Arts & Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Dawn Ford

Abstract: On San Salvador, Bahamas, there are a series of inland ponds across the island. Oyster Pond, a marine pond with underground conduit connections to the oceans, hosts an array of algae, small fish, and invertebrates. In March 2016, myself and three other colleagues, studied the effects of the October 2015 Hurricane Joaquin on the biota present on pond outcroppings. March 2017, I will be returning to the island of San Salvador to compare our findings from March 2016. In March 2016, we surveyed outcroppings that occurred along three parallel transect lines. We found a slight decrease in pH and a slight increase in salinity in comparison to 2015 data. We observed many of the same invertebrate species from pre-hurricane studies, we found oyster species to in greater quantities, while algae populations showed an absence of previously observed algae species. Eighteen months after Hurricane Joaquin, I hypothesize Oyster Pond has returned back to its normal state prior to Hurricane Joaquin with the exception to an increase in *Pinctada longisquamosa*, or Oyster Pond has not returned to its original state; still smaller outcroppings are present and no sighting of algae species that were previously found.

Mix, Charlie

“Implementing GIS & Geodesign Tools for Landscape Conservation of the greater Chattanooga region”

Administration (Office of Vice Chancellor for Research)

Co-presenters: Nyssa Hunt, Holland Youngman, Alastair Keith Lucas, Andrew Carroll

Abstract: Geographic Information Systems (GIS) has long been crucial for conservation planning, but recent developments in web based GIS applications makes geospatial tools and data more available than ever to a wider user

base with minimal knowledge of GIS. UTC's Interdisciplinary Geospatial Technologies Lab (IGT Lab) is developing a decision support tool and conservation models in partnership with the Land Trust for Tennessee, the Open Space Institute and Sewanee: The University of the South. The project works with existing climate resilience data supplied by the Nature Conservancy, local State Wildlife Action Plans, protected lands, landowner databases, and recreation data supplemented with models developed by IGT Lab and Sewanee that rank biodiversity, water quality, and agriculture. The tool employs techniques from the geodesign field incorporating multiple interdisciplinary users and stakeholders to increase collaboration and expertise among regional conservation groups and funding organizations facilitating conservation planning efforts spanning 3 states, from the southern Blue Ridge Mountains to the South Cumberland Plateau.

Mobley, Kate

“Analyzing Differential Rates of Child Maltreatment in the United States”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Pamela Ashmore

Abstract: Child maltreatment statistics are typically presented at the state level. The rate of child maltreatment ranges from 0.01% to 1.7% when states are compared, but from 0% to over 5% when counties are compared. The purpose of this research was to identify counties with significantly above or below average rates, and to find what traits those counties and areas have in common with one another. Statistical analysis of data collected by government agencies and the United States Census between 2008 and 2012 was used to identify sixteen areas of the country to be further studied, and the results of the research revealed that child maltreatment rates in a county are correlated to the rate of unemployment and poverty in the county, and somewhat correlated to the rate of urbanization in the area. The results were analyzed using Robert K. Merton and Robert Agnew's theories of strain, and how people respond differently to different types of strain. Pinpointing specific areas in which child maltreatment rates of occurrence are outer lying from the national average, and identifying the conditions that may contribute to occurrences of child maltreatment is the first step to developing more targeted methods of combating child maltreatment.

Moore, Destiny

“Beyond the Screams: Family Dynamics and Horror Films”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Shawn Trivette

Abstract: The research examines how society is portrayed in horror films. Furthermore, this research focuses on how gender and race impact family dynamics and relationships. A content analysis is used to determine how social constructs and stereotypes are reflected and reinforced through entertainment. Previous research has determined what the concept of horror entails: the mood evoked by a morbid sense to something of evil, murder, or death. Other literature explains how movies are narratives that are produced from cultural traits. Studies have found differences in portrayal amongst gender as well as race. Previous literature provide assistance in understanding how societal traits are understood and portrayed through the media. The research relied on a data collection of fifteen horror films selected from IMDb.com. Those listed on this website under the most popular horror films of 2016 were selected. The research designed codes to determine the patterns that existed among horror films. The research found that family dynamic and interaction is a central theme of horror films. The role of the family members is central to the plot of every film in the data set. The maternal role was portrayed most often and usually involved traditional stand

Moreland, Emily

“The Experiences, Relationships, and Roles of Guardian ad Litem and Court Appointed Child Advocates”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: Katie Lindsey, Deborah Johnson

Abstract: The purpose of this research was to conduct a qualitative study to examine the experiences of guardian ad litem (GAL)/court appointed child advocates (CASA). Guardian ad litem (GALs) and court appointed child advocates (CASAs) are volunteers appointed by judges to watch over and advocate for abused and neglected children (National CASA Association, 2015). GALs/CASAs advocate on behalf of the child so they do not get lost within the confusion of the legal system. Interaction between the child welfare system and the GALs/CASAs can often be very difficult because they can have different goals for the children. The GALs/CASAs' goal is the best interest of the child, whereas the court's goal is often the safety of the child. This research was conducted through online surveys with a consent form attached. We asked GALs about their experience and the experience of foster parents involved in this process.

Morgan, James

“Archaeological Survey of a Historic Gullah/Geechee Community on Sapelo Island, Georgia”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Nicholas Honerkamp

Co-presenters: Cassandra Davis

Abstract: Over the course of three weeks during UTC's summer semester of 2016, anthropology students of the university's archaeological field school led by Nicholas Honerkamp and Lindsey Cochran conducted survey and testing of a historic Gullah/Geechee community on Sapelo Island, Georgia. During the 19th century, two settlements on the south end of the island, Bush Camp Field and Behavior, were home to a large number of enslaved Africans at Thomas Spalding's plantation. UTC's field school attempted to re-locate several structures previously identified by Ray Crook which had non-typical wattle and tabby daub construction, as well as determine whether or not these structures were representative of the larger community. Using shovel test pits as well as larger test units, UTC students recovered artifacts and features confirming wattle and tabby daub construction styles, indicating an African or Caribbean style of architecture. The evidence recovered indicated that the enslaved at Bush Camp Field and Behavior settlements had a unique degree of autonomy on Sapelo Island. This relatively greater degree of self-determination on Sapelo is interpreted as an indication of Gullah/Geechee resistance to the institution of chattel slavery.

Nabors, Macall

“The Prevalence of *Batrachochytrium dendrobatidis* in Watercourses Situated in Southeast Tennessee”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Thomas Wilson

Co-presenters: Dr. Ethan Carver, Dr. Jose Barbosa, Team Salamander, Dr. Thomas Wilson

Abstract: The pressure of the fungal disease *Batrachochytrium dendrobatidis* (Bd) has been correlated with amphibian decline and extinction. Studies concerning the nature of Bd have been conducted; however, more studies are needed to adequately evaluate Bd in southeastern Tennessee. Due to previous studies, the following hypotheses were proposed: watercourses in southeastern Tennessee will test positive for Bd, urban streams will have a greater presence of Bd than rural streams, and increased canopy coverage will correlate positively with Bd. Field sampling took place at

four different watercourses: Stringer's Branch, Ryall Springs Branch, South Suck Creek, and Prentice Cooper WMA. Also at each site of capture, densitometer readings were taken. DNA was extracted from 48 Plethodontidae swabs with the Tissue protocol from the DNeasy Blood & Tissue Kit. The results indicate that two samples, both Genus Eurycea, were positive for Bd. The positives indicate that Bd is present in Stringer's Branch and PCWMA's Crater Lake. With only two positive samples, the correlation between Bd and the classification of watercourses and canopy cover could not be assessed. Due to this study, more informed Bd protocols could be enforced in southeast Tennessee.

Newell, Elliot

“Foster Mothering, Foster Fathering, and Coparenting Among Foster Parent Dyads: Links to Foster Parent Outcomes and Child Well-Being”

College of Arts and Sciences (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenter: Heather Murray

Abstract: Coparenting has been identified as an effective parenting strategy that improves child well being by providing security and consistency in family interactions, yet little research exists that investigates coparenting among foster parents (McHale 1997). This mixed-methods project attempts to fill this gap in the literature by investigating coparenting styles among foster parents, with an emphasis on the role and identity of foster fathers. Specifically, this research addresses: (a) factors that affect coparenting quality among foster mothers and fathers; (b) factors that affect the identities of foster mothers and fathers; (c) factors that affect involvement of mothers and fathers with foster children; (d) associations among coparenting, identity, and involvement of foster mothers and fathers; and (e) associations between coparenting, parenting, and child well-being in foster families. The sample consists of current foster parent couples in the United States, recruited through the National Foster Parent Association. Data is being collected through an online survey, and participants are given the option to take part in a follow-up phone interview that further examines a caregiver's role in fostering.

Nguyen, Jay

“A Study of the Photoacoustic Effect in Ethylene Gas”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. Han J. Park

Abstract: Ethylene, C₂H₄, is a plant hormone produced and released naturally by plants and soil microorganisms. This colorless, flammable gas has a slightly-sweet odor usually only recognized by those who have handled ethylene before. In situ measurements of ethylene outside of the lab are difficult to perform due to the lack of a portable yet sensitive unit capable of accurately and repeatedly measuring at necessary resolutions of a few parts per billion. In this project, photoacoustic spectroscopy was used to detect and measure the concentration of ethylene. Multiple aspects of the experimental setup were independently manipulated to determine each of their effects on the photoacoustic signal produced by ethylene. These variables included the rotational frequency of a mechanical chopper, concentration of sample, diameter of the cavity resonator, and power of the light source. An analysis of the data revealed more information about what experimental conditions were most ideal for reliable ethylene detection outside of the lab.

Nourabadi, Elnaz

“Incremental Rehearsal: Increased Sessions Yields Increased Retention Rate”

College of Arts and Sciences (Humanities)

Research Advisor: Dr. Jim Tucker

Abstract: Incremental Rehearsal is a learning/teaching technique invented by Dr. James Tucker at the University of Tennessee at Chattanooga. This technique is a basic flash card technique that is used to help users commit information to long-term memory so that it becomes automatic. Currently, Dr. Tucker and his team of graduate students are testing his teaching methods at an elementary school in Chattanooga. The graduate students will track the progress of fourteen elementary school students who have fallen behind on their reading levels to see if and how this method works. Progress is tracked by analyzing acquisition rate, the number of unknown words mastered at the end of each session, and retention rate, the amount of unknown words mastered at the end of one session and still mastered at the next session. There are many variables that affect the child's progress: gender, grade level, disabilities, behavioral differences, and also the number of incremental rehearsal sessions that are conducted per week. The present study seeks to analyze overall retention rate in correlation to the number of sessions each student has each week leading to a positive correlation between the amount of sessions a student partakes in and retention rate.

O'Connor, Kristen

“Observing Observation: An Ethnographic Exploration of College Students' Perceptions of Mass Surveillance”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Zibin Guo

Abstract: This study employs ethnographic methods to explore cultural perceptions on the use of mass surveillance among Millennial Generation students at UTC. Patterns of awareness, opinion, and behavioral responses are used as the focal points for investigating cultural perceptions. Understanding the patterns, as well as variations, in perceptions of mass surveillance is important, as its use is increasingly becoming a part of contemporary life. The study contributes to a deeper understanding of the dynamics between social changes and cultural responses.

O'Shoney, Cailee

“Mental Health Court: Resources, Needs and Experiences of Participants”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: R. David Courtad

Abstract: We will be examining the effectiveness of the Mental Health Court (MHC) in Hamilton County Tennessee. Mental Health Court is designed with the intention to rehabilitate those who have been diagnosed with a mental illness and are involved with the court system. According to the National Alliance on Mental Illness, "24% of state prisoners have a recent history of a mental health condition," yet they are not receiving the therapy they need (Numbers, 2016). Our hope is to provide accurate data based on the personal testimonies of the MHC participants to show the outcomes of the MHC program. We plan on gathering these personal testimonies through in-person interviews asking the following questions: What has your experience with the Mental Health Court been like? How has your opinion or experience of the Mental Health Court changed over time? How has the Mental Health Court been helpful to you? What are the strengths of the program? How could the Mental Health Court be improved? How well has the Mental Health Court prepared you for exiting the program? Is there anything else that you would like us to know about you or your experiences with the Mental Health Court?

Park, Ashlyn

“Maintaining Community Through You”

Honors College (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Courtney Crittenden

Co-presenters: Stephanie Poget, Abby Callahan, Lindsey Farrell

Abstract: Our group is one of multiple in an Innovation Lab that has dedicated its semester to creating a Title IX, Sexual Victimization, and Interpersonal Relationship Violence program for the Honors College Orientation. The program intends to work on these elements with regards to their impact on community as a way to interest and integrate the rising Innovation, Brock, and High Achieving Mocs students. Our portion of the program is dedicated to the impact of the choices of the individual within a community. After everyone has explained community, diversity, and relationships, our group will come in with the "This is where you come in" bit. We take what we know from the previous sections and turn it into a "What to do when X happens" scenario-based activity/program. Within this we plan to incorporate: emotional abuse, bystander intervention, peer pressure, and diversity exclusion. With this portion of the program we hope to have individuals asking questions, discussing the topics in depth, and using tactics introduced to make campus and the honors community a more inclusive and safe arena for students.

Partida, Celina

“Influence of 1st Grade Weight Status on Weight Change During Childhood and Adolescence”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Karissa Peyer

Co-presenters: A. Ewald, G. Welk, K. Hamilton, K.L. Peyer

Abstract: **PURPOSE:** The purpose of this study is to examine distributions of BMI change in a large sample of urban school district children. **METHODS:** Child height and weight were measured in 1st grade (by school nurses) and 10th grade (by Physical Education teachers) and converted to BMI% for sex and age using standard CDC SAS code. Subjects were grouped into BMI Categories based on 1st grade BMI% with all children with BMI% less than 10% in Cat0, BMI% from 10-19% in Cat1 and so forth, up to Cat9 with 1st grade BMI% of 90% or higher. Average 10th grade BMI% and average BMI% change from 1st to 10th grade were computed for each BMI Category. **RESULTS:** Complete data was available for 559 subjects. Average 10th grade BMI% ranged from 35.8% in Cat1 to 90.2% in Cat9. Average BMI% change was 2.86% from 1st to 10th grade. Average BMI% in Cat0 increased by 31.4% while Cat9 showed an average decrease of 6.9%. Cats 7, 8, and 9 showed overall decreases in BMI% while Cats 0-6 showed increases. **CONCLUSIONS:** 1st grade BMI shows only a weak association with adolescent weight status. However, BMI% decreases among heavier children, possibly due to a ceiling effect in BMI% curves, requiring further examination of approaches assessing child BMI change over time

Petty, Morgan

“Determinants of Self-Reported Empathy in a Selected Sample of Nursing Students and Faculty”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Kate Kemplin

Co-presenters: Erin Sullivan, Bailey Garner, Jessica Parker, Kathryn Messier

Abstract: The focus of this study is to measure the determinants of self-reported empathy. This study is significant to nursing due to the possibility of empathy influencing an individual's practice and career preference. The eligible participants for our proposed study include undergraduate and graduate nursing students and faculty members from the University of Tennessee at Chattanooga (UTC) School of Nursing. These individuals are 18 years of age and older, can read and write in the English language, and have graduated or are currently enrolled in a nursing program.

The survey will be distributed to 290 individuals. With a goal of a 25% response rate, 40 undergraduate students, 25 graduate students, and eight faculty members will make up our intended sample size. The data will be collected anonymously by a survey from the Qualtrics database to the UTC email server. Prior to completing the survey, participants must complete an informed consent. If consent is given, the individual may complete the survey, and the data will be sent to be analyzed through Statistical Package for the Social Sciences. The design of this research is a quantitative, non-experimental, cross-sectional, descriptive study. Data collection has yet to be completed.

Prahl, Jarid

“Mapping and Characterizing Flooding Events in the Greater Chattanooga Area using GIS and Remote Sensing”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Azad Hossain

Abstract: The greater Chattanooga area has had a long and deadly association with flooding. From the 1867 flood, which reached a flood height of 57.90 ft., to the more recent 2009 flood which saw parts of downtown submerged by up to 23.44 ft. of floodwaters. To assess the damage that might occur from such events, and to formulate flood insurance rates & allocate relief funds, FEMA's Hazards U.S. Multi-Hazard (HAZUS-MH) software is often used. This study took historical flood event levels and used HAZUS-MH to map flood extent boundaries and depths for the events that had occurred after 1970. This was done by comparing the mapped data to the areas shown to be flooded in either ground photography or satellite imagery, and see what the level of discrepancy was. After determining the level of error in this software, the socioeconomic effects of 100 and 500-year flooding events in the greater Chattanooga area were investigated. This included the use of flood depths and extent boundaries from prior to 1970, with the variation between real data and HAZUS's projections then being factored in for an accurate representation of the effects. The river systems used for this study included the Tennessee River, Chattanooga Creek & South Chickamauga Creek.

Pritchett, Raeme

“Identifying Correlation Between Personality and Nursing Specialty Preference”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Kate Kemplin

Co-presenters: Margie Berry, Tyler Eads, Kolby Herron, Amanda Maneclang, and William Vargas

Abstract: The purpose of this study is to determine if there is a correlation between personality type and specialty preference of healthcare professionals and more specifically nurses. If there is a correlation, this information can help clinical instructors make more productive clinic placement during school and provide information to help a practicing healthcare professional with deciding which specialty to focus on for practice. A personality survey will be sent through the University of Tennessee at Chattanooga School of Nursing to each student and teaching faculty member. Additionally, the survey will be distributed through Facebook, Twitter, and Instagram. The study is in progress; results are expected by April 1, 2017, and information will be updated upon completion.

Reising, Donald, Ph.D.

“Smart Building Through Smarter Models”

College of Engineering and Computer Science (Electrical Engineering)

Abstract: The research investigated Building Energy Modeling (BEM) with the purpose of: 1) assessing the accuracy and ease of use of the efficiency modeling software Energy+, and 2) integrating and/or using hardware/software based methods by which to improve the existing energy models to enable real-time, high-fidelity energy usage and efficiency analysis. Energy+ is a whole building energy simulation program used by engineers, scientists, and researchers; however, the program performs a static analysis. The energy simulation requires the generation of an accurate building

within the program. Creation of this model is quite complicated, time consuming, and requires extensive knowledge of building construction, materials, operations, and facilities (i.e., HVAC). The goal of this research was the development of a sensor based approach by which to perform modeling and analysis of building energy usage.

Richards, Ellis

“Circuit and System Modeling of Radiation Effects in Photonic Integrated Circuits”

College of Engineering and Computer Science (Electrical Engineering)

Research Advisor: Dr. T. Daniel Loveless

Co-presenters: Saama Davies, Daniel Loveless

Abstract: The objective of this research is to develop models for capturing total-ionizing dose and single-event radiation effects mechanisms in photonic integrated components and implement these models in photonic integrated circuit simulations to study the effects on complete systems. Recent developments in integrated silicon technologies have greatly expanded the capabilities and potential for photonic integrated circuits. Research is needed to determine the resiliency to radiation exposure of this emerging technology. The first phase of this project involves simulating standard photonic integrated circuit components and verifying the simulation accuracy. The second phase involves examining effects of total-ionizing dose and single event radiation on the components used in photonic integrated circuits and observing the effects in optical parameters and behavior. This will provide the foundation to directly model the radiation effects mechanisms. The third phase involves implementing the component models in complete photonic integrated circuits to observe the effects on these systems. Lastly, the results from these models will be compared with published experimental results to determine their accuracy and validity.

Robinson, Will

“Studies Toward the Synthesis of a Novel Rigid-Core Dendrimer”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. Kyle Knight

Abstract: Studies were conducted toward the synthesis of a novel rigid-core dendrimer that was to be synthesized by an Olefin metathesis reaction. Our target dendrimer core consisted of a Silicon atom bonded to four steroidal molecules. The steroidal molecules must then undergo an alkene cross metathesis reaction to connect to the dendrites, which were to be synthesized separately from the core. The metathesis reactions of the steroids were first tested with other small compounds to verify that the dendrites could be attached using cross metathesis. We first attempted to use the steroid Ergosterol in metathesis reactions, but it was unreactive. Ergosterol's side chain was too sterically hindered for this reaction. Cross metathesis reactions of Lanosterol were studied next. We successfully obtained the cross metathesis product, but in very low yields. These two steroids were our choice because of how abundant and inexpensive they are, but they proved to be incompatible for our project.

Rogers, Kaila

“Examining Effort in Undergraduate Research Participants When Simulating a Brain Injury”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Amanda Clark

Co-presenters: R. Christopher Branson, Amanda Miller

Abstract: Measuring participant effort on research tasks is of high importance when it comes to the validity of one's research. Poor effort can greatly affect the outcome of the results, possibly leading researchers to make inaccurate conclusions about overall performance. Failing to comply with research instructions is possibly a cause of unreliable data in research using undergraduate students. This is problematic because they are the most common research

sample due to how easily accessible they are. The purpose of this study was to examine the effectiveness of several psychological assessments in detecting poor effort in participants who were instructed to simulate a brain injury for the purposes of self-gain. More specifically, the focus is on the participants' level of compliance to instructions to simulate a brain injury and how level of compliance and effort affected performance on a variety of clinical and experimental assessments. Attention was given to understanding the choices the participants make in deciding what strategy they used to simulate a brain injury. The participants in the study are undergraduate students from the University of Tennessee at Chattanooga. Both quantitative and qualitative data will be presented.

Rustom, Jacqueline

“College Student Food Insecurity and Mental Well-being”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: Hanna Callicutt, Candice Hailey, Amanda Healy

Abstract: The purpose of this study is to examine the relationship between food insecurity and mental well-being of college students. Little to no research has examined this specific aspect of college student well-being. This poster will present a secondary data analysis of college students from a Southeastern university. Implications for research, practice, and policy will be addressed.

Schrenker, Erin

“Measuring the Presence of the amphibian pathogen *Batrachochytrium dendrobatidis* in East Tennessee”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Thomas P. Wilson

Co-presenters: Dr. Ethan Carver, Dr. Jose Barbosa, Team Salamander, and Dr. Thomas P. Wilson

Abstract: There is probable evidence that *Batrachochytrium dendrobatidis* is responsible for the greatest disease-caused loss of biodiversity in documented history. *Bd* is a pathogenic fungus that affects amphibians and causes chytridiomycosis, or hyperkeratosis of the superficial keratin-containing layers of skin. *Bd* occurs at all elevations that amphibians are found in the United States, and has been recorded on every known continent that amphibians occur. We have examined the presence and absence of this disease in three sample sites in Eastern Tennessee and how this statistic correlates with other ecological quantities. Canopy cover, water quality, and air and water temperature are a few of the measurements evaluated. All 48 animals that were aseptically swabbed in the field are conclusively negative for *Bd*. These results are supported by the fact that few *Bd* assays have been conducted in East Tennessee, and the majority of animals tested were larval. This study is a powerful tool in expanding our knowledge of *Bd* in Tennessee and can be used to focus biological hazard protocols in respect to the conservation status of amphibians. The implications of these findings and directions for the future will be presented.

Schwartz, Richard

“Survey of Biota in Oyster Pond Conduits on San Salvador Island, Bahamas”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Dawn Ford

Abstract: San Salvador Island, Bahamas contains several inland saltwater ponds. These ponds contain a variety of organisms including fish, invertebrates, and algae. Some of these ponds are connected to the sea via ocean corridors, or conduits, which bring sea water into the ponds. Some research has been conducted on the biota of the ponds, but

minimal research has been done on the organisms living in these conduits. In March 2017 I will conduct a biologic survey of the organisms living in the conduits of one of the ponds (Oyster Pond) and attempt to identify each individual species in order to better understand the types of organisms that live there. This will be the first time research has been conducted on this corridor with focus on its entire community of organisms. I hypothesize that there will be higher species richness found in the larger conduits.

Shown, Caleb

“Generating a Searchable Street Map”

College of Engineering and Computer Science

Research Advisor: Dr. Craig Tanis

Abstract: The development of mapping software usable on widespread handheld devices has vastly improved the quality of life of many people. With this in mind, what would be the next step for gathering and utilizing information about real time traffic flow to map more efficient traffic routes? Some of today's most popular map services do an amazing job of routing users between two points with great efficiency, but fall short when it comes to higher accuracy on a smaller scale. Additionally many of these systems are not accurately equipped to handle situations with multiple actors attempting to complete similar tasks without overlap. Using mapping tools such as OpenStreetMap, we are exploring options that would allow us to accurately measure real time traffic flow and efficiently navigate a fleet of commercial motor vehicles around a city. This poster presentation will cover the tools used to create such a system and explain the concepts behind our goals for achieving an efficient search structure capable of handling dynamically updating edge weights.

Smith, Catherine, PT, Ph.D., DPT, PCS

“Impact of Rhythmic Auditory Stimulation on Physical Activity Levels and Ambulatory Walking Behaviors of Children with Medical Needs”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Martha Summa-Chadwick, DMA, Brooke Williams, PT, DPT, Lindsey Sharpe, PT, DPT, PCS

Abstract: Children with medical needs are at increased risk for not meeting the daily recommended levels of physical activity needed to support general health and wellbeing. Rhythmic Auditory Stimulation (RAS) has been shown to help organize motor responses and improve functional performance. This study investigates the effect of rhythmic auditory stimulation (RAS) on physical activity and ambulatory patterns of children with medical needs. Participants will be recruited from children receiving therapy services at a local Children's Hospital. Individualized RAS segments will be created based on each participant's preferred music genre and self-selected comfortable walking speed. A StepWatch activity tracker will record amount of total daily walking and changes in cadence when listening to the RAS segments. Data analysis using SPSS v. 23 will examine changes in steps per time period, activity intensity levels throughout the day and percentage of stepping time compared with inactive time. This project is currently in the data collection phase., and when completed, will identify the impact of individually tailored music modules on the ambulatory walking behaviors and physical activity levels of children with medical needs.

Smith, Chris

“Food pantries on college campuses”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: Victoria Scott, Shannon Donnelly

Abstract: The purpose of this project is to explore questions, concerns, and perceptions of students, faculty, and staff about starting a food pantry on campus.

This study will address the following research questions: 1. What perceptions do students, faculty, and staff have about starting a food pantry? (positive, negative, mixed) 2. What specific concerns do students, faculty, and staff have about starting a food pantry? (logistics, funding, support, misuse, etc.) 3. Do students, faculty, and staff support the initiation of a food pantry? The impact of food insecurity on college students is especially prominent. There are many factors that affect academic success, but hunger is one very important one that people tend to forget about. This issue is more common than many of us realize, and recent studies at several colleges and universities reveal shockingly high rates of food insecurity (Cady, 2016). A lot of research now shows that food insecurity negatively impacts academic performance, mental and social health, dietary choices and overall health status among adolescents and young adults (Gaines et al., 2014). A huge part of that negative impact is students' academic performance.

Smith, Colin

“Potential environmental reservoir for bacterial species that may serve as agents of nosocomial infections in neonatal and pediatric intensive care units of a local hospital”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Henry G. Spratt

Co-presenter: Erinn Kilpatrick

Abstract: The increasing prevalence of healthcare acquired (nosocomial) infections is a growing concern for hospitals across the country. While the majority of these infections can be treated, the proliferation of antibiotic resistance bacterial strains is among the most pressing issues facing the health care community. This study seeks to specifically describe Methicillin Resistant Staphylococcus Aureus (MRSA) and found throughout Erlanger Hospital's Neonatal and Pediatric Intensive Care Units (NICU and PICU). The study was conducted in areas of the NICU and PICU where nurses, physicians, and patient family members regularly congregate. After using transport swabs to collect samples from different areas in the NICU and PICU, MRSA bacteria were detected using two different selective and differential media types, followed by disk diffusion tests with specific beta-lactam antibiotics. Once these strains were identified as MRSA, further characterization via a molecular analysis of specific genes on their chromosomes to distinguish community-associated MRSA from healthcare-associated MRSA has been ongoing. This distinction can then be used to determine how these deadly strains are being spread among patients and their hospital environment.

Snyder, Maria

“Comparative analysis of decisional reasoning between nursing faculty and student participants”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Kate Kemplin

Co-presenters: Jared Dooley, Lauren Sullivan, Cameron Cox, Ryan McKendrick, Tyler Minch

Abstract: Research pertaining to the thinking styles of undergraduate nursing students (Bachelor of Science in Nursing; BSN) as compared to the thinking styles utilized by their teaching faculty is lacking. This study is a pilot study of the differences between BSN students and nursing faculty methods of decisionality. Our aim is a beginning to address any disconnect between nursing faculty presentation of information and student reception of information to increase the level of care patients receive from new graduate nurses.

Spies, Peyton

“Factors Influencing Autonomy in Nurse Clinicians and Faculty”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Kate Kemplin

Co-presenters: Emily Robinson, Dana Swift, Jonathan Pham, Taylor Davidson, Elizabeth Trieu

Abstract: The purpose of the research is to study factors influencing autonomy, and to analyze the correlations with demographic characteristics. Autonomy is measured in this study via self-report and is measured in this study via self-reported answers to questions that are psychometrically validated and designed to capture elements of autonomy. We hypothesize that nurse clinicians and nurse faculty with a satisfactory final practicum may report higher scores of autonomy than nurses with an unsatisfactory practicum experience. We will then use the data derived from the survey created by Qualtrics and analyze it using SPSS. We will be using an electronic survey which directly inputs data from the participants to the database. Our methods will be online to keep measurements in one place with no ambiguity. A five-point Likert scale will be used with coded questions ranging from 1 (strongly disagree) to 5 (strongly agree). Surveys will be distributed nurses and faculty within the UTC School of Nursing via email through the program coordinators, and through social media (Facebook, Twitter, allnurses.com, etc.). The survey of demographics compared to a survey of the level of self-reported autonomy will provide us the evidence to prove our primary and secondary hypotheses correct.

Stanfield, Jonathan

“Characterization of Metamorphosed Shales in the Miller Cove Thrust Fault, Southeast TN”

College of Arts and Sciences (Biological, Geology, & Environmental Science)

Research Advisor: Dr. Habte Churnet

Abstract: Concurrent understanding of Appalachian geology is an ongoing effort that has proved difficult to accomplish over a large scale. The Miller Cove region in particular has become quite problematic. Fossil evidence found by Unrug et al. (1990) suggests that the western part of the Precambrian Ocoee Supergroup is Silurian or younger, and they further proposed that the entire Ocoee series could be of similar age. Work by Costello and Hatcher (1991) found stark disagreement and sparked heavy controversy regarding the 100+Ma unconformity in this supergroup. Further work by Hatcher (2012) has better defined this area by placing the Miller Cove Thrust Fault in between the eastern hanging wall (Sandsuck Formation) and the western foot wall (Wilhite Formation). This research effort is intended to characterize the shales and slates on either side of the Miller Cove Thrust and determine if there the Miller Cove Fault properly explains this inconsistency. This is performed by determining the degree of metamorphism through observation and illite clay crystallinity via X-ray Diffraction. Proper characterization of these units will contribute further understanding to the petrologic history associated with this region.

Strickler, Jeremy

“Building National Strength: New Deal Presidents and the Rhetorical Strategy of Re-Articulation”

College of Arts and Sciences (Political Science & Public Service)

Abstract: The project takes stock of two political developments which situated the institution of the presidency in a leadership dilemma I term the warfare-welfare nexus: the rise of the post-war national security state and the emergence of the modern administrative welfare state. Through the events of World War II and the Cold War, the presidency became bound to ensuring permanent military preparedness, promoting an ideology of national defense and security, and protecting the national interest through diplomacy and military action. Additionally, the crisis of the Great Depression and the policies of the New Deal welfare state redefined the role of the executive in championing the economic security of Americans, with the expectation that modern presidents advance a legislative and administrative

agenda comprising a broad array of domestic programmatic and budgetary commitments. As a result of these two developmental dynamics, reform-oriented presidents have to navigate national security imperatives as they attempt to coordinate domestic programmatic objectives. Using archival research, I reveal how Presidents Franklin D. Roosevelt and Harry S. Truman, along with key White House staff and executive branch officials, constructed and articulated

Sudbury, Haley

“The Well-Being of Grandparent Caregivers”

College of Health, Education, and Professional Studies (Social Work)

Research Advisors: Dr. Morgan Cooley, Dr. Cathy Scott

Co-presenters: Sara Hurt, Pamela Williams

Abstract: This is a secondary data analysis employing quantitative data from the study of Dr. Cathy Scott, of the Social Work Department, concentrating on the well-being of grandparent caregivers. We will be using three variables from Dr. Cathy Scott's study to further our research. These variables include age of the caregiver, race of the caregiver, and how many years the grandparent has been caregiving, which we will then incorporate research into how these variables effects their overall well-being. The intent of researching age, as a variable in this secondary analysis data study, is to see if there is an even greater connection between the effects aging may have on older adults, while also maintaining the caregiver position for their grandchild. The phenomenon of grandparents caring for grandchildren is disproportionately observed among different racial or ethnic groups in the United States. We will compare different races of grandparent caregivers, to determine if the effects on their health are similar or if there are differences between each. The number of years a grandparent has been caregiving can also have potential effects on their well-being. We will use previously gathered data and our variable research to complete this study.

Swanson, John C., Ph.D.

“Tangible Belonging: Negotiating Germanness in Twentieth-Century Hungary”

College of Arts and Sciences (History)

Abstract: The subjects of my research are the millions of "Germans" of Central and Eastern Europe living outside the state of Germany. Questioning the notion that Germans are an essentialist entity, my work investigates and explains how a term such as "German," as well as similar expressions, are employed by various constituencies to give definition to groups. In my work I look at how Germanness was negotiated throughout the twentieth century in Hungary, where for hundreds of years there had been a sizable German-speaking population. The rural German speakers had maintained a sense of "being German" denoting a kind of tangible belonging: a mental construct derived from the tactile environment of an individual. By the turn of the last century, however, this tangible belonging was in competition with new, more abstract understandings of Germanness coming from the burgeoning Hungarian-German leadership, from the Hungarian state, and from the so-called mother country of Germany. If being German had been tied to the immediate world, it now could mean membership in larger imagined communities. Throughout the twentieth century Hungarian Germans became loyal Hungarians, chauvinistic Volksdeutsche, victims of forced migration, and a minority.

Thompson, Michael D., Ph.D.

“Race, Labor, and Epidemics in Antebellum Southern Cities”

College of Arts and Sciences (History)

Abstract: My current research examines how racialized perceptions of disease (in)susceptibility affected labor policies and practices in antebellum southern cities, especially amid the panic of epidemic outbreaks. Sources such as medical journals and reports, government and business records, newspaper advertisements, and former slave narratives reveal that "aside from factors like race, status, gender, and skill" employers and officials in the urban Old South appraised the disease "acclimation" status of potential workers when making hiring decisions, whether for a gravedigger, nurse,

dockhand, or domestic. With many diseases misunderstood, southern medical and municipal authorities preferred or required free black and enslaved workers during yellow fever epidemics that overwhelmingly targeted recently arrived and "unacclimated" white immigrants. But these same white laborers were favored during bouts with cholera, given that malady's disproportionate impact upon black workers and its contemporary reputation as a "Negro disease." Despite an expanding historical literature on illness, medicine, public health, and death in the antebellum South and beyond, unexplored is how race and disease intersected with matters of urban and industrial labor.

Tinker, Casey

“Barriers and Motivators to Self-Sufficiency for Residents of Public Housing”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: Erika Goodman, Roselind Mason

Abstract: The purpose of this study is to explore the barriers, resources, needed supports, and motivators to self-sufficiency for residents of public housing. Specifically, this study will be exploring variables related to residents in both the upward mobility and traditional housing programs of Chattanooga Housing Authority (CHA).

Trapp, Allison

“Exploring Demographic Differences in Traditional Housing Versus an Upward Mobility Program”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Co-presenters: British Hunt, Elena Cross

Abstract: For this project we are working with the Chattanooga Housing Authority (CHA) to find the demographic difference of those living in traditional housing compared to those in the upward mobility program. To find these difference we went through secondary data CHA had already acquired. The demographics we are focusing on are their age, race and gender. We are hoping to find patterns within the data sets for both the Upward Mobility Program and those in traditional public housing. With these findings the Chattanooga Housing Authority can see if there is a demographic difference between the two programs. If there is a significant difference in the demographics, the Chattanooga Housing Authority will be able to determine how to best continue or improve their housing assistance programs.

Triplett, Destini

“Knowledge and Attitudes Toward Mental Health: How Should Students be Prepared to Work with Mental Illness?”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Morgan Cooley

Abstract: Social workers are often the front line responders for individuals with mental illnesses. In regards to coursework, most social work undergraduates are not required to take any mental health course at all, and graduates of accredited social work master's programs are required to take one class on psychopathology and diagnosis. Little to no literature, beyond textbooks used in the classroom, exists that presents information on how social workers are prepared, what the best practices are, and what suggestions have been made to improve preparation in this kind of setting. There are few relevant studies that provide specific information regarding issues related to mental health preparation, however, they do not discuss preparation of mental health social workers in the United States. The research questions include: 1. What is the current level of knowledge, the attitudes toward, and stigma (or lack thereof)

towards mental health and illness of social workers and social work educators? 2. What have been the most positive and most challenging experiences that social workers working with mental health issues?
3. What suggestions do social workers and social work educators have for improving mental health training and continued education?

Urciuoli, Jimmy

“How do local food systems act as sites of inclusion and exclusion?”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Joseph McCauley

Co-presenters: Dr. Shawn Trivette

Abstract: Local food systems have become a popular alternative to conventional grocers due to the perceived environmental, economic, and nutritional benefits it provides. These ideas are not grounded in fact, and are widely debated within the academic community. Extensive research shows that lower-class citizens and minorities are often excluded from local food markets, which tend to cater to upper-class whites. Barriers to those excluded groups can include proximity to local food retailers, lack of reliable transportation, costs compared to conventional retailers, lack of knowledge regarding local food, among other factors. The mechanisms of these exclusions are less clear, particularly concerning the physical location of these outlets and how they result in differential access. How do local food systems act as sites of inclusions and exclusions?

In our project, we have located access points for local food in the greater Chattanooga region, including farmers markets, CSA's, and farm stands. These have been mapped using GIS technology, and overlaid with census data. Such data includes race, income demographics, education, among others.

Wigal, Cecelia, Ph.D.

“Art for All - The Splatapult”

College of Engineering and Computer Science (Mechanical Engineering)

Co-presenters: Professor Christina Vogel, MFA, Brandon Lewis, Jacob McDaniel, Zachary Jones, Greg Hamoui

Abstract: Art is a means to express oneself as a human being. There is no limit on how art can be created, but some circumstances limit artists' ability to create. Open Arms Care (OAC) Corporation of Chattanooga, TN requested that students from the freshman Introduction to Engineering Design course at the UTC design and produce a device that assists their clients in the painting activity widely known as “splat art”. Many of the OAC clients have Cerebral Palsy which limits body movement and control and thus their ability to create art. The device developed is based on the basic catapult and is affectionally called “Splatapult”. The Splatapult allows artists with various limitations in movement to create art, with or without assistance. The Splatapult's primary objectives are to be mountable, easy to adjust, easy to clean, easy to trigger and portable. The Splatapult's primary function is to splat paint, but it also holds paint, delivers paint, positions direction, adjusts height, releases paint, and interchanges parts. The Splatapult uses a three-spring system that creates enough force to launch paint from a desired distance of 6-10 feet. The throw arm is held in the launch position by a smooth pin release. The Splatapult sits on top of a mobile support platform comprised of a wheeled laptop table. The mobile support platform gives the Splatapult the ability to rotate, tilt, and adjust height for aiming purposes. The Splatapult requires assistance from OAC art department personnel to set position and load paint.

Wigal, Cecelia, Ph.D.

“Art for All - The Art Stamper”

College of Engineering and Computer Science (Mechanical Engineering)

Co-presenters: Christina Vogel, MFA, Michael LePage, Jonathan Burkeen, Brandon Roberts

Abstract: The Art Stamper allows students requiring a wheelchair for mobility to create art on the ground from their wheelchair or other mobile assistive device. To develop the Art Stamper a team of three students in the freshman Introduction to Engineering Design course at UTC set a goal to design a product that is inexpensive and easy to operate as well as entertaining and educational for young people. The team used several brainstorming techniques during the original solution generation, including rich pictures, morphological charts, and pairwise comparison. The resulting Art Stamper consists of a handle, sensory feedback encasement, stamper head, and chalk holder. The handle is an adjustable painted metal broom handle with generic threads. The feedback encasement is a spring encasement screwed into the broom handle which provides tension and sensory feedback. The stamper head attaches to the feedback encasement and accommodates both ink and paint stamps. There are 23 ink stamps, (zoo and water animals), and 14 paint stamps of basic shapes. The chalk holder also attaches to the feedback encasement. The Art Stamper costs \$40 and all parts can be purchased from a local hardware store. The collection of stamps costs \$20.

Wu, Weidong, Ph.D

“Modeling Performance of PolyLevel for Highway Rigid Pavement Lifting”

College of Engineering and Computer Science (Civil & Chemical Engineering)

Co-presenters: Drs. Joseph Owino, Ignatius Fomunung, Mbakisya Onyango

Abstract: PolyLEVEL is polyurethane foam of high density polymers with capabilities of being expandable used to level concrete slabs and recently its application has been extended to highway concrete pavement lifting. This Ruth S Holmberg Faculty Excellence grant supported work attempts to model the injection of PolyLevel and evaluate the performance of the material under cyclic dynamic traffic loading.

Yanagida, Hiroshi

“Parameterization of 3D Printed Parts”

College of Engineering and Computer Science (Mechanical Engineering)

Research Advisor: Dr. Louie Elliott

Co-presenters: Simar Singh

Abstract: I will be discussing the strength to weight ratio of 3D printed objects using a Makerbot Fused Deposition Modelling (FDM) printer via manipulating only two parameters: the infill density and the number of shells. The purpose of the experiment was to generate a more precise set of data by decreasing variability within the designed testing matrix. The project approach was to first design the testing matrix, print out the cubes, conduct compression tests on the cubes, and finally analyze the data collected. Two parameters were chosen as opposed to the multitude of parameters which include orientation, layer height, air gap, etc. Other studies have generated ambiguous results by utilizing the Taguchi Method in attempts to encompass each parameter into a uniform testing method. The experiment was to draw conclusions regarding the strength to weight ratios of a 1 inch cube. The next phase required printing out a series of 1 inch cubes within the testing matrix starting at 5% infill density, with increases of 5% increments up to 25% and in 1-5 shells increasing in 1 shell increments. We conducted a compression test on the cubes using an Instron 5566 compression tester. Using the data collected we determined the exact strength-to-weight

Zuckerman, Holly

“The Need for Learning American Sign Language in Higher Education”

Administration (Disability Resource Center)

Abstract: The ability to work with people with hearing impairments is a critical niche across the country, one that is generally lacking in professionals who can fill that niche. And in a state rich with institutions of higher education, Tennessee is also lacking programs in those institutions that can help develop the professionals needed to work with people with hearing impairments. This presentation will explore evidence toward building an American Sign Language program at UTC by drawing connections between the disparity in the need for educated professionals to work with the hearing impaired versus higher education programs in the state of Tennessee that can produce those professionals.

UTC RESEARCH DIALOGUES

Podium Presentations

Tuesday, April 11 - Undergraduate Student & Faculty Showcase

Bailey, Andrew, Ph.D.

12:15, Fortwood Room

“Chattanooga Brainwave Project”

College of Health, Education, and Professional Studies (Health & Human Performance)

Abstract: For decades, researchers have tried to understand the first-hand experience of participants in specific activities and in different environments. In the past, research was limited to surveys, observations, and case studies. Emergent technology now enables us to peek into the brain of participants engaging in exercise, outdoor activities, and outdoor environments. Portable electroencephalographic (EEG) devices, coupled with fitness trackers and video recorders, provide a mobile lab that can measure brainwaves and physiological reactions to activity and space. This presentation will illustrate the process of developing this mobile lab, the collaborative efforts of public and private resources necessary to implement it, and preliminary findings that serve as a "proof of concept" for future research.

Brooks, Erika

1:15, Foundation Room

“Metanoia: A Compilation of the Supernatural and Young Adult Drama”

College of Arts and Sciences (Art)

Research Advisor: Professor Christina Vogel

Abstract: Fantasy and otherworldly beings have been the themes of my creative research. My artistic practice has reflected this fascination and given me a way to express my love of the unknown and strange things in our world. I created a comic for my senior thesis exhibition project called Metanoia. Honey Deveraux, it's title character, is a young college student who wants nothing to do with her destiny of being a protector of Earth. She is determined to have a normal life, but now a new form of evil is descending upon earth, and it is starting with her home. Honey must take up the mantel she abandoned and become the warrior she was born to be.

Butera, Kensie

12:00, Heritage Room

“Let's Talk About Sex”

Honors College (Women's Studies)

Research Advisor: Dr. Heather Palmer

Abstract: While television, the internet, music, and social media may be informative, these tools also tend to skew the reality of sex and healthy relationships. In light of this knowledge, public school sex education becomes crucial now more than ever to filter the information students are receiving to ensure its accuracy and encourage students to cultivate healthy, informed, and consensual sexual relations. Amongst pre-adolescent and adolescent young adults, discourses about healthy sexual behavior have been closeted, marginalized, or deemed inappropriate and shameful. A Tennessee law referred to as "The Gateway Law" currently plagues public school sex education. The basic principle of the law is that, just as alcohol or marijuana have been termed "gateway drugs" which lead to further drug use, so hand holding and kissing are gateway behaviors which lead to sexual activity. This research analyzes the cause and effect relationship between public school sex education and sex-ed related issues.

Coker, Laura

1:00, Heritage Room

“Tolkien's Linguistics: The Artificial Languages of Quenya and Sindarin”

College of Arts and Sciences (English)

Research Advisor: Dr. Katherine Rehyansky

Abstract: J.R.R Tolkien is famously known for his intricate world of Middle-earth, and the complex history that shaped his fantasy world into a literary masterpiece. Tolkien's languages, especially his Elvish languages, Quenya and Sindarin, are highly regarded for their grammatical completeness and their ability to function as natural languages instead of artificial ones. Quenya and Sindarin remain the most developed artificial languages created in literature. The first part of this paper discusses Tolkien's fascination with languages and his career in philology. This discussion leads to the topic of artificial languages and how Tolkien created two almost completed languages along with alphabets, writing systems, lexicons, and grammatical structures. There is a discussion of the hypnotic qualities of Quenya which could suggest something almost sinister about the Elves even though they are a force of good in *The Lord of the Rings*. This paper concludes with Tolkien's influences on popular culture.

Culp, Allison

12:30, Fortwood Room

“The Future of Birth Control: Eliminating Gender Stereotypes Surrounding Contraception”

Honors College (Nursing)

Research Advisor: Dr. Gregory O'Dea

Abstract: Contraceptives are widely created only for female use. Hormonal contraceptives such as the Nexplanon injection, the Depo-Provera shot, the NuvaRing, and the Pill all contain specific doses of estrogen and progesterone to override the natural hormones in the female body, prevent ovulation and thus eliminate any chance of pregnancy. Other devices such as the Intrauterine Device (IUD) and condoms are options for females to protect themselves during sexual intercourse. Because of this, a negative social stigma surrounds those who choose to do so and most responsibility is placed upon women during sexual engagement. However, steps to eliminating this stigma are being taken as more and more research is being conducted on alternate male forms of birth control.

Vasalgel, also called the reversible vasectomy, is a polymer injected into the vas deferens of a male to block sperm specifically. Gendarussa and Anti-Eppin Agent are two non-hormonal oral contraceptives for men that affect the sperm's

Daniels, Anne

2:45, Foundation Room

“Self-Absorbed: Through the Lens of a Millennial”

College of Arts and Sciences (Art)

Research Advisor: Professor Christina Vogel

Abstract: As a visual artist, my creative research is rooted in the Millennial generation's interaction with social media. The direction of my new work revolves around the selfie phenomenon and dissecting the digital selfie image. I capture the narcissistic and self-objectifying behaviors of selfies through creating collages that are handheld, layered and mobile. By transforming the original pictures into abstracted collages of fleshy colors, singular strips of hair, and separated facial features, I communicate my skepticism of the selfie's purpose since I find it to be callous and misrepresentative.

Dempsey, Margaret

1:30, Heritage Room

“Attachment Styles to the Father Figure as Seen Through Faith
Development Interviews”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Ralph Hood

Co-presenters: Sally B. Swanson, Ralph W. Hood Jr.

Abstract: Attachment theory is an evolutionary explanation of children's security in their caregiver. Researchers suggest that the type of attachment to one's father can explain how they view a higher power. This could be because of their lack of ability to attach to the father and projecting the need for attachment to a higher power. We hypothesize that there will be observable effects of a negative attachment to a father figure and their faith development. Four case studies from the Longitudinal Study of Faith Development Project are used to examine the relationship of father figures to changes of worldview or religion in adulthood. We will examine the responses to aspects of locus of authority and the father attachment scale. Especially, emphasizing the areas in which father figures are described as authoritative, strict, or disciplinary. Illuminating these case studies provides a rich view of how a father figure can play a role in a person's development and relationship to a higher power.

Ebiefung, Aniekan, Ph.D.

11:45, Foundation Room

“How To Evaluate The Validity Of A Statistical Study In A General
Education Course”

College of Arts and Sciences (Mathematics)

Abstract: A statistical study could be biased or invalid even when conducted by a researcher with a good reputation. It is the responsibility of the reader to critically examine a study's conclusion for accuracy and to discover hidden biases or invalid conclusions. In this paper, we give some guidelines that students can use to critically evaluate the validity of the methodology and conclusions of statistical studies.

Eckelmann Berghel, Susan, Ph.D.

2:45, Heritage Room

“Preserving Women's Voices: Chattanooga Women's Oral History
Project”

College of Arts and Sciences (Mathematics)

Co-presenter: Carolyn Runyon

Abstract: This podium session presents an overview and current progress of the Chattanooga Women's Oral History Project. Supervised by the Mayor's Council History Committee, a local collaboration consisting of UTC, Covenant College, Southern Adventist University faculty and community volunteers, this project seeks to recover, archive, publish, and celebrate an inclusive historical repository of women's accomplishments, activism, and experiences as business leaders, legal advocates, educators, social activists, and community builders from 1920 to 2020.

To date, the project has completed 59 of the goal of 200 interviews, publishing 35 online with full text transcriptions to enhance usability and accessibility. UTC's CRISP grant funded purchase of recording equipment, digital processing of all recordings, and transcription of the interviews by student assistants. Highlighting the experiences and perspectives of local women of different generational contexts, socio-economic and professional backgrounds, and cultural heritage, this oral history project strives to inspire and empower future generations of women in the area. This session features excerpts from the interviews, showcasing the powerful voices of women in the greater Chattanooga area.

Collaboratively, committee members will begin to organize the oral history interviews and supplemental research. As part of internships and semester course project, UTC, Southern Adventist University, Covenant College students will examine interviews, creating brief encyclopedic biographies, designing public displays, and developing research papers. This globally accessible repository offers researchers and scholars with an opportunity to study this rich regional and women's history.

George, Chloe

1:30, Foundation Room

“Exploring Inherent Reactions to the Abject”

College of Arts and Sciences (Art)

Research Advisor: Professor Christina Vogel

Abstract: In Julia Kristeva's essay Powers of Horror, she defines abjection as the human reaction to the loss of distinction between self and other, or subject and object. My creative research consists of two main components: the examination of beauty ideals that exist in Western society and the way in which abjection can change the perception of them. I attempt to take objects that are viewed as beautiful or that "enhance" beauty and alter their perception by pushing the abject nature of the "beauty object" . The materials that are featured in my work are hair, fake nails, false eyelashes, and pantyhose. I chose these items due to the idealization and fetishization imposed on them by societal beauty standards. I am interested in the way in which abjection and the lack of a body alter our perception of these materials, and shows they do just serve to beautify but can also be repulsive.

Gray, Emily

10:45, Foundation Room

“A 16th Century Ovid: The Influence of Classical Mythology on the Understanding of Shakespeare's Plays”

College of Arts and Sciences (English)

Research Advisor: Carl Springer

Abstract: Regarded as the greatest writer of the English language, William Shakespeare was heavily influenced by the resurgence of classical mythology, particularly the works of Ovid, that took place during the early Elizabethan period. Following Arthur Golding's groundbreaking translation of the Metamorphoses in 1567, the English people regarded Ovid as an unparalleled mythographer and a source of inspiration. As Shakespeare's plays are fraught with mythological allusions, it is obvious that he is no exception to this way of thinking. Containing an abundance of allusions, Shakespeare's mythology is overwhelmingly Ovidian, with the Metamorphoses supplying the bulk of the basis for these well-known allusions. When paying special attention to the classical mythological influences, Shakespeare's A Midsummer Night's Dream epitomizes the dynamic role of mythology in literature to both provide plot context and help readers understand the implications associated with Shakespeare's chosen allusions.

Hacker-Cerulean, Jeannie,

3:30, UC Auditorium

“Research Day Senior Forum”

College of Arts and Sciences (Theatre & Speech)

Abstract: Students will present speeches in the UC Auditorium on Tuesday, April 11th from 3-5. This is the third year for the Senior Forum. Students from the Contemporary Speech class are performing. Other interested students may be selected.

Hargrave, Katie, MFA

3:00, Foundation Room

“Learning from the Long Haul - Place and Neighborhood Innovation in a UTC Engaged Grant”

College of Arts and Sciences (Art)

Abstract: "Learning from the Long Haul: Place and Neighborhood Innovation" uses the tools of socially engaged art and community-driven research to explore how individuals and communities develop site-specific practices to meet their needs. This project has three parts: a tour of inspirational projects within the Innovation District (ID), a catalogue of innovation in Chattanooga outside the ID, and four case studies of place-based artists, designers, and community

organizers that are also innovators. The project is a collaboration of the Causeway Foundation, faculty and students in the departments of Art and History to explore how the idea of "innovation" impacts neighborhoods.

Hossain, Azad, Ph.D.

1:00, Ocoee Room

“Quantitative Estimation of Mercury in Surface Water Using Remote Sensing”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Abstract: In the United States large number of waterbodies are considered impaired due to mercury, especially because of high mercury levels in fish. Many states have issued advisories to limit fish consumption from certain water bodies due to high levels of mercury. Remote sensing techniques have been successfully used to study water quality issues for many years. However, application of these techniques to study mercury contamination in waterbodies is not well documented. This study explored the potential of the Moderate-resolution Imaging Spectroradiometer (MODIS) imagery to estimate suspended sediment associated mercury concentration in Enid Lake, MS as part of the initiative to fill this gap. In MS several water bodies currently have fish consumption advisories for mercury, including Enid Lake. MODIS visible and near infra-red data and near-real time in situ measurements of suspended sediments and associated mercury concentrations obtained from two field campaigns were coupled to develop a

Ide, David

1:30, Ocoee Room

“Study of the Photoacoustic Effect on C₂H₄ at High Concentrations, at Trace Detects in N₂, and Detect Concentrations of Gas in Fruit”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. Han Jung Park

Abstract: Ethene (C₂H₄), which is produced in plants as they mature, was used to study its photoacoustic properties using Photoacoustic Spectroscopy. Detection of trace amounts, with N₂ gas, of the C₂H₄ gas was also applied. The gas was tested in various conditions-temperature, concentration of the gas, gas cell length, and power of the laser-to determine their effect on the photoacoustic signal, the ideal conditions to detect trace gas amounts, and concentration of C₂H₄ produced by an Avocado and Banana. A detection limit of 10 ppm was determined for pure C₂H₄. A detection of 5% and 13% (by volume) concentration of C₂H₄ produced for a ripening avocado and banana, respectively, were determined in closed space.

Kashner, Ryan

2:00, Heritage Room

“Feeling the Bern! Don't know why.”

College of Arts and Sciences (Psychology)

Research Advisor: Svetlana Chesser

Abstract: As the voting populous becomes younger, with millennials being nearly as represented as baby boomers (Pew, 2016), we are witnessing a shift in voting attitudes. The most current example of this is the emergence of Bernie Sanders, who represented a break from the typical candidate and whose momentum was mostly instigated by the support from the millennials. If a candidate like that can gather this much steam when the voter distribution is relatively equal, can we expect a president aligned with Mr. Sander's sensibilities when millennials overtake the baby boomers? According to Social Learning theory, we gain information about how we will operate in the world by observing those who we respect and look up to, mostly parents (Bandura, 1977). While parental political involvement is an effective indicator of offspring's political identity when they reach voting age, this might change once the offspring become older and exposed to more political information (Dinas, 2013). The purpose of this study is to determine whether the implicit attitude of millennials in the conservative Bible belt areas (Chattanooga, TN and Auburn, AL) more closely aligned with the views of not religious socialist Bernie Sanders or attitudes of their parents. Survey constructed in Qualtrics will assess participants' explicit political attitude and political orientation of their parents.

Implicit Associations Test will be embedded into this survey and will detect participants' implicit political attitude. To examine how self identified political attitude of millennials relates to their parents political attitude and to their political orientation determined by the IAT, Chi-square Test of Independence will be performed.

Kurtz, Gwendolyn Spring

10:00, Foundation Room

“The Activist-Enhanced Classroom”

College of Arts and Sciences (Women's Studies)

Abstract: One of the three learning outcomes for WSTU 2000: Introduction to Women's Studies focuses on how individuals and society are impacted by patriarchal institutions and practices that stem from a power imbalance between men and women. A major problem arising from this power imbalance is sexual assault. Our project aims to further develop students' understanding of sexual violence and how it impacts individuals and society that they derive from assigned readings, as well as give students a way to put what they've learned into practice. During an eight-hour Saturday workshop in March of 2017, community activist Regina McDevitt of the Partnership for Families, Children, and Adults, will train approximately 60 WSTU students as sexual assault hotline volunteers. This project will transcend the usual classroom read-discuss-write learning sequence to actively involve students in anti-sexual violence work and foster community engagement.

Lee, Alesha

1:45, Foundation Room

“Unmellow Yellow: Reclaiming my Identity”

College of Arts and Sciences (Art)

Research Advisor: Professor Christina Vogel

Abstract: My creative research centers around my cultural identity as a Korean-American. The lack of representation in society, specifically in media, has been a motive for me to create work that allows me to make a space for myself and for my voice to be heard. I am interested in the problematic ways in which stereotypes have become a source of identification as well as racist situations I have encountered. My studio practice has been a continuous investigation into how I should stage my narrative to debunk these stereotypes. My work takes on different types of forms through paintings and sculptures that present racist remarks and their unreliability. This is an effort to unapologetically be myself and to continue the conversation of racial oppression that far too often is dismissed.

Lindsay, Emily

12:45, Ocoee Room

“Surveying the Impact of Fatty Acids on Chemotaxis in *Vibrio cholerae*”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. David Giles

Abstract: Bacterial chemotaxis involves recognition and response to environmental signals. To test our hypothesis that fatty acids are signaling molecules for chemotaxis in *V. cholerae*, the motility response to seven fatty acids was examined. Linoleic acid (18:2), arachidonic acid (20:4), and docosahexaenoic acid (22:6) caused an increase or decrease in motility (±20%) and were chosen for further study. *V. cholerae* encounters 18:2 and 20:4 in the human host during infection, while 22:6 is abundant in aquatic life associated with *Vibrio*. Using a non-redundant *V. cholerae* transposon mutant library, we targeted genes encoding methyl-accepting chemotaxis proteins, which are the sensors for chemotactic responses. A survey of mutant response to 20:4 identified 8 candidates for further analysis and motility assays are being performed with 18:2 and 22:6. Confirmation and characterization of the *V. cholerae* mutants will aid discovery of fatty acid signaling pathways that control bacterial locomotion.

Meadows, Carrie, MA, MFA

11:00, Foundation Room

“Design for Writers: Exploring the Convergence of Image and Text in Professional Writing”

College of Arts and Sciences (English)

Co-presenter: Laura Coker

Abstract: English 4910: Design for Writers Workshop was a hands-on, project-based course that challenged students to write and design complex public documents. Students learned Adobe Illustrator, InDesign and Photoshop basics then developed design layouts and wrote text for three projects: a broadside, a t-shirt, and, most challenging, a design handbook for professional writers. Students met with local professionals and developed their own creative projects from concept to printed product, all thanks to a ThinkAchieve grant. I will discuss this practical approach to professional writing instruction, focusing on the the benefits of teaching writers design concepts and software.

Miles, Kirby

2:00, Foundation Room

“Fluorescent Pink and Glitter”: A Brief Discussion on Obsession and Compulsion through Painting”

College of Arts and Sciences (Art)

Research Advisor: Professor Christina Vogel

Abstract: My creative research and painting practice is one that is guided by philosophical thought. I primarily research French philosopher Michel Foucault's writings on how society dictates the term 'madness.' Along with my personal experience with Obsessive Compulsive Disorder my work is concerned with being compulsions rather than just being about compulsions. In this sense, I aim for my paintings to sit on the edge of failure, a system on the verge of collapse. Through the lens of painting, my aim is to interpret obsessive compulsive behaviors and make them visually accessible.

Murillo, Edwin, Ph.D.

10:30, Foundation Room

“Contestations to 'The Hispanic Challenge'”

College of Arts and Sciences (Modern & Classical Languages & Literatures)

Abstract: In his unapologetic text "The Hispanic Challenge" (2004), which became the basis for the equally shortsighted chapter in the bestselling *Who Are We?* (2005), Samuel P. Huntington cautions that the Hispanic immigrant flux and its resistance to "American" acculturation will create a volatile societal condition of disunion. Raul Ramos y Sanchez's *America Libre* (2007) dramatizes this alarmism of the "Hispanic Boom" of the early 21st century. The novel's dystopian narrative results from the incompatibility of an immigrant nation, the culturally diversified United States, to reconcile with its Hispanic constituent. Ramos y Sanchez's novel also utilizes historically conscious dialogues between the protagonists to challenge facile stereotypes of "Latinoness" promoted by Huntington, while narrating the effects of governmental demonization of a single ethnic group. A pertinent warning echoing of Sinclair Lewis and others.

O’Conner, Kristen

12:30, Heritage Room

“Observing Observation: An Ethnographic Exploration of College Students' Perceptions of Mass Surveillance”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Zibin Guo

Abstract: This study employs ethnographic methods to explore cultural perceptions on the use of mass surveillance among Millennial Generation students at UTC. Patterns of awareness, opinion, and behavioral responses are used as the focal points for investigating cultural perceptions. Understanding the patterns, as well as variations, in perceptions of mass surveillance is important, as its use is increasingly becoming a part of contemporary life. The study contributes to a deeper understanding of the dynamics between social changes and cultural responses.

Oliver, Jaylee

1:45, Heritage Room

“The Criminological Conflict Theory and How It's Applied in Orwell's "1984"”

Honors College (Psychology)

Research Advisor: Dr. Gregory O’Dea

Abstract: In George Orwell's 1984, the main character Winston explains that "The thing he was about to do was... not illegal (nothing was illegal, since there were no longer any laws), but if detected... it would be punishable by death, or at least by twenty-five years in a forced labor camp" (Orwell, 8). Orwell juxtaposes two diametrically opposed groups in his novel- Big Brother & the Brotherhood. This causes the novel to be littered with conflicts, and according to the Criminological Conflict Theory, this is inevitable. Various sources explain the conflict theory as defining social structure as the origin of crime- Vold states that in complex societies, conflict due to the normalization of the group in power's ideals as law. Readers can see this theory being applied in 1984 with groups such as the Spies, the Ministry, and the Brotherhood. By examining Orwell's novel 1984, I plan on demonstrating that the fictitious criminals have virtually identical origins as modern day American Criminals.

O’Malley, Laura

2:00, Ocoee Room

“Nursing Student Attire and its Effect on Exam Self-Esteem”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Kate Kemplin

Co-presenters: Julia Lyons, Nargiza Kurbanova, Destiny Rickheim, Hunter Holland

Abstract: We hypothesize that the dress of the nursing student can influence their self-esteem during a test. Furthermore, if the nursing student dresses casually their self-esteem level will decrease and they will self-report less self-esteem in how they performed during the exam. If the nursing student dresses professionally, their self-esteem level will increase and they will self-report a higher level of it during the exam. Self-esteem is central to success in undergraduate nursing programs students and the care provided by students (Chesser-Smyth, & Long, 2013). Chesser-Smyth and Long go on to mention the nursing environment in particular can greatly negatively affect student self-esteem levels due to the exposure of excessive anxiety, further negatively impacting academic performance (2013). We are able to tell through research that the insight surrounding this problem and how to facilitate higher-self-esteem levels in nursing students is lacking.

Ortega, Dana

2:15, Foundation Room

“Mixed Emotions: An Exploration through Paint”

College of Arts and Sciences (Art)

Research Advisor: Professor Christina Vogel

Abstract: My creative research focuses on depicting emotional and physical feelings with paint. My research began with me making work that focused on the anxiety I was feeling at the time and later expanded to address other emotions. My paintings acts like a journal where I take the time to unpack and acknowledge what feelings I have experienced. We are taught how to feel. Men are taught that showing different emotions is a sign of weakness. Women are told that they overreact and their feelings are dismissed. The paintings I make are abstract to allow for people to see their own sensations in the painting and they give the viewer a chance to acknowledge their own feelings in whatever manner is best for them.

Parker, Colter

10:30, Fortwood Room

“An Analysis of Stock Price Return Factors Following an IPO”

College of Business (Economics)

Research Advisor: Dr. Leila J Pratt

Abstract: This presentation will examine the market adjusted returns of companies following their IPOs, beginning from the closing price of the first full trading day. The data will be gathered from Bloomberg, and the factors analyzed could include the initial gains or losses to the firm's price on the first day of trading, the sector, the year and month of the IPO, the market cap of the firm, consumer sentiment at the time of the IPO, which company initially priced the firm, and the price of each share at the IPO. These independent variables will then be analyzed with respect to the change in the price of the stock adjusted for the market's returns.

Patel, Ketan

11:00, Chattanooga Room

“Synthesis of Hybrid Platinum-Iron Oxide Nanoparticles via DNA-Conjugation”

College of Engineering and Computer Science (Civil & Chemical Engineering)

Research Advisor: Palchoudhury, Soubantika, Ph.D

Co-presenter: Justin Miller

Abstract: We have been working to develop a nanodrug system with integrated diagnostic and therapeutic components, particularly in the field of oncology. Magnetic iron oxide np's are highly promising candidates as drug delivery and diagnostic agents because they are inherently non-toxic and can be used to enhance contrast in MRI's. Recently, Pt np's have shown therapeutic potential as scavengers for free radicals and as radiosensitizers. In this research, we integrated the diagnostic component, iron oxide np's and the therapeutic component, Pt np's in a hybrid nanoparticle system using two different synthetic approaches. The first route shows direct attachment of Pt to iron oxide np's coated with hydrophilic polymers (polyvinylpyrrolidone and polyethyleneimine). The second route uses oligomer chemistry to attach preformed iron oxide and Pt np's for better structural flexibility. The hybrid Pt-iron oxide np's will be used for in vitro and in vivo tests on cancer cell lines in the future.

Pew, Dylan

2:30, Foundation Room

“Eliminating the Environment: Emergent Properties of Objects in the Aesthetic Dimension”

College of Arts and Sciences (Art)

Research Advisor: Professor Christina Vogel

Abstract: There is a misconception that Nature exists outside of human development and that natural and cultural spaces are mutually exclusive. When undeveloped places are treated as "other than" or "away from" they function as gathering places for unwanted objects. This is due to the mindset that once an object, such as a plastic bottle, is out of sight it ceases to exist. In reality discarded matter does not disappear, but rather relocates and forms new relationships somewhere outside the preferred human domain. My creative research is based around studying the objects that are exiled from human society and realizing their functional possibilities through collection, assemblage, and display. Working towards denying the boundaries between Nature and society by bringing foreign objects into view, my practice is a way of studying the causality of manmade alien objects and their adjacent compatriots. Paralleling fungal decomposition within temperate forest ecosystems with inanimate objects and the

Plaxco, Allison

10:15, Fortwood Room

“An Analysis of the Factors that Influence Differences in Child Mortality Rates Between Countries”

College of Business (Economics)

Research Advisor: Dr. Leila Pratt

Abstract: In this research, I will be using regression analysis to determine the extent to which female literacy rate, gross national income per capita, total health expenditure as a percent of GDP, percent of population with access to improved sanitation facilities, percent of population age 15-49 infected with HIV, adolescent fertility rate, urban population growth rate by annual percent, percent of rural population, and fertility rate (births per woman) influence under 5 mortality rates between countries. All of the data for this project was obtained from the world bank database.

Ryan, Spenser

12:30, Ocoee Room

“Exploring the role of local adaptation in the response of *Maianthemum canadense* to climate warming”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Jennifer Boyd

Abstract: By the year 2100, it is projected that average global temperatures will increase by ~4C. Shifts in species distributions to higher latitude and elevation have been evidenced as a common response to climate change. Certain populations of species can become locally adapted to a particular environment, which may differ from the climate that is home to other populations within the same species. To better predict the role of local adaptation within the context of projected climate warming, I grew *Maianthemum canadense* individuals propagated from rhizomes collected from distinct naturally occurring populations of this species in Tennessee, Virginia, Pennsylvania, and New York in controlled-environment growth chambers that simulated current and future projected average growing season temperatures throughout the sampled range. My findings suggest *M. canadense* does not respond well to warming overall and that populations in warmer parts of the current range could be most negatively impacted.

Spanjer, Alexander

10:15, Foundation Room

“A Neo-Latin Theological Bestiary of the Seventeenth Century”

College of Arts and Sciences (Modern & Classical Languages & Literatures)

Research Advisor: Carl P. E. Springer

Abstract: Tens of thousands of university dissertations and disputations written in Latin lie, virtually unstudied, in the libraries of Germany. One of the more unusual of these is the *Disputatio historica de cultu idololatratico bestiarum*, written by Elias Geisler in 1669 for his bachelor’s degree at the University of Leipzig, under the supervision of the Lutheran theologian and professor Valentin Alberti.

Despite its title, this work does not accord with the format often found in oral disputations, lacking the enumerated theses common in such works. Instead, the bulk of the work takes the form of an alphabetized catalogue, listing some 60 animals, all worshipped as divine by some people at some time.

This work may be situated in a long bestiary tradition. Unlike its predecessors, however, which often attempted to draw moral lessons from the animals described, *Disputatio historica de cultu idololatratico bestiarum* describes where and how each animal catalogued may have been an object of zoolatry, with the aim of proving that the worship of animals, instead of the Christian God, is false doctrine.

Beyond this, one of the primary aims of the author appears to be comprehensiveness, with the extensively documented catalogue drawing evidence from Greco-Roman writers, as well as other, more recent sources, even including examples of animal worship from “the new world” (e.g., Peru, Mexico, and Virginia) and Asia (India and Japan). Such comprehensiveness is unnecessary for the purposes of a disputation or a dissertation, but accords well with the traditional expectations for a bestiary.

Tanis, Craig, Ph.D.

11:30, Chattanooga Room

“Portable Finite Element Calculations”

College of Engineering and Computer Science (Computer Science & Engineering)

Abstract: Graphics Processors (GPU’s) require a particular approach to parallel programming due to their unique thread model and complex memory hierarchy. We present a C++ framework for efficiently processing tetrahedral finite element meshes in a manner that allows a numeric kernel to be efficiently applied using either GPU’s or traditional multicore processors.

Weber, Jason

2:15, Heritage Room

“Liar, Liar: How Big Five Personality Traits Influence Motives for Lying”

College of Arts and Sciences (Psychology)

Research Advisor: Kate Rogers, Ph.D.

Abstract: Lying is a part of everyday life, and is something that each person must consider in interpersonal interactions. A misunderstanding of lying and deceptive behaviors can lead to detriments in a variety important domains and situations. As noted by Ekman, there are several different primary motives to lie. Despite the prevalence and consequences of lying, many questions remain. Lying and deception have been investigated from cognitive and social psychology perspectives, however one area that has not been as thoroughly investigated is personality psychology. Given that differences in personality are related to a variety of interpersonal behaviors and life outcomes, it is probable that there is a connection with lying and the motivations for telling a lie. The present study finds evidence that basic and dark personality traits do differentiate different motives for lying. In sum, personality at the both the trait and facet level can provide further understanding for why people lie.

White, Douglas

11:30, Foundation Room

“Time Optimization of a Draining Tank”

College of Arts and Sciences (Mathematics)

Research Advisor: Dr. Boris Belinskiy

Abstract: We consider a tank containing a given volume of liquid and suppose that the liquid drains under the influence of gravity through a small orifice at the bottom. The liquid's viscosity and friction at the orifice are assumed to be negligible. The velocity of the exiting liquid is given by Torricelli's law, which states that the height of the liquid affects the velocity of the exiting liquid. We optimize the time T taken for such a tank to drain.

After exploring the results of a few types of tank, we prove the existence of a certain class of the tank for which the draining time can be made to be arbitrarily large or arbitrarily small. We also consider a dual problem and prove that for any finite time on the interval from zero to infinity, there exists a tank which drains in this time. We finally consider the optimization problem for some other physical models when Torricelli's law has to be modified.

Yanagida, Hiroshi

11:15, Chattanooga Room

“Parameterization of 3D Printed Parts”

College of Engineering and Computer Science (Mechanical Engineering)

Research Advisor: Dr. Louie Elliott

Co-presenters: Simar Singh

Abstract: I will be discussing the strength to weight ratio of 3D printed objects using a Makerbot Fused Deposition Modelling (FDM) printer via manipulating only two parameters: the infill density and the number of shells. The purpose of the experiment was to generate a more precise set of data by decreasing variability within the designed testing matrix. The project approach was to first design the testing matrix, print out the cubes, conduct compression tests on the cubes, and finally analyze the data collected. Two parameters were chosen as opposed to the multitude of parameters which include orientation, layer height, air gap, etc. Other studies have generated ambiguous results by utilizing the Taguchi Method in attempts to encompass each parameter into a uniform testing method. The experiment was to draw conclusions regarding the strength to weight ratios of a 1 inch cube. The next phase required printing out a series of 1 inch cubes within the testing matrix starting at 5% infill density,

UTC RESEARCH DIALOGUES

Panel Presentations

Tuesday, April 11 - Undergraduate Student & Faculty Showcase

Bryan, Victoria

12:00, Chattanooga Room

“Capstone Projects from Cleveland State’s Honors Program”

Cleveland State Community College

Panelists: Clairee Hammons, Haven Wright, Emily Phillips, Brianna Riley

Abstract: At Cleveland State Community College, students completing the Honors program must complete a Capstone project during their final semester. This project is designed by the student and focuses on an element of his or her field in which he or she is primarily interested. Student must choose and adviser within their department, develop a preliminary proposal for directors to review, complete a literature review, submit a formal proposal to the Honors Program Committee, conduct their research/experiment, engage in any community outreach or service to the campus that accompanies their project, and write a full report of their findings. At the end of the semester, they present their findings to the Honors Program Committee, their family and peers, and other students in their departments. The students we’re showcasing on this panel are some of our highest achieving students. Clairee Hammons’s research contrasts the United States’ environmental accounting standards with those of countries in Europe and Asia. Haven Wright has researched the use of art therapy in high-stress environments and used that research to implement an art therapy program for women at the Bradley County Jail. Emily Phillips is researching how to teach a variety of topics to children with different learning styles and implementing that knowledge as she works as a volunteer gymnastics instructor at Diamond Fitness. Brianna Riley is exploring how musicians can succeed in the modern music industry without tying themselves to a label. She’s interested in how digital downloading and streaming services have impacted the livelihood of musical artists and various other challenges faced by independent artists.

Bryan, Victoria

1:30, Chattanooga Room

“Capstone Projects from Cleveland State’s Honors Program”

Cleveland State Community College

Panelists: Ivy Torbett, Desdia Dill, Abigale Phillips, Nicholas Poe-Jones, Justin Deal

Abstract: In our Honors American Literature course at Cleveland State, we have been interrogating what it means to build a canon and what impact that can have on American identity. This course (coded as a high impact course under the categories of Honors education and undergraduate research), has asked that students think consistently about elements of researched literary analysis as they work through the syllabus week by week, keeping in mind that the intensive research unit that will wrap up the course in April will require a length research paper and a panel-style presentation for their peers. The papers included in this panel showcase some of the work the students in this course are undertaking. Ivy Torbett will speak about her research on canon-building and representation of marginalized individuals, focusing on the Harlem Renaissance and women’s writing.

Desdia Dill will speak about her research on the exclusion of incarcerated writers from the American literary canon and will include literary analysis of writing by incarcerated individuals, including some work produced by students in a workshop at the Bradley County Jail. Nicolas Poe-Jones will be speaking about war literature as forces that have encouraged or discouraged American involvement in war efforts at home and abroad. Justin Deal will discuss his research into medical history as it relates to Charlotte Perkins Gilman’s “The Yellow Wallpaper.” Finally, Abigale Phillips will wrap up our presentation by discussing her research on “The Yellow Wallpaper” that focuses specifically on injustices in women’s mental health treatment in the late nineteenth and early twentieth centuries.

Bonnal, Michael, Ph.D

11:00, Fortwood Room

“Economic Development: Country-Case Studies”

College of Business (Economics)

Panelists: ECON 4440-Economic Development Class: Students' Presentation of Country-Case Studies

Abstract: A panel of students from the class ECON 4440: Economic Development will each be presenting a country case study.

McDowell, Ryenne

1:45, Ocoee Room

“Non-white Perspectives: A Different Lens”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Dr. Linda Frost

Panelists: Ryenne McDowell, Simone Edwards, Elizabeth Benn, Semaja Reed, Dominique Malone

Abstract: Being African American while attending a predominately White institution/university (hereafter to be referred to as "PWI") comes with inherent challenges. An African American student can become overwhelmed by the ceaseless presence of the majority combined with the notable absence of fellow African-Americans, and the mental repercussions of attending a PWI can affect the overall college experience for that individual. Over the past year there have been rising tensions in America regarding race relations and the racial division between minorities and Whites. We would like to enumerate the various ways in which the same division seen in general American society is reflected on a college campus. Additionally, everyday life on campus at a PWI can be very different for an African American student than it would be for, as an example, a Caucasian student. From the joining of clubs to attending campus-wide events, experiences can differ depending on if that student is in the majority or minority. By sharing firsthand accounts of African American students' experiences on the campus of the University of Tennessee at Chattanooga, the goal is to instill a new understanding about what it is to be Black at a predominately White institution.

Yanagida, Hiroshi

11:15, Chattanooga Room

“Parameterization of 3D Printed Parts”

College of Engineering and Computer Science (Mechanical Engineering)

Research Advisor: Dr. Louie Elliott

Panelists: Simar Singh

Abstract: I will be discussing the strength to weight ratio of 3D printed objects using a Makerbot Fused Deposition Modelling (FDM) printer via manipulating only two parameters: the infill density and the number of shells. The purpose of the experiment was to generate a more precise set of data by decreasing variability within the designed testing matrix. The project approach was to first design the testing matrix, print out the cubes, conduct compression tests on the cubes, and finally analyze the data collected. Two parameters were chosen as opposed to the multitude of parameters which include orientation, layer height, air gap, etc. Other studies have generated ambiguous results by utilizing the Taguchi Method in attempts to encompass each parameter into a uniform testing method. The experiment was to draw conclusions regarding the strength to weight ratios of a 1 inch cube. The next phase required printing out a series of 1 inch cubes within the testing matrix starting at 5% infill density, with increases of 5% increments up to 25% and in 1-5 shells increasing in 1 shell increments. We conducted a compression test on the cubes using an Instron 5566 compression tester. Using the data collected we determined the exact strength-to-weight

Yoachim, Ann, MPH

3:00, Heritage Room

“Where Place Will Take You: A Hands-On Look at an iLab”

Honors College / Office of Civic Engagement

Panelists: Victoria Baltz, Business Management; Jacob Bogard, Business Management; Samantha Burns, Theater; Chris Cronnon, Biology; Chloe Cross, Biology; Allison Dearing, Sociology; Jose-Luis Gonzalez, Computer Science; Jordan Madrigal, Physics; Victoria Noyes, Biology; Barbara Sevilla, Mechanical Engineering; Simar Singh, Electrical Engineering; Ha Vo, Electrical Engineering

Abstract: How do you define place? This question served as the starting point for a Innovation Lab's year long exploration of individual values and community concerns. An iterative research process led to exploration of issues of campus/community engagement, creative place-making, homelessness and race relations on campus.

This "panel" will offer an "hour" in an Innovation Lab. The Innovation Lab is a two-semester course sequence for the Honors and Innovation program. ILab's are committed to community engagement and problem-based learning. Attendees to this panel will be asked to join in this learning journey. Students will offer their reflections on the course, share insights gained from the design thinking process and lead attendees in hands-on activities that encourage creative problem solving and collaboration.

UTC RESEARCH DIALOGUES

Performances

Tuesday, April 11 - Undergraduate Student & Faculty Showcase

Ford, Ronda, D.M.A.

3:00, UC Auditorium

“UTC Scenic City Flute Ensemble”

Kaitlin Barfield, Lizzie Johnson, Mikaela Parker, and Sarah Shinholser

College of Arts and Sciences (Music)

Hacker-Cerulean, Jeannie

3:30, UC Auditorium

“Research Day Senior Forum”

College of Arts and Sciences (Theatre & Speech)

Motok, Josiah

12:00, UC Auditorium

“*Small Town* Inspired”

College of Arts and Sciences (Theatre & Speech)

Research Advisor: Gaye Jeffers

Co-presenters: Octavius Lanier, Kamen Sims, Carlton Smith, The UTC Theatre Department

Parker, Jenny

1:00, UC Auditorium

“Benjamin Britten, On This Island”

Colleges of Arts and Sciences (Music)

Co-presenter: Mark Laseter

Wilson, Kenyon, D.M.A.

1:30, UC Auditorium

“Antepenultimate Tango”

College of Arts and Sciences (Music)

Co-presenters: Blake Bowling, Spencer Elliott, Zak Truett, Clint Schmitt

UTC RESEARCH DIALOGUES
Undergraduate Lightning Round
University Center Auditorium
Tuesday, April 11 - Undergraduate Student & Faculty Showcase

Black, Luke

“Conservation Outreach in Zoos and Aquariums”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dawn Ford

Garner, William

“Reducing post operation rates of infection during surgical irrigation in the plastic surgery operating room for breast augmentation/reconstruction”

College of Engineering and Computer Science (Electrical Engineering)

Research Advisor: Abdul Ofoli

Harris, Cullen

“The Status and Conservation of the eastern hellbender (*Cryptobranchus alleganiensis*): Is it Functionally Extinct?”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Thomas P. Wilson

Ide, David

“Study of the Photoacoustic Effect on Ethylene (C₂H₄)”

College of Arts and Sciences (Chemistry & Physics)

Research Advisor: Han Jung Park

Andrews, Daniel

“Molecular Monitoring of MRSA: Identification and Prevention in Healthcare Settings”

College of Arts and Sciences (Modern & Classical Languages & Literatures)

Research Advisor: Dr. Carl Springer

Hanson, Abigail

“But Are They Really Your Friends?”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Kate Rogers

Carmichael, Sandra Jean

“Burning Down the House: How the industrialization of American Medicine burns out its best and brightest in the field of Emergency Medicine”

College of Arts and Sciences (Social, Cultural, & Justice Studies)
Research Advisor: Dr. Zibin Guo

Boeger, Reed

“Studying *Vibrio cholerae* Adaptations to Improve Cholera Prevention”

College of Engineering and Computer Science (Civil & Chemical Engineering)
Research Advisor: Dr. Bradley Harris

Yanagida, Hiroshi

“The Compressive Strength Properties of 3D Printed Cubes”

College of Engineering and Computer Science (Mechanical Engineering)
Research Advisor: Louie Elliott
Co-presenters: Simar Singh

Ammon, Jessica

“Molecular Monitoring of MRSA: Identification and Prevention in Healthcare Settings”

College of Arts and Sciences (Biology, Geology, & Environmental Science)
Research Advisor: Dr. David Giles

Harden, William

“Reducing post operation rates of infection during surgical irrigation in the plastic surgery operating room for breast augmentation/reconstruction”

College of Arts and Sciences (Biology, Geology, & Environmental Science)
Research Advisor: Dr. Spratt

UTC RESEARCH DIALOGUES
Undergraduate Lightning Round Judge Panel

Dr. Dominique Belanger

UTC Adjunct Faculty, Department of Chemistry

Ms. Jennifer Hoff

CEO of Skye Strategies

Ms. Eva Lewis

UTC Executive Director of the Office of Planning, Evaluation, & Institutional Research

Dr. Robert Liddell

UTC Director of Career & Student Employment Center

Ms. Jenny Park

Strategic Capital Planner for the City of Chattanooga

Mr. David Steele

Vice President for Policy & Education at the Chattanooga Chamber of Commerce

Ms. Rebecca Suttles

Director of Scholarships for Community Foundation of Greater Chattanooga

Joda Thongnopnua

CEO of Metro Ideas

Ms. Ann Yoachim

UTC Director of Civic Engagement

THANK YOU!

UTC RESEARCH DIALOGUES
Schedule of Events

WEDNESDAY, APRIL 12, 2017
GRADUATE STUDENT & FACULTY SHOWCASE

8:00 AM

Registration

UC Tennessee Room Atrium

9:00 AM - 2:00 PM

Poster & Display Presentations

UC Tennessee Room

9:00 - 11:30 AM, 1:30 - 5:00 PM

Podium & Panel Presentations

UC Breakout Rooms

9:00 - 11:00 AM

3 Minute Thesis Competition

UC Auditorium

11:30 AM - 1:00 PM

Plenary Session: Lunch & Remarks

UC Chattanooga Room

1:00 - 3:00 PM

Performance Presentations

UC Auditorium

1:15 - 2:45 PM

Faculty Collabor(d)ating - MOCS I3 (Interdisciplinary Instruction & Inquiry)

UC Foundation Room

3:00 - 4:30 PM

Faculty Elevator Speech Competition

UC Auditorium

5:00 - 7:00 PM

Reception

UTC Library, 4th Floor

UTC RESEARCH DIALOGUES

Poster & Display Presentations

Wednesday, April 12 - Graduate Student & Faculty Showcase

Abbu, Stephanie, MSN, RN

“Peer-to-Peer Mentoring”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Carolyn Schreeder

Abstract: Nurse retention focuses on keeping nurses in an organization's employment and has been associated with decreased healthcare costs, decreased patient care errors, increased staff and patient satisfaction, and improved patient outcomes. Nurse residency programs (NRP) were developed to improve the transition to practice and decrease the overwhelming turnover rates of new graduate nurses. Vanderbilt University Medical Center's NRP has retention rates of 98-99% for the first year. The challenge in the Neonatal Intensive Care Unit (NICU) is nursing turnover rates as high as 62% at 18 months. This mixed methods study aims to determine the impact of a peer-to-peer (P2P) mentoring program on job satisfaction and intent to stay for NICU nurses beyond their first year of practice. Mentees will complete the McCloskey/Mueller Satisfaction Scale pre and post-P2P. Mentors will complete an initial training session and participate in 6 focus group sessions. Mentor competence will be measured pre/post through the Mentoring Competency Assessment and self-efficacy will be measured pre-P2P, at 3 months, post-P2P by completing the Mentor Efficacy Scale. Anticipation of findings is that mentoring will improve job satisfaction and retention in the NICU.

Adams, Allie

“Applying the Transtheoretical Model to Occupational Therapy Intervention with Adolescents with Substance Use Disorder”

College of Health, Education, and Professional Studies (Occupational Therapy)

Research Advisor: Dr. Elicia Cruz

Co-presenters: Anna Catherine Holmes, Deidre Roberson

Abstract: Substance use disorder (SUD), which is a prevalent issue for adolescents in the United States, is difficult to treat. Prior studies have evaluated the effectiveness of occupational therapy (OT) interventions and the effectiveness of interventions that are guided by the transtheoretical model of behavior change (TTM). Yet no study has observed the effects of combining these intervention methods. This study examined the effects of OT interventions that are based on the theoretical principles from the TTM. Seven 13-17 year old male participants were selected and randomly divided into a treatment group (n=4) and a control group (n=3). The participants participated in their respective groups in six treatment sessions over a six week time period. This poster will present this study and its results.

Albattah, Abdulaziz

“Investigating the Effect of Engineered Nanoparticles on Germination of Seeds”

College of Engineering and Computer Science (Civil & Chemical Engineering)

Research Advisor: Dr. Soubantika Palchoudhury

Co-presenters: Uday Gharge, Dr. Soubantika Palchoudhury

Abstract: As nanoparticles (NPs) are widely becoming part of everyday consumer products, it is crucial to analyze their impact on the environment. Though organisms may have evolved to cope with naturally occurring nanoparticles like nano-sized airborne particles from volcanic eruptions or components of aquatic natural organic matter, engineered NPs can be a markedly different scenario. In particular, engineered NPs are designed to have specific properties, which may pose risk for the exposed organisms. In this study, iron oxide and hybrid Pt-attached iron oxide NPs, home-made at UTC are used as models to assess the effect of engineered NPs on different germinating seeds (e.g., snow peas, chickpeas, and green gram). In specific, lengths of the germinating roots are measured over a period of six days in the presence of different nanoparticle concentrations and the control. It is found that nanoparticle concentration and morphology has a marked influence on germination. Germination is significantly different at low nanoparticle concentrations of 5.54×10^{-6} mg/mL Fe as compared to the higher concentrations (2.77×10^{-2} mg/mL Fe). These results provide useful insights in risk assessment of new engineered NPs.

Amirkhani, Jordan, Ph.D.

“Women Artists and Black Female Identity: Undergraduate Engagement at Atlanta's Spelman College Museum of Fine Art”

College of Arts and Sciences (Art)

Co-presenter: Dr. Susan Eckelmann

Abstract: In the Spring of 2017, Dr. Susan Eckelmann (History) and Dr. Jordan Amirkhani (Art) received a High-Impact Grant to facilitate an undergraduate trip to Atlanta's Spelman College Museum of Fine Art for a guided tour of the museum's rich holdings of art made by women of the African diaspora, including the exhibition 'Mickalene Thomas: Mentors, Muses, and Celebrities.' Students enrolled in Dr. Eckelmann's 'History of African-American Women' course and Dr. Amirkhani's 'Feminism and the Visual Arts' course were provided a unique opportunity to explore and study these rich primary materials with peers from another discipline, and to deepen their understanding of issues related to their classes, including: the experiences and histories of African-American women; the history and organization of Black feminism; the shaping of black female identity through visual means; and the significance of cultural institutions in creating visibility for marginalized voices and communities. This excursion was an extremely rewarding experience for everyone involved (professors and students included), and presents a pedagogical case for the value and significance of teaching with primary sources and mobilizing visual art as an experiential learning tool.

Arabshahi, Abi, Ph.D.

“Computational Simulations of the Aerothermal Environment of Hypersonic Fight Vehicles”

College of Engineering and Computer Science (Mechanical Engineering)

Co-presenters: Drs. Robert Webster, Kidambi Sreenivas

Abstract: The study of anything related to hypersonic flows has always been a challenge, whether experimental measurements in tunnels or experimental measurements via flight testing, or computational simulation. The flow conditions (pressure, temperature, density, velocity) are so extreme, and the time scales on which things occur are so small that the accurate measurement and/or computation of these flows are not at all trivial. There are numerous physically complex phenomena that are simultaneously in play, and, ultimately, these phenomena have to be

accounted for if a hypersonic vehicle, regardless of its purpose, is to be successful in its mission. That is to say, it is truly a multi-physics problem. This is significant with regard to computational simulations, because flow solvers have been evolving in the direction of having multi-physics capabilities. In other words, a given computational tool is expected to be able to simulate the fluid mechanics problem coupled with the thermal and solid mechanics problems of the vehicle. The primary goal of the research is to accurately and efficiently compute the unsteady aerothermodynamics and aerothermoelastics for hypersonic vehicles in support of Tennessee Aerospace Initiative.

Bakland, Paul-Erik

“Investigation of Habitat Effects on the Prevalence of the Amphibian Chytrid Fungus in East Tennessee”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Thomas P. Wilson

Co-presenters: Dr. Ethan Carver, Dr. Jose Barbosa, Bradley Reynolds, Team Salamander, Dr. Thomas Wilson

Abstract: In light of the current global biodiversity crisis facing amphibians, studies investigating the pathogenic fungus *Batrachochytrium dendrobatidis* (Bd) are a foremost priority as the fungus is responsible for extirpation and extinction events around the world. The data presented here are some preliminary results from an ongoing project that evaluates Bd infection prevalence and severity in American Bullfrogs (*Lithobates catesbeianus*) and Green Frogs (*Lithobates clamitans*) at natural wetlands as compared to urban retention ponds across East Tennessee. In addition to evaluating the role of factors such as habitat type, average rainfall, average air temperature, and canopy cover on infection prevalence and severity, this study also seeks to further characterize potential interspecific differences in infection rates between these two ecologically very similar species. The preliminary results presented here are derived from data collected at two natural wetlands in Southeast Tennessee.

Barlow, Susan, DPT, Ph.D., NCS

“A Survey of Capstone Courses in United States DPT Program Curricula”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Dr. June Hanks, Dr. Jeremiah J. Tate

Abstract: Purpose: Capstone courses in professional curricula provide opportunities for students to synthesize and integrate clinical and theoretical information from previous coursework. The purpose of this research is to ascertain the capstone projects utilized by Doctor of Physical Therapy programs in the United States (US-DPT).

Methods: Programs accredited by the Commission on Accreditation in Physical Therapy Education website as of June 2016 were included in this analysis (n=218). The majority of these programs (n=204) published web accessible curricula that were evaluated for the presence of the word "capstone" in the course title or course description.

Results: Of the US-DPT program curricula analyzed in this study, 36% designated a capstone course. The capstone courses focus on research (53%), professional development (15%), managing the complex patient (7%), licensure preparation (4%) or clinical education (3%).

Discussion: Dialogue among programs leading to consensus regarding capstone course content may serve to promote best practice in entry-level professionals.

Bellino, Christina

“Location Determines Health Outcomes for Families with Special-Needs Children”

College of Health, Education, and Professional Studies (Education)

Research Advisor: Dr. Jim Tucker

Abstract: Families living in poverty often do not have a choice but to live in impoverished neighborhoods. Low-income neighborhoods are typically characterized by poor-quality housing, ineffective schools, and a higher prevalence of crimes, drugs, and violence. For low-income families with children with special-needs, living in areas of concentrated poverty is especially challenging. Owing to the isolation of such neighborhoods, residents often do not have access to quality supportive services and developmental opportunities for special-needs children. This lack of support predetermines the health outcome of a vulnerable child.

Bennett, April

“Stopping the Pipeline to Prison: Dual Involvement in the Foster Care and Juvenile Justice System”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Research Advisor: Dr. Tammy Garland

Co-presenters: Dr. Tammy S. Garland, Dr. Morgan Cooley

Abstract: This research study sought to identify the experiences, perceptions, challenges, and training needs of professionals and service providers working with dual system youth (i.e., youth involved in the child welfare and juvenile justice system concurrently). Professionals and service providers have different types of training to meet the multiple needs of dual system youth, and research is needed to determine how to best support both the youth and the professionals involved. Convenience sampling was used to survey individuals who work with dual system youth from the fields of criminal justice, social work, and education. The results of this survey and implications for training, practice, research, and policy will be discussed.

Blount, Christy

“An HPV Vaccine Protocol to Increase Education and Compliance”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Joanie Jackson

Abstract: Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States with 14 million persons newly diagnosed each year. Despite proven vaccine effectiveness, adherence to recommended vaccination guidelines remain low. The method used for this study is the development of tools, utilizing critical elements of Rosenstock's Health Belief Model, which will measure the provider participant's knowledge of HPV vaccine and the utilization of an evidenced based protocol. The project includes a pre-test survey, an education session and one-on-one training, and initial post-test survey administration. An HPV vaccine protocol was implemented. After project implementation, a second post-test survey tool will be administered to clinical staff to evaluate what effect occurred in knowledge retention. Short term goals include a 50% increase in provider knowledge and protocol utilization from pre-test survey to first post-test survey and a 10% increase in HPV vaccine initiation rates over baseline. Long term goals include a 75% increase in provider knowledge and protocol utilization from pre-test to second post-test survey and a 25% increase in HPV vaccine initiation rates.

Brady, Lisa

“The Role of Sense of Coherence in Stressor Appraisal”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Christopher J.L. Cunningham

Abstract: According to Lazarus and Folkman's (1984) transactional theory of stress, a person's appraisal of a stressor is impacted by various factors, including cognitive individual differences. Within the stress literature there is a need to understand those factors that influence the way in which individuals appraise work-related stressors. One such cognitive individual difference, Sense of Coherence (SoC), refers to an individual's generalized emotional-cognitive perception of environmental stimuli (Antonovsky, 1987a). Individuals with a strong SoC perceive the world as more comprehensible, manageable, and meaningful, and research suggests that individuals who have stronger levels of SoC may be more likely to appraise work-related stressors as challenges than as hindrances or threats. The present study was designed to assess the role of SoC in an individual's appraisal of work-related stressors as challenges, hindrances, or threats. Although one's SoC remains relatively stable upon reaching adulthood, there is a positive association between age and SoC across the lifespan. The present study was also designed to examine the moderating effect of age on the relationship between individuals' SoC and their appraisal of work-related stressors.

Bullock, Caitlin

“Building Without the Blocks: Language Learning Without the Alphabet”

College of Health, Education, and Professional Studies (School Psychology)

Research Advisor: Dr. James Tucker

Abstract: How is it possible for a first-grade student to recognize and understand sight words when they fail to produce the correct names and sounds of letters in the alphabet? Similarly, how could a third-grade student who does not recognize the word "it" manage to make it to the next grade level? And what about the fourth-grader who doesn't know all of the letter sounds? These are only a few anecdotal examples that suggest language can be learned well enough to get by without knowledge of the alphabet, the basic units from which words are constructed, recognized, and understood. By teaching students in a graduate program a series of sight words written in a foreign language in order to form a preliminary vocabulary and then asking them to correctly name and define unfamiliar words from the same language, the present study seeks to find out whether or not it is necessary to begin with the alphabet when teaching a foreign language. The conclusions drawn from this study should reveal the implications of situations like those detailed above and aid in understanding the process of language acquisition, while clarifying the process through which people generalize knowledge of words and sounds to novel, unfamiliar words.

Carroll, Andrew, PG, GISP

“Acquisition of High Accuracy Geospatial Data for Environmental and Natural Resource Management Using Light Detection and Ranging (LiDAR) Sensor Equipped Unmanned Aerial Systems (UAS)”

Administration (IGT Lab and Office of Vice Chancellor for Research)

Abstract: Light Detection and Ranging (LiDAR) sensors are commonly used in geospatial data acquisition for natural resource and environmental management. LiDAR sensors are fully capable of vegetation and ground cover penetration for accurate terrain surface measurement, as compared to more common, less obstruction tolerant, photogrammetric methods. Recent advances for inertial measurement unit devices, global navigation satellite system receivers, and regulatory authorizations have increased the deployment of unmanned aerial systems (UASs) for geospatial data acquisition. Comparably, commercially manufactured LiDAR sensor payloads are available in smaller form factors and weights. Results from recent field mapping missions and LiDAR sensor evaluations, indicate

increased mobility, reduction of safety hazards, and high data quality results from LiDAR enabled UAS platforms. In addition, UAS systems offer potential time and cost savings, verses traditional survey or manned aircraft acquisitions.

Cobble, Brittney

“The Benefits of Therapeutic Crafts for the Development of Leisure Coping Skills Among Adolescents with Substance Use Disorder”

College of Health, Education, and Professional Studies (Occupational Therapy)

Research Advisor: Dr. Elicia Cruz

Co-presenters: Noel Crowder, Fidela Mendiola, Diane McKinney

Abstract: This study aimed to examine the effects of the use of therapeutic crafts as a method to facilitate the development of the knowledge and skills needed for healthy leisure engagement, such as coping skills. This research participants were adolescents in an inpatient substance use program located in Chattanooga, TN. Participants included three seventeen-year-old females who were recently enrolled in the substance use program. A mixed-method design was utilized using qualitative and quantitative data from field notes, semi-structured interviews, and results from a standardized assessment tool, respectively. The Children's Assessment of Participation and Enjoyment (CAPE) and Preferences for Activities with Children (PAC) is a standardized assessment to examine leisure participation and preferences. Data from the CAPE/PAC was analyzed pre- and post-test. Thematic coding and triangulation was utilized to analyze the data from field notes and the semi-structured interviews. The results of the study will be presented at the Second Annual ReSEARCH Day at the University of Tennessee at Chattanooga.

Compton, Larry

“The Use of Metformin and Lifestyle Interventions in Obese Children and Adolescents: Reducing the Risk of the Development of Type 2 Diabetes”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Gwen Carlton

Abstract: Childhood and adolescent obesity has risen to epidemic proportions world-wide and particularly in the United States. It is estimated that more than 50 million school-age children are obese globally and 12.7 million in the United States. The prevalence of childhood and adolescent obesity is associated with an increase in the diagnosis of type 2 diabetes (T2D) and metabolic syndrome (MS) also known as insulin resistance syndrome (IRS). These two conditions which were once uncommon among this population are predicated by obesity related insulin resistance (IR). Early development of IR, IRS, and T2D is associated with various health problems including metabolic disorders, cardiovascular disease, and early death. Therefore, early intervention may prevent future metabolic disorders, cardiovascular deterioration, and the long list of other diseases. Although the treatment of T2D is well founded, the treatment of IR and IRS in pediatrics is controversial due to a lack of supporting evidence. The purpose of this project is to evaluate the use of metformin in obese children and adolescents as a single therapy and as an adjunct therapy to therapeutic lifestyle intervention (TLC) to improve obesity and prevent the future development of T2DM.

Cowan, Kay W., Ph.D.

“The Role of the Arts in Cognition and Student Performance”

College of Health, Education, and Professional Studies (Education)

Co-presenters: McKenzie G. Fox, Katie S. Howell, Kaitlyn M. Macri, Jessica M. Dickerson

Abstract: The poster presentation, The Role of the Arts in Cognition and Student Performance, will capture highlights of a longitudinal, qualitative study that focused on the function of the arts to foster higher-order reasoning. This study

has been joined by two graduate and two undergraduate UTC students who are preparing arts-based literacy materials to address instructional delivery through the use of a range of art forms. The materials being prepared by the UTC students are to be shared with five area school systems this spring and summer and will be implemented in reading, science, social studies, and math classes next fall. The poster presentation will be grounded in constructivist, arts-based literacy research and will connect that research to the findings of the National Reading Panel Report. The presentation will include findings from earlier parts of the study that demonstrate the power of the arts to foster metaphorical and analogical reasoning. Connecting this work to the National Reading Panel Report, the presentation will showcase the UTC students' work with arts-based strategies to foster key elements of comprehension, vocabulary, fluency, comprehension/metacognition, phonological awareness, and phonics.

Crowe, Jessica, OTD, OTR/L

“Building the Skills to Navigate a Changing Scholarly Landscape”

College of Health, Education, and Professional Studies (Occupational Therapy)

Co-presenters: Emily Thompson, MSI Library

Abstract: Occupational therapy (OT) practitioners play a unique role on healthcare teams by promoting health, well-being, and occupational participation (American Occupational Therapy Association [AOTA], 2015). To meet client needs, OTs will use higher-level cognitive skills to increase opportunities for occupational engagement by addressing factors that impede participation (Lee, 2010). With "advances in knowledge and technology" (Hinojosa, 2007, p. 629), these solutions will evolve. Accordingly, OT educators are challenged to help students move toward higher cognitive domains in entry-level degree programs (AOTA, 2009). Digital media is one method which can help students attain higher level cognitive skills because students must analyze information about the topic area, select areas of emphasis, plan for the digital delivery, and apply knowledge of technology to create a digital product (Tabor & Minch, 2013). Best practices for the use of digital media assignments emphasize the importance of interdisciplinary collaboration, careful planning, a review of pedagogy, an understanding of technology, and adequate training and student support. Failure to do so could result in frustrating challenges for students and faculty (Tabor & Minch, 2013).

Cruz, Elicia, Ph.D., OTR/L

“Twelve-Step Facilitation, an Occupational Therapy Perspective”

College of Health, Education, and Professional Studies (Occupational Therapy)

Abstract: Occupational therapists provide therapeutic activities to facilitate independence in and satisfaction with daily living. In mental health settings, activities such as arts, crafts, and games challenge individuals to develop abilities and habits needed for daily living. OT can facilitate improved self-development, including self-discovery, self-expression, and self-management. Such development is particularly relevant to substance abuse treatment, in which these personal skills are needed for sober living. Many treatment settings incorporate twelve-step programming into the overall treatment plan. These settings introduce clients to the notion of 12 step programs (TSPs) as an option for long term recovery. Some treatment settings aim to facilitate 12 step engagement by structuring interventions to introduce clients to the twelve-steps and have them begin a TSP while in treatment. They focus on 12 step facilitation (TSF). OTs are uniquely positioned for TSF by designing therapy to introduce clients to TSP and deepen their understanding of the first few TSP steps. This poster describes OT programming aimed at TSF, with the hope of prompting dialogue about TSF and creative, activity and group based therapies.

Cunningham, Christopher J.L, Ph.D.

“Identifying gaps in nursing safety education and practice”

College of Arts and Sciences (Psychology)

Co-presenters: Linda Chaff, Thomas Preston, Drake Terry

Abstract: Safety in healthcare settings is a major concern, with direct and indirect worker injuries and illnesses costing the healthcare industry close to \$20 billion/year. Arguably the most important point for safety-focused interventions in

healthcare settings is at the level of nurses. These healthcare professionals manage the majority of patient contacts and as a result face an extremely high risk for safety-related errors and incidents. This project is being done to lay the groundwork for a broad evaluation of safety education and practice issues among nursing students and nursing professionals. The ultimate goal is to identify and address gaps in the education-practice linkages for members of this critical population of healthcare providers.

Cutting, Amanda

“Exploring Relaxation Techniques as Coping Strategies During Stressful Transitions”

College of Health, Education, and Professional Studies (Occupational Therapy)

Research Advisor: Dr. Janice Ryan

Co-presenters: Katie Browner, Katie Murdock

Abstract: This exploratory study considers the use of The Mindful Occupational Therapy Approach and multi-sensory environments to increase emotionally self-regulation, engage participants in new learning, and facilitate positive coping mechanisms. For veterans who experience stress reactions, mindfulness and reflective journaling can be an alternative to pharmacological treatment. Student researchers analyzed reflective journals of occupational therapy students to understand stress reactions during transition phases. During a five-week data collection period, pre-established multi-sensory and mindfulness treatment protocols were implemented. Participants completed weekly reflective journaling exercises, discussing changes in stress following participation in protocols including: learning modules, multi-sensory environments, progressive muscle relaxation exercises, and centered breathing experiences. Comparison of reflective journals among the three cohorts who engaged in mindful learning found that using mindfulness strategies during reflective journaling can ease the process of stressful life transitions, by shifting one's negative, self-defeating thoughts or emotions about the transition to more positive, self-motivating thoughts.

Daniels, Kelly

“Comparing unmanned aerial vehicles (UAVs) to traditional field methods in surveying of basking riverine turtles”

College of Arts and Sciences (Biology, Geology & Environmental Science)

Research Advisor: Dr. Thomas Wilson

Co-presenters: Dr. Thomas Wilson

Abstract: Unmanned aerial vehicles (UAVs), or drones, are an emerging technology that shows promise in up and coming method in ecological research. We would like to test To determine their usefulness for sampling freshwater basking turtles., In this comparative study, we are comparing UAVs to the more traditional sampling methods such as , basking traps and spotting scopes. UAVs have This comparison has yet to be used successfully sampling freshwater turtles; however, they have been used with mixed success for monitoring to be made for turtles due to the newness of the method and the trend of sampling large mammals and or birds. Herein, we propose that the conservation utility of UAVs be formally tested in the field prior to them being used to make adaptive conservation and management decisions. We will statistically evaluate the use of UAVs in contrast to try and use this new method to proven field methods as a means to elucidate our basic understanding of occupancy, site fidelity, and species richness. spot basking turtles on their chosen platforms and determine species and possibly gender as well as taking measurements. I will be comparing the effectiveness of the other two methods against UAVs.

Drake, Sarah

“Survival Time of Staphylococcus aureus on Ultrasound Transducer Heads”

College of Health, Education, and Professional Studies (Occupational Therapy)

Research Advisor: Dr. Susan McDonald

Co-presenters: Katherine Duke, Casey Kluttz

Abstract: This study explored the survival time of Staphylococcus aureus on therapeutic ultrasound (US) transducer heads to better understand potential pathogen transport among patients in rehabilitation clinics. Therapeutic US is commonly used by occupational and physical therapists in the rehabilitation of soft tissue injuries. The transducer head directly contacts patient tissues during treatment, putting patients at risk for healthcare acquired infections (HAI's), a primary health issue in the U.S. healthcare system (Centers for Disease Control and Prevention, 2016). In this study, S. aureus was applied to US heads using two different mediums and samples were taken over predetermined periods of time. Surviving bacteria were removed from the heads using sterile transport swabs, that were enumerated using a serial dilution viable plate count. S. aureus survival rate was calculated by counting the number of colony forming units (cfu) obtained from the swab counts, for head exposure times of 30 minutes, 24, and 72 hours. The results indicated that S. aureus added to the heads and allowed to dry survived for less than 30 minutes. S. aureus applied to the US head directly from the overnight culture (ONC) in tryptic soy broth (TSB) survived at all exposure times. These results suggest it is feasible for S. aureus to be transferred among patients via contaminated US heads depending on the time between US use, cleaning protocols, and presence of an organic matrix substantial for bacterial survival. Additional research using a medium with a composition mimicking bodily fluids is needed to substantiate this argument.

Dye, Eva

“L.E.A.N. - Lean Efficiency Among Neonatal Nurse Practitioners”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Susan Thul

Abstract: L.E.A.N. - Lean Efficiency Among Neonatal Nurse Practitioners is a DNP translational project focusing on improving the pre-rounding preparation efficiency of Neonatal Nurse Practitioners (NNPs) in the Neonatal Intensive Care Unit at Vanderbilt Children's Hospital. Lean methodology is a framework to improve efficiency by reducing waste and redundancy in order to increase value. The L.E.A.N. project introduces a new, more efficient method for NNPs to use to prepare for interdisciplinary rounds with a goal to increase the time NNPs have for direct patient care and exams. The effects of implementation will be measured by pre and post implementation surveys of NNP satisfaction with pre-rounding preparation, NNP workload, and the number of NNP patient exams able to be performed prior to rounds.

Eckelmann Berghel, Susan, Ph.D.

“Why Must There Be War?”

College of Arts and Sciences (History)

Abstract: In their written correspondence with the White House between 1963 and 1968, well over 1,200 children and adolescents ages 5 to 17 across the United States and abroad debated the U.S. deployment during the Vietnam war, the ideological conflict against communism, and American public policy addressing environmental issues, class inequality, and civil rights campaigns. Cold War conflicts and LBJ's Great Society programs politicized American teenagers' daily life beyond the electorate. Letter correspondence offers a window into the world of 1960s youth, illustrates the significance and impact of presidential leadership, and highlights the ways in which children and teenagers exercised their rights as citizens during one of the most formative decades in U.S. history. Letter writing allowed youth to engage with the adult world on their own terms as “loyal citizens,” “friends,” and “advisors.” In their

letters, child and adolescent letter writers addressed adults' age prejudices and rejected assumptions about adult influence. In a letter to President Johnson, Rebecca Spooner, a high school freshman from Tempe, Arizona, maintained, "... this is my thinking only and not my friends or parents. If I was old enough to vote, I would vote for you." Letters like these implicitly or explicitly challenged adult notions about child and adolescent fitness as citizens. Performing their ableness, youth sought the direct engagement with the president to express their ideas, air their grievances, and influence public policies and military decisions.

Evans, Amber

"Antibiotic Stewardship Programs"

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Priscilla Simms-Roberson

Abstract: Antibiotic stewardship refers to the coordinated efforts of inpatient and outpatient providers to appropriately prescribe antibiotics. This means that the correct antibiotic will be prescribed in the correct scenario and for an appropriate amount of time. Antibiotic resistance is becoming an increasing healthcare crisis; which can partially be attributed to the inappropriate use of antibiotics. Another goal of antibiotic stewardship is to prevent adverse drug reactions that are commonly known to occur with the administration on antibiotics; thereby also improving patient outcomes. To combat resistance providers (physicians, nurse practitioners, physician's assistants, and pharmacists) must be cognizant of one's prescribing practices and make every attempt to be a good steward of medications. This small research study evaluates the knowledge of family nurse practitioner students regarding basics of antibiotic stewardship programs, safe prescribing practices, and common adverse outcomes related to the administration of antibiotics.

Ewald, Ashley

"Tracking BMI in Childhood through Adolescence"

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Karissa Peyer

Co-presenters: Partida, G. Welk, K. Hamilton, K.L. Peyer

Abstract: The purpose of this study is to examine distributions of BMI change in a large sample of urban school district children. **METHODS:** Child height and weight were measured in 1st grade (by school nurses) and 10th grade (by Physical Education teachers) and converted to BMI percentiles (BMI%) for sex and age using standard CDC SAS code. Subjects were grouped into BMI Categories (Cat) based on 1st grade BMI% with all children with BMI% less than 10% in Cat0, BMI% from 10-19% in Cat1 and so forth, up to Cat9 with 1st grade BMI% of 90% or higher. Average 10th grade BMI% and average BMI% change from 1st to 10th grade were computed for each BMI Category. **RESULTS:** Complete data was available for 559 subjects. Average 10th grade BMI% ranged from 35.8% in Cat1 to 90.2% in Cat9. Average BMI% change was 2.86% from 1st to 10th grade. Average BMI% in Cat0 increased by 31.4% while Cat9 showed an average decrease of 6.9%. Cats 7, 8, and 9 showed overall decreases in BMI% while Cats 0-6 showed increases. **CONCLUSIONS:** 1st grade BMI shows only a weak association with adolescent weight status. However, BMI% decreases among heavier children, possibly due to a ceiling effect in BMI% curves, requiring further examination of approaches assessing child BMI.

Fabries, Brian

“Assessment of Reactive Agility Test Performance as a Potential Predictor of Injury Risk”

College of Health, Education, and Professional Studies (Athletic Training)

Research Advisor: Dr. Gary Wilkerson

Co-presenters: Elaine M. Odum, Molly A. Vickers, Gary B. Wilkerson

Abstract: Analyze reactive agility, visuomotor response, and reaction time of 72 college male NCAA Division I football players over the duration of a spring football season. Using a Trazer device, we will be collecting baseline measurements of visuomotor response and agility measured by reaction time.

Foerder, Preston, Ph.D.

“iChimp: Using Internet Technology to Connect Captive Chimpanzees”

College of Arts and Sciences (Psychology)

Co-presenters: Dr. Farah Kandah, Dr. Hope Klug

Abstract: Providing zoo animals with stimulating environments to demonstrate species-typical behavior is called environmental enrichment. New technologies expand the range of possibilities for enrichment and animal research. Chimpanzees (*Pan troglodytes*) are highly intelligent and social primates that live in the wild in groups of up to 150. Due to recent changes in research regulations, more chimpanzees are being placed into zoos and sanctuaries. Captive environments have difficulty providing for their social and cognitive needs. To address these needs, we have devised a real-time interactive video animal enrichment system installed in chimpanzee exhibits at two zoos in Tennessee. The system uses Chattanooga's high-speed Internet along with a dedicated Internet server, UTC engineering's GENI rack, to connect the Chattanooga Zoo's chimpanzee colony with chimpanzees at Zoo Knoxville. This system will provide enrichment by expanding each chimpanzee group through both visual and auditory connections with another group. This system will virtually expand each zoo's chimpanzee population and allow us to study chimpanzee social structure and communication. In the future we will expand this project to chimpanzees at other zoos and sanctuaries.

Fortunatus, Mawazo

“Correlation between International Roughness Index (IRI) Results from ICC Profiler and Rainhart Profilograph Index (PrI)”

College of Engineering and Computer Science (Civil & Chemical Engineering)

Research Advisor: Dr. Mbakisya Onyango

Co-presenters: British Hunt, Elena Cross

Abstract: Road roughness is a phenomenon that results from the interaction between the road longitudinal profile and the vehicle moving along the road. Road roughness measurement is affected by parameters such as vehicle's suspension (includes how the tires are connected to the vehicle body with springs and shock absorber), tire pressure and human body sensibility to vibration as the vehicle travel at a certain speed. Depending on the road type and data usage, road roughness can be evaluated using instrumentation of precision ranging from high to low. Some profile measuring devices has a built-in ability to process the profile data and provide the IRI. This project provides the analysis of longitudinal profiles data collected using ICC profiler and simulated to Rainhart Profilograph to obtain the PI. ProVAL Software was used to analyze the raw profile data collected by ICC profiler to obtain the IRI. A linear correlation between IRI and PI was obtained with a coefficient of determination of 0.95 which shows a good relationship.

Fox, Lauren

“Concussion Education at Pediatric Sports Physical Appointments”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Priscilla Simms-Roberson

Abstract: Implementing concussion education during primary care sports physicals can increase awareness (prevention, recognition, and management) of concussions, to decrease concussions and prevent secondary concussions from occurring. It has been found that providing education to athletes and their parents/guardians before the season begins increases awareness of concussions and their symptoms. The aim of the education during the physical focuses on identifying the signs and symptoms of a concussion after an injury occurs and what needs to be done from that point. The second part of the education would focus on reintegrating the athlete back into activity in a safe and timely matter that is managed by the athlete's primary care provider. This increased awareness leads to understanding the importance of not returning to play and properly treating concussions until fully healed. An athlete is predisposed to long term, damaging effects from secondary concussions most often occurring as a secondary concussion. If athletes and those involved with the athlete are aware of symptoms and the long-term effects, it provides the confidence to report the signs/symptoms that leads to proper management and reducing the incidence of a secondary concussion.

Gao, Cuilan, Ph.D.

“Genome-wide Gene Expression Profiling Between African American and Caucasians Colorectal Cancer Patients”

College of Arts and Sciences (Mathematics)

Co-presenters: Dr. Cuilan Gao, Dr. Sumith Gunasekera, Dr. Yu Liang, Dr. Greg Heath

Abstract: Colorectal cancer (CRC) is the second most lethal malignancy in the USA and affects over a million people every year. Over the past four decades in the United States, there has been a divergent trend in mortality rates between African-Americans (AA) and Caucasians (CA) with colorectal cancer. The incidence and mortality of CRC is higher in AA than CA in the U.S. general population. But the causes of the CRC disparity that exists between AA and CA are unknown. Although most of the research on this disparity has focused on socioeconomic factors, recent findings strongly support the role of genetic and biological factors. Gene expression data (measurement of the activity of tens of thousands of genes at once) by microarray or next-generation sequencing (NGS) has been emerged as an efficient technique to extract huge amount of molecular information.

We hypothesis that the gene expression profile of CRC in AA and CA patients may reveal biological differences between the two populations, which may explain the higher incidence and mortality of CRC in AA population. We perform a two-stage method to analyze differential gene expression at both gene level and gene-set level.

Grant, Alexandra

“Changes in Self-reported Sleep During a Structured Exercise Program in College Females”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Elizabeth Hathaway

Co-presenters: E.D. Hathaway, M.V. Fedewa, S. Higgins, K. Peyer, K.C. Hamilton, E.M. Evans, M.D. Schmidt

Abstract: PURPOSE: As beginning a structured exercise program may have unfavorable effects on sleep, the primary aim of this study was to examine changes in self-reported sleep during a structured exercise program in previously inactive, overweight/obese, young women. METHODS: Forty participants (20.5±1.6y, 30.6±4.6 kg/m², 66.7% Caucasian) were randomized to six weeks of a) continuous moderate-intensity exercise (MOD-C) or b) vigorous-intensity sprint-interval exercise (VIG-SIC). Sleep time was assessed via self-report at pre-, mid-, and end-study (T1,

T2, and T3, respectively). Changes in sleep were analyzed using a 2-way ANOVA (Group \times Time). **RESULTS:** The Group \times Time reaction was not statistically significant ($p=0.56$), however sleep duration changed over time ($p<0.01$). MOD-C participants ($n=23$) averaged 8.4 ± 1.1 , 6.3 ± 1.3 , and 8.2 ± 1.2 and VIG-SIC participants ($n=17$) averaged 7.8 ± 1.3 , 6.1 ± 0.9 , and 8.0 ± 1.2 hrs/night of sleep at T1, T2, and T3, respectively. **CONCLUSION:** These females reported decreased sleep at the onset of structured exercise, but returned to baseline levels at end-study.

Grillo, Sara

“Physiological stress response with manipulated predation risk in a small mammal, *Octodon degus*”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Loren D. Hayes

Abstract: An animal's response to danger, such as a predator encounter, activates physiological pathways that influence survival. In vertebrates, a major component of the stress response is the hypothalamic-anterior pituitary-adrenal axis (HPA axis). The HPA involves a cascade of hormones that reinforce the nervous system and leads to elevated levels of stress hormones (glucocorticoids) after exposure to a stressor. Elevated glucocorticoid levels are necessary to increase cardiovascular output, increase respiration rates, and breakdown glycogen and glucose, increasing available energy to the cells. After the stressor is gone, negative feedback mechanisms in the HPA axis return glucocorticoids to baseline levels. To summarize, a healthy HPA response involves the ability to produce elevated glucocorticoids in response to stressors and effective negative feedback. Elevated stress hormone levels are associated with predation risk, and individuals exposed to predator cues exhibit increased stress hormones. The objective of my study was to determine the effects of experimentally reduced predation risk on the stress response of adult *degus*, a caviomorph rodent endemic to Chile.

Guida, Erin

“Interrelationships among factors that influence rapid responses to environmental stimuli”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Shellie Acocello

Co-presenters: Dani Heidt

Abstract: To assess interrelationships among concussion history, psychoemotional status, dietary attitudes and sleep quality that may be associated with neuromechanical performance capabilities.

Guven, Emine, Ph.D.

“The Impact of Humidity on Gene Expression in the Human Skin ”

College of Engineering and Computer Science (Computer Science & Engineering)

Co-presenters: Dr. Hong Qin, Dr. Jianming Zhang

Abstract: As the largest organ in the human body, the skin can directly sense environmental humidity changes, and adjust itself by either losing or absorbing moisture. Consequently, humidity changes are commonly observed to influence the morphological and physiological condition of the skin, such as skin wrinkles, ageing lines and stem cell activities. The goal of this research is to investigate the impact of room humidity on human skin by profiling the genome-wide gene expression. This study aims to determine whether there is a common pattern of regulation of gene expression under different humidity stress in human skin. We invented an ex-vivo model system to investigate the molecular cell response of human skin under various dryness conditions (from relative humidity 20% to 100%) for 8 hours ex vivo culture. One specific set of genes involved in the *Staphylococcus aureus* infection pathway from the

KEGG classification showed significant responses to relative humidity changes. More interestingly, several genes in this pathway also regulate hair follicle development besides the function of immune response.

Hackathorne, Jessica, MOT

“Preparing Future Leaders in Practice Through the Development of Professional Behaviors”

College of Health, Education, and Professional Studies (Occupational Therapy)

Co-presenters: Jessica Crowe, OTD, OTR/L

Abstract: Occupational therapy (OT) is one of the fastest growing professions of this time. It is imperative that educators facilitate the development of a myriad of skills across the curriculum. These skills extend beyond clinical practice techniques to include leadership, communication, teamwork, conflict resolution, and personal responsibility. Research demonstrates that students do not automatically possess these skills (Coates & Crist, 2004; Davis, 2009; Engelmann, 2014). Davis (2009) found that approximately 89% of clinical educators have reported dealing with a student who demonstrates unprofessional behaviors, which include interrupting a supervisor, ignoring environmental stimuli leading to unsafe clinical scenarios, being unprepared, and demonstrating lack of self-control (Coates & Crist, 2004). Academic programs must create a culture to successfully teach professional behaviors (Hodges et al, 2011). In OT, teaching and assessing professional behaviors has been limited to self and peer assessments and clinical education tools (Engelmann, 2014; Hodges et al., 2011). The faculty at UTC have created a novel approach to promoting the growth of professional behaviors for its entry-level OT students using a professional behavior rubric.

Hacker, Jessica

“Motivational Influences on Prospective Memory in the Laboratory and the Real World”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Jill Shelton

Co-presenters: Calli Bianchi, Emily Royal, and Lydia May

Abstract: Pro-social motivation is defined as the desire to protect and promote the well-being of others as opposed to self-interested motivation, which is the motivation to protect and promote the well-being of oneself. Previous research has demonstrated a pro-social advantage for remembering to perform future intentions (i.e. prospective memory). The purpose of this study was to investigate how these motivational forces impacted prospective memory performance in the lab and naturalistic settings. College students were randomly assigned to one of three conditions: pro-social context, self-interested context, or standard context. All participants completed both a lab and naturalistic prospective memory task. We observed significantly higher performance in the pro-social condition relative to the self-interested and standard conditions across both prospective memory tasks. No differences were observed between the self-interested and standard conditions.

Hall, Jonah

“Application of remote sensing and GIS to study the impact of urbanization on surface water quality in Hamilton County TN”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Azad Hossain

Co-presenters: British Hunt, Elena Cross

Abstract: As Hamilton county continues to increase urbanization it is critical to research the surrounding environment to see how it is responding to this rapid development. There has been previous research investigating the impact of urban development has on hydrological processes that directly or indirectly impact water quality. Satellite remote

sensing began in the 1970's and has accrued an extensive wealth of geospatial data with over a long temporal span. The combination of multispectral spatial data across a large period of time allows for regional spatial analyses to be conducted to measure urbanization growth through time. This research investigates the total urbanization change and growth within HUC-12 watersheds within Hamilton county. Also impervious development located near waterbodies within the watershed boundaries are investigated as well. These results can be used as indicators of areas causing suspected water quality changes or degradation. Having this information Hamilton county can implement sustainable development procedures to help ensure that future growth does not compromise its hydrologic resources.

Hamilton, Kara, Ph.D.

“Effects of a School-based Intervention on Daily Moderate to Vigorous Physical Activity in Rural Children”

College of Health, Education, and Professional Studies (Health & Human Performance)

Co-presenters: Mark Richardson, Jonathan Wingo, John C. Higginbotham

Abstract: This study determined whether improvements in moderate to vigorous physical activity (MVPA) occurred in rural children following a school-based intervention that was designed utilizing a partnership between researchers and community members. Two fifth grade classes (n=19, n=20) at a low socioeconomic status (SES) rural school were assigned to either a comparison or an intervention group that participated in a 4-week physical activity intervention. Participants' physical activity (ActiGraph accelerometer wGT3X-BT, Pensacola, FL) was assessed prior to and immediately following the intervention. Only valid accelerometer data (wear time \geq 10 hrs, minimum of 3 weekdays and 1 weekend day) were included in the analysis (n=18, n=16). An ANCOVA, controlling for known physical activity moderators and baseline physical activity, was used to assess group differences in follow-up MVPA. Follow-up MVPA of the intervention group (30 ± 4 min/day) was \sim 67% higher than the comparison group (18 ± 3 min/day; $p=0.001$). A physical activity intervention designed using community input may favorably impact MVPA among low SES, rural children who are at high risk for obesity and obesity-related diseases.

Hanks, June, PT, Ph.D., DPT, CWS, CLT

“A Survey of Capstone Courses in US-DPT Curricula”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Susan Barlow, PT, PhD, DPT, NCS; Jeremiah Tate, PT, PhD

Abstract: Objective: Ascertain capstone projects utilized by US-DPT Programs. Methods: US-DPT Programs accredited by CAPTE were included in the initial analysis. Of these, 204 published web accessible curricula, which were evaluated for a program-designated capstone course. Course descriptions assessed to assure course was culminating event representing large portions of the curriculum. Results: 36% of US-DPT programs utilize a capstone project. Types (%) as follows: research (53%); professional development (15%); evidence-based practice (13%); managing complex patients (7%); licensure preparation (4%); clinical education (3%); community project (1%); combination of above (10%). Of the programs with research as a capstone course, the types (%) were: case study (32%); research project (23%); research study (18%); literature-based research (9%); combination of any of above (9%). Conclusion: Predominant content in US-DPT capstone courses relates to various forms of research. The minority of these research-focused capstone courses focus on integration and application and the majority focus on generation of knowledge through research projects and/or studies. Preferred content must be considered in training an entry-level clinical practitioner.

Hargrave, Katie, MFA

“ART 1060: Animated Drawing Assignment High Impact Practices”

College of Arts and Sciences (Art)

Abstract: Over the course of the spring semester, students in Art 1060: Expanded Drawing will create a hand-drawn animation one minute in duration. With the assistance of the Library Studio, students will integrate digital tools and technologies into the traditional medium of drawing, learning how to use Adobe Premiere Pro (a professional video editing software) while continuing to develop their technical skills working with charcoal. This is the first semester-long, largely independent project in the Art Department curriculum, and prepares students to balance multiple projects, break projects into component parts, and work without set deadlines.

Harris, Austin

“Fall Recognition using Wearable Technologies and Machine Learning Algorithms ”

College of Engineering and Computer Science (Computer Science & Engineering)

Research Advisor: Dr. Mina Sartipi

Abstract: Falls are common and dangerous for the elderly or individuals with decreased independence or functional limitations. Fall recognition is extremely important for fallers, healthcare providers, and society. Immediate fall recognition triggers emergency services and potentially decreases individuals time with injury without care. Acute post-fall intervention works to mitigate life threatening fall consequences, decrease fall risk through rehabilitation, and improve quality of life. Extended from our research on real-time fall risk estimation in mStroke, a real-time and automatic mobile health system for post-stroke recovery and rehabilitation, our investigation here is expanded to include fall recognition by taking advantage of wearable technologies and machine learning algorithms. Up to three wearable sensors are employed to acquire raw motion data related to activities of daily living or falls. Feature selection and classification on the basis of machine learning algorithms are explored for fall recognition. The fall recognition performances are presented to justify their accuracy and reliability. Meanwhile, the effects of sensor placement/location and the feature number on the recognition performance are also discussed.

Harrison, Lisa, PT, DPT, MEd, GCS

“Needs Assessment for an Outcome Measure to Assess Prior Level of Function in Older Adults”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Joe Carpenter, SPT, Kate Hawkins, SPT, Kelsey Moyers, SPT, Faith Stokes, SPT

Abstract: The aging population is expected to generate new challenges for the Medicare program and the healthcare system. These new challenges along with Medicare caps on rehabilitation funding require therapists to be efficient and impairment focused in their allocation of resources. The ability of physical therapists to determine a patient's prior level of function will help aid in assigning appropriate rehabilitation goals and expectations. This will be important to utilize resources more efficiently decreasing Medicare costs along with improving patient care. A majority of outcome tools only measure current level of function or are specific to a population other than general geriatric population. While currently there are two outcome tools that measure the prior level of function, both are limited in providing a comprehensive view. In an effort to gauge the need for an outcome measure that assesses the prior level of function, a survey was created with content centered around the principles of the ICF model. The survey was designed and distributed to a variety of clinical settings. Ninety percent of survey participants agree that there is a need for a new outcome measure that identifies the prior level of function.

Hathaway, Liz, Ph.D., MPH, MEd

“Associations Among Compensatory and Cardiometabolic Responses to Exercise in College-Age Females”

College of Health, Education, and Professional Studies (Health & Human Performance)

Co-presenters: M.V. Fedewa, S. Higgins, E.M. Evans, M.D. Schmidt

Abstract: Purpose: Substantial inter-individual variability exists in cardiometabolic (CM) responses to exercise. Potential behavioral responses to exercise that likely influence these differences include changes in energy intake (EI) and non-exercise activity thermogenesis (NEAT). The purpose of this study was to explore whether compensatory changes in NEAT and EI explain inter-individual differences in CM responses to exercise training. Methods: Overweight/obese previously inactive females (n=61, 20.4±0.2 y, 30.6±0.7 kg/m², 67% Caucasian) completed 6 weeks of structured exercise. NEAT via Actiheart monitors and EI via ASA24 24-hour recalls were assessed at baseline and two time points during the program. CM markers [C-reactive protein (CRP), fasting glucose (GLUC), high-density lipoprotein (HDL), fasting insulin (INS), low-density lipoprotein (LDL), and triglycerides (TG)] were measured at baseline and post-study. Results: On average (M±SEM), participants maintained NEAT levels (-0.40±62.69 kcal/day, p=0.99, decreased EI (-177.11±23.66 kcal/day, p<0.01) and maintained CM risk factor levels [(CRP: -0.49±0.40 mg/dL), (GLUC: 0.68±0.72 mg/dL), (HDL: 1.64±0.93 mg/dL), (INS: -0.23±0.53 mU/L), (LDL: -2.80±1.79 mg/dL), (TG: 1.12±3.08 mg/dL)].

Heatherly, Angela

“Transitional Care to Decrease 30-day Heart Failure Hospital Readmissions”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Carolyn Schreeder

Co-presenters: Dr. Carolyn Schreeder

Abstract: Objectives: The purpose is to integrate literature to denote statistical analysis with nurse-led transitional care programs, hospital readmission rates, and the outcomes of patients diagnosed with heart failure. Background: Changes in healthcare such as The Affordable Care Act (ACA) of 2010 warrants safer transitions of patient care to prevent disease exacerbations and re-hospitalization. Increases in hospital readmissions cause a decrease in patient satisfaction and a reduction in facility reimbursement. The lack of transitional care programs directly impacts higher facility readmissions and further exacerbates patient management of the disease, medication compliance, and follow-up visits with primary care providers. Methods: Using an integrative review method a search of the current literature was reviewed utilizing PubMed, Google Scholar, and CINAHL databases using a search range from January 2011 to March 2016. Fifty articles were retrieved and examined for correlations between nurse-led transitional care programs and positive patient outcomes. Results: A thorough review of this literature shows a direct correlation with higher facility reimbursement, higher patient satisfaction, and nurse-led transitional care programs.

Hill, Linda, DNSc, CRNA, APN

“Impact of Testing and Intervention on Student Registered Nurse Anesthetists' Critical Thinking Skills”

College of Health, Education, and Professional Studies (Nursing)

Co-presenters: Farron Kilburn, MA; Christopher Pell, Ph/D; Marclyn D. Porter EdD(c); Robin Sturnes, MA

Abstract: Nursing education research argues that the instruction & evaluation of nontechnical skills prior to entering the clinical arena is essential to decreasing human error that risks patient safety. This study examines the impact of testing & intervention on SRNAs' critical thinking skills. The project goals were to determine baseline critical thinking

scores & to measure any growth in critical thinking over a 1-year period. 24 SRNAs participated in a "pre-test, intervention, post-test" research design utilizing the Health Sciences Reasoning Test, a tool specifically designed to assess the critical thinking skills of health science students and professionals. Intervention consisted of test score debriefing, didactic and clinical experiences. Analysis of data included mean comparisons, correlation & regression analysis. Significant gains were seen in the overall scores, in deduction skills, & analysis skills. In terms of the demographic factors, 3 findings emerged: Students that attended public high school had higher overall post-test scores; students from educationally disadvantaged schools significantly improved their deduction skills scores compared to other students; and younger students had significantly higher analysis scores.

Hiller, Kristeen

Title Pending

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Susan Thul

Co-presenters: Dr. Susan Thul

Abstract: Abstract

Post-partum mothers and their partners are often fatigued and overwhelmed during the post-partum hospitalization period. This is typically when healthcare providers educate patients regarding important self-care and infant care instructions. Patients often carry anxiety and stress home after discharge due to ill ability to absorb information. Research shows that both providers and patients feel that post-partum education would serve patients better if provided prenatally (Martin, Horowitz, Balbierz, & Howell, 2014).

The purpose of this translational project is to provide a new post-partum educational protocol option for pregnant women aiming to improve patient care and outcomes post-partum. The protocol utilizes a technology based educational presentation viewed by patients both prenatally, as well as post-partum at the patients convenience by accessing the practice website. The subject population includes both physicians and nurse practitioners employed at Women's Health Partners, and all pregnant patients within the practice who are age 18 or older at 36 weeks gestation through 6 weeks post-partum.

Hughes, Leslie

“Got Sadness? Diagnosis & Treatment of Depression”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Susan Thul

Abstract: Depression is a common mood disorder affecting between 5 and 9% of the United States population (Maurer, 2012). Depression causes symptoms that affect feelings, thought processes and the ability to handle day to day activities. The majority of patients turn to their primary care provider for evaluation and treatment. Primary care providers should be equipped with the confidence and knowledge to screen clients and initiate the appropriate treatment. The purpose of this project is to improve provider knowledge about depression, encourage routine screening for depression and to offer non-medication treatment options for patients.

The method used for this study is the screening for depression of all patients presenting to Blue Mountain Family Practice for a well-women or well-man exam. These patients will be screened for depression using the PHQ-2 and the PHQ-9. Providers will utilize a treatment algorithm to initiate treatment for depression for patients that have a positive screen. A treatment brochure will be given to each patient diagnosed with depression to assist them in obtaining cognitive behavioral therapy and establishing an exercise plan. The goal is to increase provider knowledge and improve patient care.

Hu, Fang Yu, Ph.D.

“Schooling for the Empire: A Gendered and Colonial Curriculum for Han Taiwanese Children under Japanese Colonialism, 1895-1945”

College of Arts and Sciences (History)

Abstract: This poster presentation examines the Japanese ideal of womanhood, "good wife, wise mother" as enacted in schools in Taiwan to reveal gender, class and ethnic differences among children educated in the Japanese empire. It first traces how the official ideal of womanhood in Japan spread with Japanese imperialism to China and Korea. The presentation then explores how the colonial government in Taiwan implemented the official ideal of womanhood differently for Japanese and Taiwanese girls by examining educational programs implemented by the colonial state and articles published in Taiwan Daily News. Finally, the presentation discusses how Taiwanese intellectuals responded to "good wife, wise mother." The presentation shows that Taiwanese and other East Asian elites embraced Japanese beliefs regarding the linkage between education for girls and a strong, modern nation-state while resisting Japanese colonialism.

Hunt, Nyssa

“Predictive Spatial Modeling and Assessment for a Rare Tennessee Anuran: Barking Treefrog (*Hyla gratiosa*)”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Thomas P. Wilson

Co-presenters: Andy Carroll, Dr. Thomas P. Wilson

Abstract: Amphibian declines worldwide continue to cause concern for conservationists, where researchers must assess at-risk and vulnerable species within their own regions to effectively monitor population statuses. Members of this taxonomic group tend to be sensitive to habitat alteration and climate change, which both have the ability to shift distribution across a landscape and potentially contribute to local extinction. As landscapes gradually change with multiple factors, monitoring amphibian occurrence is especially important for species that may be threatened, endangered or rare. In Tennessee, the Barking Treefrog (*Hyla gratiosa*) is listed as a rare species and seemingly has potential to disperse to new areas, although little is known about the mechanisms affecting its dispersal. To better understand distribution patterns, we utilized land cover data by HUC 12 and collectively analyzed North American Amphibian Monitoring Program (NAAMP) data and Tennessee Department of Environment and Conservation (TDEC) "rare species by watershed" data, with which it is possible to better elucidate our understanding of the habitats suitable for this species and to fill in data gaps for its selective distribution. Areas with documented presence will be compared to areas of apparent absence to assess for a difference in land cover metrics. In order to ensure the accuracy of the presence data, auditory field surveys will be performed to monitor occurrence. Additionally, predictive models of *H. gratiosa* presence were generated with MaxEnt, where the produced models will be field tested by monitoring for the species in "new" locations.

Hunter, Rik, Ph.D.

“Buzzing In. Buzzing Along: A Short-Lived, Tactical Orientation to Community-Based Writing Projects”

College of Arts and Sciences (English)

Abstract: In this poster presentation, I argue that in contrast to the negatively-perceived "hit-it and quit-it" approach to community service-learning projects as noted by Cushman (2002), Mathieu's (2005) proposal for a more "tactical orientation" in the *The Public Turn in Composition* creates a space for community-based digital writing projects in professional writing courses. I will discuss how institutionalized, strategic sustainability and course-based, tactical projects can effectively work together to address community partners' needs and make room for the creation of bottom-up, short-lived projects.

Ingram, Debbie, PT, Ed.D., FAPTA

“Social Media Use by Physical Therapist Doctoral Students”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Hannah Hester, SPT; Hayley-Rae Tillman, SPT

Abstract: The use of social media in healthcare presents both opportunities and challenges. Some of the opportunities include collaboration amongst professionals, professional development, increased accessibility of information, and patient support. The challenges include inaccurate information provided with poor quality and reliability and confidentiality and professional ethical issues.²

Langenfeld, et al. found that over 25% of medical residents had posted unprofessional content on social media.

Benetoli, et al. reported that pharmacists often expressed dissatisfaction with the profession over social media.

Grajales, et al. suggested increased education and established policies regarding social media. Fenwick, et al. developed an "e-professionalism" course to integrate into healthcare education. Sandlin, et al. recommended separate personal and professional social networking sites for healthcare professionals. Few studies have addressed the use and impact of social media in physical therapy. The purpose of this study was to investigate the use of social media by students in a doctoral physical therapy program and determine their perspectives regarding "acceptable" use of social media in educational and clinical environments.

Jackson, Kaitlynn

“Family Attitudes and Risky Behaviors Among LGBTQ+ Young Adults”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Amy Doolittle

Co-presenter: James Matthew Lopp

Abstract: Research interests regarding the LGBTQ+ population has risen as social stigma has decreased. Previous research has led to the conception of this study - LGBTQ+ youth may struggle with family rejection, risky sexual behaviors, mental health issues, and substance abuse. The research questions used to create this study are: 1) Does family rejection have an effect on sexual risky behaviors, mental health, and substance abuse in the LGBTQ+ community? and 2) What is relationship between risky behavior and sexual orientation? We hypothesized that individuals who have experienced higher rates of family rejection would have higher rates of risky behaviors, and we hypothesized that gay males will have higher rates of risky behaviors as compared to other sexual orientations. Participants were sent a link via email to an online Qualtrics survey that contained different questionnaires about the topics of interest, including: the Rejection Sensitivity Questionnaire - Adult Version (A-RSQ), the Patient Health Questionnaire (PHQ-9), the Drug Use Questionnaire (DAST-20), and a newly created questionnaire about risky sexual behaviors. After this data was collected, it was analyzed with Statistical Package for the Social Science (SPSS).

Jackson, Ashley

“The Woodmore Initiative: Implementation of Incremental Rehearsal”

College of Health, Education, and Professional Studies (Education)

Research Advisor: Dr. Jim Tucker

Abstract: Students attending Woodmore Elementary School are experiencing the effects of what their new principal, Brenda Cothran, calls "the sounding of the alarm." Recently collected data shows that across grade levels, a significant amount of students are reading below grade level. In efforts to drastically decrease these numbers Principal Cothran has initiated a school-wide reading program to address these issues. In addition, Principal Cothran has agreed to allow UTC students to assist in this remediation effort. Through James A. Tucker, Ph. D., McKee Chair of Excellence in Learning, twelve graduate students will work with sixteen of Woodmore's most at-risk student by implementing the intervention called incremental rehearsal (IR). The UTC students will implement IR twice a week for ten to fifteen minutes. Data will be collected on the rate of acquisition and retention. This data will be presented.

Johnson, Robyn

“Southern Melting Pot: Analysis of Joel Chandler Harris's Uncle Remus As Southern Folklore and Cultural Appropriation”

College of Arts and Sciences (English)

Research Advisor: Dr. Joyce Smith

Co-presenters: Katherine Duke, Casey Kluttz

Abstract: This project exams the unconscious racism of the Uncle Remus collections, seen through Joel Chandler's writing symptoms in order to establish its existence as well as the need to move forward with the collections as literature. After recognizing the unconscious racism and its symptoms, the Uncle Remus collections are dissected to identify what makes them Southern folklore, exploring six qualities, the importance of farming, of domestic trades, of food, of proper behavior, of race, and the presence of a post-civil war psyche. Concluding the presentation, an examination of the stories themselves will reveal the cultural appropriation of European, African, and Native American folklore present in the Uncle Remus collections.

Johnson, Gary

“Bridging Emotional Leadership and Transformational Leadership Components to Enhance the Job Satisfaction of Both Nurse Managers and Their Direct Reports”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Carolyn Schreeder

Abstract: In the current job market, nurses have numerous options for employment. Thus, the issues of nurse retention, the nursing shortage, job satisfaction and intent to stay, are key factors that organizational nurse leaders must address (Cowden, 2011). These issues are important to consider now as FMC outpatient dialysis facilities in Nashville TN have experienced high turnover rates among staff nurses, resulting in financial expenses related to onboarding, as well as staff shortages. The aim of this project is to provide nurse managers with an educational program that focuses on Emotional Intelligence and Transformational Leadership training and nurse manager development as a leader/manager that will result in improved methods of addressing relationship and personal issues and result in job satisfaction for both nurse managers and staff. There are two short term goals, increased nurse manager personal and social competence by 10% and increased nurse personnel satisfaction by 10% (over the 6 months). Long term goal is increased satisfaction and decreased turnover rates among staff nurses.

Jones, Rebecca, Ph.D.

“Catalpa Magazine”

College of Arts and Sciences (English)

Research Advisor: Dr. Rebecca Jones

Co-presenters: (Graduate Magazine class) Drake Farmer, Daniel Giraldo, Elaine Gunn, Faith Jones, Jenna Lacey, Alex Plaumann, Adrienne Siegenthaler, Brittain Whiteside-Galloway, Layton Woods

Abstract: Graduate students in the Department of English will present a year long project culminating in an online and print magazine. Catalpa Magazine explores curious perspectives rooted in the South: the unexpected, unconventional, and unorthodox. Students will discuss the editorial and design process that lead to the magazine as well as hopes for future annual publications.

Jones, Katherine

“Concussion History and Neuromechanical Capabilities as Predictors of Injury Occurrence Among College Football Players ”

College of Health, Education, and Professional Studies (Athletic Training)

Research Advisor: Dr. Shellie Acocello

Co-presenters: Monica Burruss Carney

Abstract: This project involves the investigation of concussion history and neuromechanical capabilities as predictors of injury occurrence among college football players. The goal is to determine whether or not injury occurrence throughout the season can be predicted by concussion history. This has been done by comparing preseason scores on different neuromechanical tests of those who have a history of a concussion to those who have no history of a concussion. Through showing that concussion history can predict the likelihood of injury occurrence, this research demonstrates the importance of collecting thorough preseason medical history in order for athletic trainers to properly direct injury prevention efforts toward those athletes who are identified as high-risk.

Jones, Logan

“Unmasking Autism and ADHD: How to Save Money and Get Exponentially Better Treatment Outcomes”

College of Health, Education, and Professional Studies (School Psychology)

Research Advisor: Dr. James Tucker

Abstract: With Autism and ADHD on the rise, there are more treatment options available to families. My research is on unmasking these labels, piece by piece, and examining what research has to say about each area examined. Not only does this paper offer treatment options, it attempts to help families save money and, exponentially, get better treatment outcomes.

Joshuva, Justin

“Identifying Security Threats on Social Network Using Pattern Recognition”

College of Engineering and Computer Science (Computer Science & Engineering)

Research Advisor: Dr. Farah Kandah

Abstract: Social networks like Facebook, Twitter, etc. have become a huge part of many people's lives. Users communicate with each other on these networks blindly believing they are talking to the correct person. This blind belief sometimes results in security threats due to the passing of private or confident information to the wrong user. This may lead to malicious readers getting a user's private information and using it illegally. This paper proposes a mathematical model for identifying security threats using pattern recognition with the aid of Naïve Bayes method. By looking at the communication history between users, patterns can be observed. These patterns will authenticate if the message is written by the same person from the history.

Kim, Eun Young, Ph.D.

“Environmental Preferences of Adolescent Patients in Hospital Rooms:
Natural Views and Private Patient Rooms ”

College of Health, Education, and Professional Studies (Interior Design)

Abstract: The goal of the study was to investigate environmental preferences of adolescent patients in patient rooms that might affect emotional well-being and healing process. Adolescent outpatients in surgical departments participated in the survey. To examine comprehensive environmental preference of adolescents, healthy high school students also were participated in the survey. Preferences on natural window view, semi-private rooms, and architectural details were examined. Adolescent patients' emotional states and environmental needs of hospital settings were also surveyed. The findings indicate that having a natural view in hospital rooms are not necessarily preferred by adolescent patients. Although being able to control of privacy is crucial, some adolescent patients preferred to have peers in their hospital rooms depending on their medical conditions. The results suggested adolescent patients' emotional states affected their environmental preferences and perceptions of hospital rooms. The findings also revealed environmental preference discrepancy exist between adolescent patients and healthy high students.

Kuby, William, Ph.D.

“Inconceivable Vows: The Erasure of Black-White Marriages in the
1920s and 1930s”

College of Arts and Sciences (History)

Abstract: This poster explores judicial efforts to annul black-white marriages in the 1920s and 1930s, illustrating the complex role that courtrooms played in discouraging intermarriages, even in states where such unions were legal. Though courts could not make miscegenation laws materialize where they did not exist, they could provide regretful spouses” or more frequently, their disapproving families and friends” with opportunities to dissolve such unions on grounds of fraud and deceit. Courtroom efforts to terminate intermarriages, as well as the media accounts that accompanied them, helped reinforce the notion that such marriages were inconceivable, and could thus only result from trickery, intoxication, or mental illness. Though the outcomes of these divorce and annulment cases varied, each one hinged on the premise that black-white marriage could only result from the black partner's deception and the white partner's mental ineptitude. Ultimately, these courtroom proceedings fed the myth that consensual interracial unions were not possible, while simultaneously putting those very unions on display for public scrutiny.

Levine, David, PT, Ph.D., DPT

“The Effects of Photobiomodulation on Quadriceps Muscle Endurance”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Bobbi Dodson, Chaz McCormick, Chris Newsom, Andrew Thompson

Abstract: The purpose of this study was to examine whether photobiomodulation induced via laser therapy between sets of isokinetic exercise improves muscle endurance. Laser therapy was applied to the quadriceps between sets of isokinetic, concentric knee extension. Differences between laser and placebo were examined for all variables (peak torque [Nm], peak torque normalized by body mass [Nm/kg], average torque [Nm], total work [J], and power [W]). Twenty healthy subjects participated in a double blind, cross-over study, approved by the UTC IRB. Subjects were trained and tested using the BIODEX System 3 isokinetic dynamometer. The protocol consisted of a 5 minute warm-up on a stationary bike followed by testing. During testing, subjects performed 4 sets of 30 isokinetic, concentric knee extensions with laser or placebo laser applied between sets 1-2, 2-3, and 3-4. Each repetition was performed through a 75 degree arc at 75 \hat{A} °/s. There was a 4 minute standardized recovery period between each set, during which laser was applied. Data analysis was performed using a factorial analysis of variance (set X laser type). A significant difference ($p < .01$) was found between laser and placebo laser suggesting a potential ergogenic effect.

Liu, Tuo

“Automatic curved mesh movement”

College of Engineering and Computer Science (Computational Engineering)

Research Advisor: C. Bruce Hilbert

Abstract: A new method for moving boundary problems with viscous mesh layers is presented. This method is extended from a former mesh generation approach, which is based on the advancing front method and a spring model named Spring-Field. This improved technique can not only be used for high-order mesh movement but also for high-order mesh generation. Based on the curved mesh deformation strategy named vector-adding, it can handle the curved mesh movement with minimal extra computational time compared with the linear mesh movement. Several 2D boundary movement cases are tested: boundary translations, boundary rotations, and boundary morphing. The results demonstrate that this approach can handle large boundary movements while preserving a good mesh quality.

Loveless, Daniel, Ph.D.

“An Interdisciplinary CubeSat Research and STEM Education Platform (UTChattSat)”

College of Engineering and Computer Science (Electrical Engineering)

Co-presenters: A. Patel, M. Joplin

Abstract: UTChattSat designs and develops low-cost small-satellite systems for space-infrastructure needs, researches emerging technological problems related to the space sciences and develops 3D-printed satellite models and electronics systems for middle and high school instruction as well as research in cyber-physical systems. The satellite technology is currently being used for the development of science and engineering curriculum, research on robust electronics for space systems, high-altitude balloon projects, and general IoT sensor applications.

Mauldin, Marcus, Ph.D.

“Local Economic and Community Development Approaches to Understanding and Mitigating Urban Food Deserts”

College of Arts and Sciences (Political Science & Public Service)

Co-presenters: Nicole Brown, MPA; Kara Hamilton, Ph.D.; Shewanee Howard-Baptiste, Ph.D.

Abstract: This research seeks to understand the economic development and community health implications of food deserts by exploring factors associated with the creation of food deserts and social determinants of health. The economic development perspective explores the role of local governments in incentivizing small, independently owned food stores as a means to reduce food deserts. We argue that local governments attempt to attract larger, full service grocery stores. However, these grocery stores tend to locate away from inner-city neighborhoods to suburbs where the potential for profit is greater. With this, opportunities may arise where governments can utilize existing institutions to fulfill policy goals. The community health perspective examines the effects of food deserts on health outcomes. This perspective will address the social determinants of health and impacts of individuals and communities. Social determinates of health include factors such as race and ethnicity, socioeconomic status, wealth, education, government resources, historical context, culture, access to healthcare, and health policy.

Maynard, Erin

“Measuring Symptoms of Disability: A Systematic Review of Detecting Falsified and Exaggerated Symptomology”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Amanda Clark

Co-presenters: Dr. Amanda J. Clark

Abstract: The number of students in college with disabilities has been steadily rising. To help such individuals be as successful as possible in their college career, accommodations are often provided. These accommodations can include extended testing time, distraction-free environments and assistance with note taking. These resources to support students with disabilities are limited though so it is important that professionals ensure symptoms presented in psychological testing are valid and not falsified. This project looks at several articles that cover two main topics around measuring symptoms of disability. First, how effective is the average college student in faking disability? Second, how adept are psychological tests at differentiating between falsified and actual symptoms? The main argument is that disabilities are shockingly easy for college students to fake, and new or more in depth psychological tests are needed to reliably sort the students who are falsifying or exaggerating symptoms from students with actual disabilities. Making accommodations for students with disability demands financial resources and manpower; detecting students who fake or exaggerate disabilities may be able to save colleges time and money.

McAllister, Deborah, Ed.D.

“CRISP: Lego EV3 Robotics and Data-logging”

College of Health, Education, and Professional Studies (Education)

Abstract: UTC faculty and staff are collaborating with Boyd-Buchanan School teachers to determine the feasibility of using data-logging with robotics to present middle grades and high school concepts in science and mathematics. The process will be extended to interface with the content of the GLOBE program. State assessment data shows the need for improvement in content knowledge, prior to entering high school. This poster will present an update on the project, with regard to activity correlation to state curriculum standards and data collection instruments.

McCullough, Claire, Ph.D.

“STEM, Gender, Ethnicity, and Cyberbullying”

College of Engineering and Computer Science (Computer Science & Engineering)

Co-presenter: Dr. Svetlana Chesser

Abstract: As the need for professionals in Science, Technology, Engineering and Mathematics (STEM) is projected to continue to increase, the under-representation of women and minorities in these fields is increasingly seen as a problem. To investigate whether the growing trend of cyberbullying could contribute to this lack of participation, a study was conducted to investigate links and interactions among race, gender, and college major in experience of cyberbullying. A cross-tabulation analysis of 402 surveys, 93% of whom were students, revealed statistically significant differences in cyberbullying by major and gender, with non-STEM majors showing a higher incidence of cyberbullying than STEM majors, and women in all majors being bullied at a higher rate than men. Race did not appear to be a contributor to cyberbullying in the sample overall, but among STEM majors minorities were bullied at a higher rate. A logistic regression analysis revealed that while major and gender were significant predictors of cyberbullying, race was not a good predictor.

McDonnell, Katelyn

“Exploring Mindfulness and Stress-Based Reactions in Veterans”

College of Health, Education, and Professional Studies (Occupational Therapy)

Research Advisor: Dr. Janice Ryan

Co-presenters: Sarah Chesler, Hillary Johns

Abstract: This exploratory research study collected descriptive data on perceptions of stress, sensory preferences/sensitivities, adaptive capacity for occupational goal-setting, and follow-through with an online Mindfulness Training Program. Literature shows that veterans with PTSD have high treatment dropout rates and need novel treatment approaches to increase program completion. Research has also identified primary barriers to treatment program retention as lack of time, discomfort in group settings, negative reactions to instructors, and the logistical barriers to attending classes. A 5-week online multi-media training program was explored as a way to increase treatment enrollment and retention in this population. Multi-media training program design and extensive subject recruitment efforts will be described. This study had an 8-person subject pool. The Retention rate was 25%, as only 2 of the 8 subjects completed the study. Pre- and post-intervention data using the Mindful Attention Awareness Scale will be discussed. Demographic and sensory profile data will be analyzed and compared with previous studies on people with PTSD. Recommendations will be made for future studies to treat this population.

McElhinny, Catherine

“Screening for Depression in Adult Primary Care Patients”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Priscilla Simms-Roberson

Abstract: Depression is a leading cause of disease disability and ever growing public healthcare concern on both global and national scales. Primary care is major access point for depression treatment. However, despite its growing prevalence within the primary care population, research shows that clinical recognition of depression is lacking. Routine utilization of validated screening tools such as the PHQ-2, has recently been suggested by U.S. Preventive Services Task Force (USPSTF) national guidelines to aid providers in higher rates of the detection and diagnosis of depression. Does implementing routine PHQ-2 depression screenings by a local healthcare provider with each patient encounter impact the provider's number of depression diagnoses?

Melnik, Laurie, MFA

“Southeast Center for Education in the Arts: Transforming Education in and through the Arts”

College of Arts and Sciences (Southeast Center for Education in the Arts)

Co-presenters: Joel Baxley, Director of Visual Art Education; Michele Mummert, Teaching and Learning through the Arts Program Coordinator

Abstract: The Southeast Center for Education in the Arts (SCEA) celebrates 30 years of transforming education in and through the arts across the southeast region. From early learning to K-12 education to professional training, SCEA continues to make a positive impact through their quality programs. Highlighted programs include From STEEEP to STEEPPER: Investigating Visual Art Analysis and Drama-Based Praxis in Physician Training; the Chattanooga Arts Area Needs Assessment (2017 CRISP Grantee), I COME FROM A PLACE: A cross-generational storytelling project (2017 Arts, Innovation, and Activation Grantee), Early Learning in the Arts, and Sherwood Elementary: An Arts360 School.

Miller, Tonya, MFA

“Service-Learning Projects as a Tool for Promoting Evidence-Based Design for Special Populations”

College of Health, Education, and Professional Studies (Interior Design)

Abstract: Service-learning projects have long been believed to enhance learning outcomes for interior design students by promoting community engagement and professional competence (Zollinger, Guerin, Hadjiyanni, & Martin, 2009; Watson, 2001). These types of projects also support the most common learning style among interior design students which is hands-on (Watson, 2001). However, there are perhaps even further benefits of this learning model beyond those which have been previously explored. This poster illustrates two case study projects that explore how service-learning projects can be used as a tool for promoting evidence-based design solutions.

The Center for Health Design (2016) defines evidence-based design as "the process of basing decisions about the built environment on credible research to achieve the best possible outcomes." The special physical, intellectual, social, and psychological considerations of the user groups for these projects dictated the enhanced need for design decisions that were based on credible research. In these case studies, the research-based approach is believed to have not only improved learning outcomes but also improved the quality of the design solutions produced for the community partners.

Mindermann, Andrew

“Tennessee Statewide Interactive Paddling Map and National River Recreation Database”

College of Arts and Sciences (Office of Vice Chancellor for Research)

Co-presenters: Nicole Brown, MPA; Kara Hamilton, Ph.D.; Shewanee Howard-Baptiste, Ph.D.

Abstract: Representatives from the Tennessee Valley Authority (TVA), in close collaboration with the State of Tennessee, and the National Park Service requested the UTC Interdisciplinary Geospatial Technology Lab (IGTLab) to create a statewide interactive paddling web map and river resource database. The project is designed as the premier comprehensive recreation paddling and water trail information resource for the state of Tennessee. The IGTLab received data from State and Federal Agencies (TWRA, TDEC, USGS), River Management Society, American Whitewater, local GIS resources, and Watershed Organizations (Tennessee Scenic Rivers Association, Wolf River Conservancy, Harpeth River Watershed Association). The geospatial data used in the web mapping application followed a database structure and set of linear referencing tools compatible with the standards of the National River Recreation Database (NRRD) data donation process. Today, the IGTLab plays a key role in the River Management Society's National River Recreation Database, assisting in the data donation and hosting services.

Mix, Charlie

“Implementing GIS & Geodesign Tools for Landscape Conservation of the greater Chattanooga region”

Administration (Office of Vice Chancellor for Research)

Co-presenters: Nyssa Hunt, Holland Youngman, Alastair Keith Lucas, Andrew Carroll

Abstract: Geographic Information Systems (GIS) has long been crucial for conservation planning, but recent developments in web based GIS applications makes geospatial tools and data more available than ever to a wider user base with minimal knowledge of GIS. UTC's Interdisciplinary Geospatial Technologies Lab (IGTLab) is developing a decision support tool and conservation models in partnership with the Land Trust for Tennessee, the Open Space Institute and Sewanee: The University of the South. The project works with existing climate resilience data supplied by the Nature Conservancy, local State Wildlife Action Plans, protected lands, landowner databases, and recreation data supplemented with models developed by IGTLab and Sewanee that rank biodiversity, water quality, and agriculture. The tool employs techniques from the geodesign field incorporating multiple interdisciplinary users and stakeholders

to increase collaboration and expertise among regional conservation groups and funding organizations facilitating conservation planning efforts spanning 3 states, from the southern Blue Ridge Mountains to the South Cumberland Plateau.

Morgan, Christopher

“Trust in Direct Leader and Employee Outcomes: The Moderating Effects of Leaders' Perceived Emotional Sincerity”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Brian O’Leary

Abstract: Emotional sincerity, an emerging construct in the trust in leadership literature, refers to the congruency between emotions internally experienced and externally expressed. With regard to attribution theory, observers (employees) can use the emotional expressions of others (supervisors) as an information source for making judgments. Although previous research has examined the uniqueness and explanatory power of the leaders' perceived emotional sincerity construct (LPES), relatively few studies have examined LPES as a moderator. This study examined the moderating effects of LPES on the well-established relationships between trust in direct leader (TDL) and several employee outcomes (i.e., turnover intentions, organizational citizenship behaviors-altruism, and organizational commitment). Data were collected from 185 participants representing 13 industries. Results of hierarchical regression analyses demonstrated that LPES moderated the positive effects of TDL on altruistic behaviors while controlling for demographic and personality factors. Moreover, LPES uniquely predicted affective commitment while controlling for TDL and demographic and personality factors.

Myers, Betsy, PT, DHS, OCS

“10-meter timed hop test in a healthy active population”

College of Health, Education, and Professional Studies (Physical Therapy)

Abstract: Purpose: 4 hop tests are commonly used for return to play decisions after lower extremity injury. Only one, the 6-m timed hop, addresses speed. Normative data demonstrates little variation of test scores. This study investigated a 10-m timed hop test. Hypotheses: The 10-m timed hop would take longer and have more variability than the 6-m test with minimal faults. There would be no difference in scores between limbs and between devices. Males would hop faster than females. Participants: 50. Materials/Methods: Participants performed a standardized warm-up, one practice trial, and three maximal 10-m hop tests on each limb. Trials were timed simultaneously using a stopwatch (SW) and Brower timing gate system (TG). The average hop time for each device was used for analysis. Results: 10-m hop time means (SD) were: male SW 3.16 (.45), male TG 2.88 (0.34), female SW 3.83 (.36), and female TG 3.52 (.36). There was only one fault during testing. There were no significant differences between limbs. Data between devices were significantly different but highly correlated (0.0916-0.926). Males hopped significantly faster. Conclusion: The 10-m time hop test is a viable option. Comparisons should not be made across devices or genders.

Nauert, James

“Stable Inconsistency: A Study of Response Inconsistency Over Time”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Michael Biderman

Abstract: Personality measures are currently a popular method for selection in the business world, despite issues such as poor predictive ability and the potential for output manipulation by participants. Another issue with personality testing that is often overlooked is that individuals sometimes respond differently on test items that otherwise measure the same traits. This phenomenon has been called Response Inconsistency (Reddock, Biderman, & Nguyen, 2011). The focus of this study is to attempt to show the phenomenon as a measurable trait that is stable over time. The study administered two different Big Five Inventories to participants taken from a local university. The two inventories were administered at different dates. Inconsistency measured as the mean standard deviation of responses within domains

was computed and then correlated across the two time periods to determine reliability of the inconsistency measure. High correlations supported the hypothesis that response inconsistency is stable across time.

Nielsen, Jill

“Bolusing Insulin: A Tool for the Clinician, Simplified!”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Susan Thul

Abstract: In healthcare providers in a rural Georgia Internal Medicine practice, the implementation of an evidence based practice guideline to include provider and patient education and incorporation of a bolus advisor integrated into a glucose meter, compared to current practice, is expected to improve provider knowledge, self-efficacy, short-term glucose stability, and HbA1c among patients using the bolus advisor over six months. The immense burden of diabetes care facing the current healthcare system is staggering. One way diabetics on multiple daily injections (MDI) can share pertinent information would be to use an automated bolus calculator with decision-support software integrated into a blood glucose meter. Weissmann, et al. (2016) found that physicians reported spending 61% less time in clinical decision making when provided technical reports on patient statistical data. Therefore, studies on Type 2 Diabetes (T2D) using MDI with stand-alone automated bolus calculators integrated into a glucose meter are needed to address the majority of the diabetic population that is currently poorly controlled on insulin therapy. The incidence of T2D between 90-95% of all cases of diabetes and over half of T2D are using insulin to manage blood glucose (Sousa et al., 2009). To overcome the clinical inertia, decrease complications, and improve health outcomes, this new, affordable and superior bolus calculator technology should be adopted in most insulin dependent diabetics. The diabetics using the bolus advisor enrolled in the project are expected to have improved satisfaction with treatment resulting in less stress and disease burden, improved confidence and increased overall wellbeing.

Northcutt, Kaila

“Aging in Place: Is Chattanooga the Place?”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Amy Doolittle

Co-presenters: Alicia Payne, Reginald Gilmore

Abstract: This research was conducted by three UTC students working with University of Tennessee at Chattanooga Engaged: Aging to provide an in-depth qualitative research study on the greater Chattanooga area as an ideal location for aging in place. The purpose of this qualitative research project is to explore the perceptions and experiences of aging adults in Chattanooga. The researchers conducted interviews at local retirement centers to discover emerging themes regarding resources offered to this population and to determine potential needs within the community in order to better understand this new paradigm of aging in place.

Nunley, Kala

“Evaluating the effectiveness of a coordinated-school health program in a single gender school”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Nicholas Boer

Co-presenter: Shaquille Robinson

Abstract: The purpose of this research is to identify the effectiveness of coordinated school health programs for a single gender school in Chattanooga, Tennessee. Coordinated school health programs encompass bringing in resources to facilitate the importance of healthy behaviors to establish prevention of non-communicable disparities: heart disease, diabetes, cancers and hypertension. Each quarter within the school year, the children create SMART goals to accomplish by participating in activities geared towards improving physical fitness and introducing the

importance of healthy eating. At the start of a new quarter, participant's physical fitness is assessed by measuring resting heart rate, one-minute jumping jack intervals and their body weight. This process is repeated for the duration of the school year highlighting a temporal relationship between the behavior and the exposure. By indentifying the lapse of a structured system's approach to barriers of programs set in place in urban communities with declining health, we can bridge the gap of disparities and introduce programs like these to other crippling school systems.

Ormond, Kelly

“Dual-task postural balance and reaction time testing for college football injury risk screening”

College of Health, Education, and Professional Studies (Athletic Training)

Research Advisor: Dr. Gary Wilkerson

Co-presenter: Madalene Greene

Abstract: Collegiate athletics provide many different opportunities for student athletes, but they also pose certain risks associated with participation. Previous research has shown that better performance in balance and reaction time tests is correlated with fewer injuries. Using this information and looking at the interaction between balance and reaction time in 70 division I football players, we sought to prove a correlation between below-average performance in these measures and injuries sustained during the course of the season. Balance and reaction time data were gathered during the football pre-season and injuries sustained by each player were recorded throughout the season. The study assesses the potential value of simultaneously imposed cognitive and postural balance challenges for estimation of injury risk among college football players.

Ozbek, Irene (Nicky), Ph.D.

“Relationship between Affective Factors, Resilience, and Olfactory Sensitivity”

College of Arts and Sciences (Psychology)

Co-presenters: Heaton, William Joseph; Pendergast, Katherine; Gagliano, Suzanne

Abstract: There is a long line of research showing the negative correlation between olfactory sensitivity and negative emotional states such that those who experience more negative emotions tend to have the lowest olfactory sensitivity and odor identification scores (Dileo, J., Brewer, W., Hopwood, M., Anderson, V., Creamer, M., 2008; Negoias, S., Hummel, T., Symmank, A., Schellong, J., Joraschky, P., Croy, I., 2016). This study aimed to measure whether those with the highest scores on a measure of resilience might have the highest scores on measures of olfactory sensitivity, i.e. higher resiliency scores would predict lower olfactory thresholds. Resiliency is conceptualized as the ability to cope despite adversity and is considered to counter negative mood (Davydov, D., Stewart, R., Ritchie, K., and Chaudieu, I., 2010). Measures of stress, depression, trauma, and resilience were administered to a sample of 197 college students. The Wheeler University of Tennessee Chattanooga Olfactory Threshold Test (WUTC), which consists of a range of stepwise concentrations for multiple odorants, was administered to a subset of 25 students. Olfactory sensitivity was negatively correlated with higher stress, depression, and trauma scores for noxious odor.

Pendergast, Katherine

“The Effect of Trait Resilience on Olfactory Sensitivity and Cortisol Reactivity under Acute Stress”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Irene N. Ozbek

Co-presenters: Suzanne Gagliano, Kathleen Phelps, Dr. Irene N. Ozbek

Abstract: Stress is discomfort arising from undesirable external or internal states that can disrupt normal functioning (Ingram & Luxton, 2005). Stress reduces olfactory sensitivity (OS) in those with high state or trait anxiety (Takahashi, et al., 2015). Research has begun to identify protective factors to stress, one of which is trait resilience, i.e. the process of adapting to stress in positive and effective ways (Luthar, Cicchetti, & Becker, 2000). We will assess the relationship of resilience, OS, and acute stress responses in college students. We are interested in if resilience is reflected in cortisol levels and olfactory thresholds (OT) of vanillin and isoamyl acetate. The addition of the OT allows us to assess if trait resilience influences olfaction in an acutely stressful situation or if differences in OS under stress are unaffected by this trait. Participants complete a measure of trait resilience and a WUTC olfactory threshold test, then each participant gives a sample of saliva to analyze baseline cortisol. Afterward, participants receive

Peoples, Erika

“The Effects of a School-based Intervention of Psychosocial Constructs of Physical Activity in Rural Children

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Kara Hamilton

Co-presenters: E. Peoples, K.L. Peyer, E.D. Hathaway, K.C. Hamilton

Abstract: PURPOSE: Interventions that positively affect the psychosocial constructs associated with physical activity can increase the number of children meeting the national physical activity guideline. This study determined whether improvements in psychosocial constructs associated with increased physical activity occurred following a school-based intervention in children. METHODS: Two 5th grade classes (N=19, N=20) at a rural school were assigned to an intervention or comparison group. The intervention group participated in a 20 min/day, 2 day/week school-based 4-week intervention designed to improve the psychosocial constructs of physical activity. Paired-samples t-tests were used to assess pre- and post- differences in constructs within groups, while independent-samples t-tests were used to determine construct delta score differences between groups. RESULTS: All psychosocial constructs improved ($p < 0.05$) in the intervention group. Skills and knowledge delta values were significantly higher for the intervention group when compared to the comparison group ($p < 0.05$). CONCLUSIONS: Priority should be placed on understanding the long-term impact of interventions designed to improve theory-based psychosocial constructs that influence PA.

Perret, Victoria

“Visual and Olfactory Recognition of Humans and Elephants by African Elephants”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Preston Foerder

Abstract: African elephants (*Loxodonta africana*) can distinguish between familiar and non-familiar conspecifics and between human ethnic groups through vision and olfaction. We investigated if elephants can recognize individual familiar humans and elephants through these senses in 2 captive African elephants. Visual recognition was tested using a matching to sample procedure. Initially, the elephants were trained to touch a photo of a person holding an array of 2 photos, one matching that person. Three more sessions were conducted with 3 other people holding the array.

Olfactory recognition was tested using a t-shirt worn by an individual as the sample above the photo array. T-shirts of 3 different individuals were used in different sessions. Visual recognition was tested matching a photo of one side of a familiar elephant to an array of 2 photos of the other side. Olfactory recognition was tested using the urine of a familiar elephant on a cloth as the sample above the photo array. In all experiments, recognition was determined if the elephant touched the correct photo at better than chance levels in each session and transferred that ability across sessions.

Perry, Penne

“Improving Surgical Wound Classification Accuracy”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Joanie Jackson

Abstract: SSI are a significant burden to patients and the healthcare system. SSI surveillance and data feedback to surgeons are being used as strategies to reduce SSI risk. Successful surveillance for SSI includes risk stratification using the surgical wound classification (SWC) of the operation to determine observed versus expected rates of SSI. An interrupted time series study design is being used to assess OR nurses' knowledge of SWC. Following IRB approval, OR nurses completed a knowledge survey before and after receiving education on accurately determining correct SWC. A modified World Health Organization checklist, which includes a surgical debriefing and confirmation of SWC, will be implemented as standard of care within the OR. Data extracted for the National Surgical Quality Improvement Program- Pediatrics submission will be used to determine the efficacy of the intervention in improving the accuracy of SWC. The objectives are to increase OR nurses' knowledge of SWC, improve the accuracy of documented SWC, and to measure compliance of checklist utilization. Findings from this study will provide information that could have a positive impact on the accuracy of SWC, increase reimbursement with SSI, QI, and improve patient outcomes

Peyer, Karissa, Ph.D.

“Discrepancies in the 99th Percentile Among Children”

College of Health, Education, and Professional Studies (Health & Human Performance)

Co-presenter: Ashley Ewald

Abstract: Use of the Body Mass Index percentile curves (BMI%) creates a ceiling effect for youth classified at the 99th percentile. This study evaluated variances by age and gender of alternative measures of weight in youth. Age, height and weight from children ages 3-18 were obtained from NHANES 2009, 2011, and 2013 and BMI variables - BMI (kg/m²), BMI%, BMI z-score, and BMI₅₀ - were calculated. Means and variances were calculated for all children with BMI% of 99% as well as 50% for comparisons. Data was available for 9049 subjects. Raw BMI for all subjects with BMI% = 99 ranged from 19.06 - 57.1 kg/m², but was narrower among children at the 50th percentile (15.2 - 22.0 kg/m²). The mean BMI at 99th percentile was 22.7, 29.7, and 39.4 kg/m² for 3-6 year olds, 7-11 year olds, and 12-18 year olds, respectively. Average BMI z-score ranged from 2.6 in 7-11 year olds to 2.97 in 3-6 year olds. BMI₅₀ ranged from 22.3% - 155.8% in 3-6 year olds, 44.6%-189.6% in 7-11 year olds, and 60.0%-169.1% in 12-18 year olds. These ranges were narrower in children at the 50th percentile (-0.3% to 0.9%, -0.8% to -0.4%, and -0.9% to -0.2%, respectively). Alternative weight variables including BMI₅₀ may allow for better distinction among youth with severe obesity.

Policastro, Christina, Ph.D.

“Perceptions of Male Rape Victims: Examining Rape Myth Acceptance and Victim Blaming Attitudes Among a Sample of College Students”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Co-presenters: Tammy Garland, PhD, Courtney Crittenden, PhD, & Whitney Ridley

Abstract: This study explores college students attitudes towards male victims of rape and other forms of sexual violence (e.g., unwanted sexual contact, sexual coercion, sexual assault). Although women comprise the majority of rape and sexual violence victims, emerging research is identifying a small, yet substantial number of males who experience sexual victimization. The study will present preliminary findings from a sample of college students with attention to the prevalence of victim blame, as well as individual-level characteristics associated with student perceptions of male victims of sexual violence. Policy implications will also be presented.

Ponto, Jordan

“Effectiveness of Metronome Training for Correction of Neuromuscular Control Deficiency at the Knee ”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Gary B. Wilkerson

Co-presenters: Hilary Proper, Olivia Piccirillo

Abstract: There have been numerous research articles studying short-term and long-term consequences of ACL injury and reconstruction, including persistent muscle weakness of both involved and uninvolved limbs, disability, and osteoarthritic joint changes, even after consistent rehabilitation programs. Long-term strength deficits commonly resulting from arthrogenic muscle inhibition can have detrimental effects and can result in up to a 70% increased risk of developing osteoarthritis. The purpose of this study was to assess associations among quadriceps weakness, hamstrings to quadriceps strength ratio, and reactive agility, and the extent to which metronome-guided strength training may enhance functional capabilities of individuals with a history of knee injury. Reactive agility is defined as an unplanned, rapid whole-body movement with a change of direction or velocity in response to an unpredictable stimulus, which is the type of movement highly common in sports. Reactive agility was tested with the Fitlight Trainer[®], muscle strength was tested with the Biodex isometric dynamometer, and participants were put through a metronome-guided intervention program to attempt to ameliorate imbalances and increase strength and reactive agility.

Powell, Grace

“What Does Sensory Integration "Look" Like in Pediatric Occupational Therapy?”

College of Health, Education, and Professional Studies (Occupational Therapy)

Research Advisor: Dr. Susan McDonald

Co-presenters: Rachel Woods, Faith Smith

Abstract: The purpose of this research was to identify if there were discrepancies or similarities among sensory integration (SI) techniques implemented by practicing pediatric occupational therapists (OT's). This research investigated two questions: 1.) How are SI interventions used by pediatric OT's? 2.) What are similarities and differences of the SI interventions used by three pediatric OT's in an outpatient therapy clinic? Two methods of data collection were utilized including a survey and direct observations. The results from the survey revealed the following: patterns of the primary equipment used to stimulate the various senses during interventions and autism as the primary

diagnosis treated by SI. The results from the direct observations revealed differences in SI among the three pediatric OT's. The lack of similarities in the use of SI among all three therapists revealed the uncertainty within the field of OT regarding which interventions are considered SI. Based on the results from both the survey and direct observations, the differences in SI interventions might be attributed to various backgrounds and trainings of the individual therapists. It is recommended that OT's clarify the use of Ayres SI versus sensory-based approaches.

Reeder, Ashley

“How Common is Common Sense? Exploring Opportunities among Core Knowledge and Common Core Curriculum”

College of Health, Education, and Professional Studies (Education)

Research Advisor: Dr. Jim Tucker

Abstract: Core Knowledge is essentially knowledge that is built upon prior knowledge. In many areas of the country, Core Knowledge is not a popular or universal form of curriculum. Common Core, however, tends to be the dominant trend among many educational institutions in the United States. Many Core Knowledge schools are affiliated with an application process, or a tuition to attend school and obtain that type of curriculum. Why is this? Why don't all schools in the United States practice the same educational standards and goals for all children? This presentation will explore the advantages, disadvantages, and opportunities among both styles of educational curriculum.

Reising, Donald, Ph.D.

“Smart Building Through Smarter Models”

College of Engineering and Computer Science (Electrical Engineering)

Abstract: The research investigated Building Energy Modeling (BEM) with the purpose of: 1) assessing the accuracy and ease of use of the efficiency modeling software Energy+, and 2) integrating and/or using hardware/software based methods by which to improve the existing energy models to enable real-time, high-fidelity energy usage and efficiency analysis. Energy+ is a whole building energy simulation program used by engineers, scientists, and researchers; however, the program performs a static analysis. The energy simulation requires the generation of an accurate building within the program. Creation of this model is quite complicated, time consuming, and requires extensive knowledge of building construction, materials, operations, and facilities (i.e., HVAC). The goal of this research was the development of a sensor based approach by which to perform modeling and analysis of building energy usage.

Ross, David, Ph.D.

“(I think) I know that masked man! How disguise influences identification of familiar faces”

College of Arts and Sciences (Psychology)

Co-presenters: Amye Warren, Ph.D.; Sally Swanson, B.S.; Jason Weber

Abstract: Surveillance videos of bank robberies and other crimes are often shown in the media in the hopes that a viewer may recognize the robber. Unfortunately, very little is known about the ability of individuals to recognize familiar faces that are heavily disguised. The purpose of the present study is to fill a void in the literature and examine whether individuals can recognize famous or familiar faces when disguised versus undisguised. In the present study research participants were shown faces of famous male celebrities whose images had been edited to appear heavily disguised or were undisguised. Each celebrity was shown wearing a panty hose covering the face similar to that worn by bank robbers. After viewing each face, participants were asked whether they knew the person, and if so, to identify that person by name. Recognition accuracy was significantly worse when participants were shown faces that were disguised versus undisguised, but the impact of the disguise varied considerably across the various celebrities that were used in the study.

Saad, Akram

“Near Real-Time Detection of Anomalous Power Consumption in Smart Power Distribution Networks”

College of Engineering and Computer Science (Electrical Engineering)

Research Advisor: Dr. Nurhidajat Sisworahardjo

Abstract: Monitoring energy consumption and diagnosing abnormal behavior will enable utilities to introduce strategies to improve system resiliency and stability. Moreover meet energy efficiency targets. The deployment of advanced metering infrastructure (AMI) enables utilities to collect various raw data from its customers and networks. This research presents anomaly detection algorithm to detect irregular power consumption and visualize anomaly indices using unsupervised learning algorithm. The algorithm works as two steps process. In the first step, the algorithm computes an anomaly index for each user by just considering their own energy consumption and historical data. In the second step, the anomaly index for a user is adjusted by analyzing contextual variables such as seasonal variation day of the week and other users with the same historical pattern.

Sandefur, Sarah, Ph.D.

“Preparing Teachers of English-Learning Students: Teachers HELP”

College of Health, Education, and Professional Studies (Education)

Co-presenters: Anne Gamble, M Ed; Amye Warren, PhD (Psychology); Valerie Rutledge EdD; Kay Cowan PhD; Rebecca Amos, B.S. (Psychology)

Abstract: The number of students in Tennessee schools who do not speak English proficiently has increased dramatically in recent years. These English Learners (ELs) face substantial challenges including lower academic achievement and lower graduation rates. To address the critical shortage of teachers prepared to work with ELs, UTC and partners formed the Teachers HELP consortium to provide an additional 140 ESL endorsed teachers in six school districts in southeast Tennessee. Participating teachers earned six hours of course credit through an intensive two-week session incorporating core, research-based ESL competencies. Four cohorts (totaling 62 pre-service and 84 in-service teachers) completed the Academy, and their knowledge improved significantly from pre- to post-test as a result. Furthermore, 104 of these teachers participated in professional learning communities in which they received instruction and feedback on videotaped lessons exhibiting strategies to support ELs. Analyses of lessons delivered before and after professional development and feedback from a facilitator revealed statistically significant improvements in teacher practices. Our research indicates that intensive, evidence-based instruction is effective in preparing both current and future teachers to work with English Learners in the classroom.

Sasser, Jason

“Facilitating Hypertension Management in a Retail Health Setting”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Joanie Jackson

Abstract: Retail health is an appropriate and convenient setting for patients to receive care for hypertension. This project enhances the care provided to patients with hypertension in a retail health setting in Memphis, TN. The project includes the measurement of provider participants' knowledge of hypertension management and the measurement of actual practices of participants before and after an educational intervention. Short term goals include a 25% increase in four key interventions for patients with hypertension and a 50% increase in participant knowledge. Long term goals include a 50% increase in the four key interventions and a 75% increase in provider knowledge. The following are outcomes related to practice: education for providers strengthen knowledge, ability, and self-efficacy; increased retention of providers; cost savings; increased revenue for organization; increased access to healthcare providers for HTN management; cost savings for organization and healthcare system overall; improved outcomes for patients.

Schmitt, Steven

“WECAAN - Wide Emergency Crowdsourced Automated Adaptive Networking System”

College of Engineering and Computer Science (Computer Science & Engineering)

Research Advisor: Dr. Farah Kandah

Abstract: Safety and security are major requirements for any community. These criteria in the past have been granted through the work of emergency first respondents whose work relies on accuracy and efficiency. A misevaluated incident could escalate into a larger situation leading to critical events with greater consequence. Therefore to combat this problem accurate information needs to be passed to the right personnel to ensure appropriate measures are taken. This is in fact the weakness of the first response system. Citizens who are often caught in crisis situations are required to relay information to emergency officials to allow for aid. The issue being that under increased stress and danger citizens often struggle to give an accurate account of the situation. Our proposed solution is the WECAAN system (Wide Emergency Crowd-sourced Automated Adaptive Networking System). This system allows for simple live streaming from a citizen's smart device directly to a first response system. This serves to alleviate the pressure from the individual allowing for a more accurate solution for information transfer. Once information is received along with relevant GPS information, respondents can then act accordingly.

Seagren, Woody

“Reconciling the International Achievement Gap: A Study Comparing Comparing Language Learning and Results on Tests of International Achievement”

College of Health, Education, and Professional Studies (Education)

Research Advisor: Dr. James Tucker

Abstract: As the United States has continued to display lower scores on tests of international achievement in recent years, educators have sought to implement large-scale system changes in order to address the gap in such scores. Consequently, the United States education system has undergone diverse changes, with none succeeding in closing the gap. Additionally, as education in the United States is ubiquitously monolingual, it also falls behind other countries' in the introduction of a foreign language. Therefore, this research seeks to account for such a gap through the comparison of countries' results on the 2015 PISA and TIMSS. Countries were categorized based on their age of introduction of foreign language one, two, and three. This information resulted in the classification of over 70 countries into four categories, through a review of educational literature. Categories include Low-, Moderate-, High-, and Very High-language levels. Significantly higher scores were found between both the High and Very High categories when compared to Low linguistic categories on PISA, with significant results on three out of four areas between High and Low areas on the TIMSS using ANOVA and ANCOVA analyses.

Seagren, Chelsey

“Functional Independence Measure's (FIM)'s Influence on Professional Reasoning in Inpatient Rehabilitation”

College of Health, Education, and Professional Studies (Occupational Therapy)

Research Advisor: Dr. Jessica Crowe

Co-presenters: Cassie Grimes, Ashley Howarth

Abstract: Background: In inpatient rehabilitation, occupational therapists (OTs) use professional reasoning when determining where a patient should go following services. Purpose: This study examined the influence of the FIM on professional reasoning in inpatient settings when discharge planning.

Methods: Qualitative methodology was employed using surveys (n=14) and semi-structured interviews (n=6).
Results: Qualitative data analysis revealed the following themes regarding the FIM's influence on professional reasoning for discharge planning: (1) provides a foundation to initiate discharge planning, (2) predicts reimbursement and impacts discharge planning with respect to length of stay (LOS), and (3) drives the need to gather additional data to gain a holistic picture of the client's discharge needs.
Discussion: While the FIM provides initial data for discharge planning, clinicians gathered additional data to create a holistic, client-centered discharge plan. Further research is needed to determine how OTs can assess client needs in a more holistic manner.

Shaffer, Cynthia

“Increasing Access to Fresh Produce in Food Deserts in Chattanooga”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Susan Thul

Abstract: Tennessee has over 17% food insecurity and over 24% of the children face food insecurity, 27% of people living in Chattanooga have to travel 1 mile to purchase fresh produce (Elliot et al., 2015, p. 7). The significance of this problem is that food deserts have been implicated in problems with obesity and poor self-rated health (Galvez, Hong, Choi, Liao, Godbold & Benner, 2009). The purpose of this project is to increase access to fresh produce for Chattanooga residents living in food deserts. In urban residents living in food deserts in the Chattanooga area using SNAP benefits, the development and implementation of a 3 prong approach including the development of a community consortium, collaborative marketing campaign combined with a web-based application compare to current practices or resources affect the utilization of the Fresh Savings program and web application over 7 months.

Shedd, Jessica

“Pilot Program: The Effects of an Interventional Training Session on Provider Self-efficacy and Knowledge Level on the Management of Childhood Asthma”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. B. Gwen Carlton

Co-presenter: Brynna Hamilton

Abstract: Asthma is the most common chronic disease in childhood. It is associated with significant morbidity and mortality. The asthma action plan and the asthma control test (ACT) can potentially reduce the morbidity and mortality associated with asthma and result in improved patient outcomes. Objective: To determine if the implementation of an interventional training session for the use of an asthma action plan and the asthma control test increase provider self-efficacy and knowledge and therefore results in improved patient outcomes? Methods: This is a pilot program to study the impact that provider training has on the treatment and management of childhood asthma.

Slayton, Trevor

“The Effect of Unresolved Interruptions on Prospective Memory”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Jill T. Shelton

Co-presenters: Hannah Allen, Lydia May

Abstract: I investigated how memory for future intentions (termed prospective memory or PM) was impacted by interruptions, unresolved interruptions, and delays. The PM task was to shop for eight items within an environmental sustainability rating task. A comedy routine appeared after participants had rated several items for both interruption groups, while the delay group viewed the comedy routine before beginning the shopping task. In the unresolved interruption group the comedy routine never reached its conclusion. I predicted that 1) PM performance would be

hindered by interruptions with the unresolved group performing worst, 2) that working memory capacity would moderate effects of interruptions on PM performance, and 3) that interruptions would influence gaze patterns such that less information was considered when making consumer decisions relative to delays. Interestingly, delays rather than interruptions negatively impacted PM performance. Working memory capacity predicted PM performance across conditions. No distinct gaze patterns were observed between conditions.

Slayton, Trevor

“A Study Comparing Survival Processing and Implementation Intentions for Prospective Memory Encoding”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Jill Shelton

Co-presenters: Lydia May, Bradley Myers

Abstract: One encoding strategy that has repeatedly been used with success in studies of retrospective memory, or past-related memory, is the survival processing strategy. Individuals who process information in terms of survival value tend to recall these items later more frequently than they do items relevant to non-survival related stimuli. We tested whether there is a significant difference between groups who encode future intentions using survival process compared to a group who uses implementation intentions. We predicted that using survival processing for prospective memory encoding would not be beneficial compared to implementation intentions. In one experiment we found that individuals who use survival processing are the less likely to remember their prospective memory intentions compared to individuals who use implementation intentions. Poorer performance among those using survival processing is attributed to poor contextual associations with survival-relevance during retrieval relative to encoding.

Smartt, Anna

“Childhood Obesity: 2017 Update for School nurses”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Gwen Carlton

Abstract: Childhood obesity currently affects 1 in 6 children in the United States. Childhood obesity is defined using the body mass index (BMI), a child is considered obese when his or her BMI is above the 95th percentile (CDC, 2015). Behaviors related to childhood obesity include diet patterns, physical activity, and inactivity. These behaviors are further impacted by the environment, education, and accessibility. A large portion of the childhood and adolescent years are spent at school, or in some form of a school setting thus making schools an ideal environment to implement healthy behaviors, including healthy dietary options and adequate physical activity. The school environment and support and uphold supportive efforts to encourage healthy eating and physical activity, allowing the pediatric population the opportunity to learn how to make healthy decisions.

The purpose of this research is to update Hamilton County School Nurses regarding the latest evidence on childhood obesity. The hypothesis is that the update on obesity training session will improve the knowledge and awareness of the current childhood obesity epidemic for the school nurse participants. An evaluation of the pre and post surveys will be included.

Smith, Bernadette

“CK, Now! Postsecondary Awareness for Elementary Students”

College of Health, Education, and Professional Studies (Center for Community Career Education)

Research Advisor: Sandy Cole

Co-presenters: Lauren Leisenring

Abstract: College Knowledge, Now! is a post-secondary awareness initiative that educates elementary students about future options. Not only do students come to UTC to learn what they can do, but also the steps it takes to make their

dreams reality. In alignment with Chattanooga 2.0, UTC's Strategic Plan, and the Drive to 55 movement, CK, Now! helps prepare our youth for the road ahead. Our work is quantitatively evaluated by teachers and school counselors, and qualitatively evaluated by the children themselves.

Smith, Catherine, PT, Ph.D., DPT, PCS

“Art in Motion: Using Gesture Activated Digital Art to Increase Movement Excursion in Individuals with Mobility Challenges”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Lisa Harrison, PT, DPT, GCS; Lindsey Sharpe, PT, DPT, PCS; Stacey Miles, PT, PCS

Abstract: This UTC Engaged Arts, Innovation and Activation CRISP grant funded project promotes movement expression of children, adolescents and seniors with mobility challenges by using gesture-activated interactive display to create digital artistic effects. Through the creation of an Art-in-Motion theatre, individuals ranging from 4 to 98 years old have had the opportunity to engage in fun and challenging game-based activities that challenge dynamic balance and increase movement excursion. The Art-in-Motion project encourages active movement by creating an engaging interactive visual surround that changes in response to the participant's movement efforts. Producing artistic changes on a digital palate through gesture-activated technology has the potential to promote physical wellbeing through improved dynamic posture, flexibility and endurance. To date, the Art-in-Motion theatre activities have been incorporated into the program design for 4 community-based events including a camping experience for youngsters with neuromotor challenges aged 6 to 18, a Halloween event sponsored by Children's Hospital serving over 700 children and parents, and 2 health fairs addressing the needs of community dwelling seniors.

Smith, Catherine, PT, Ph.D., DPT, PCS

“Comparing StepWatch and Optijump Measures of Change in Pace in Healthy Young Adults During Treadmill Walking at Differing Frequencies of Rhythmic Auditory Cues”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Elizabeth Phelps, SPT; Lisa Rangel, SPT; Briana Vastano, SPT; Holly Wright, SPT; Martha Summa-Chadwick, DMA

Abstract: Purpose: Compare StepWatch activity tracker and OptoJump measures of cadence during treadmill walking at differing speeds and during altered cadence conditions based on metronome-guided auditory cues. Methods: A convenience sample of 30 healthy college-age students without musculoskeletal impairments participated in this study. Participants completed six 90-second walking bouts on a treadmill at varying speeds (2.7, 3.0 and 3.3 mph) and differing cadences (110, 120, and 130 bpm) guided by metronome-based auditory cues. Steps taken per minute were simultaneously measured by the StepWatch and OptoJump activity tracking instruments. Pearson R correlation coefficients and intraclass correlation coefficients (ICC) were calculated to examine relationship of measures between the StepWatch and OptoJump instruments. Results: The strength of relationship between the OptoJump and StepWatch was found to be significant at $p \leq 0.01$ level. The ICC was found significant at $p \leq 0.001$ level. Conclusions: Both devices exhibited reliability at different treadmill speeds. Lower correlation was found with slower rhythmic auditory cueing at 110 bpm, with the StepWatch proving more accurate at detecting changes in pace at comfortable walking speeds.

Smith, Catherine, PT, Ph.D., DPT, PCS

“Impact of Rhythmic Auditory Stimulation on Physical Activity Levels and Ambulatory Walking Behaviors of Children with Medical Needs”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenters: Martha Summa-Chadwick, DMA; Brooke Williams, PT, DPT; Lindsey Sharpe, PT, DPT, PCS

Abstract: Children with medical needs are at increased risk for not meeting the daily recommended levels of physical activity needed to support general health and wellbeing. Rhythmic Auditory Stimulation (RAS) has been shown to help organize motor responses and improve functional performance. This study investigates the effect of rhythmic auditory stimulation (RAS) on physical activity and ambulatory patterns of children with medical needs. Participants will be recruited from children receiving therapy services at a local Children's Hospital. Individualized RAS segments will be created based on each participant's preferred music genre and self-selected comfortable walking speed. A StepWatch activity tracker will record amount of total daily walking and changes in cadence when listening to the RAS segments. Data analysis using SPSS v. 23 will examine changes in steps per time period, activity intensity levels throughout the day and percentage of stepping time compared with inactive time. This project is currently in the data collection phase., and when completed, will identify the impact of individually tailored music modules on the ambulatory walking behaviors and physical activity levels of children with medical needs.

Stevens, Angela, BSN, RN

“Improving Care Transitions: Strategies for Reducing Avoidable 30-day Hospital Readmissions in Patients with Heart Failure”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Carolyn Schreeder

Abstract: Reducing heart failure (HF) readmission rates has become a priority among many healthcare organizations worldwide. Nationally, an estimated 20% of all HF Medicare beneficiaries are readmitted within 30 days and 34% are readmitted within 90 days following hospital discharge. Hospital HF readmissions have been linked to ineffective communication of the patient's discharge instructions leading to the patients inability to perform self-care activities, medication errors, lack of physician follow-ups, decompensation, and unfortunately in some cases even death. Currently, the Center for Medicare and Medicaid Services is mandated to penalize hospitals up to 3% for HF patients readmitted back to an acute care facility within 30 days of discharge. To reduce unnecessary readmissions at Southern Tennessee Regional Health System (STRHS), I have proposed a plan to implement Project Re-Engineered Discharge (RED); a transitional care program proven to improve patient care, satisfaction, and reduce hospital readmission rates by as much as 30% in 30 days. The Chronic Care Model (CCM) will be used to guide each step of the nursing process and continuously refined using the Plan-Do-Study-Act (PDSA) cycles to promote successful implementation.

Strickler, Jeremy

“Building National Strength: New Deal Presidents and the Rhetorical Strategy of Re-Articulation”

College of Arts and Sciences (Political Science & Public Service)

Abstract: The project takes stock of two political developments which situated the institution of the presidency in a leadership dilemma I term the warfare-welfare nexus: the rise of the post-war national security state and the emergence of the modern administrative welfare state. Through the events of World War II and the Cold War, the presidency became bound to ensuring permanent military preparedness, promoting an ideology of national defense and security, and protecting the national interest through diplomacy and military action. Additionally, the crisis of the Great Depression and the policies of the New Deal welfare state redefined the role of the executive in championing the economic security of Americans, with the expectation that modern presidents advance a legislative and administrative

agenda comprising a broad array of domestic programmatic and budgetary commitments. As a result of these two developmental dynamics, reform-oriented presidents have to navigate national security imperatives as they attempt to coordinate domestic programmatic objectives.

Strimaitis, Jacob

“Domain Specificity of the Cognitive Reflection Task: A Look at Numerical Ability and Religion”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Ralph Hood

Abstract: The Cognitive Reflection Task (CRT) is a popular test of analytical thinking style, because of its predictive power with a number of decision-making measures. However, some critics have raised doubts to its validity, claiming that its efficacy stems from its ability to assess numerical ability instead of cognitive reflection alone. This claim leads into a separate, though related, argument that performance on the CRT and other measures of cognitive thinking ability is domain specific. The purpose of this current study is to test whether we can evaluate the domain specificity of cognitive reflection by comparing performance of the CRT between math majors, or those who would be familiar with the domain of mathematics, and psychology majors, or those who would be less familiar with the domain of mathematics. This study also acts as a replication of past research that has reported that performance on the CRT is negatively related to religious belief. Replication of these religious findings and evidence in favor of domain specificity will reveal the need to make a new measure of religious cognitive reflection.

Suarez, Hector

“Implementing Secure Open Source Software Solutions”

College of Engineering and Computer Science (Computer Science & Engineering)

Research Advisor: Dr. Mina Sartipi

Co-presenters: Austin Harris

Abstract: Transporting sensitive data is important, therefore building a secure and efficient system to securely transport and store data on a remote server were the objectives of this research. In this research data will be collected and stored from a mobile device and securely uploaded to the secure server. The latest open source Linux OS was used for the server. Hardening the OS was done before expanding the software stack. The Sails JavaScript server was important as it allowed the developer to focus on the overall system requirements instead of spending more time coding things from scratch. The server application uses the latest authentication and secure data transport methods such as JSON authentication tokens and TLS-1.2. Furthermore, the client application is protected from MITM (man-in-the-middle) attacks by pinning the server's certificate to the mobile device's application. A layer of security was added to the system by integrating a finger print bio-metric security feature. Therefore, only the mobile device owner can start the mobile application and use our built remote services. A NoSQL database was used as it increases the scale-ability of our system.

Swanson, John C., Ph.D.

“Tangible Belonging: Negotiating Germanness in Twentieth-Century Hungary”

College of Arts and Sciences (History)

Abstract: The subjects of my research are the millions of "Germans" of Central and Eastern Europe living outside the state of Germany. Questioning the notion that Germans are an essentialist entity, my work investigates and explains how a term such as "German," as well as similar expressions, are employed by various constituencies to give definition to groups.

In my work I look at how Germanness was negotiated throughout the twentieth century in Hungary, where for

hundreds of years there had been a sizable German-speaking population. The rural German speakers had maintained a sense of "being German" denoting a kind of tangible belonging; a mental construct derived from the tactile environment of an individual. By the turn of the last century, however, this tangible belonging was in competition with new, more abstract understandings of Germanness coming from the burgeoning Hungarian-German leadership, from the Hungarian state, and from the so-called mother country of Germany. If being German had been tied to the immediate world, it now could mean membership in larger imagined communities.

Throughout the twentieth century Hungarian Germans became loyal Hungarians, chauvinistic Volksdeutsche, victims of forced migration, and a minority.

Swanson, Sally B.

“Text Analysis of Faith Development Interviews using Linguistic Inquiry and Word Count (LIWC)”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Ralph W Hood Jr.

Co-presenters: Lotte Pummerer, Michael E. Nielson, Dr. Ralph W. Hood Jr.

Abstract: New ways of electronically collecting and evaluating data make analyses via text programs like LIWC2015 a valuable supplement to traditional qualitative coding. Many aspects of Fowler's theory connect to reasoning structures and complex thinking. The aim of this study is to assess the extent to which a quantitative technique may reflect qualitative analysis. In an exploratory study, we hypothesized that higher Faith Stage scores connect to higher analytical thinking measured by LIWC. Faith Development Interviews (N=51) gathered in the 2011 Longitudinal Study of Development Change in Spiritual and Worldviews received LIWC scores for analytical thinking, positive and negative emotions and other variables. Individuals receiving a higher stage score (score>3.5, N=30) were compared with individuals receiving a lower stage score (score<3.5, N=21). Higher stages of faith development were connected to higher analytical thinking scores, though groups did not differ significantly. However, participants in higher stages used fewer words connected to negative emotions, or religion, and seemed to use more words in the present, and future tense.

Tate, Jeremaih, Ph.D., PT

“The Effects of Different Verbal Instructions on Hop Height and Contact Time During the Vertical Hop Test in Recreational Athletes Post ACL Reconstruction”

College of Health, Education, and Professional Studies (Physical Therapy)

Co-presenter: Betsy Myers, PT, DHS, OCS, CWS, CLT

Abstract: Purpose/hypotheses: The purpose of this study was to assess the effect of two verbal instructions on contact time and jump height during performance of a vertical hop test in recreational athletes after ACL reconstruction. We hypothesized that participants' contact times would decrease when asked to perform the test as fast as possible and hop height would remain similar. We also hypothesized that no differences would exist between limbs for both contact time and hop height. Number of Subjects: Twelve college-age recreational athletes (9F; 3M) who had undergone ACL reconstruction surgery were included in this study. Participants were currently active 2x/week for a minimum of 30 minutes and participated in jumping/cutting activities at least 1x/month. Materials/methods: Participants performed a vertical hop test which consisted of 5 consecutive hops on the same lower extremity. An optical measurement system (Optojump, Micrograte, USA) was used to determine contact time and hop height. Participants were instructed to hop as high as possible on one leg. During the landing, participants were instructed to try to land in the same spot.

Tracy Samuel, Annie Ph.D.

“Commanding the Faithful: The Kingdom of Morocco's Relations with the Islamic Republic of Iran”

College of Arts and Sciences (History)

Abstract: This project analyzes the Kingdom of Morocco's relations with the Islamic Republic of Iran, with a particular focus on Morocco's decision to sever ties with Iran in 2009, and is based on research conducted in Morocco and on an analysis of primary and secondary sources in English, Arabic, and Persian. The examination reveals that Morocco's foreign policy regarding Iran, and more broadly, is driven by two key concerns: (1) The prevailing strategic dynamics of the Middle East, particularly apprehension over Iran's growing influence, the mobilization of Arab monarchies into a coalition to counter Iran, and the implications of a close alliance with the United States; and (2) The paramount goal of domestic policy, that of maintaining monarchical authority and legitimacy and the particular way Muhammad VI has sought to do that. In making that argument, the research sheds light on the broader, underlying dynamics that drive Morocco's foreign policy, and supplements and complicates the dominant narrative concerning that subject. Additionally, it argues for the importance of domestic political considerations in driving Morocco's foreign policy and for the close connections, in the view of the Moroccan regime, between Islam and security.

Thomas, Maggie

“The correlation between homeownership and the perceived quality of life”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Amy Doolittle

Co-presenters: Dina Rogers, Mindy Rudell

Abstract: The purpose of this study is to determine the impact of homeownership and how it affects the perceived quality of life. This research is an expansion of a prior study that was completed in 2013 for Habitat for Humanity in the Greater Chattanooga area. This study will explore generational transformation, educational classes, benefits, community involvement, finances and health as well as crime statistics.

Thompson, Rebekah

“The Use of See-Through Technology for Fleet Management of Large-Scale Connected Autonomous Vehicles”

College of Engineering and Computer Science (Computer Science & Engineering)

Research Advisor: Dr. Mina Sartipi

Co-presenter: Jin Cho

Abstract: Due to scientific breakthroughs and technological innovations, the deployment of autonomous vehicles will undoubtedly revolutionize the transportation system in the future. Though autonomous vehicles hold many promises, we must first overcome some major hurdles, such as safety risks or efficiency weaknesses. The existing research mainly focuses on the single autonomous vehicle or a small number of connected vehicles, which cannot fully address such safety and efficiency issues. Our research is about fleet management of large-scale connected autonomous vehicles. We believe that scalability and coordination will provide a powerful solution, and reinforce the transportation revolution due to autonomous vehicles. In our poster, we will demonstrate our vision of advanced wireless infrastructure for vehicular communications, cooperative sensing for real-time traffic monitoring and scene understanding, and large-scale cooperative mobility. We will also emphasize the importance of fleet management and its capability to improve safety and efficiency when connected autonomous vehicles are employed in complex urban driving scenarios. We have implemented and will demonstrate see-through technology.

Treat, Sarah

“An Evidence-Based Sexual History Intervention”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Joanie Jackson

Abstract: Individuals aged 15 to 24 are a population at risk for sexually transmitted diseases secondary to a plethora of contributing factors. Although many of the contributing factors belong to college students, health care providers play an integral role in sexually transmitted disease screening, primary prevention, and sexual health education. An integrative literature review supported the need for an educational intervention focused on sexual health history education for college health providers. By increasing sexual health screening, this DNP student aims to decrease the number of sexually transmitted diseases on a college campus and to improve health care providers' sexual health history knowledge and self-efficacy. Additionally, the implementation of an evidence-based sexual health history standard of care, executed in an electronic health record along with a sexual health utilization policy, will improve sexual health outcomes. The implementation of sexual health standards of care will increase the number of sexually transmitted disease screenings, improve treatment, increase community partnerships to meet the sexual health needs of the students, and ultimately decrease sexually transmitted disease load on campus.

Turgeson, Andy

“The Benchtop Fermentor: A Growing Research Project”

College of Engineering and Computer Science (Civil & Chemical Engineering)

Research Advisor: Dr. Bradley Harris

Abstract: Microorganisms such as algae, bacteria, and fungi live in every part of the biosphere and are crucial to life. An improved understanding of these organisms is vital to the advancement of research in fields such as renewable routes to energy and commodity chemicals and the prevention and treatment of disease. The focus of this project was to develop a bioreactor system that would provide chemical engineering students with the opportunity to engage in hands-on research in this vital area and learn valuable skills related to microbiology and biochemistry. The chosen bioreactor system and ongoing research will be presented.

Warner, Amanda

“The Timing of Accurate Personality Judgements”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Katherine Rogers

Abstract: Accuracy of personality impressions research assesses individual differences in impression accuracy (Funder, 1995). Research has not assessed individual differences in response time. In this study, we assess the relationship between response time and accuracy and personality and response time. Undergraduates at the University of Tennessee - Chattanooga, N= 66, participated in a study assessing accuracy of first impressions. Participants completed personality self-reports (Saucier, 1994) and met with other participants in dyads, rating the other's personality after each interaction. They wrote the time they began their ratings and the time they completed their ratings. Extraverts are impulsive and quick to respond to stimuli (Stelmack, Houlihan, & McGarry-Roberts, 1993), so we hypothesize that they will have faster response times. Introverts take longer to examine stimuli (Stelmack et al., 1993), so we hypothesize that introverts will have slower response times. Neuroticism was positively correlated with reaction time (Stelmack et al., 1993), so we hypothesize that those high in neuroticism will have faster response times. We will assess interactions of response time and accuracy and personality predictors of response time.

Warren, Amye R., Ph.D.

“Attitudes toward English-learning students: The roles of formal and informal educational experiences”

College of Arts and Sciences (Psychology)

Co-presenter: Rebecca Amos, B.S.; Sarah Sandefur, PhD; Anne Gamble, M Ed; Renee Murley, EdD

Abstract: A large and increasing number of U.S. students are English Learners (ELs). Although most ELs are born in the U.S., their predominant home language is not English and they require support to reach full English proficiency. Given the current political climate regarding immigration and education and the need for highly qualified and motivated teachers to support ELs, we conducted a study to examine the roles of formal and informal educational experiences in attitudes toward EL students. During the fall 2016 semester, we surveyed 547 UTC students in education and psychology courses (120 Education majors, 228 Psychology majors, and 188 with other majors). We examined differences in attitude by major, number of education and foreign language courses completed, experiences with ELs, and experiences with other cultures (e.g., traveling abroad), among other factors. We also compared our results to those from 146 participants in the Teachers HELP program, which provides intensive training for teachers seeking to earn their English as a Second Language endorsement. As predicted, averaging across 13 questions, those with the most formal training in education and foreign language held more positive attitudes towards ELs. Specifically, Teachers HELP participants had the most positive attitudes (M=4.10 on a 5-point scale), followed by Education majors (M=3.51), then Psychology majors (M=3.39) and Other majors (M=3.18). Greater fluency in another language and experience with other cultures was significantly, positively correlated with attitudes towards ELs. We will discuss implications for the university curriculum, teacher recruitment efforts, and wider community support for ELs and their families.

Webster, Robert, Ph.D.

“Higher-order Computational Simulations of a 3-stage Axial Compressor”

College of Engineering and Computer Science (Mechanical Engineering)

Co-presenters: Dr. Kidambi Sreenivas, Dr. Abi Arabshahi

Abstract: This research is a follow-on effort from the previous year. In the earlier work, good agreement between the computational and experimental results for compressor performance was obtained for the low- to nominal-loading operating points. The computational results over predicted the performance at the high-loading to near-stall operating points. As blade/vane counts were altered to facilitate the partial-wheel simulations, this was suspected to be the primary source of the over predicted performance error. Intermediate simulations were performed using a 1/3-wheel approximation, which allowed for the blade/vane counts to be almost the same as the real machine. However, this did little to improve the agreement with experiment at the high-loading points. Higher-order spatial accuracy was then introduced by means of a somewhat ad-hoc method. This improved the agreement with experiment at the high-loading points, and inspection of the solution showed that the details of the wake regions of both the rotor blades and stator vanes were enhanced. The vortical structures within the wakes were more well preserved, which increases the loss in the system. This increased loss results in improved agreement with experiment at high loading.

Whitehead, Stacy

“Implementation of an Educational Intervention Program on Sleep Disordered Breathing to School Nurses (i.e. sleep apnea)”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Joanie Jackson

Abstract: Sleep disordered breathing (SDB) is being recognized by the American Academy of Pediatrics (AAP) as an under-diagnosed health problem. This has encouraged the AAP to re-emphasize the importance of screening for

SDB. "Sleep apnea" is a commonly used term to describe this health problem, however the medically appropriate term is SDB. Identifying SDB in children is a challenge, as each child doesn't manifest the same risk factors. Unfortunately, little education is given to health care professionals on sleep disorders, which posit one factor for its low recognition. Additionally, many children do not see a pediatrician regularly unless managing a chronic condition. This project implements an educational intervention program on SDB in school-aged children directed toward 90 school nurses in the Hamilton County school system in Chattanooga, Tennessee. School nurses utilize the developed SDB protocol to guide in the recognition of SDB and encourage evaluation by the pediatrician. Implementation of the protocol is anticipated to increase recognition, awareness, and treatment of SDB.

Wilt, Kayitesi

“Predicting Cross-Cultural Adaptability”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Michael Biderman

Co-presenter: Dr. Michael Biderman

Abstract: Effectively interacting with individuals in or from an unfamiliar culture requires cross-cultural competence and adaptability. The Cultural Intelligence Scale (CQS; Ang et al., 2007) is designed to measure cultural intelligence, or an individual's ability to adapt in a culturally unfamiliar situation. Though the CQS has been used extensively in the cross-cultural literature, studies using the scale have mixed results regarding its dimensionality, construct validity, and distinctness from other intelligences, such as social and emotional intelligence. Additionally, the phrasing of some of the items in the CQS require respondents to have been to a foreign culture to be able to answer. To address these critiques, a goal of the current study is to create a modified version of the CQS to accommodate individuals who have never been to a foreign culture. Additionally, the current study explores the nomological network of the CQS by examining its correlation with scales that measure emotional intelligence, social intelligence, and personality.

Winkle, Chris

“Lumbar Multifidus Cross Sectional Area as a Possible Predictor of Injury Among College Football Players”

College of Health, Education, and Professional Studies (Athletic Training)

Research Advisor: Dr. Gary Wilkerson

Co-presenters: Jackson Mize, Justin Farris

Abstract: High impact sports, such as football, have an increased rate of injury throughout the course of a season. Deficits in core stabilizing muscles, such as the Lumbar Multifidus, have been shown to increase the incidence rate of injuries in athletes that participate in these sports. Identifying weaknesses that are contributing to these injuries is a crucial step in the injury prevention process. Ultrasound imaging has been shown to be an appropriate measuring tool to find the size of the Lumbar Multifidus. Due to the location of the Lumbar Multifidus, it is a difficult muscle to assess without an invasive procedure. Therefore, ultrasound imaging can be a useful tool in providing a noninvasive alternative for inspection. We believe that a small Lumbar Multifidus cross-sectional area will be associated with a higher injury rate over the course of a season. Finding weaknesses in the Lumbar Multifidus and other core stability muscles would provide the ability to develop strength programs for that specific muscle group to promote performance gains. The purpose of this study is to assess a possible association between Lumbar Multifidus cross sectional area derived from ultrasound images with subsequent occurrence of soft tissue injuries.

Wright, Ashley

“The Effect of Statins on the Mortality and Morbidity Related to Cardiovascular Disease in Adults Between 40 and 75 Years Old With Known Risk Factors for Cardiovascular Disease”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Gwen Carlton, Dr. Priscilla Simms-Roberson

Abstract: Statins have been getting significant attention lately as studies have emerged regarding the role of statins to treat cholesterol for primary and secondary treatment and prevention of cardiovascular disease. A total of five non-research and five research-based articles were reviewed and will be presented to help summarize the current literature discussing the appropriate role of statins in disease management and prevention. This research provides strong evidence that the use of statins in those who have known risk factors for cardiovascular disease will reduce the mortality and morbidity due to a cardiovascular event. There are certainly other aspects to consider and additional studies that focus on factors such as long term effectiveness versus adverse effects, the benefit of lifestyle modifications versus statin therapy, and patient's baseline lipids compared the their risk factors. This presented research is supportive of the use of statins but those additional elements must be thoroughly reviewed and considered prior to starting a patient on a statin.

Youngman, Holland

“Using ArcGIS Collector App for Avian Research”

College of Arts and Sciences (Office of Research for the Vice Chancellor)

Research Advisor: Andy Carroll

Abstract: The purpose of this study is to determine the impact of homeownership and how it affects the perceive quality of life. This research is expansion of a prior study that was completed in 2013 for Habitat for Humanity in the Greater Chattanooga area. This study will explore generational transformation, educational classes, benefits, community involvement, finances and health as well as crime statistics.

Ziedan, Abubakr

“Analysis of level-1 MEPDG Traffic Input Parameters for the State of Tennessee in comparison to Level-3”

College of Engineering and Computer Science (Civil & Chemical Engineering)

Research Advisor: Dr. Mbakisy Onyango

Co-presenters: Drs. M. Onyango, S. Udeh, W. Wu, J. Owino, I. Fomunung

Abstract: Traffic inputs for Mechanistic Empirical Pavement Design Guide (MEPDG) provides necessary information in terms of traffic load distributions, intensity and number of traffic load repetitions. The MEPDG requires more traffic data input than the AASHTO design guide, which makes switching to the new design guide a challenge to some states DOT's. According to MEPDG, data inputs are a hierarchical as level 1, 2 and 3. Level-1 is site-specific data, level-2 is regional or statewide data, and level-3 is national wide data. This study compares the design output using site specific traffic input data to the design output using national default values. The analysis uses data collected and processed by Long Term Pavement Performance and measured distresses by Tennessee DOT. It was found out that the national wide inputs values overestimates the distresses. Also the site specific traffic input predicts more economical pavement sections than national wide although both input values estimate more economical designs than AASHTO-1993.

Zimmerman, Jennifer

“Effectiveness of closed chain mobility training for improvement of weight bearing dorsiflexion and functional movement pattern”

College of Health, Education, and Professional Studies (Health & Human Performance)

Research Advisor: Dr. Marisa Colston

Co-presenters: William Dunham, Killian Mollner

Abstract: The purpose of this study is to assess the potential benefit of the ROTEX training for remediation of restricted weight bearing dorsiflexion and improvement of multisegmental functional movement.

Zuckerman, Holly

“The Need for Learning American Sign Language in Higher Education”

Administration (Disability Resource Center)

Abstract: The ability to work with people with hearing impairments is a critical niche across the country, one that is generally lacking in professionals who can fill that niche. And in a state rich with institutions of higher education, Tennessee is also lacking programs in those institutions that can help develop the professionals needed to work with people with hearing impairments. This presentation will explore evidence toward building an American Sign Language program at UTC by drawing connections between the disparity in the need for educated professionals to work with the hearing impaired versus higher education programs in the state of Tennessee that can produce those professionals.

UTC RESEARCH DIALOGUES

Plenary Lunch

UC Chattanooga Room

Wednesday, April 12 - Graduate Student & Faculty Showcase

Lunch Sponsor: College of Health, Education, & Professional Studies

Remarks

Dr. Joanne Romagni
Vice Chancellor for Research

Dr. Steven Angle
Chancellor

Dr. Valerie Rutledge
Dean of the College of Health, Education, & Professional Studies

Dr. Stacey Patterson
Vice President for Research, University of Tennessee
Vice President of the UT Research Foundation

UTC RESEARCH DIALOGUES

Podium Presentations

Wednesday, April 12 – Graduate Student & Faculty Showcase

Arnett, James, Ph.D.

9:30, Foundation Room

“Amma Darko and the Market For and Of African Literature”

College of Arts and Sciences (English)

Abstract: Drawing on my UTC-sponsored (Office of Equity and Diversity; PREP Fellowship) travel to Ghana and Nigeria, I will address the ways that actual marketplaces – where goods are sold and traded, where buyers come and go, and bodies circulate – are reflected and refracted in the work of the Ghanaian novelist Amma Darko. Focusing on her representations of the Agbogbloshie and Makola markets in Accra, my presentation will weave together images from my travel, anecdotes from the marketplace, an interview I conducted with Darko herself, and an academic argument about the gendered value and literary values of the market.

Ashmore, Pamela, Ph.D.

10:30, Foundation Room

“Primates as Pets: What do the laws allow?”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Co-presenters: Rachel Fuller, Karen McGuffee, Ph.D.

Abstract: Many individuals think that monkeys and apes make good pets. However, in November of 2009 a chimpanzee by the name of Travis brutally mauled and injured Charlene Nash. This horrific incident brought to light the dangers of owning a primate. Even small bodied primates such as marmosets and tamarins can inflict severe injuries and most people are not always aware of the zoonotic diseases that may be transmitted through bites and scratches. We investigated the laws for all 50 states pertaining to the private ownership of primates to see what restrictions or lack of restrictions exist. We found that there is a wide range in what state laws prohibit and allow. States like Connecticut, where Travis lived, have strict bans on the private ownership of primates while states like Kansas have no legal restrictions. We attempt to link the existence of legal restrictions on primate ownership to incidences of primate inflicted injuries that have occurred in such states.

Baptiste, Mo, Ph.D.

2:00, UC Auditorium

“Who's really experiencing culture shock here?: Critically Analyzing
Voluntourism and College Alternative Break Programs”

Administration (Student Development)

Abstract: Easing global poverty is an enormously complex task. To make so much as a dent requires hard, sustained work, and expertise. Even the experts sometimes get it wrong. A 2008 study surveyed 300 organizations that market to would-be voluntourists and estimated that 1.6 million people volunteer on vacation, spending around \$2 billion annually. Volunteering seems like an admirable way to spend a vacation but more often than not, well intended do-gooders end up making the situation worse by not checking their privilege before traveling to a developing country. I believe that the first step toward making the world a better place is to simply experience that place. Unless you're willing to devote your life and career to studying international affairs and public policy, researching the mistakes that foreign charities have made while acting upon good intentions, and identifying approaches to development that have data and hard evidence behind them, perhaps volunteering abroad is not for you.

Carroll, Andrew, PG, GISP

10:00, Foundation Room

“Acquisition of High Accuracy Geospatial Data for Environmental and Natural Resource Management Using Light Detection and Ranging (LiDAR) Sensor Equipped Unmanned Aerial Systems (UAS)”

Administration (IGT Lab and Office of Vice Chancellor for Research)

Abstract: Light Detection and Ranging (LiDAR) sensors are commonly used in geospatial data acquisition for natural resource and environmental management. LiDAR sensors are fully capable of vegetation and ground cover penetration for accurate terrain surface measurement, as compared to more common, less obstruction tolerant, photogrammetric methods. Recent advances for inertial measurement unit devices, global navigation satellite system receivers, and regulatory authorizations have increased the deployment of unmanned aerial systems (UASs) for geospatial data acquisition. Comparably, commercially manufactured LiDAR sensor payloads are available in smaller form factors and weights. Results from recent field mapping missions and LiDAR sensor evaluations, indicate increased mobility, reduction of safety hazards, and high data quality results from LiDAR enabled UAS platforms. In addition, UAS systems offer potential time and cost savings, versus traditional survey or manned aircraft acquisitions.

Cho, Jin

10:15, Ocoee Room

“Big Data Analytics for Smart Health”

College of Engineering and Computer Science (Computer Science & Engineering)

Research Advisor: Mina Sartipi

Abstract: Big data analytics allows analysts to examine the data to discover underlying meanings, which in turn, guides to build efficient algorithms to solve the problem. Big data analytics for smart health can be utilized to provide insight about the past and expound the historical data, forecast the future using statistical models and predicting techniques, and enhance existing prediction models to provide better solutions.

For our work, we have explored big data analytics to build a predictive model that could predict TN stroke patient's hospital discharge disposition status. Predicting stroke patient's discharge disposition status would allow hospitals and caregivers to perform efficient post-stroke management, which could improve patient's healthcare outcome and reduce the healthcare cost. To predict and analyze the discharge status, several machine learning techniques such as logistic regression, support vector machine, random forest, and neural network were applied to build the model.

Cholota, Taylor

4:15, Foundation Room

“Fizzling out? Prevalence of Burnout in the Social Work Profession”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Amy Doolittle

Co-presenters: Jared Cantrell, Stephan Belasco

Abstract: Our research project deals with the level of burnout within the field of social work and how it has an impact on their reported compassion fatigue. The purpose of this research is to identify and analyze the frequency of burnout among employees in a social work involved position. This research will be researching those in a social work position in the Chattanooga area.

Cobble, Brittney

10:00, Heritage Room

“The Benefits of Therapeutic Crafts for the Development of Leisure Coping Skills Among Adolescents with Substance Use Disorder”

College of Health, Education, and Professional Studies (Occupational Therapy)

Research Advisor: Elicia Cruz

Co-presenters: Noel Crowder, Fidela Mendiola, Diane McKinney, Brittney Cobble

Abstract: This study aimed to examine the effects of the use of therapeutic crafts as a method to facilitate the development of the knowledge and skills needed for healthy leisure engagement, such as coping skills. This research participants were adolescents in an inpatient substance use program located in Chattanooga, TN. Participants included three seventeen-year-old females who were recently enrolled in the substance use program. A mixed-method design was utilized using qualitative and quantitative data from field notes, semi-structured interviews, and results from a standardized assessment tool, respectively. The Children's Assessment of Participation and Enjoyment (CAPE) and Preferences for Activities with Children (PAC) is a standardized assessment to examine leisure participation and preferences. Data from the CAPE/PAC was analyzed pre- and post-test. Thematic coding and triangulation was utilized to analyze the data from field notes and the semi-structured interviews. The results of the

Davies, Saama

2:00, Ocoee Room

“Component Models for Radiation Effects in Photonic Integrated Circuits”

College of Engineering and Computer Science (Electrical Engineering)

Research Advisor: Dr. Daniel Loveless

Abstract: Recent developments in nanostructures, metamaterials, and integrated silicon technologies have enabled new functionality in highly integrated Photonic Integrated Circuits (PICs). This work investigates thermal and radiation effects in PIC devices. Three-dimensional computer-aided design models (3D CAD) of fundamental PIC building blocks are used to elucidate primary mechanisms responsible for the degradation of operating parameters. Results are used to inform the development of device compact models for simulation and prediction of circuit and system response to environmental conditions.

Dumas, Joe, Ph.D.

10:30, Ocoee Room

“Online vs. Face-to-Face Student Performance in Computer Science Courses”

College of Engineering and Computer Science (Computer Science & Engineering)

Abstract: Online courses are becoming more and more popular in universities, including computer science departments. However, it is not clear whether online course delivery results in equivalent, better, or worse learning achievement for the students. Studies across disciplines and within the computing discipline show mixed results. The author analyzed student performance in an Introduction to Operating Systems course that was converted from a face-to-face class to online delivery. Test and final exam scores from before and after the online conversion were analyzed. The results showed a slight improvement in student performance when the course went online, but not enough to establish statistical significance. Follow-up research (ongoing) will examine performance in a subsequent, senior-level course (Computer Architecture) for which the Introduction to Operating Systems course is a prerequisite, to see which mode of prerequisite course delivery better prepares students for later success.

Ghafari, Mehran

10:00, Ocoee Room

“4D Data Acquisition and Reconstruction for Medical Applications”

College of Engineering and Computer Science (Computer Science & Engineering)

Research Advisor: Dr. Dalei Wu

Abstract: The purpose of the this study is to create a Remote Virtual Intelligent Coaching System (RVICS) for modality reha- bilitation. The work is based on collection of exercise motion data from professional coach (master) and give a pinpoint feedback to a patient in Virtual Environment (VE) that is categorized in two sections. The

visualization section to follow the exercise instruction and correction - point section to monitor patient in case of incorrect exercise. Moreover, the data collection from master is based on electromyography (EMG) signal via series of wireless sensors and the patient monitoring feedback is given by actuator / vibrator sensors.

Gunasekera, Sumith, Ph.D.

11:00, Ocoee Room

“Reliability of Multi-Component Stress-Strength Model”

College of Arts and Sciences (Mathematics)

Abstract: Generalized point and interval estimation for, and the hypothesis testing of, the reliability parameter $R_{s,k} = \Pr(\text{At least } s \text{ of the } (X_{\{1\}}, X_{\{2\}}, \dots, X_{\{k\}}) \text{ exceed } Y) = \Pr(X_{\{k-s+1:k\}} \leq Y)$, $s \leq k$, of an s -out-of- k : G system with strength components $X_{\{1\}}, X_{\{2\}}, \dots, X_{\{k\}}$ subjected to a common stress Y , when X and Y are independent two-parameter general class of exponentiated inverted exponential (abbreviated GCEIE) random variables, are discussed. These statistical analyses are carried out with the aid of progressively type-II right censored data with uniformly random removals. We develop new testing procedures for $R_{s,k}$ in the generalized variable framework of inferences. There are no exact or approximate testing procedures and confidence intervals for reliability parameter of a multicomponent stress-strength model from the GCEIE distributions, based on the progressively type-II right censored data with random or fixed removals, available in the literature.

Güven, Emine, Ph.D.

1:30, Ocoee Room

“The Impact of Humidity on Gene Expression in the Human Skin”

College of Engineering and Computer Science (Computer Science & Engineering)

Co-presenters: Hong Qin, Jianming Zhang

Abstract: As the largest organ in the human body, the skin can directly sense environmental humidity changes, and adjust itself by either losing or absorbing moisture. Consequently, humidity changes are commonly observed to influence the morphological and physiological condition of the skin, such as skin wrinkles, ageing lines and stem cell activities. The goal of this research is to investigate the impact of room humidity on human skin by profiling the genome-wide gene expression. This study aims to determine whether there is a common pattern of regulation of gene expression under different humidity stress in human skin. We invented an ex-vivo model system to investigate the molecular cell response of human skin under various dryness conditions (from relative humidity 20% to 100%) for 8 hours ex vivo culture. One specific set of genes involved in the Staphylococcus aureus infection pathway from the KEGG classification showed significant responses to relative humidity changes. More interestingly

Howard-Baptiste, Shewanee, Ph.D.

9:45, Heritage Room

“Challenges and Triumphs: Addressing Priorities for Community Based Research”

College of Health, Education, and Professional Studies (Health & Human Performance)

Co-presenters: Chris Smith, PhD; Lindsey Pearse Greiner, MS; Gwen Carlton, DNP

Abstract: Burgeoning rates of obesity and associated chronic conditions pose one of the greatest challenges for health care in the U.S. Obesity negatively impacts nearly every aspect of body function and quality of life. To enhance the academic and clinical preparation and practice of advanced practice nursing students through implementation of an interprofessional education and clinical practice model that teams graduate students and clinicians to address multiple chronic conditions in the Chattanooga community. Over the course of a 3 year HRSA grant, a team of professionals who work in allied health developed education materials in the following areas: physical activity, nutrition, diabetes, prenatal health, stress, and obesity. As the grant comes to a close, much can be gleaned from implementing community-based programs that will likely improve future initiatives in the area.

Jackson, Kaitlynn

2:00, Chattanooga Room

“Family Attitudes and Risky Behaviors Among LGBTQ+ Young Adults”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Dr. Amy Doolittle

Co-presenter: James Matthew Lopp

Abstract: Research regarding the LGBTQ+ population has risen as social stigma has decreased. Previous research has led to the conception of this study - LGBTQ+ youth may struggle with family rejection, risky sexual behaviors, mental health issues, and substance abuse. The research questions are: 1) Does family rejection have an effect on sexual risky behaviors, mental health, and substance abuse in the LGBTQ+ community? and 2) What is relationship between risky behavior and sexual orientation?

Participants were sent a link via email to an online Qualtrics survey that contained different questionnaires about the topics of interest, including: the Rejection Sensitivity Questionnaire - Adult Version (A-RSQ), the Patient Health Questionnaire (PHQ-9), the Drug Use Questionnaire (DAST-20), and a newly created questionnaire about risky sexual behaviors. After this data was collected, it was analyzed with SPSS.

Newman, James, Ph.D.

2:15, Ocoee Room

“Advanced Modeling and Simulation using the FUNSAFE Framework”

College of Engineering and Computer Science (Mechanical Engineering)

Abstract: With the exception of fluid-dynamics, the finite-element method has traditionally been utilized for simulation in most disciplinary fields. To this end, second-order finite-volume methods are currently the dominant methodology used for computational fluid dynamic simulations. Although less mature and not widely adopted, finite-element methodologies offer some distinct advantages over their finite-volume counterparts. The current talk will discuss some of the inherent attributes of this methodology and present research that has been devoted towards developing the multidisciplinary/multiphysics FUNSAFE framework at UTC.

O’Brien, Andrew, MFA

9:15, Foundation Room

“TN Contemporary”

College of Arts and Sciences (Art)

Co-presenter: Phillip Lewis, MFA

Abstract: TN Contemporary is a nomadic program committed to presenting innovative and thought provoking contemporary art in unused and even unorthodox locations. The project, supported through the inaugural UTC Engaged Arts Activation Grant, aims to facilitate opportunities for local, regional and national artists to develop their practice and connect with the community. Over a nine month period the project leaders, Professors Phillip Lewis and Andrew O'Brien, conducted studio visits, established an online presence, developed a system of deployable equipment for temporary art installations, and formed partnerships with community members and local business groups. These collaborative efforts have resulted in a series of curated exhibitions throughout the Chattanooga area, with more projects planned for the Spring and Summer of 2017.

Patel, Ameer

11:15, Ocoee Room

“Development of a Remote IOT Laboratory for
Cyber Physical System”

College of Engineering and Computer Science (Electrical Engineering)

Research Advisor: Dr. Daniel Loveless

Co-presenters: Dr. Donald Reising, Dr. Daniel Loveless

Abstract: A remote Internet of Things (IoT) laboratory has been developed for use in teaching and research of cyber physical systems. Specifically, remote access, sensor networking, and data retrieval is realized in the development of science education curriculum and research in smart infrastructure. The remote IoT capability is first demonstrated with UTChatSat, a ground model small-satellite system (CubeSat) that provides learning opportunities in the space sciences via real-time communication. Second, the capability is demonstrated with a remote sensor network for monitoring real-time energy consumption in buildings. The network requires the use of secure interconnected devices for the specific purpose of developing 'Smart Buildings' that have the capability of real-time monitoring and reporting energy and resource usage. The development of an interconnected, real time, smart networked system with embedded sensors and processors is used to assess building energy models in remote laboratory.

Qin, Hong, Ph.D.

1:45, Ocoee Room

“A network model of cellular aging”

College of Engineering and Computer Science (Computer Science & Engineering)

Abstract: Biological aging is a complex phenotype with many genes involved, and is characterized by an exponential increase of mortality rate. A probabilistic gene network model will be presented to demonstrate that cellular aging can be an emergent property of gene networks. Results on empirical network models and simulation-based fitting will be presented. Methods will be presented to infer changes of gene interactions during aging by comparing viability of cells with mutations in gene pairs with special properties. Open mathematical and computational challenges will be discussed.

Seagren, Woody

10:15, Foundation Room

“Reconciling the International Achievement Gap: A Study Comparing
Comparing Language Learning and Results on Tests of International
Achievement”

College of Health, Education, and Professional Studies (Education)

Research Advisor: Dr. James Tucker

Abstract: As the United States has continued to display lower scores on tests of international achievement in recent years, educators have sought to implement large-scale system changes in order to address the gap in such scores. Consequently, the United States education system has undergone diverse changes, with none succeeding in closing the gap. Additionally, as education in the United States is ubiquitously monolingual, it also falls behind other countries' in the introduction of a foreign language. Therefore, this research seeks to account for such a gap through the comparison of countries' results on the 2015 PISA and TIMSS. Countries were categorized based on their age of introduction of foreign language one, two, and three. This information resulted in the classification of over 70 countries into four categories, through a review of educational literature. Categories include Low-, Moderate-, High-, and Very High-language levels.

Sreenivas, Kidambi, Ph.D.

2:30, Ocoee Room

“Numerical Simulation of Horizontal and Vertical Axis Wind Turbines”

College of Engineering and Computer Science (Mechanical Engineering)

Co-presenters: Robert Webster, PhD; Abi Arabshahi, PhD

Abstract: Numerical simulation is a valuable tool that can be used to study the complex interactions between wind turbines. This talk will focus on the challenges associated with the numerical simulations and how they are being addressed through the research being carried out at the SimCenter. A variety of test cases will be presented that covers models of varying fidelity that are used to simulate the wind turbines.

Treat, Sarah

10:15, Heritage Room

“An Evidence-Based Sexual History Intervention”

College of Health, Education, and Professional Studies (Nursing)

Research Advisor: Dr. Joanie Jackson

Abstract: Individuals aged 15 to 24 are a population at risk for sexually transmitted diseases secondary to a plethora of contributing factors. Although many of the contributing factors belong to college students, health care providers play an integral role in sexually transmitted disease screening, primary prevention, and sexual health education. An integrative literature review supported the need for an educational intervention focused on sexual health history education for college health providers. By increasing sexual health screening, this DNP student aims to decrease the number of sexually transmitted diseases on a college campus and to improve health care providers' sexual health history knowledge and self-efficacy. Additionally, the implementation of an evidence-based sexual health history standard of care, executed in an electronic health record along with a sexual health utilization policy, will improve sexual health outcomes. The implementation of sexual health standards of care will

Vance, Sherricka

4:00, Foundation Room

“Assessing Goodwill's High School Job Readiness Course”

College of Health, Education, and Professional Studies (Social Work)

Research Advisor: Amy Doolittle

Co-presenters: Bret Schlisner, Hailey Mercer

Abstract: Research shows that youth with disabilities have a difficult transition into the workforce. 80% of individuals with disabilities are unemployed (Department of Labor, 2016). Disabled youth represent a gap in the research on the disabled in the workforce. Goodwill Chattanooga has initiated a pilot program to facilitate workforce integration by training disabled youth for National Retail Federation certification and providing job readiness. This study assesses the satisfaction of the first cohort of high school students with disabilities in Goodwill Chattanooga's pilot program. The researchers of this study will evaluate the quantitative data from the program to determine which phase of the program was found most satisfactory. Qualitative data, including the suggestions and opinions of students and staff will be analyzed to determine improvements to future iterations of the program. Data tables will be presented to illustrate the results and best predicted outcomes for future programs.

UTC RESEARCH DIALOGUES

3-Minute Thesis Competition

Wednesday, April 12 – Graduate Student & Faculty Showcase



Jones, Kyle

“An Ecological and Cultural Valuation of the South Cumberland Plateau”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Research Advisor: Dr. Henry Spratt

Johnson, Robyn

“Power of the Southern Melting Pot: Analysis of Joel Chandler Harris’s
Uncle Remus As Southern Folklore and Cultural Appropriation”

College of Arts and Sciences (English)

Research Advisor: Dr. Joyce Smith

Brady, Lisa

“Eustress, Distress, We All Stress!”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Christopher J.L. Cunningham

Dirghalli, Jared

“Quantifying and qualifying the links that bind: A conceptual map of the
workplace experience”

College of Arts and Sciences (Psychology)

Research Advisor: Dr. Christopher J.L. Cunningham

Nauert, James

“Stable inconsistency”

College of Arts and Sciences (Psychology)
Research Advisor: Dr. Michael Biderman

Terry, Drake

**“A Noble Task: Work Stress, Sense of Coherence, and Work-Nonwork
Conflict in Christian Ministers”**

College of Arts and Sciences (Psychology)
Research Advisor: Dr. Christopher J.L. Cunningham

Trimble, James

“Connectivity Control of Unmanned Systems”

College of Engineering and Computer Science (Computational Engineering)
Research Advisor: Dr. Daniel Pack

Joshuva, Justin

**“Identifying Security Threats on Social Network Using Pattern
Recognition”**

College of Engineering and Computer Science (Computer Science & Engineering)
Research Advisor: Dr. Farah Kandah

Patel, Ameer

“Development of a remote IOT laboratory for cyber physical systems”

College of Engineering and Computer Science (Electrical Engineering)
Research Advisor: Dr. Daniel Loveless

Turgeson, Andy

**“Setup and Experimental Validation of a Bioengineering Laboratory
Station for the UTC Chemical Engineering Program”**

College of Engineering and Computer Science (Civil & Chemical Engineering)
Research Advisor: Dr. Bradley Harris

Ghafari, Mehran

“4D Data Acquisition and Reconstruction for Medical Applications”

College of Engineering and Computer Science (Computer Science & Engineering)

Research Advisor: Dr. Dalei Wu

Sowers, Damon

“Influence of concussion history on reactive agility performance among elite boxers and wrestlers”

College of Health, Education, and Professional Studies (Athletic Training Program)

Research Advisor: Dr. Carrie Baker

Hathcock, Sarah

“Interior Design Pedagogy through a Multidisciplinary Urban Revitalization Project”

College of Health, Education, and Professional Studies (Interior Design)

Research Advisor: Professor Tonya Miller

Battle, Wahtawah "TJ"

“Archival Offender Records Analysis: Are Patient Abuses Related to the Type of Healthcare Practitioner?”

College of Health, Education, and Professional Studies (EDD Learning & Leadership)

Research Advisor: Dr. David Rausch

UTC RESEARCH DIALOGUES
3-Minute Thesis Competition Judge Panel
April 12

Dr. Mo Baptiste

UTC Executive Director of Student Development

Dr. Roger Brown

UTC Chancellor Emeritus

Dr. Michael Colvin

Professor Emeritus, Department of Mathematics at Cal Poly-SLO

Dean Theresa Liedtka

Dean of the UTC Library

Dr. Irene Loomis

UTC Professor, Department of Mathematics (retired)

Ms. Kristina Montague

Managing Partner at the Jump Fund

Mr. Shawn Ryan

UTC Executive Staff Writer

THANK YOU!

UTC RESEARCH DIALOGUES
MOCS I3 (Interdisciplinary Instruction & Inquiry)
Wednesday, April 12 - Graduate Student & Faculty Showcase

MOCS I3 (Interdisciplinary Instruction & Inquiry)

presents

Faculty Collabor(d)ating

1:15-2:45

University Center Foundation Room

Back by popular demand!

Join MOCS I3 for an academic twist on traditional speed dating where participants explore research interests of fellow faculty members and get to know each other in a fun, informal setting.

UTC *RESEARCH* DIALOGUES

Performances

Wednesday, April 12 - Graduate Student & Faculty Showcase

Jackson, Richard, Ph.D.

2:00, Chattanooga Room

“Council of Scholars and UTC English Department Creative Writers on their Writing”

Wednesday, 2:00, Chattanooga Room

College of Arts and Sciences (English)

Co-presenters: Sybil Baker, MFA; Earl Braggs, MFA

McNair, Jonathan, D.M.A.

1:00, UC Auditorium

“O King: a multidisciplinary celebration and reflection”

Wednesday, 1:00, UC Auditorium

College of Arts and Sciences (Music)

Co-presenters: David Walters, MM; Clint Schmitt, MM

UTC RESEARCH DIALOGUES
Faculty Elevator Speech Competition
Wednesday, April 12 - Graduate Student & Faculty Showcase

Competition Sponsor: University of Tennessee Office of Research

Miles, H. Lyn, Ph.D.

“What Is a Person?”

College of Arts and Sciences (Social, Cultural, & Justice Studies)

Moody, Dana, Ph.D., ASID, IDEC

“Havana: Behind the Facade”

College of Health, Education, and Professional Studies (Interior Design)

Purkey, Lynn, Ph.D.

“Translating Spain under Stalin: Politics, Censorship, and Reader
Reception”

College of Arts and Sciences (Modern & Classical Languages & Literatures)

Melnik, Laurie, MFA

“The Art of Balance: Caring for Patient and Physician”

College of Arts and Sciences (Southeast Center for Education in the Arts)

Kim, Eun Young, Ph.D.

“Place attachments for patients’ Psychological Well-being in Hospital
rooms”

College of Health, Education, and Professional Studies (Interior Design)

Brockman, Beverly, Ph.D. & **Liza Soydan**, MBA

“Solution Scholars: An Applied Research Student Consulting Model”

College of Business (Marketing & Entrepreneurship)

Cooley, Morgan, Ph.D., LCSW

“Foster Parent Resilience: Relevant Factors, Importance, and Family Impact”

College of Health, Education, and Professional Studies (Social Work)

Cunningham, Christopher J.L., Ph.D.

“Resources and recovery management @ work”

College of Arts and Sciences (Psychology)

Witt, David, Ph.D.

“Entrepreneurial Passion and Burnout - Disentangling The Connections”

College of Business (Management)

Lamb, Nai, Ph.D.

“Board interlocks and the diffusion of strategic actions”

College of Business (Management)

Beasley, DeAnna, Ph.D.

“Invisible Life: Exploring pathogen diversity in an urban environment”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Gunasekera, Sumith, Ph.D.

“Generalized Inference for the Reliability of Multi-Component Stress-Strength Model for the General Inverted Exponential Distribution”

College of Arts and Sciences (Mathematics)

Lee, John, Ph.D.

“Reducing Barriers for Transfer Students in Chemistry while Reducing Chemical Bonds”

College of Arts and Sciences (Chemistry & Physics)

Wu, Dalei, Ph.D.

“Monitoring and Mapping Underground Infrastructure for Smart Maintenance and Usage”

College of Engineering and Computer Science (Computer Science & Engineering)

Simms-Roberson, Priscilla, DNP, NP-C, SANE-A

“An App to Make a Difference”

College of Health, Education, and Professional Studies (Nursing)

Sartipi, Mina, Ph.D.

“Health-Centric Multimodal Mobility”

College of Engineering and Computer Science (Computer Science & Engineering)

Spratt, Henry, Ph.D.

“UTC's Clinical Infectious Disease Control Research Group: Helping Local Healthcare Facilities in the Battle Against Healthcare Acquired Infections”

College of Arts and Sciences (Biology, Geology, & Environmental Science)

Wigal, Cecelia, Ph.D.

“Communicating for Independence”

College of Engineering and Computer Science (Mechanical Engineering)

Heath, Gregory, DHSc, MPH

“If you build it, will it prevent chronic diseases?”

College of Health, Education, and Professional Studies (Health & Human Performance)

UTC RESEARCH DIALOGUES
Faculty Elevator Speech Competition Judge Panel

Mr. Paul Grove

Executive Director of WTCI TV

Ms. Kim White

President & CEO of River City Company

Ms. Marisa Ogles

Vice President for Donor Services & Engagement at Community Foundation of Greater Chattanooga

Dr. Elaine Swafford

Executive Director of Chattanooga Girls Leadership Academy

Dr. Stacey Patterson

UT Vice President for Research & Vice President of the UT Research Foundation

Mr. Macon Toledano

Associate Director of Lyndhurst Foundation

Joda Thongnopnua

CEO of Metro Ideas

THANK YOU!

UTC RESEARCH DIALOGUES

Closing Reception

UTC Library, 4th Floor Roth Reading Room

Wednesday, April 12 - Graduate Student & Faculty Showcase

UTC Scenic City Flute Ensemble

Kaitlin Barfield, Lizzie Johnson, Mikaela Parker, and Sarah Shinholser

Dr. Joanne Romagni

Remarks

Award Presentation for

3 Minute Thesis and Elevator Speech Competitions

Violin & Cello Duo

Melody Poke and Ben Van Winkle