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Presentation Abstracts
(Alphabetized by presenter’s name)

Tympanometric Preconditioning: Effect and duration of consecutive wideband tympanometry on the energy absorbance of the middle ear
Bryan Abbott, Audiology
Poster Session
Faculty Advisor: Wafaa Kaf

Purpose: Wideband tympanometry (WBT) assesses middle ear function by measuring the percentage of sound energy absorbed by the middle ear across a wide range of frequencies and pressures. Researchers reported that consecutive runs of WBT change the properties of the sound absorbed by the middle ear, an effect called tympanometric preconditioning. This study aims to measure the duration of tympanometric preconditioning by assessing EA at ambient pressure before, and at intervals after, consecutive runs of WBT. Methods: Baseline EA was measured at ambient pressure from 13 young adults with normal hearing and middle ear status. Then, eight consecutive WBT runs were performed, followed by EA measurements at 30 sec, then at five 2-minute intervals, and then at five 10-minute intervals. Results: EA at .707 kHz and 2 kHz, which previous research found to change with WBT, was not found to be significantly different from baseline immediately after 8 consecutive runs of WBT, or at later intervals. Conclusions: This data suggests that the duration of tympanometric preconditioning is very short: less than the 30 seconds required to switch test types. These findings mean that tympanometric preconditioning resulting from repeated measurements of middle ear status using WBT will have a minimal effect on middle ear properties.

Effect of cerium oxide nanoparticle and soil nitrogen level on phosphorus and phytate-phosphorus in wheat (Triticum aestivum) and barley (Hordeum vulgare) grains
Oluwasegun Abolade, Chemistry
Poster Session
Faculty Advisor: Cyren Rico

The knowledge of the impact of soil nitrogen level and engineered nanoparticles on total and phytate-phosphorus in grains is still limited. The research was performed on wheat and barley grains harvested from plants grown in soil amended with cerium oxide nanoparticles (nCeO2). Wheat plants were grown in high and low nitrogen (N) soil and four treatments: C1C2, C1T2, T1C2, T1T2; C = control (0 mg nCeO2/kg soil), T = treated (500 mg nCeO2/kg soil), 1 = first generation, 2 = second generation. Barley plants were grown in high nitrogen soil and had two treatments only in first generation: control (0 mg nCeO2/kg soil) and treated (500 mg nCeO2/kg soil). All treatments were replicated six times. Total (T) and phytate phosphorus (PP) were assessed using megazyme K-PHYT method and colorimetric (SpectraMax M5) determination at 655nm. Results showed that total and phytate phosphorus in wheat grain (WG) from the four high N treatment were not significantly different from each other. Conversely, significant difference was observed in WG from the four low N treatment wherein multigenerational exposure (T1T2) increased the total and phytate phosphorus content of WG. Data also showed that there was no significant change in the total and phytate phosphorus in barley grains exposed to nCeO2. These findings indicated that generational exposure to nCeO2 can affect the T and PP in wheat grains.
**Age-specific differences in the magnitude of malaria-related anemia during low and high malaria seasons in rural Zambian children.**
Clement Acheampong, Public Health
Oral Presentation
Faculty Advisor: Maxwell Barffour

Background: Malaria causes anemia by destructions of red blood cells and inhibition of erythropoiesis. Objective: In 4-8 y old rural Zambian children (N=891) participating in a biofortified maize efficacy trial, we assessed whether the magnitude of the malaria-specific effect on anemia differs by age, during low and high malaria seasons. Method: Logistic regression models were used to estimate differences in anemia (defined as hemoglobin <110 g/L for children <60 mo. and <115 g/L in older children) by malaria status. Malaria-age interactions were also assessed. Results: In the low malaria season, anemia prevalence (32% overall) was 29% in malaria negative children and 54% malaria positive children (p<0.001), and the effect did not differ by age (p for interactions=0.614). In the high malaria season, anemia prevalence (46% overall) was 41% in malaria negative children and 54% malaria positive children, and the effect differed significantly by age (P for interaction=0.05 for anemia). The difference in anemia (by malaria status) was 28 (p<0.001), 24 (p<0.001), 19 (p<0.001), 15 (p<0.01) and only 1 percentage point (p=0.231) in children aged <60, 60-71, 72-83, 84-96 and =96 months respectively.
Conclusions: Anemia resulting from malaria is most severe in younger children and highlights a need for appropriate age-targeting of available programs.

**Geospatial analysis of bank erosion for conservation planning, Lamar Lake Watershed, Missouri**
Hannah Adams, Geospatial Sciences in Geography and Geology
Poster Session
Faculty Advisor: Robert Pavlowsky

Eutrophication is caused by excess nutrients and sediment that produce large algal blooms. In municipal water supplies, large amounts of algae lead to chronic taste and odor problems often disrupting civilian use. Lamar Lake, located in SW Missouri, is experiencing this problem. In 1998 Lamar Lake was listed under section 303(d) of the federal Clean Water Act for algae pollutants caused by excess phosphorus. However, little is known about the role of bank erosion as a nonpoint pollution source in Lake Lamar. Historical aerial photos were used to digitize streams and analyze changes in channels for the following years: 1953, 1966, 1997, 2008, and 2016. Disturbances were classified using a 1.3-meter stream buffer based on the 1966 aerial photo’s Max Point to Point Error. Riparian corridor condition were classified using the 2016 aerial imagery. The channel change and riparian classifications were used to identify potential nonpoint sediment sources to Lamar Lake. LiDAR data from 2015 was used to extract bankfull height, bankfull width, and cross-sectional area which were plotted against the Osage Plains Regional Curve. Most vegetated cross-sections plotted below the regional curve, whereas channelized reaches plotted closer to the curve. Results will be used plan a field study of channel stability and bank erosion to help identify conservation practices that are most beneficial.
Synthesis and Characterization of Novel Inverted NiO@MnxNi1-xO Core-Shell Nanoparticles
Md Nazmul Alam, Materials Science
Poster Session
Faculty Advisor: Robert Mayanovic

Core-shell nanoparticles (CSNs) show promise for a wide range of applications because of their diverse potential use in magnetic recording media, magnetic resonance imaging, drug delivery, hyperthermia, and spin valves. Inverted magnetic CSNs, having an inner core consisting of an antiferromagnetic (AFM) material and an overlying shell consisting of a ferro-or ferrimagnetic (FM/FiM) component, are particularly of interest due to the tunability of their magnetic properties. We have synthesized NiO nanoparticles using a chemical reaction method, which were subsequently used to coat with a MnxNi1-xO shell for varying x values, with the help of our hydrothermal nano-phase epitaxy method. X-ray diffraction (XRD) was used to characterize the crystal structure of the CSNs: Rietveld refinement analysis of the XRD data made using TOPAS software is consistent with a core-shell morphology of our CSNs. High resolution transmission electron microscopy (HRTEM) imaging shows the thickness, atomic plane directions and a noticeable, epitaxial interface between the core and shell of the CSNs. Magnetic measurements show that the CSNs exhibit AFM/FM or AFM/FiM characteristics with a coercivity that is highly Mn-concentration dependent. The field cooled (FC) vs zero field cooled (ZFC) hysteresis loop measurements show a significant exchange bias effect.

The Influence of Christian Faith on Marital Satisfaction
Sarah Allen, Social Work
Oral Presentation
Faculty Advisor: Qiang Chen

The institution of marriage, experienced by our society regardless of religious beliefs, has a major impact on our society, its values, and our subsequent life experiences. The health of a marriage will have an impact on the mental health of not only spouses, but also their children. This study focused on the correlation between Christian faith and marital satisfaction. The sample consisted of 45 participants, 32 females and 13 males. These participants were married adults over the age of 18, living in Missouri, that reported to be of Christian faith. The Couples Satisfaction Index (CSI 32; Funk & Rogge, 2007) and Duke University Religion Index (DUREL; Koenig, Parkerson, & Meador, 2011) were used to measure these variables. A Pearson Correlation of .583 showed a positive correlation between Christian faith and Marital satisfaction. These findings suggest that a person’s perceived faith has an impact on felt satisfaction within a marriage.
Immune function of four North American bat species with white-nose syndrome
Briana Anderson, Biology
Oral Presentation
Faculty Advisors: Tom Tomasi and Christopher Lupfer

White-nose syndrome (WNS) causes substantial mortality in certain species of hibernating North American bats. The responsible agent is Pseudogymnoascus destructans (Pd), a fungus which causes increased arousals and energy depletion during hibernation. Elevated immune responses have been observed in torpid Pd-infected bats, but bat immunology remains under-studied. Tri-colored bats (Perimyotis subflavus) and northern long-eared bats (Myotis septentrionalis) suffer extensive WNS mortality, while gray bats (Myotis grisescens) and big brown bats (Eptesicus fuscus) are infected, but mortality is rarely observed. It is hypothesized that these species differ in immune responses and/or hibernation metabolism, resulting in interspecific variation in disease severity. Wing tissue cells were cultured and infected with Pd, and RNA-sequencing was used to assess differences between the WNS-susceptible and WNS-resistant species mentioned above. Results are currently being analyzed. This study has the potential to explain interspecific differences in WNS disease severity, which could assist in establishing specific treatment and conservation strategies for North American bats. In addition, we are pioneering a cell culture method to address WNS-questions without using live bats; this will allow researchers to address a myriad of questions without disrupting natural populations.

Molecular Dynamics Simulation Study on Amorphous B4C
Nirmal Baishnab, Materials Science
Oral Presentation
Faculty Advisor: Ridwan Sakidja

We investigated the properties of amorphous B4C (Boron Carbide) material. We performed large scale reactive molecular dynamics simulation to model the formation of carbide phase at the supercomputer cluster in Lawrence National Laboratory. To perform virtual experiments in synthesizing amorphous B4C we artificially melted and quenched the materials with a varying degree of cooling rate and annealed the materials at room temperature to mimic the experimental observations. We focused on optimizing the strength of this material under high temperature and pressure.
Does Guarding Experience Influence Performance on the Functional Gait Assessment?
Boaz Beard & Kaytlyn Wells, Physical Therapy
Poster Session
Faculty Advisors: Barbara Robinson, Jason Shaw, and Marcia Himes

Introduction: The Functional Gait Assessment (FGA) is a measure of balance and postural stability for older adults and individuals with vestibular disorders. Upon initial examination, it may be difficult to determine the amount of guarding required for safety during balance and gait assessments. Purpose: The purpose of this study was to determine if guarding experience affects FGA scores when used with older adults. We hypothesized that there would be no significant difference in FGA scores regardless of whether an expert PT or a novice SPT guarded the participants. Methods: Seventeen older adults who were 55 years or older, with no reported history of neurological disorders participated. All participants completed two trials of the FGA and were video recorded. The first trial was randomly assigned to be guarded by either an expert PT or a novice SPT. Results: The intraclass correlation used to assess interrater reliability indicated very high internal agreement between scores. A paired samples t-test compared the sum of expert PT with the sum of novice SPT FGA scores. Expert PT ratings did not differ from novice SPT ratings, t(16) = -0.33, p = .743. Participants (16/17) indicated that they did not perceive a difference between the two FGA trials. Conclusion: Guarder experience did not have a significant effect on total FGA scores for community dwelling older adults.

The Impact of Ideology on Homeless Shelter Service Delivery
Judith Beaver, Social Work
Oral Presentation
Faculty Advisor: Kenneth Tombley

This program evaluation focuses on an often unstudied element of homeless shelter systems: the impact of ideology on service delivery. The aims of this program evaluation were to look at both individual and agency ideology, and examine if and how staff ideology impacts client shelter services, as well as individual delivery of services. In addition, differences between general service delivery were examined between the agencies, in order to determine the accessibility, program types, and overall structure of each shelter. Results were recorded in a spreadsheet, and coded so that like answers could be grouped. Staff and agency definitions of their values and prioritizations were explored within the surveys/interview to code answers more accurately. Key findings included high rating of the use of staff’s values with clients, a and common core value of faith across participating agencies.
**American Association of Nurse Anesthesia Standard of Care I: Perform and document a thorough preanesthesia assessment and evaluation. A Training Module for the Adult Learner**

Ashley Beeching, Nurse Anesthesia

Poster Session

Faculty Advisors: Monika Feeney and Tracey Beckham

Dating back nearly fifty years, the concept of adult learning has been recognized and studied in comparison to the ways in which children learn. Notable differences reinforce the importance of individualizing teaching methods towards adult populations of graduate students enrolled in nurse anesthesia programs across the United States. A survey presented to Certified Registered Nurse Anesthetists (CRNA) and Student Registered Nurse Anesthetists (SRNA) supported the findings of a comprehensive literature review on adult learning. 142 CRNA/SRNA’s completed the survey which revealed that 61.27% of participants learned best with visual teaching methods and 55.63% learned best with kinesthetic teaching methods.  

Key Words: adult learning theory, learning styles, nurse anesthesia, graduate school

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**Investigation of Hand Surface Temperature Patterns during Hot Pack Treatments**

Miranda Benson, Occupational Therapy

Poster Session

Faculty Advisors: Marc Willey and Ashlea Cardin

Hot packs are used in occupational therapy as a preparatory method; however, usage protocols vary. Skin temperature during treatment is unknown and excessive heat is indicated by patient verbalization. The purpose of the study is to investigate hand surface temperature patterns during treatment, provide evidence for prevention of thermal injuries, and develop a safe protocol. Thirty participants received a 15-minute treatment. Hot packs within covers were placed on each side of the hand. Two sensors recorded skin temperatures. An intervention occurred when a towel was placed or removed on both hand surfaces when the participant reported uncomfortable temperatures or if the temperature left therapeutic range (104°F-113°F). The maximum temperature tolerated on the dorsal surface (M=108.9°F) differed significantly from the volar surface (M=111.12°F). Most participants requested two interventions to maintain comfort level. The first intervention occurred at an average of 62.2 seconds. Temperatures can exceed therapeutic range sooner than current protocols suggest, and most participants are unable to tolerate the high end of therapeutic range. The findings suggest the need to develop a safe protocol to treat hand injuries.
Technical Professional Communicators (TPCs) are commonly viewed as excellent technicians, but too few colleagues in their universities and workplaces understand the shared rhetorical traditions or the research and creativity required for success in this field. Such misunderstandings diminish professional collegiality and productivity. The author seeks to increase understanding and collegiality among writing professionals by researching and illustrating their common rhetorical tradition, research, and creativity among proponents of various composition theory models: Aristotelian, Formalism, Expressivism, Process, and Social Constructionism. The author defines a new composition theory model for TPC: Audience-Centric Theory Model. This model has an Audience of End Users as the chief concern of the writer’s work shown in the center of the traditional triad. It has triad legs of Content developed with the help of Subject Matter Experts, Design-Format, and Venue-Style. The Writer with his/her creativity haloes all those elements representing the training, research, and creative work the TPC brings to each project.

Americans utilize various cooking methods and alternative ingredients to improve health and promote healthy eating. By switching unhealthy ingredients, such as a saturated fat, to a heart healthy option like monounsaturated fats, there can be positive benefits on overall health. The objectives of this study are to evaluate the physical and nutritional properties of potato chips in various frying mediums and to determine if participants will be able identify the higher saturated fat content chip by evaluating the texture, appearance, taste and crunch properties. Density of the potato samples was measured with a Warner-bratzler shear. Grapeseed oil chips had the highest firmness and vegetable oil chips had the least firmness. Objective testing was done for acceptability. Lard had the highest acceptability for texture. Grapeseed had the highest appearance and taste acceptability. Vegetable oil chips and grapeseed oil chips had the same acceptability for crunchiness. Both lard and vegetable oil chips had the same value for what chip the participants thought had the highest fat content. The grapeseed oil chip was the overall favorite. Testing the acceptability of potato chips fried in different oils and determining the nutrient analysis of each oil can determine if there is there is a correlation to fat content and participant acceptance of the chips.
Construction of the linkage map in two North American native species of grapevines which are important genetic resources for grape breeding

Gaurab Bhattarai, Biology
Oral Presentation
Faculty Advisor: Laszlo Kovacs

Two native North American grapevines; Vitis rupestris and V. riparia are adapted to diverse climatic conditions with different growth habits. A well-constructed linkage map offers tremendous opportunities in crop improvement programs to study and harness the genetic basis of observed phenotype. The specific objectives of this research are 1) to construct the linkage maps of these native grape species and 2) to test the accuracy of developed maps to locate the gene/s responsible for quantitative traits. DNA was extracted from parents V. riparia 588271 × V. rupestris 588160, and 355 F1 progeny and genotyping was performed using genotyping-by-sequencing (GBS) method. Raw single nucleotide polymorphism (SNP) data obtained were processed through various filtering pipelines to get the most informative SNP markers. LepMap3 software will be used to assign and order useful markers in linkage groups followed by map construction. Data on economically important phenotypic traits will be collected during the summer, 2018 and analyzed with R-qtl software package to map the possible quantitative trait loci (QTL). This research project is expected to provide valuable genetic information of native North American grapevines to harness their potential in grape breeding.

Relationship between HEXACO Personality Inventory, Empathy, and Applicant Interview Scores

Kelli Black, Victoria White & Blair Twaddle, Physical Therapy
Poster Session
Faculty Advisors: Jeanne Cook, Patricia Cahoj and Scott Wallentine

The purpose of this study was to determine if there is a relationship between the MSU DPT Program's Multiple Mini Interview (MMI) the HEXACO-PI-R, and scores from the Toronto Empathy Questionnaire (TEQ). Participants included applicants interviewing on campus during the 2015-2017 interview cycles. Relationship was determined using a bivariate correlation with significance at p<.05. Results indicate that applicants with high domain scores in Honesty-Humility, Extraversion, and Conscientiousness were rated highly on the MMI. Applicants with high domain scores in Emotionality and Agreeableness were rated lower on the MMI. Applicants with high empathy scores were rated highly by student raters and by the Maturity rater of the MMI. However, there was an inverse relationship between MMI criteria Motivational Set and Critical Thinking. Results of this study may illuminate the efficacy of the MSU DPT MMI in identifying desired non-cognitive attributes of applicants.
Synthesis and Characterization of Block Copolymers for Shear Force Responsive Materials
Jacob Blankenship, Chemistry
Oral Presentation
Faculty Advisor: Keiichi Yoshimatsu

There is intense effort in chemistry and material science to develop and characterize stimuli-responsive polymeric materials. Applications of those materials range from drug delivery to self-healing polymers. In this project, RAFT (Reversible Addition-Fragmentation chain Transfer) polymerization is used for a controlled polymerization to yield an amphiphilic block copolymer. RAFT allows for the preparation of polymeric materials with narrow size distribution. This is advantageous over traditional polymerization techniques which produce a wide distribution of polymer lengths. The goal of this project is to prepare amphiphilic block copolymers with different hydrophilic block lengths, allowing for the preparation of polymeric materials with ‘engineered’ shear-force responsive properties. In aqueous solution, amphiphilic polymers self-assemble to form micelles, encapsulating and solubilizing hydrophobic material. We have observed the release of the encapsulated “cargo” from the polymeric micelles upon exposure to shear force.

Examination of temporal and dose relationships between physical activity and drunkorexia behaviors among first-year college students
Robert Booker, Health Promotion and Wellness Management
Poster Session
Faculty Advisors: Riley Galloway, Melinda Novik and Sarah McCallister

PURPOSE: Drunkorexia, alcohol misuse and inappropriate compensatory behaviors, is common among college students. The purpose of the current study was to examine the temporal element of physical activity (PA) in relation to drunkorexia occurrences and the dose relationship between PA intensities and drunkorexia severity. METHODS: Drunkorexia positive first-year college students (n=127) living in residence halls participated in the study. Participants completed an online survey including The Drunkorexia Motives and Behaviors scales, the International Physical Activity Questionnaire–Short Form, and typical daily PA and alcohol participation. Participants were classified as pre- or post-drinking exercisers from exercise and drinking tendencies. A one-way ANOVA was implemented to examine PA between temporal classifications. Hierarchical linear regression was executed to observe the relationship between PA and drunkorexia severity. RESULTS: Among all participants, vigorous PA per day averaged 58.77±72.06 minutes with significant differences observed between pre-drinking and post-drinking exercisers. When analyzing moderate PA per day, participants averaged 99.08±103.92 minutes with significant differences between pre-drinkers and post-drinkers. Vigorous PA minutes per day was a significant predictor of drunkorexia severity. CONCLUSION: This research provides insight to differences in
Hydrological studies in the Midwest United States indicate an emerging trend of increasing magnitude and frequency of river flooding across the region. However, the effects of a more active flood regime on fluvial wood recruitment, transport, and geomorphic impacts are not well understood. Few studies have been undertaken on large woody debris (LWD) in the Missouri Ozarks. Therefore, the purpose of this study is to compare the characteristics and spatial patterns of fluvial wood in three tributaries the North Fork of the White River in the Missouri Ozarks following a “1000-year” flood event which occurred in April-May 2017. To evaluate the influence of watershed scale on LWD sample reaches increased in the order: 4.48 km, 49.13 km, and 53.97 km. All pieces >0.1 m diameter and >1.5 m were located by GPS, tagged and characterized according to orientation, size, condition, and geomorphic effect, and jam volume was also measured. Total debris volume and jams varied considerably between the three reaches. An increase in drainage area and stream size affect wood recruitment, transport, and flood impacts. Results will aid in understanding how floods influence LWD recruitment and transport in drainage areas of varying size.

OBJECTIVE: The purpose of this study is to determine if improving mobility to the lower body posterior musculature, as measured by a sit-and-reach test, affects the anterior-posterior sway during a standing toe touch. METHODS: The study employed a controlled laboratory study design with randomization in which 12 participants reported for a single data collection session. Participants were either placed in the control group that did not contain an intervention, or in the experimental group that performed foam rolling. FINDINGS: For the sit-and-reach test, there was a statistical significant finding in posterior chain flexibility for between intervention and time, F(1, 10) = 12.745, P = .005, eta = .560. This indicates the post intervention group (39.750 ± 0.99 cm, P = .018) had a significant increase compared to the pre-intervention group (31.583 ± 2.79, P = .018), and when compared to the control group. No significant finding was found during the anterior-postural sway test when comparing group and time, F(1, 10) = 2.1947, P = .169, eta = .180. CONCLUSION: Although significant difference could not be obtained, postural sway increased by 37.24% in the experimental group. A longer intervention program may increase postural sway to a statistically significant comparison.
The Relationship Between Acceptable Noise Levels and Preferred Listening Levels of Music
Haley Brantley, Audiology
Poster Session
Faculty Advisor: Thomas Franklin

The Acceptable Noise Level (ANL) test is a proven measure to predict hearing aid success based on the amount of background noise a person is willing to tolerate while listening to running speech. Those who have lower ANLs accept higher levels of background noise and have been shown to be more successful with hearing aids. This study sought to determine if an individual’s ANL is related to their preferred listening level for music, whether it be soft, moderate, or loud. ANL is calculated by subtracting the background noise level (BNL) from the most comfortable level (MCL). Results showed that louder preferred listening levels of music were associated with higher MCLs, higher BNLs, and lower ANLs. It could therefore be presumed that individuals who prefer loud music will show greater success with hearing aids.

The Effects of Acclimatization on Acceptable Noise Levels in Females
Emily Brennecke, Audiology
Poster Session
Faculty Advisor: Clay Franklin

The acceptable noise level (ANL) was created to quantify the amount of background noise that a listener is willing to tolerate while listening to speech (Nabelek, Tucker, & Letowiski, 1991). ANL can help determine the benefit of hearing aids for a listener when referring to speech in background noise. Auditory acclimatization when referring to background noise is a major complaint from users, and though hearing aids have shown some benefit and satisfaction, technology has not ended the problem. Listeners are still reporting difficulty in background noise. The purpose of this study was to investigate the effects of acclimatization of noise on listeners pre-and post-ANL scores. Twenty-five female participants, with normal hearing sensitivity, were asked to perform a pre-ANL test, after which they would listen to 15 minutes of noise and then perform a post-ANL test. The pre- and post-ANL scores from all participants were then compared. The analysis of pre- and post-ANLs revealed no statistically significant differences. Results indicate that acclimatization of noise has no effect on participants pre- and post-ANL scores. Findings conclude that listeners do not perceive a change in noise tolerance throughout the day.

Supporting role innovation: Mediators of the role innovation-performance relationship.
Ricardo Brooks, Psychology
Poster Session
Faculty Advisor: Phillip Thompson

Little is known about the mediators of role innovation-outcome relationships. We propose that perceived organizational support (POS) will be a stronger mediator than perceived supervisor support (PSS) of the role innovation-job performance relationship. Counter to our predictions, we found that PSS was a stronger mediator than POS. Theoretical and practical implications are discussed.
Geology of the Pollock Mountain 7.5-minute Quadrangle
Mark Brown, Geospatial Sciences in Geography and Geology
Poster Session
Faculty Advisor: Matthew McKay

The Pollock Mountain 7.5-minute quadrangle contains metamorphic assemblages thought to record Mesozoic island arc accretion onto the western margin of Laurentia. Underlying the basalt in the eastern portion of the quadrangle, the Pollock Mountain thrust sheet contains the Mesozoic Pollock Mountain amphibolite and intercalated orthogneisses, and is bound to the west by the Pollock Mountain thrust fault. The Pollock Mountain thrust fault separates rocks of the Riggins Group in the footwall. The Riggins Group is bound to the west by the Rapid River thrust fault that places the Riggins Group onto the Lucile Formation which contains graphitic phyllite and minor marble lenses. Marbles are interbedded with greenstones and are mapped as Triassic marbles and greenstones of the Doyle Creek Formation overlies greenstones and monomictic volcanoclastic breccias of the Triassic Wild Sheep Creek and Permian Hunsaker Creek Formation contains quartz-bearing, polymictic volcanoclastic breccias are interbedded with greenstones. The Seven Devils Group is intruded by the Echols Mountain pluton (123 Ma) in the southwest portion of the quadrangle which is not cut along its eastern boundary by the Morrison Ridge Thrust Fault. Faulting in the region must have concluded before the intrusion of the Echols Mountain Pluton.

Rape Myth Acceptance Among College Students on a Missouri University Campus
Megan Brown, Social Work
Poster Session
Faculty Advisor: Qiang Chen

Objective: Rape Myth Acceptance is an important factor related to sexual assault behaviors. This proposed study is aimed to examine and compare the rape myth acceptance among students of Greek life and student-athletes and then comparing those results to the general college population. Participants: Results are of 82 participants of all grades and school involvement at a University in Missouri. Methods: Participants completed the Illinois Rape Myth Acceptance Scale as well as a few demographic questions. Participants recruited by emailing the survey to students within the University Campus. Results: The key findings from this study is that there is no significant difference between “Greek/athletes” and “general population/neither”. Conclusion: Sexual assault training should be continued throughout the university but specifically for student-athletes and the Greek system.
The Relationship between Sensory Processing Disturbances and Behavioral Traits Characteristic of ASD
Elizabeth Bucy, Psychology
Oral Presentation
Faculty Advisor: Carly Yadon

To better understand sensory processing abnormalities found in individuals with autism spectrum disorders (ASD), the current study analyzed the relationship between sensory processing and behavioral traits typically seen in individuals with autism. In a nonclinical sample of 55 participants recruited through SONA and word of mouth, we measured behavioral traits using the Autism Quotient (AQ) and the Broad Autism Phenotype Questionnaire (BAPQ) and sensory processing with the Sensory Gating Inventory (SGI) and the Adult/Adolescent Sensory Profile (AASP). We also asked if participants had a relative diagnosed with ASD as previous research has shown greater amounts of autistic traits in ASD relatives. Our results show a fairly strong correlation between the AQ and the SGI, \( r(55) = .569, p < .01 \), the AQ and the SPA, \( r(55) = .520, p < .01 \), the BAPQ and the SGI, \( r(55) = .526, p < .01 \), and the BAPQ and the SPA, \( r(55) = .516, p < .01 \). The correlations between sensory processing measures, \( r(55) = .783, p < .01 \), and between behavioral measures, \( r(55) = .833, p < .01 \), were strong. Ten participants endorsed having a relative with ASD. Our results show that even in nonclinical samples, behavioral traits characteristic of autism are related to endorsement of sensory processing abnormalities.

Developing Interprofessional Experiences for Speech-Language Pathologists and Occupational Therapists
Caitlin Burch, Communication Sciences and Disorders
Poster Session
Faculty Advisor: Lisa Proctor

Interprofessional education provides an opportunity for students to practice collaborative care and learn about professional roles prior to becoming a member of an interprofessional team. However, hands-on experiences with interprofessional practice are not guaranteed, as students are only expected to understand how to perform in an interprofessional team, and specific instruction techniques are not outlined by accreditation standards (Council of Academic Accreditation, 2016). This study provided graduate students in speech-language pathology and occupational therapy with education and practical experience in interprofessional practice related to AAC evaluation and treatment, and analyzed outcomes of participating in interprofessional activities. Students reported significant positive changes in attitudes and perceptions regarding interprofessional practice.
Exploring the Impact of Social Support and Gender on Veteran Psychosocial Outcomes
Laura Byland, Social Work
Poster Session
Faculty Advisors: Qiang Chen and Michele Day

Currently limited research exists on the role of social support and gender when examining veteran psychosocial outcomes. A total of 25 veterans completed a mixed methods survey consisting of two DRRI-2 surveys measuring satisfaction with eight psychosocial domains currently and 6 months after discharge, as well as three open-ended questions assessing difficulty transitioning from military, helpful social supports, and suggested advice to other service members. In the results, veterans with strong social support were found to be more likely to report positive measures of psychosocial health. Male veterans and female veterans were not found to differ in their reported positive social support. However, there were areas of gendered difference in the results, including satisfaction with employment, finances, spirituality, and physical health. Limitations include the generalizability of results is extremely limited due to low sample size and disproportionate sample of older female veterans.

Development of solid-state super ionic electrolyte for electrochromic applications
Thomas Callaway, Materials Science
Poster Session
Faculty Advisor: Saibal Mitra

In this project, we report the development of a lithium ion-based solid-state electrolyte for electrochromic devices. An electrochromic device changes color reversibly and has great potential as an energy saving device. The device consists of two FTO-coated glass, which act as contacts. Tungsten oxide films were also deposited on one of the FTO contacts. We report the deposition of xLi2SO4-(1-x)(Li2O-P2O5) thin films on glass substrates using electron beam evaporation and tungsten oxide films using pulsed laser deposition. The electrolyte provides the lithium ions for migration into the tungsten oxide films. The performance of these lithium-based electrolytes will be discussed.

Is virtual reality an effective treatment for urinary incontinence?
Erica Campbell, Physical Therapy
Oral Presentation
Faculty Advisors: Patricia Cahoj, Jeanie Cook, Jason Shaw and Sean Newton

Objective: The objective of this study was to investigate the effectiveness of virtual reality games in treating urinary incontinence (UI). Methods: Two female subjects with self-reported UI participated in this study. The subjects participated in supervised virtual reality intervention consisting of 30 minutes of seated exercises on the Wii Fit® Balance Board three times a week for six weeks. Data was collected at pre- and post-intervention using the International Consultation on Incontinence Questionnaire UI-Short Form (ICIQ UI-SF), the International Consultation on Incontinence Questionnaire Overactive Bladder (ICIQ-OAB), and the King’s Health Questionnaire (KHQ). Subjects also completed daily journals tracking fluid intake, voiding habits, and periods of incontinence. Results: Both subjects reported a decrease in leakage, urination frequency, and interference of incontinence with daily life. The greatest improvement was noted in frequency of episodes per day and in quality of life following intervention. Discussion: This case series design demonstrates the utilization of Wii Fit® may be an appropriate, efficient, and effective treatment intervention for urinary incontinence, and furthermore increased quality of life.
Managing Goji Berry Plants for Greens Production is Southwest Missouri
Jesse Carroll, Plant Science
Oral Presentation
Faculty Advisor: Melissa Remley

Goji berry plants (Lycium barbarum) are grown across the globe for their nutritious berries. However, in Ningxia, China, the plants are also grown as a source of edible greens. In order to harvest the young green shoots, the plants are subjected to intense pruning and kept as a small, low-growing shrub. The purpose of this research is to determine if Goji cultivars grown for berry production in the United States can survive and grow under the intense pruning used for growing edible greens. This research will also examine the effect of air-root pruning on potted Goji plants grown in greenhouse conditions, transplant success into field conditions, and subsequent growth and survival. Forty plants each of 'Big Lifeberry', 'Vermillion Sunset', and 'Sweet Lifeberry' cultivars were acclimated to greenhouse conditions, pruned to 15.25 cm height, and transplanted into 1-gallon containers. For each cultivar, 20 plants were potted in air-pruning containers and 20 plants were potted into regular 1-gallon containers. In May, four pots of each cultivar in each container type will be harvested, root structure will be determined using WinRHIZO software, and dry weight will be measured. Remaining plants will be transplanted into the field in a randomized complete block design and pruned for greens production. Greens will be harvested and weighed weekly to assess survivability and vigor.

Head Start's Impact on Parental Self-Efficacy
Rebecca Case, Social Work
Poster Session
Faculty Advisor: Qiang Chen

Low parental self-efficacy (PSE) can have a negative impact on parenting styles, stress levels, and child development. Interventions such as home visiting, identification of strengths, parent education, and task observations are associated with improving parental self-efficacy levels, therefore, increasing child and family outcomes. The purpose of this study is to assess for the impact of Head Start services, such as home visiting, child development and mental health screenings, community referrals, prenatal services, health screenings, and parent education on parents’ parental self-efficacy. By implementing a post-test, two-group pre-experimental research design, this study measures the impact of Head Start services on parental self-efficacy levels among a non-probability convenience sample of 43 enrolled parents, between the ages of 18-65. Parents are divided up into two groups, Group 1 (n=23) including parents receiving services for six months or greater, and Group 2 (n=20) receiving services for less than three months. Results from the study do not support the hypothesis of Head Start services having a positive impact on parental self-efficacy. An independent samples t-test indicates there is no significant difference between the two group means, t(41) = 1.75, p = .09, d = .52. Implications focus on continued understanding of the impact on child and family outcomes.
Financial Literacy of Child Welfare Workers
Natalie Cheah, Social Work
Poster Session
Faculty Advisor: Qiang Chen

Child welfare workers encounter families struggling with poverty on a regular basis. Studies show that financial related stress can lead to child welfare involvement. Ford child welfare workers to accurately educate families about financial literacy, the child welfare worker should have some basic financial knowledge. This study assessed the financial literacy of child welfare workers to determine if additional training was needed in the area of financial social work. This study surveys child welfare workers within a private child welfare agency in Springfield, Missouri. The survey was distributed via an online link through a representative of the agency. The survey consists of three different areas: demographics, financial confidence, and financial knowledge. 70% of the question related to financial knowledge were answered correctly, ranging from 27.3% answered correctly to 100% answered correctly each question. This could be due to the usage of certain financial knowledge in the average person’s daily life. Overall confidence of survey participants is 4.3 out of a scale of 1 to 5. The child welfare workers within this agency are confident of their ability to manage finances. Limits of this study include having a small number of participants from one agency within the same geographic area.

Certified Athletic Trainers' Perception of Sexual Harassment in the Workplace
Celcey Clark, Athletic Training
Poster Session
Faculty Advisor: Kristin Paloncy

OBJECTIVE: The purpose of this study is to identify the prevalence of sexual harassment towards male and female certified athletic trainers (ATs) and to identify if ATs can accurately define sexual assault and sexual harassment. DESIGN: This web-based survey contained 13 scenario-based questions validated by a panel of experts (n=6) for content validity. The survey was randomly sent to 3,222 ATs through the NATA members-only database and complete by 506 participants. RESULTS: There was no statistically significant difference in the accuracy of males (n=181) to define sexual assault (M=2.80, SD=0.53) and females (n=325) defining sexual assault (M=2.87, SD = 0.38), t(504) = -1.90, p = 0.058. There was no statistically significant difference in males (M=6.87, SD=1.60) to females (M=7.11, SD=1.36) accurately defining sexual harassment, t(504) = -1.74, p = 0.082. Neither were able to accurately identify the scenario in which neither incidence occurred, t(504) = -0.009, p = 0.993. Experiences with sexual assault and harassment were analyzed for prevalence. CONCLUSION: While males and females can both accurately identify scenarios of these incidences, further exploration of the prevalence of this topic should be completed.
Dulosis is a type of social parasitism in which a parasitic ant has become dependent on captured workers (hosts) of a closely related species. The Formica sanguinea group consists of 12 species of parasitic ants, which are all traditionally considered to be facultative parasites. However, recent studies suggest that F. subintegra has characteristics that are more consistent with obligate parasitism. As parasites become more specialized, their domestic abilities gradually degenerate until they become unable to survive without the host. In this study, the foraging behaviors of F. subintegra were examined while in the presence and absence of host workers. When the parasites were in groups without hosts, they spent more time foraging and fed other ants (oral trophallaxis) more often than when in groups containing host workers. There was also a trend showing that latency to begin feeding was shorter in parasite-only groups, suggesting that isolated parasites began exploratory foraging behavior more quickly than when they were with host workers. These results indicate that F. subintegra demonstrates behavioral plasticity in its foraging abilities. Since F. subintegra seems to be an intermediate between its facultative relatives and more derived obligate parasites that have lost all foraging ability, it can be used as a model for investigating the evolution of social parasitism.

Missouri State University Friendship Study
Cody Conner, Psychology
Oral Presentation
Faculty Advisor: Leslie Echols

Caregiver attachment is linked with adjustment outcomes in children. As children age peer relationships become increasingly important and impact adjustment outcomes. These connections have not been fully explored. In this research attachment was used to predict different types of academic engagement variables such as school liking and belonging and academic efficacy. The attachment subscales of trust and communication were the focus. Initial analysis showed parent trust was a significant predictor of school belonging. High parental trust evoked greater school belonging, t(134) = 4.547, p < .001. Then, parent trust predicted the mediator peer trust, t(131) = 3.761, p < .001. The relationship between the mediator and school belonging was examined next controlling for the parent trust. A positive relationship was found, t(130) = 3.783, p < .001. The final model was examined for a drop in prediction when the mediator was added to the model. A partial mediation was found, a slight drop in prediction occurred, t(130) = 2.173, p = .032. The Sobel test confirmed that a partial mediation was present. Further analyses are planned to expand on other adjustment outcomes and types of attachment.
Characterization of the SIRT2 and SIRT3 homologs in Tetrahymena thermophila  
Kyle Cook, Cell and Molecular Biology  
Poster Session  
Faculty Advisor: Joshua Smith

The ciliate Tetrahymena thermophila contains 18 histone deacetylase (HDAC) homologs, which are responsible for removing acetyl groups from acetylated lysines on histones and other proteins. There is a class of HDACs called Sirtuins (Class III HDACs), which have been implicated in various cellular processes like cancer, diabetes, aging, apoptosis, and transcription regulation. The model organism Tetrahymena thermophila has 11 homologs of Sirtuins (four more than humans and other vertebrates even). The scope of this research is to investigate the genes homologous to human SIRT2 and SIRT3, Tetrahymena Histone Deacetylases (THDs) 13, 15, and 16. This study will investigate their expression levels within the cell under various conditions including genotoxic stressors, starvation, and conjugation using qRT-PCR. Localization studies were done through cloning these genes into plasmids to encode for GFP and 2HA tags. These tagged constructs were then transformed into T. thermophila to be used in future studies. Characterizing the function, localization, and the proteins interacting with THD13, THD15, and THD16 could help us better understand the various roles of SIRT2 and SIRT3 histone deacetylases.

Application of the Sphere Project Guidelines to a Refugee Camp in Sudan: A Class Exercise  
Lily Darbishire, Kamala Simkhada & Esther Adejoke, Public Health  
Poster Session  
Faculty Advisor: David Claborn

The Sphere guidelines consist of a set of minimum standards for international humanitarian aid. These guidelines, developed by a set of non-governmental organizations and the Red Cross, are universally recognized as the “best-practice” response to international disasters. As masters of public health students, we were asked to design a 10,000 person refugee camp located in Darfur, Sudan, to maximize these public health standards through a class exercise (PBH 781: Public Health Preparedness, Dr. David M. Claborn). To be considered in our design was location, size, organization/separation of tribes or clans, accessibility, topography/geography, water availability, food sources, cultural issues, soil composition, climate/season, environmental hazards, fuel sources, land rights, recreation, security, and administration, among others. The final design was presented to the class on scaled graph paper and this presentation describes the complete project.

INVESTIGATION OF ELECTRONIC AND MAGNETIC PROPERTIES  
HETEROSTRUCTURE OF 2D MATERIALS  
Sanchali Das, Materials Science  
Poster Session  
Faculty Advisor: Kartik Ghosh

2D materials are single layered material comprises of single layer of atoms. In 2D materials including graphene and MoS2, the extraordinary properties such as high transmittance in visible light spectrum, high electrical conductivity, and high thermal conductivity have a wide range of applications in electronics industry and other fields. Our objective is to investigate electronic and magnetic properties of MoOx/MoS2 and NiO/NiS heterostructures. We are fabricating these heterostructures by combination of pulsed laser deposition (PLD) and hydrothermal techniques. To synthesize 2D materials, first we have grown thin oxide films by PLD, then we have performed hydrothermal on the oxide film using thio-eureka solution to convert oxide to sulfide. Being very atomically thin layer, x-ray diffraction did not show any significant result. However, Raman spectroscopy and energy dispersive x-ray spectroscopy (EDS) show some conversion from oxide to sulfide. Detailed results and discussion will be presented in the poster.
Effect of grade and gender on spelling accuracy among twins
Peyton Davis, Communication Sciences and Disorders
Poster Session
Faculty Advisor: Julie Masterson

Spelling is a linguistic skill (Masterson & Apel, 2007; Treiman & Bourassa, 2000). In this study, spelling within connected writing from spelling samples collected from sets of twins from the state of Florida was analyzed. Spelling accuracy and how it was affected by grade and gender of twins was the primary focus. The kinds of spelling errors made by each twin, how frequently those errors occurred, and how the spelling accuracy of one twin compared to the spelling accuracy of the other twin were documented. Spelling accuracy among sets of both fraternal and identical twins were analyzed. Correlational analyses were used to determine whether the types of spelling error made by one twin was consistent with the types of spelling error made by the other twin. The Spelling Sensitivity Scoring (SSS) system was used to conduct the spelling analyses and formed the basis for all comparisons. There were no statistically significant gender differences, but there were statistically significant grade effects on these twins’ spelling accuracy. As expected, students in higher grades tended to have higher accuracy than students in the lower grades. Each twin was place into a higher or lower performing group based on overall spelling ability. In general twins who were the better spellers also used more advanced syntax and narrative markers.

Stability and Mobility Interventions Combined Equally Maintain Mobility Gains
Cameron Deckett, Athletic Training
Poster Session
Faculty Advisor: Michael Hudson

Mobility and stability are both key aspects of any rehabilitation plan, but there is no consensus regarding the order of the interventions. We assessed if stability interventions done after mobility therapy (ie, instrument assisted massage) maintained mobility changes with shoulder internal rotation. We randomly assigned 21 healthy college-aged students (mean age = 22.2 years; 9 males; 12 females) to two groups: 10 participants received massage only and 11 participants received the massage treatment and a shoulder stability intervention similar to a side plank. We provided treatments for 4 weeks, with a 2-week follow-up. Our hypothesis was the participants who received the stability intervention after the mobility therapy will maintain increases in shoulder mobility versus those participants who only received the massage therapy. Both groups showed a significant improvement in rotation as time went on (P = .000), but there was no significant difference between the groups (P = .215) at any point through the study.
Exploring the Potential Role of Vps1 as a Golgi Fusion Protein
Mariel Delgado Cruz, Biology
Oral Presentation
Faculty Advisors: Kyoungtae Kim

Protein trafficking within the cell is more than just the series of steps necessary to get cargo from one end of the cell to another location, it also involves, the easily overlooked, fusion step. Fusion is the very last step in trafficking when the transported cargo is passed on from the carrier versicle on to the target membrane. This step in intracellular trafficking has often been characterize by the use of SNARE proteins, however, there are a multitude of proteins involved in this step. Among them are Rabs, Golgins, and Multitethering proteins. Vps1 was suspected to play a role in homotypic Golgi fusion after noticing that a depletion in this GTPase resulted in an increase of Late Golgi number. This lead to the hypothesis that Vps1 is functioning as a fusion protein acting to bring two late Golgi compartments together in order to form a lesser number of larger Golgi compartments. This question was explored using yeast two hybrid where it has been found that Vps1 interacts with Golgi localized SNAREs: Tlg1, Tlg2, Vti1, and Snc1. To further investigate this question GST pulldown assay and an in vivo yeast mating experiments are all underway.

Eccentric Strength Training in Subacromial Impingement Syndrome: Examining Evidence
Cole Denton, Physical Therapy
Poster Session
Faculty Advisors: Sean Newton and Scott Wallentine

Background: Therapeutic exercise is commonly used as conservative treatment in patients with Subacromial Impingement Syndrome (SIS). Purpose: To determine the potential of eccentric exercise compared to concentric exercise in the treatment of patients with SIS. Methods: A comprehensive literature search was performed with inclusion of: articles published from 2002-2017, SIS with rotator cuff involvement as pathology, eccentric exercise as a component of intervention, and shoulder function and/or pain as outcome measures. Exclusion criteria: diagnoses other than SIS with rotator cuff involvement or treatment interventions other than eccentric exercise. The Delphi technique was then performed to determine quality of articles. Results: 6 articles were chosen based on inclusion/exclusion criteria and merit. Conclusions: Eccentric training produced significant improvement in strength, pain, and function in patients with subacromial impingement. However, from research that has been performed thus far it is unclear if they are an improvement on established exercise protocols. Further studies should be performed with stricter control group conditions, larger sample sizes, and exploration of eccentric exercise protocols to determine the potential of this emerging treatment technique.
The Perception of Pediatric Occupational Therapists Regarding Their Use of Constraint-Induced Movement Therapy
Kelsey Dulin, Professional Studies
Poster Session
Faculty Advisor: Sapna Chakraborty

Background: Research has shown constraint-induced movement therapy (CIMT) to be an effective intervention for children with hemiplegia. The effectiveness and perceptions of CIMT with pediatric patients and their caregivers has also been explored. However, little is known about pediatric occupational therapists’ perspective of CIMT. This qualitative study explored the perceptions of pediatric occupational therapists with knowledge of CIMT and sought to better understand contextual variables influencing implementation. Methods: Eight pediatric occupational therapists from the Midwest United States participated in the study. Questions were administered in two forms based on the preference of the participant: a structured interview or a written questionnaire. Thematic analysis and coding were used to analyze data and determine themes. Results: Three themes emerged from the data: pediatric occupational therapists’ perceived effectiveness of CIMT, their comfort level with delivery of the intervention, and their methods of implementation. Conclusion: While all participants agreed CIMT was an effective intervention, there were no clearly defined protocols nor consensus on materials. Therapists’ comfort level with the implementation of CIMT was found to increase when education and training were provided.

Using Electropalatography and Motor Learning to Remediate Persistent Lisping
Cara Dunn, Communication Sciences and Disorders
Virtual Oral Presentation
Faculty Advisor: Alana Mantie-Kozlowski

Few studies report systematically varying biofeedback from EPG with clinician feedback as a component of treatment addressing persistent lisping. This study describes how the principles of motor learning were applied through manipulation of feedback in treatment of an adult with persistent lisping. A multiple baseline design across treatment targets was used. Remediation of the lisp at the word level was efficiently accomplished.

Gd:InP/ZnS Quantum Dots for Multimodal Imaging Applications
Molly Duszynski, Chemistry
Poster Session
Faculty Advisor: Katye Fichter

Quantum dots (QDs) are highly fluorescent nanocrystals, about 2-10 nanometers in diameter, with promising potential in biological and biomedical applications, such as fluorescence imaging and cell targeting. These QDs can be doped with a paramagnetic atom in order to impart magnetic properties and allow their application in magnetic resonance imaging (MRI). Currently, in vivo applications of QDs are somewhat limited due to the opaque surrounding of tissue and bones. MRI-active QDs could circumvent this limitation and act as a multimodal imaging agent. Previous work had developed a highly specific QD probe for detection of alpha-synuclein oligomers, which are implicated in Parkinson's and other alpha-synucleinopathies; however, the MRI-activity of these probes has not been confirmed. Here, we optimize the synthesis of Cd-free QDs doped with MRI-active metals (e.g. Gadolinium and Maganese) into the crystal lattice of the nanoparticle. The resulting nanocrystals were characterized to assess the successful incorporation of the paramagnetic atom into the structure. Such QDs could be valuable in the biomedical field as an alternative to current contrast agents with the benefit of increased specificity to a molecular target.
**Hand length and hand volume as predictors of grip strength: A correlational study**

Amanda Elliott, Ashlin Smith & Sonja Stark, Occupational Therapy
Poster Session
Faculty Advisors: Marc Willey and Ashlea Cardin

Abstract

Objective  The Jamar® dynamometer, with norms based on age and gender, measures grip strength. Current research postulates other variables may be more accurate predictors. This correlational study investigated relationships between (1) hand length and grip strength, and (2) hand volume and grip strength.

Methods

Students, (18-24 yrs) were recruited on campus (n = 239). Following accepted protocols, researchers measured hand length from the wrist’s distal crease to the 3rd digit, grip strength using the Jamar® Dynamometer, and hand volume using the Jamar® Hand Volumeter.

Results

Multiple regression revealed the following predictors of grip strength: for the left hand, gender (β = .506; t = 9.406, p < .001), hand length (β = .275; t = 5.085, p < .001), hand volume (β = .130; t = 2.416, p = .016), and age (β = .085; t = 2.315, p = .021); for the right hand, gender (β = .471; t = 8.582, p < .001), hand length (β = .292; t = 5.237, p < .001), and hand volume (β = .149; t = 2.640, p = .009). Conclusion Gender, hand length, and hand volume were stronger predictors of grip strength than age for both left and right hands. This evidence contributes to the literature supporting the need for creation of new normative data describing grip strength.

**Effectiveness of the Posterior Relocation Test for Improving Hip Range of Motion and Pain Ratings in Symptomatic Individuals**

Phillip Emling, Physical Therapy
Poster Session
Faculty Advisor: Scott Wallentine

The purpose of this study was to determine if there was a significant change in hip pain and motion (flexion and internal rotation [IR]) in symptomatic individuals with hip instability during a manually applied approximation force from posterior to anterior through the greater trochanter, known as the posterior relocation test (PRT). We hypothesize that the PRT re-centers the femoral head in the acetabulum. Seventeen females, 8 males (mean age 26.28±4.77), met the inclusion criteria. Passive ROM and visual analog scale (VAS) pain ratings were then repeated 3 times for each motion without and with PRT with each subject in supine. A 2x2 repeated measures ANOVA was used to evaluate the relationship between range of motion and PRT. There was a significant main effect for PRT (F(1,38)=443.6, p < .001, ? 2p=.921) indicating that PRT improved range of motion in both conditions. There was a significant interaction between the variables, F(1,38)=36.08, p < .001, ? 2p=.49) indicating that range of motion increased more under the IR condition (MD=90.8) than under the flexion condition (MD=86.0). Changes in VAS pain ratings with PRT were not statistically significant, but did show a trend indicating decreased pain with the PRT in each condition. The PRT may have re-centered the femoral head in the acetabulum, unloading irritable structures, and allowing more pain free motion.
EFFECTS OF A STRUCTURED EXERCISE PROGRAM FOR INDIVIDUALS WITH DEVELOPMENTAL DISABILITIES
Samuel Enright, Health Promotion and Wellness Management
Oral Presentation
Faculty Advisor: Rebecca Woodard

The purpose of this study was to assess the benefits of a structured exercise program for individuals with developmental disabilities. The exercise program was completed for three, 16 week sessions with three 60 minute workouts per week. A convenience sample was acquired through a Missouri State University partnership with The Arc of the Ozarks, from which there was a range of seven to twelve participants through the three semesters. The study consisted of a pre-test at the beginning of each session and a post-test at the end. The study assessed BMI, body fat percentage, max Vo2, muscular endurance, and flexibility. Small improvements were found in the sessions in max Vo2, BMI, BF%, and muscular endurance, none of which reaching statistical significance. The results showed that this sample population can experience health benefits from adhering to structured exercise programs. The developmentally disabled population suffers from disproportionate numbers of morbidities compared with the general population, many of which are associated with lack of physical activity. The importance of this study is that this population can experience improvements in key health factors such as Vo2, BMI, and BF%, which could lead to a reduction in comorbidities of physical inactivity.

EXERCISE AND PHYSICAL ACTIVITY PREFERENCES FOR INDIVIDUALS WITH A DEVELOPMENTAL DISABILITY
Samuel Enright, Health Promotion and Wellness Management
Poster Session
Faculty Advisor: Zachary Burt

The purpose of this study was to assess the preferences of exercise and physical activity for individuals who experience a developmental disability. Adherence to exercise programs and maintaining an active lifestyle is greatly influenced by the enjoyment and motivating factors of such activities. This study used The Burt’s Preferences of Exercise and Physical Activity Survey to assess the preferences of our sample population looking at many variations of exercising and physical activity. A convenience sample was acquired from Bear Play, a Missouri State University partnership with The Arc of the Ozarks. The sample consisted of 15 participants who fully completed the survey. Results showed that our sample population prefers resistance machines over the usage of free weights, and all exercises and physical activity would be best enjoyed with others. This data provides insight into what an exercise/physical activity regimen should look like for this sample population. Allowing for programs that will encourage adherence and essentially creating a more active lifestyle for this sample population.
Homework Assistance: What is Recommended and How to Provide that Assistance
Shae Ewan, Social Work
Poster Session
Faculty Advisors: Kenneth Tombley and Qiang Chen

Stress is ever present in families, but stress related to homework issues can be worked through with the appropriate techniques. Ensuring children are not spending too much time on homework, are receiving quality homework assistance from their parents, and the parents are modeling for the children appropriate behaviors when presented with something difficult can decrease the presences of homework related stress. This study consists of a Parent Survey, Teacher Survey, and phone interview. The study used a convenience, snowball sample for the Parent Survey and Teacher Survey. The Parent Survey surveyed 54 parents living in Southeast Kansas and Southwest Missouri. The phone interviews included four of the 54 participants and gave structure to the proposed pilot program. The Teacher Survey included five participants, and their responses yielded little conclusive results. Those who participated in the Teacher Survey and the Parent Survey agreed parents should provide their children as much help on homework as needed. I presented the findings of the study as well as the proposed pilot program to the Diamond School Board in Diamond, Missouri on February 14, 2018.

Selection Feedback Derived from Biographical Correlates of Long Term Strategic Perspective
Michaela Fisher, Jessica Aikens, Rachel Kennell & Nivia Ayala, Psychology
Poster Session
Faculty Advisor: Robert Jones

Abstract The purpose of this research was to find biographical information that could be used to provide applicants with feedback from the personnel selection process. Much of personnel selection is focused on the decisions made by the employer. This research aims to provide meaningful feedback to applicants regarding their scores on selection devices. In addition to possibly changing applicant reactions to the selection process (Smither, Reilly, Millsap, AT&T, & Stoffey, 1993), such feedback may provide developmental options that applicants can pursue in order to improve their employability. The Long Term Strategic Perspective (LTSP) scale used in this study measures one's development perspective on life experiences. Managers often refer to this as "the big picture." The LTSP scale was used to identify life experiences unique to those who scored higher, indicating a more strategic, developmental level of thinking. Results suggest there are significant amounts of biographical life experiences that are related to higher scores on the LTSP scale. Employers can suggest these experiences to future applicants who seek to improve their LTSP score and possibly to current employees pursing developmental activities. Keywords: life experience, employability, developmental changes
Adult Mosquito Activity in the Ozarks as Determined by Various Survey Techniques
Matthew Flint & Victor Okwo, Public Health
Poster Session
Faculty Advisor: David Claborn

In recent years, information has been published on Aedes aegypti and Aedes albopictus as vectors of the Zika virus, but few surveys have provided information on the efficacy of trap and bait types or the abundance of certain species in Missouri. This study aims to provide baseline information on the appropriate traps and baits needed to obtain substantial species-specific results and to provide an overview of the most abundant mosquito species in Missouri. This information can be used to aid model-based predictions on future transmission of the Zika virus and other important arboviruses. A total of 31 counties were surveyed from June to September 2016. Survey sites were selected based on the Center for Disease Control (CDC) estimates for the presence of Ae. aegypti. CDC light traps, Fay-Prince and BG Sentinel traps were used to trap adult mosquitoes. Dry ice, octenol, or both were used as baits. Of all the 43 species that were identified, Aedes vexans, Aedes japonicus, Aedes triseriatus, Culex eraticus, and Anopheles quadrimaculatus were the most trapped species. The Fay-Prince trapped more An. quadrimaculatus, Cx. eraticus, and Ae. triseriatus, while the BG Sentinel was more effective at trapping Ae. vexans. The BG Sentinel and Fay-Prince had similar trap averages with respect to Ae. albopictus. Using a combination of both baits was far more effective than using just one.

Can post-concussion symptoms be prevented through utilization of interventions and activities associated with vestibular therapy?
Samantha Fluck, Athletic Training
Oral Presentation
Faculty Advisors: David Carr and Tona Hetzler

Context: Conventional treatment of concussions focused on rest and achieving an asymptomatic state before progressing an athlete's return to play (RTP) protocol. A newer tool, the Vestibular Ocular Motor Screen (VOMS) has proven to determine the underlying cause of continued symptoms following a concussion. Objective: The purpose of this study is to identify a set of exercises to help treat concussed athletes to prevent post-concussion symptoms and decrease the length of time it takes to fully return to play. Design: All athletes participated in a multi-exercise/activity treatment until asymptomatic, followed by the standard RTP protocol. Subjects were tested every 48 hours post-concussion with the VOMS and a symptom checklist every 24 hours until asymptomatic. Setting: Collegiate athletics. Participants: Subjects consisted of 32, 18-22 year old athletes from Evangel University, Missouri State University and Drury University who sustained a concussion. Interventions: Multi-exercise/activity protocol based from the VOMS. Main outcome measures: Repeated measures ANOVA to assess symptom severity and total. Results: The mean age of the participants was 19.84 years old, SD ±1.12. RM ANOVA showed symptom severity and total symptoms decreased over time, indicating a positive correlation. p<.001 Conclusion: pending.
Making Mental Health a Priority on College Campuses: Implementing Large Scale Screening and Follow-up in a High Enrollment Gateway Course
Flora-Jean Forbes, Psychology
Oral Presentation
Faculty Advisor: Brooke Whisenhunt

Objectives: A universal mental health screening program for undergraduate students was implemented using graduate student clinicians and online interviewing tools. Participants: Participants included 455 undergraduate students at a large Midwestern University enrolled in introductory psychology. Methods: Participants in the experimental group first completed an in-class self-report mental health screening questionnaire. Based on subscale elevations, students scoring in at “at risk” range on any subscale were invited to participate in individual online follow-up interviews to assess risk level and provide referral information. Results: Results demonstrated that a majority of undergraduate students scored in an at-risk range on at least one subscale a mental health screening questionnaire, and follow-up interviews were successfully conducted for 40% of students scoring in an “at risk” range. Perceptions of campus mental health priorities improved over a three-month period from the time of the initial screening. Conclusions: Universal campus mental health screening was successfully implemented using graduate student clinicians resulting in a large number of referrals for mental health treatment and improved perceptions of mental health treatment on campus.

Effect of Yoga on Metabolic Parameter of a Young Adolescent with Cerebral Palsy: A Single-Subject Design
Andrew Ford, Cory Stattelman, Kristine Drane, Micheala Altvater, Kailey Ackerman & Derek Schildknecht, Physical Therapy
Poster Session
Faculty Advisor: Elizabeth Williamson

Abstract Purpose: Our purpose was to determine the methodology for a future study using a single-subject exploratory study. Background: The prevalence of obesity in children with cerebral palsy (CP) has risen in the last decade (Rogozinski et al. 2007). Yoga improves body composition, cardiopulmonary fitness and promote healthy lifestyle habits (Slawta et al. 2008). Subject: A 14-year-old male with CP participated in the study. Methods and Materials: This was a single subject design. Baseline measurements of body mass index (BMI), body fat percentage, heart rate, respiration rate, blood pressure, height and weight were completed over 5-days, prior to beginning the yoga sessions. The Body Stat Quad Scan 4000 measured body fat percentage and BMI. The participant underwent six weeks of bi-weekly, 45 minutes yoga sessions. Measurements were taken prior to each yoga session and one time a week for six weeks following the cessation of yoga. Results: Analysis of variance revealed a significant decrease in the resting respiration rate (F=4.201, Sig. =0.032, p<0.05). The rate decreased during yoga sessions and remained low six weeks after cessation of yoga. No other parameters were significant. Discussion: The study defined the methodology for a future 26-week single-case research design study. It also indicates that yoga may benefit individuals with childhood disabilities.
Real Estate Research in the Hospitality Industry: A Quantitative Systematic Literature Review
Cindy Forde, Professional Studies
Oral Presentation
Faculty Advisor: Albert Barreda

A group of diversified factors mainly including project development, financial impact, social trends, information technology, and risk techniques, structures the subject of Real Estate. As observed throughout most current research on real estate, meta-analysis is the preferred approach researchers use to strengthen their methodologies and support their conclusions. The objective of this research however, is to introduce a quantitative systematic literature review approach as the favored method through the analysis of three main topics, namely: real estate in general, real estate in the hospitality industry and real estate in the lodging industry. The findings suggest that most of the empirical and qualitative research is on vacation ownerships, resorts development, and Real Estate Investment Trust (REIT). Few scholars have focused their attention to study risks associated with real estate and to review pure hospitality real estate. The systematic findings support the abundance of meta-analysis research in manufacturing and retail industry and introduce the substantial limitation of hospitality-based research on real estate. Some conclusions and implications are then formed from the findings.

Commitment, Confidence, and Concerns: Exploring Walsh’s Three Factors with Teachers in Southwest Missouri
Joshua Freeman, Social Work
Oral Presentation
Faculty Advisor: Ken Tombley

Schools are the largest source of American child abuse and neglect hotline reports. Teachers spend more time with children than any other professional group and are best placed to notice physical and behavioral signs of Child Sexual Abuse. However, many teachers choose not to report their suspicions. This study sought to understand what relationships exist between Missouri teacher's attitudes about mandated Child Sexual Abuse reporting and their decisions. Walsh’s three-factor approach provided a framework to explore attitudes about mandated reporting among Missouri teachers. The factors, Commitment to the reporting role, Confidence in effective response to reports, and Concerns about the consequences of reporting provide a frame to begin exploring this critical element of child abuse prevention. Commitment to the reporting role was high in the teachers sampled. Teachers responded to these questions primarily by agreeing or strongly agreeing. Teacher’s concern for the consequences of reporting was less positive than commitment, though it still reflected an overall rejection of negative perceptions about those consequences. The third factor, confidence in the system’s effective response to reports, showed the least positive trends. Two questions in the attitude set drew non-positive responses, both dealt with the child protective system’s ability to respond to reporting CSA.
Detection of predators early in a predation sequence may allow prey to increase their probability of survival by taking evasive action. For aquatic species in ephemeral ponds visibility is often limited, so predation risk assessment via chemical cues can be useful. Prey may directly detect cues given off by a predator (e.g., predator scent) or indirectly detect the presence of a predator via alarm cues released when a nearby conspecific is attacked. Most mole salamanders of the genus Ambystoma breed in vernal ponds, and larvae suffer high mortality rates due in part to high levels of predation. We tested whether larvae can assess predation risk by detecting chemicals (alarm cues) released from the skin of damaged conspecifics. Since decreased activity is a typical antipredator response of larval Ambystoma, we recorded number of moves before and after addition of stimuli. Field-caught larvae showed stronger activity reductions to conspecific skin extract than to controls, indicating that larval mole salamanders may possess a conspecific alarm cue. Because chemical cue recognition can be either innate or a learned response, we are also testing both lab-raised and field-caught larvae.

A Road to Divinity: Analyzing How Institutional Supports Impact the Experiences of Members of NPHC Organizations
Christina Gardner, Student Affairs in Higher Education
Oral Presentation
Faculty Advisor: Keri Franklin

The purpose of this ethnographic study is to examine institutional supports of fraternal organizations within the National Panhellenic Council (NPHC), a group of nine fraternal organizations founded by African Americans with a largely African American membership and a service focus. One organization was selected to participate in the study. The participants include four male, African American students who are members of an NPHC fraternity and are between the ages of 19 and 23. The students represent the membership body size and an average range of years in which the members have been a part of the organization. Data collection includes interviews with each of the four participants and a focus group. Data will be analyzed using open coding (Strauss and Corbin, 1990). Results include the identification of resources that were influential to their experiences within fraternity and sorority life at this institution. This research filled a gap in understanding student experience in NPHC at institutions of this type and in this region.
New transducers on the market, bone conduction headphones, are non-occluding headphones that allow an individual to listen to music while being aware of environmental noise. Little research has been conducted assessing these headphones and their hazardous volume levels. This research study investigated comparative loudness values of traditional in-the-ear headphones with bone conduction headphones. Utilizing a sound level meter, each click level on the iPad using a song clip was measured on an A-weighted scale (dB A). These measurements were used as a baseline for matching loudness levels of each click under the in-the-ear headphones to bone conduction headphones. This process allowed for the calculated dB A estimation of bone conduction headphones. Results showed the overall number of clicks for each volume level of the bone conduction headphones had to be increased to equate the loudness level of the in-the-ear headphones. The average listening levels were not significantly loud enough to warrant any hazardous volume levels. The A-weighted measurements revealed that increasing the volume level of the iPad to approximately 15 clicks using bone conduction headphones (14 clicks for in-the-ear headphones) or more could put the listener at risk for noise-induced hearing loss.

Measuring Effects: An Online App for Effect Size Calculation for Research and Statistics Classes
Amber Gillenwaters, William Padfield, Addie Wikowsky & Abigail Van Nuland,
Psychology
Oral Presentation
Faculty Advisor: Erin Buchanan

Recent developments in the psychological sciences have shown the de-emphasis of p-values with a renewed focus on effect sizes as a measure of the importance of research findings (Cumming, 2014). Even with the shift in focus, report rates for effect sizes are very low (Fidler et al., 2005; Fritz, Scherndl, & Kühberger, 2013). In this presentation, we will demonstrate a new application that could be used as a teaching tool in statistics and research method courses. This application is designed to allow the user to select the research design and corresponding effect size through drop down menus. For each effect, users type in relevant numbers to calculate those effects, and the effect size and related statistics are presented in APA style. For teaching purposes, helpful description text and YouTube how-to videos are coupled with each effect size page. A previous version of this application was implemented in statistics classrooms wherein students indicated that the application was easy to use and helpful for their homework. Faculty feedback from presentations of the new application during beta testing have been overwhelmingly positive. We believe this application will aid in teaching and learning in statistics and research methods courses for students at the undergraduate and graduate level.
The Effects of Goal Setting and BAS-BIS Motivation on Recognition Memory
Amber Gillenwaters & Abigail Van Nuland, Psychology
Poster Session
Faculty Advisor: D. W. Mitchell

According to goal-setting theory, the application of a specific but attainable goal will improve performance (Locke & Latham, 2006). The Behavior Approach Scale (BAS) and the Behavior Inhibition Scale (BIS) are regarded as measures of motivation: One associated with approach motivation (BAS: seeking of rewards) and one associated with aversive motivation (BIS: avoidance of aversive events, sensitivity to one’s failure). The purpose of the research was twofold: to investigate the effect of Goal vs. No-Goal setting on recognition memory Response Latency as assessed by a Delayed-Match-To-Sample-Task (DMTST), and to assess the relationship of motivational disposition (BAS/BIS) with RL with the inclusion of an unsolvable problem. It was hypothesized that specific goal setting would increase cognitive effort and the magnitude, and type of BAS/BIS Motivation would be predictive of recognition memory performance. BIS was predictive of RL; RL became faster after failure. Overall, RL was slower in the No-Goal Group when compared to the Goal Group, suggesting that goal setting increases performance and results in differences in cognitive allocation.

Seven Day Salad: Improving Microgreens Production with Calcium
Cady Goble, Plant Science
Oral Presentation
Faculty Advisor: Melissa Remley

Production of microgreens as food crops has been on the rise in recent years. Microgreens are vegetable seedlings harvested only seven to twenty days after germination. Research in microgreens production is limited, especially with regards to optimum fertilization. The objective of the current research was to identify the calcium (Ca) rate that leads to optimal growth, yield, and nutrient content of daikon radish (Raphanus sativus) microgreens. Microgreens were grown hydroponically (600mL containers with 250ml of solution wicked to a Capmat II fabric seedbed) in a controlled environment chamber (22.5 °C, 91% humidity, 350µmol m-2s-1 light level after four days). Treatment solutions were 0, 2.5, 5, 7.5, and 10mM Ca (as CaCl2). Four replicates of each treatment were arranged in a randomized block design. After seven days, percent germination, shoot fresh weight, shoot dry weight, cotyledon area, and hypocotyl length were measured. Data will be analyzed using ANOVA and Tukey’s pairwise comparisons. Preliminary results indicate that germination decreased with increasing Ca, and 5mM Ca treatment resulted in highest fresh weight per shoot. Results will be used to develop further Ca studies with different microgreens varieties.
Vascular Maturation via Notch-mediated Vascular Smooth Muscle Cell Recruitment
Bruce Green, Biology
Poster Session
Faculty Advisor: Ryan Udan

During development, the vascular system undergoes a series of sequential transformations yielding in mature blood vessel subtypes (arteries, veins, and capillaries). Initially, endothelial cells create a network of capillary tubes (vasculogenesis) that remodel and form hierarchies in which the thickest vessels are most proximal and the thinnest are most distal in relation to the heart (angiogenesis). The final step is vascular maturation, in which the single-layer endothelial cells are stabilized by layers of surrounding tissues. One such tissue, the tunica media, forms by the maturation and attachment of murine cells called vascular smooth muscle cells (vSMCs). Many of these processes, including remodeling, are controlled by hemodynamic force. What remains misunderstood is the process that mediates vSMC coalescence. When hemodynamic force is reduced, so too is the recruitment and attachment of vSMCs. Initial data indicate that Hey1 expression is also affected by hemodynamic force. Hey1 is a downstream target of Notch, thereby indicating a potential role for Notch in vascular maturation. Normally, Notch is a juxtacrine signaling pathway, but Chen et al., 2017, indicate that primary cilia mechanically transduce Notch resulting in vSMC recruitment in zebrafish. We address the conservation of Notch mechanotransduction and mediation of vascular maturation in mammals.

The Road to Success: A Mixed-Methods Study on a First-Generation Student Program
Andrea Greer, Student Affairs in Higher Education
Oral Presentation
Faculty Advisor: Keri Franklin

The purpose of this study is to understand the experiences of students enrolled in a resource program for first-generation students at a public comprehensive institution. The voluntary program, implemented in Fall 2017, supplements TRIO's enrollment cap. The goal of the program is to support underrepresented first-generation students for social and academic success. The participants consisted of 40 first year, first-generation students between the ages of 18-20, who are Pell-eligible with an ACT composite score between 17-23. The study utilized an explanatory sequential design (Creswell, 2015). The survey data was examined using correlations and cross-tabulations in Excel 2015. The qualitative data consisted of focus groups with five students in the program and analyzed using open coding (Strauss and Corbin, 1990). The survey assessed the engagement of the student by measuring the number of opportunities participated. The results found correlations between monthly workshop attendance rate, meetings with peer mentor, GPA, and demographics. The data assessed found relationships among student characteristics and retention rates in the program. Results have informed programmatic decision-making and the understanding of first-generation students' experiences. Data will improve the quality of the curriculum, and thus, the experience and persistence of first-generation students.
Attitudes and Knowledge About Individuals with Intellectual Disabilities
Olivia Grelle, Social Work
Poster Session
Faculty Advisor: Kenneth Tombley

The purpose of this study was to explore the relationship between knowledge and attitude toward people with intellectual disabilities (ID). It intended to determine if education could be an effective intervention to increase positive attitudes and inclusion of people with ID. Participants were 45 adults who worked for businesses in the regional Midwest. A previously validated questionnaire was used with added questions about business characteristics. Results showed no meaningful correlation between knowledge and attitudes. Participants reported knowing little about people with ID, but survey results showed most participants had knowledge of this population. Knowledge was shown to have almost no effect on attitudes toward people with ID. Therefore, education likely would not be an effective intervention to improve attitudes. Future research should focus on what it is about people that influences their attitudes toward those with ID, such as traits like empathy.

Implementing an Enhanced Recovery After Surgery Protocol in a Rural Hospital Setting
Sandy Hammon, Nurse Anesthesia
Poster Session
Faculty Advisors: Monika Feeney and Tracy Beckham

An Enhanced Recovery After Surgery (ERAS) protocol for colorectal patients at a rural critical access hospital was implemented. ERAS refers to patient-centered multi-disciplinary team developed pathways for surgical specialties. Implementation of an ERAS protocol utilizes evidence-based practice, adequate hospital resources, and effective teaching and communication between involved departments. Four educational in-services were held for 34 nurses. The following areas were included: the pre-op holding room, operating room, recovery room, nursing unit, nurse education department, and nursing administration at a 25-bed rural Missouri medical facility. A survey was conducted for all in-service participants to assess the effectiveness of the ERAS education provided. Ninety-Seven percent of the participating nurses agreed that the educational in-service contributed to their understanding of the ERAS protocol, as well as improved their understanding of how to care for colorectal patients under the new protocol. After the in-service was presented, surveys were collected and analyzed. An ERAS protocol was subsequently developed. The protocol included a physician order set to be implemented at the rural medical facility.
This paper analyzes the policies Beijing has used to combat the three evils: separatism, extremism, and terrorism. This is done to determine if Beijing is addressing the Uyghur grievances that have resulted in increased levels of unrest and violence in Xinjiang. It begins by providing a background of the region, starting with its incorporation into China in the 18th century under the Qing Dynasty and conclude with the New Year’s Eve 2016 attack on a nightclub in Istanbul. A brief look at the two most significant actors in Xinjiang, the East Turkistan Islamic Movement (ETIM) and Turkestan Islamic Party (TIP) follows. It looks at the policies and strategies Beijing has implemented to stabilize the region under four broad categories: economic development, religious crackdown, securitization and policing, and Han migration. Followed by a brief analysis of the efficacy of Beijing’s policies and strategies by using data from the Global Terrorism Database compiled by the National Consortium for the Study of Terrorism and Responses to Terrorism (START). The third section elaborates on possible policy recommendations for the Chinese government to effectively combat the three “evils.” This paper finds that Beijing’s polices are aimed at suppressing the unrest in Xinjiang instead of addressing the grievances of the Uyghur population.

Abstract: There is evidence that disparities exist in access to health-related services among the growing Hispanic population across the United States (Healthy People, 2017). This includes services provided by Speech-Language Pathologists (SLPs) to prevent, assess, diagnose, and treat speech, language, social communication, cognitive communication, and swallowing disorders in adults and children (ASHA, 2018). Lack of awareness and knowledge about SLPs and the services they can provide, contribute to continued disparities in access to health-related services. This study aimed to survey local Hispanics about speech and language disorders and the profession. Participants completed a questionnaire that was available in English or Spanish, and written or verbally. Results provide insight on the needs within the local community to increase access to SLP services. ASHA (2018). About Speech-Language Pathologists. Retrieved from https://www.asha.org/Students/Speech-Language-Pathologists/ Healthy People. (2017). Disparities. Retrieved from https://www.healthypeople.gov/2020/about/foundation-health-measures/Disparities
Exploring the Accessibility of Suicide Response Programs in Jasper and Newton Counties
Brianna Harris, Social Work
Poster Session
Faculty Advisor: Kenneth Tombley

This is an exploratory study identifying the accessibility of suicide awareness in Jasper and Newton Counties. Sixty-five individuals participated in the exploratory questionnaire that included open and closed-ended questions and five Likert Scales to identify resources within the counties and to assess awareness and accessibility of available suicide response programs. The survey was self-designed and disseminated as a link on Facebook by Survey Monkey. Results indicated a lack of awareness of available suicide response programs, barriers to access, and implicated the need for further research.

Qualitative Study of Sense of Place in Historic Mining Communities in the Missouri Lead Belt
Clarissa Hatley, Geospatial Sciences in Geography and Geology
Poster Session
Faculty Advisor: Judith Meyer

Mines and mining communities are symbolic landscapes, idealized places associated with boom and bust of rapid growth and exploitation followed by inevitable decline. While a significant body of research exists on mining communities as both boomtowns and degraded landscapes, the complex "sense of place" of mining communities is less well-researched. Sense of place is the meaning people attribute to a place based on their experiences in and attachment to that place. This research describes aspects of the sense of place in historic mining communities in the Missouri Lead Belt during the periods of mine operation through post-industrial phase. The objectives are to describe (1) place perception; (2) place identity; and (3) place attachment and how they are depicted in the cultural landscape using qualitative methods. In particular, documents and artifacts are analysed as evidence and representations of place. This research addresses the use and value of qualitative analysis to understand perception of mining landscapes by the mining community and is a first step toward understanding the complex sense of place in historic mining towns in the Missouri Lead Belt.
**Summer Orientation Programs: Study to Identify Areas of Support**  
Leanna Henning, Student Affairs in Higher Education  
Poster Session  
Faculty Advisors: Keri Franklin

At a large public comprehensive institution in the Midwest, incoming students with fewer than 24 transferable credit hours attend incoming student orientation. The purpose of this study is to understand the experiences of 15 professional staff presenters. An explanatory sequential design (Creswell, 2015) was used and survey data was examined using correlations and cross-tabulations in Campus Labs. Qualitative data from voluntary interviews and open-ended survey questions was analyzed by open-coding (Strauss & Corbin, 1990) and grounded theory which were collapsed to identify concise, common themes. Results from this study will contribute to the knowledge regarding interdivisional and intradivisional collaboration and support at incoming student orientation. This study can model a fundamental and concise way in which orientation programs can strengthen relationships with university partners and develop a new dimension of orientation evaluation which can be seamlessly integrated into orientation assessment.

**Vietnam’s New Hedging Strategy Against China**  
Stefan Herron, Global Studies  
Poster Session  
Faculty Advisors: Ashley Leinweber and David Romano

The South China Sea is a crucial trade pass, source of billions of barrels of oil, and trillions of cubic feet of natural gas. It also hosts one of the most fiercely contested territorial disputes in the world. China has continued to assert its dominance along the important shipping lanes of the area and has encroached upon the surrounding state's borders and resources. Thus far, international court rulings, international organization laws, and multilateral negotiations have failed to deter China from pushing for complete dominance over the South China Sea. This paper will look at the relationship between Vietnam and China. Specifically, the evolving hedging strategy employed by Vietnam against China in the South China Sea. This paper will analyze the various actions taken by Vietnam against China and conceptualize them under a firmly realist version of hedging. Vietnam has shown its willingness to forgo international originations and multilateral agreements in favor of bilateral weapons deals with China’s most powerful rivals. Vietnam’s hedging strategy employs more realist characteristics of hedging such as hard military balancing and abandoning more liberal characteristics like soft balancing. This use of hard balancing will no doubt spread to other states currently involved in the South China Sea dispute and could create conditions for a multi-state arms race.
Outrageous observations: The redheaded stepchild of data analysis
Tabetha Hopke, Arielle Cunningham, Addie Wikowsky & Haley Wilson, Psychology
Poster Session
Faculty Advisor: Erin Buchanan

The social sciences have begun to take a careful look at the way we process and interpret data, as many famous experiments do not appear to replicate (Open Science Collaboration, 2015). The Open Science Foundation (OSF) was founded in 2013 to promote a transparent research process from formation of the hypotheses to completely reproducible papers (Nosek et al., 2015). This project examines the impact of the formation of OSF and changing research culture on the publication of information concerning data screening methods for outliers, as the impact of outliers can critically change the findings and interpretation of experiments. In 2012, n = 1090 experiments were extracted from the articles examined. Only 20.3% of these experiments mentioned screening for outliers, which ranged from 1.6% (Forensic) to a high of 38.4% (Cognitive). Of the studies indicating outliers, 92.8% removed outliers. The following criteria were used to identify outliers: 65.4% participant error, 27.8% statistical criteria, 4.4% experimenter error, and 2.4% with no reason given. Common participant errors included very short response latencies or low effort, while statistical criteria often were tied to z-scores and skewness of the distribution. The 2017 data is currently being processed, and our prediction is an overall increase in report rates for outlier screening.

A Local Church's Perceptions of Poverty in Springfield, Missouri: A Descriptive Analysis
Charissa Howes, Social Work
Oral Presentation
Faculty Advisor: Qiang Chen

Poverty has been a pervasive issue facing the city of Springfield, Missouri. While this problem has been greatly acknowledged among the community, new solutions for poverty reduction efforts are constantly being sought after. Scholars have noted how collaboration with faith-based organizations and churches have shown to be beneficial and effective in advancing poverty reduction. With Springfield being a “highly churched” area, this study surveys church members from a specific local church in Springfield, located in the lowest socioeconomic neighborhood of Springfield, MO. The purpose of this quantitative study is to provide descriptive information about a specific church congregation, to survey church members’ perceptions of people living in poverty and causes of poverty, and to provide recommendations to continue poverty reduction initiatives based on their perceptions. The findings suggest that church members’ sociodemographic information impact their perceptions and attitudes of poverty, thus inferring impacts on poverty reduction efforts within church communities.
Perception of Parental Values and College Student Attitudes Toward Sexuality
Keeley Howes, Social Work
Poster Session
Faculty Advisor: Qiang Chen

Background: Over the past few decades in the United States, there has been discussion about the source of information that adolescent and young adults receive regarding sex education and the development of their own attitudes toward sexuality. Purpose: This study examines the relationship between college students' perception of parental values and his or her own attitudes towards sexuality in an effort to better understand the role and impact that parental values have on the development of college students' attitudes toward sexuality. Method: A total of 77 college students ages 18-25 years old, recruited through social media postings and email invitations, participated in this study by completing a survey combining Perceptions of Parents: The College Student Scale and Brief Sexual Attitudes Scale. Results: The findings of this research study and data analysis demonstrate extremely minimal significance and weak relationships regarding the correlation between the "Perception of Parental Values" subscale variables and the "College Student Attitudes Toward Sexuality" subscale variables. Implications: Results suggest that benefit could be found in conducting additional research to further explore the perception of parental values and other factors that assist in the development of attitudes toward sexuality among college students.

Struggling In or Between Conscious And Subconscious Mind
Shen Chen Hsieh, Visual Studies in Art and Design
Performance Presentation
Faculty Advisor: Sarah Williams

Through the study and research in the visual study program, I found that I am interested in creating images that express my inner spirituality and emotional experience. I draw from my multi-cultural background, personal relationships, and my introvert personality. Creating art helps me examine my inner self. I was born a third generation Chinese immigrant in South Korea and moved to the United States. During my teenage years, I struggled with the confusion of my nationality and struggle with this today. This multicultural background continuously leads me to question myself where and why I should belong. I have felt isolated at times but also afraid that deep relationship with others could cause me more loneliness because of my difference. These personal experiences have become the main content in my artwork and it reflects the Questions in identity, anxiety, isolation, self-judgment and the struggle with acceptance I feel. The masks and use of facial expressions have been my vehicle for expressing my feelings. I use characters and masks as avatars for myself as a way to deliver my emotions and psychological status to my viewer. I continued to explore a range of mediums that provides me an opportunity to combine deliberate and accidental images into one. I am seeking to express and understand the conscious and subconscious of myself, communicate with others through my creation.
Lessons from the heart: A kinesthetic heart model for practical nursing students
Sue Hudson, Nursing
Performance Presentation
Faculty Advisor: Melissa Penkalski

Current trends in health care delivery require nursing programs to change how education is presented to nursing students. Active learning strategies, such as discovery learning through kinesthetic activities, has been associated with increases in student engagement and satisfaction. A kinesthetic learning strategy was developed and implemented at a licensed practical nursing program to increase student engagement and provide knowledge of cardiovascular function and various etiologies associated with the heart. The goals of the kinesthetic activity were to provide deeper understanding and improve critical thinking and clinical application for the student.

Optimizing Quantum Dot Probe for Single-Molecule Imaging of Serotonin Receptor Trafficking
Gregory Illy, Natural and Applied Science
Poster Session
Faculty Advisor: Katye Fichter

Malfunctioning serotonin receptors are involved in the pathology of many psychological diseases. One subtype of serotonin receptors, 5-HT1B, has been implicated in decreased membrane expression in post-mortem hippocampal tissue samples of subjects diagnosed with unipolar depression. Therefore, we investigated the membrane expression of 5-HT1B with treatment of selective serotonin reuptake inhibitors (SSRIs). In order to observe receptor trafficking in response to SSRI treatments, we utilized InP/ZnS quantum dots (QDs) for single-molecule fluorescence imaging of receptor trafficking. QDs exhibit high photostability, making them ideal fluorophores for single-molecule imaging. We have modified QDs through a multiple-step bioconjugation reaction to synthesize probes with extremely high affinity for 5-HT1B. We hope that these studies will help to unravel the molecular basis of psychological disorders and produce more efficacious treatments.

Cyclophilin A Enhances Early HIV-1 Replication Steps In Microglial Cells
Zachary Ingram, Cell and Molecular Biology
Poster Session
Faculty Advisor: Amy Hulme

The early steps of HIV replication are required to establish infection making these pre-integration events ideal targets for the development of therapies. After viral fusion with the cell membrane, the HIV capsid is released into the cytoplasm. As the capsid traffics to the nucleus, early products of reverse transcription help initiate capsid disassembly, a process called uncoating. Uncoating is required for nuclear import of HIV DNA, which precedes integration. Cyclophilin A (CypA) is a cytoplasmic protein that binds the capsid to modulate HIV infectivity. The drug cyclosporine A (CsA) disrupts the CypA-capsid interaction in microglial cells resulting in decreased infectivity at early time points. The interplay between reverse transcription, uncoating, and nuclear import suggests that CypA may affect multiple steps of replication. Therefore, microglial cells in CsA or ethanol containing media were infected with HIV. At early time points post-infection HIV DNA was extracted. Early and late reverse transcription products and 2-LTR products were quantified using qPCR to determine the replication steps altered by CypA. Elucidating which steps are impacted CypA will provide a better understanding of the early steps of HIV replication.
Cultural landscape
Hua Jin, Visual Studies in Art and Design
Performance Presentation
Faculty Advisor: Sarah Williams

My paintings are landscapes. However, they are not the landscape of the earth's surface, but the landscape of cultures, politics, and Histories. The landscape cannot just please the eyes of the people, more importantly, it affects people's thinking and feelings. Everything we see could be a landscape, and the influence begins with our first sight at birth. My composition’s area simple but somewhat strange. I choose one section of the horizon and provide a different perspective to deny the normal information in front of your eye and to find the true feelings under the landscape. My research is trying to reveal the truth of life that people live in an unfree society where thoughts are controlled and behaviors are regulated. Some works express my skepticism and criticism of totalitarian rule, which comes from my reflection on living in China in 37 years. I hope my work can provide positive information to serve the healthy development of society.

Predation and Alarm Cues effect on Different Life History Modes of Oklahoma Salamanders
Shannon Johnson, Biology
Oral Presentation
Faculty Advisor: Alicia Mathis

Oklahoma Salamanders, Eurycea tynerensis, has both metamorphic (terrestrial) populations and paedomorphic (aquatic) populations, which may result in varying selection on anti-predator responses across adults. Chemical cues serve as an indicator of predator presence in aquatic systems, either directly released from the predator, or indirectly via alarm cues released when another individual is attacked. This study examined how different life strategies would respond to a common source of aquatic predation threat. We measured responses of paedomorphic adults and metamorphic adults to either: predator cue (sculpin, Cottus sps), alarm cue (darters, Etheostoma sps), or a blank water cue. Darters have been shown to respond E. tynerensis alarm cue but it was not known if E. tynerensis respond similarly. Metamorphic adults spent significantly more time in the “look small” (FLAT) posture and had a significantly longer latency to move when exposed to predator cue than when exposed to either alarm cue or blank water cue. In contrast, the paedomorphic adults tended to have longer latency to move to both alarm and predator cue than the blank cue. Even though, metamorphic adults have a decreased chance of facing predation threat from sculpin, it appears that there is some benefit in retaining this ability to correctly identify and respond to these threats.
Children’s Division Staff Perception of the Team Decision Making Process
Dan Johnston, Social Work
Oral Presentation
Faculty Advisor: Qiang Chen

Team Decision Making (TDM) is a group decision making process being piloted by the State of Missouri to help child welfare systems make better decisions regarding the custody of children in child abuse and neglect cases. The purpose of this study is to find out the perceptions the staff members who have observed TDM meetings have regarding the process. TDM has been piloted in St. Louis in the past where it had positive results regarding the outcomes of children in custody. This study surveys Greene County Children's Division staff members who have experienced TDM meetings. The survey asked the staff members if TDM is beneficial to them, their cases and their decision making. The study found that 83% of the staff members surveyed felt that TDM was worth their time investment. 70% reported that TDM effected their cases in a positive way and 60% stated that TDM meetings effected their recommendations.

Stratigraphic Analysis and Environmental History of Legacy Floodplain Deposits, Lower Big River, Southeast Missouri
Miranda Jordan, Geospatial Sciences in Geography and Geology
Oral Presentation
Faculty Advisor: Robert Pavlowsky

Floodplains function as long-term storages of sediment delivered from the watershed and therefore are often targeted for stratigraphic analysis to evaluate past records of environmental disturbances. Human activities can increase flooding and sediment loads resulting in higher sedimentation rates and the formation of legacy deposits on floodplains. This study evaluates the sedimentary and geochemical characteristics of legacy floodplain deposits along the lower portion of Big River watershed (2,500 km2) which drains the Ozark Highlands in southeast Missouri. Upland erosion occurred during the agricultural settlement period beginning in the 1700s and peaking in the late 1800s. In addition, Big River received large volumes of mine tailings generated from the Old Lead Belt District which was a world leader in lead production from the early 1900s to 1972. Previous research indicates that legacy deposits from 1 to 4 m thick occur on floodplains of Big River. However, this study is the first to examine high resolution core records using sediment properties, metals analysis, Cs-137, and magnetic susceptibility to identify discrete sediment events and attempt to link floodplain strata to historical disturbances along the lower segment of Big River near the USGS gage at Byrnesville, Missouri.
Decades of research has established a strong association between depressive symptomology and body mass index (BMI), as well as a contentious relationship between poor body image and BMI (de Wit et al., 2009; Sarwer, Thompson, & Cash, 2005). However, less is known about how individual coping strategies can positively or negatively influence these relationships. The Body Image Coping Scales Inventory assesses the management of body image dissatisfaction according to three categories of coping strategies: appearance fixing behaviors, avoidance, and positive rational acceptance (Cash, Santos, & Williams, 2005). The present study explores how avoidance coping strategies, specifically, may mediate the relationship between BMI and depression. Participants included a broad range of women between the ages 18-87. Analyses revealed that avoidance coping behaviors mediated the relationship between BMI and reported depressive symptomology, suggesting BMI alone is not responsible for depressive symptomology, but rather the way women cope with their BMI, impacts the experience of depressive symptoms. The results of this research suggest clinicians working with individuals with eating disorders or obesity should address coping strategies early in treatment and monitor their use and relationship to mood-related symptoms.

Kishmish vatkana is an Asian grapevine variety and is characterized by resistance to the fungal pathogen Erysiphe necator which causes powdery mildew (PM) disease. This disease of is a major issue for grape growers who must use large quantities of chemicals that are harmful for human health and the environmental pesticide against this fungus. Kishmish vatkana contains resistance gene(s) against this disease in the REN1 locus of its genome. It is important to determine the precise nucleotide sequence of this locus so that we can identify the gene(s) that are responsible for PM resistance. To identify the resistance gene(s), it is important to determine the precise nucleotide sequence of this locus. I sequenced the DNA of part of the REN1 region by using a long-read generating Oxford Nanopore Technology (ONT) sequencer. Long reads are required to close small gaps between contigs. The resulting nucleotide sequence has revealed the presence of full-length resistance genes that can be potentially responsible for the PM resistance phenotype of Kishmish vatkana. In addition, transposons have also been identified in this region.
Investigation into SpyCatcher/SpyTag isopeptide bond formation
Sydni Marie Samuel Kasson, Chemistry
Oral Presentation
Faculty Advisor: Keiichi Yoshimatsu

Proteins are composed of amino acids linked through peptide bonds. Some pathogenic bacterial proteins contain additional linkages between side chains, known as isopeptide bonds. These isopeptide bonds increase the stability of the proteins making pathogenic bacteria resistant to immune responses. One such example is the CnaB2 domain of the FbaB pilus structure of Streptococcus pyogenes. Interestingly, split fragments of the CnaB2 domain showed the ability to form an isopeptide bond. This system, termed SpyCatcher/SpyTag, can provide a model for the understanding of the formation of these isopeptide bonds. We have recombinantly expressed SpyCatcher and SpyTag-fused proteins in E.coli in order to develop a new assay method. Our current goal is to establish a better understanding on the nature of the isopeptide bond formation.

Perceived Quality and Meaningfulness of Communication during Songwriting for a Woman with Primary Progressive Aphasia
Clara Keller, Communication Sciences and Disorders
Poster Session
Faculty Advisor: Alana Mantie-Kozlowski

A growing research base supports the use of songwriting as a means to assist people with neuro-cognitive disorders meet their varied psychosocial and communication needs. This was the first application of songwriting to address the communication needs of woman with the logopenic variant of Primary Progressive Aphasia. The aim of this study was to explore participant perceptions of quality and meaningfulness of communication during songwriting. A different songwriting technique was employed for each of two songwriting experiences. Song A: Parody using original lyrics. Song B: Parody using pre-composed lyrics or quotations. Measures of perceived quality of communication were collected pre- and post-intervention. Measures of perceived meaningfulness of songwriting were obtained after each songwriting experience. Results revealed a 26.4% increase in perceived quality of communication within the context of songwriting, over baseline measures. Scores for perceived meaningfulness of songs indicated both songwriting processes and products were perceived as meaningful. Post-study participant interview confirmed these findings, with enjoyment and satisfaction rated slightly higher for song A than song B. In the face of declining cognitive-linguistic skills, participation in therapeutic songwriting provided a meaningful context to enhance the perceived quality of communication.
Does Early Exposure to Endoscopy Affect Confidence in Implementing FEES?
Lauren Kelley, Communication Sciences and Disorders
Poster Session
Faculty Advisor: Klaas Bakker

Depending on available internal and external funding sources, graduate speech language pathologists receive variable amounts of training and hands-on experiences using Flexible Endoscopic Examination of Swallowing (FEES). This study was to explore the relationship between self-reported confidence using FEES and level of training and practice experience received during graduate training. A survey was administered to seven speech language pathologists who currently use FEES in their practice. Responses will be examined to learn more about the speech language pathologist first exposure to FEES (i.e., additional graduate course work, workshops or on the job- training) and how their first exposure influenced their self-reported confidence level in implementing FEES. There was no statistically significant correlation between type of FEES training received and confidence level as reported by the participants. As, expected speech language pathologists who received FEES training via additional graduate course work reported higher confidence levels in implementing FEES. Ramifications of these findings for future training of graduate speech language pathologists will be discussed.

Missouri State University
Brett Kenning, Geospatial Sciences in Geography and Geology
Oral Presentation
Faculty Advisor: Kevin Evans

This contribution examines the characteristics and ages of sedimentary units in the Coastal Group located along the southwestern Jamaica coast between Great Pedro Bluff and Fort Charles Bay. The coastline is characterized by laterally discontinuous low cliff exposures, separated by modern beach deposits and tectonically raised shore platforms composed of the White Limestone Group (mid-Eocene to mid-Miocene) and coral rudstone to floatstone and calcareous sandstone of the Coastal Group (late Pleistocene). Electron-Spin Resonance spectroscopy conducted on corals from a coral rudstone to floatstone facies yielded an estimated age of 120 ka. The coral facies may be assigned to the Falmouth Formation, and it has been suggested to have been deposited within the MIS 5e (132 ka – 115 ka). However, the other units within the Coastal Group likely are diachronous. These exposures cannot be a standard for determining relative mean sea level as they have been tectonically disturbed and the upper surface of the coral facies may have been eroded below cross-bedded sandstones. While these exposures in southwestern Jamaica cannot serve as a proxy for correlation of MIS 5e strata due to tectonism and siliciclastic influxes, they provide an example of the potential for accelerated sea-level rise with current trends in climate changes.
In this research we studied the properties of amorphous B4C (Boron Carbide) produced from gaseous precursors e.g. B2H6, BCl3 and CH4 material which is the third strongest material found in nature. We identified the characteristic short-range and medium-range orders that are present within the amorphous structures as a function of the compositional variations of these precursors and deposition parameters. We performed large scale reactive molecular dynamics simulation. Our investigation was based on experimental analysis and proven theories on this material. We particularly focused on the strength of the material in high temperature and high pressure and find out the potential applications of this extremely strong application. We employed a new computational method called Hybrid Reverse Monte Carlo (HRMC) which optimized the determination process of atomic model structures from these experimental data. We acknowledged the support from NSF’s DMREF grant (No. 1729176) and DOE’s NERSC computational support.

Alluvial sediments within the Galena River Watershed were severely contaminated with heavy metals by historical zinc (Zn) and lead (Pb) mining operations during the early 1800s until 1979. Since the mines closed, there have been efforts to remediate on-site mine waste. However, the effectiveness of these efforts to reduce metal concentrations in stream sediments is unknown. This study compares present-day (2017) contamination trends in the Galena River Watershed to trends reported 25 years ago. A total of 415 sediment/soil samples were collected and analyzed using X-ray florescence spectrometry to determine sediment metal concentrations. The highest concentrations of zinc measured were 23,577 ppm in the channel bed, 19,825 ppm in the channel banks, and 51,273 ppm in tailings. Zinc concentrations averaged 198 ppm within the unmined Madden Branch (n=10), 2,057 ppm within the main branch of the Galena (n=31), 9,569 ppm within the heavily mined Diggings Branch (n=11), and 26,158 ppm in tailings (n=16). Present-day results show little difference compared to 25 years ago. Stream sediments collected downstream of some large-scale remediation projects have shown significant decreases in Zn concentrations. Even with continued efforts to remediate contaminated sediments in the Galena River, high concentrations of Zn will persist well into the future.
Screening the effects of environmental contaminants on zebrafish embryonic development and viability
Kayla King, Biology
Poster Session
Faculty Advisor: Ryan Udan

Lakes and streams are often polluted with many contaminants including: mining, pesticides, oil, sewage, fertilizers, pharmaceuticals, and industrial. Much of these pollutants come from groundwater runoff and improper disposal of material, and have been shown to be detrimental to different aquatic organisms causing effects on behavior, embryonic development, or survival. Although many contaminants have been tested, many remain untested, and thus have unknown effects on organisms. In addition, tested contaminants that exhibit no defects, may act in concert with other contaminants to have an effect. Thus, we propose to assess the effect of untested contaminants and combinations of contaminants on zebrafish embryonic development and viability. We have established the zebrafish system in our lab, and as a proof of principle, we began testing embryos upon exposure to a commonly used laboratory reagent—TEMED. Though TEMED has been tested in cell culture experiments and in adult rats, its effect on embryonic development is unknown. We exposed zebrafish embryos to various amounts of TEMED, and observed development over four days. We intend on determining if embryos show toxicity or if they develop abnormalities. After our analysis, we will continue this strategy with untested contaminants and combinations. If exposure leads to defects, monitoring of contaminants should occur.

A Review of Literature: Dialect Perception in Children
Lauren Koth, Communication Sciences and Disorders
Poster Session
Faculty Advisor: Shurita Thomas-Tate

The role of bias as it relates to dialect differences in children will be explored. A review of pertinent and current research will be studied to determine whether adult prejudices in regards to dialectal differences are shared with a younger population. The method of study involves review and discussion of various scholarly articles, reported in a summarized format. Through synthesis of research regarding dialect preference in children, clinical significance revealing adult preferences instated and evident at a young age will be evaluated, as well as how this research validates previous findings. Consequences and necessity for further research in this area of study will be included. Implications of the results of dialect awareness for future research will also be included in the review of literature.

Discovering the Composer Petr Eben and His Piano Works
Amanda Krieg, Music
Performance Presentation
Faculty Advisor: John Prescott

Petr Eben was a composer from Czechoslovakia. He was born in 1929 to a family of teachers. His father taught him to play piano at a young age, and from there he branched out into playing cello but was particularly drawn to the organ. During World War Two his talents were requested at his local church to fill in while the older men were called away to active duty. During his teenage years, he and his brother were imprisoned at Buchenwald concentration camp and nearly died. After his survival and release he became an improvisational performer and composer over a variety of subjects and instruments, although his love of organ was to remain his primary focus. He was beloved by family and friends and enjoyed a long fulfilling musical career until the died in 2007. His piano music is less known. This presentation will include information pertaining to his life and an overview of compositions. It will conclude with a short discussion and explanation of some music concepts and a description and demonstration of a lesser-known piano piece.
Purpose: To assess clinical competency upon completion of advanced assessment by incorporating best practices in clinical simulation. In utilizing a clinical competency tool, the project will assess the student's ability to obtain a thorough history and physical examination by the FNP graduate student upon completion of advanced assessment clinical course. Students will have the opportunity to demonstrate bedside manner, history taking, physical examination, basic clinical reasoning and initial integration of these skills. The foundation of the project is the utilization of core competencies of Nurse Practitioner Practices established through AACN and NONPF organizations. The MSU Family Nurse Practitioner Doctorate of Nurse Practitioner handbook will also be a resource for the objective standard clinical examination for clinical excellence upon completion of the standardized examination. Evidence to support the project is in utilizing NP Core Competencies across the lifespan in order to communicate practice knowledge effectively, both didactically and clinically. With a continued need to document clinical competence, research will be completed in an attempt to raise the standard for clinical excellence in an FNP-DNP program. Results pending final data analysis in April, 2018. The DNP project has the potential to positively impact and improve patient care in the community.

Correlation Between Instagram Use and Body Image Satisfaction
Mandy Kubilus, Social Work
Poster Session
Faculty Advisor: Qiang Chen

The purpose of this study was to examine whether the amount of time spent on the social media application Instagram is correlated to body image satisfaction. A total of 50 Instagram users aged 18 to 25 (M = 22.52) completed an online survey questionnaire. Analysis of this questionnaire revealed that there is a nonlinear relationship between time spent on Instagram and body image satisfaction, with the correlation coefficient being 0.039. However, further analysis showed a weak, but uphill positive correlation between whether viewing other user's photos affects how they feel about themselves or their life and body image satisfaction with a correlation coefficient of 0.33. These findings suggest that while there may not be a correlation between time spent on the application and body image satisfaction, the use of social media can have an effect on an individual. Findings from this current study provides a baseline understanding to potential timely trends regarding social media usage, specifically with Instagram.
Student perceptions of disability support on campus: A mixed methods pilot study
Kristeena LaRoue, Student Affairs in Higher Education
Oral Presentation
Faculty Advisor: Keri Franklin

At a public, comprehensive institution with an enrollment of 24,000 in the Midwest, two offices support disability accommodations for all students. The purpose of this study is to understand student perceptions and experiences of disability support. Six hundred students who received accommodations in spring of 2018 received an online survey that was developed in Campus Labs and emailed to students. An explanatory sequential design (Creswell, 2015) was used and survey data was examined using correlations and cross-tabulations in Campus Labs. Focus group data was analyzed using open coding in which codes were collapsed and major themes were developed. Results included a more developed understanding of students’ experience with accommodations and identification of specific resources that most impacted student experience.

Student Expectations of SOAR
Ashley Larson, Student Affairs in Higher Education
Poster Session
Faculty Advisor: Keri Franklin

This study explores the Student Orientation, Advisement, and Registration (SOAR) new student orientation program at Missouri State University. The research aims to determine the following: students' initial expectations of SOAR, suggested SOAR topics, and the gap between the previous two data points. The study uses an explanatory sequential study (Creswell, 2015). Participants will be first-year students who attended SOAR in the summer of 2017. Participants participated in a focus group and answered questions regarding their SOAR experience, as well as gave feedback about the program. This study will be submitted to Missouri State University’s Institutional Review Board in March 2018.

Comparing exercise protocols of volume and intensity on the clearance of amyloid beta in App/pS1 mice.
Justin Lawson, Julia Larson, Jordan Brewer & Kaylin Dobbs, Cell and Molecular Biology
Oral Presentation
Faculty Advisors: Scott Zimmerman and Benjamin Timson

It has been shown in Tg2576 mice that soluble amyloid beta is cleared in a dose dependent manner from the cortex and hippocampus by exercise (Moore 2016). This clearance has been shown to reduce amyloid plaques and improve cognitive outcomes later in the lifespan of the same model (Thomas 2018 unpublished thesis). However, it is unclear if this dose response is due to greater exercise volume, or greater exercise intensity. We are researching the effect of volume and intensity of treadmill exercise on soluble amyloid beta clearance in APP/pS1 mice. We have trained both male and female APP/pS1 mice on a treadmill at 12 m/min for one hour (SS n=23), 12 m/min for 2 hours (SL n=17), and 24 m/min for 1 hour (FS n=20) to compare to sedentary controls (SED n=24). Soleus citrate synthase activity was assayed to confirm a training effect and that the effect is
TOWARDS NATURAL SPEECH ANALYSIS AND PROCESSING FOR SMART HOMES
JunHyeong Lee, Computer Science
Poster Session
Faculty Advisors: Razib Iqbal

In this poster, we present our research to enable automatic natural speech analysis to improve the quality of experience in smart home environments. Our initiative enables naturally spoken words and sentences in lieu of specific voice commands to interact with every day things found in a smart home. We propose a cloud-based middleware to detect phrases and analyze the semantic and syntactic makeup of the phrases to generate appropriate tags to trigger an action for a provisioned smart device. We applied a method for measuring the similarity between short phrases based on synonyms and word order information to determine if a spoken phrase can be mapped to a predefined provisioned command. Our experimental results based on the work-in-progress research demonstrate the viability of the proposed system for delay-tolerant real-time environments. We are motivated by the fact that our research will help the disabled and elderly people who might struggle to get around well to control many aspects of a house without memorizing specific commands.

Management Consulting: A Systematic Literature Review in Business
Phillip Lehane, Professional Studies
Oral Presentation
Faculty Advisor: Albert Barreda

Abstract: Over the past century the consulting industry has grown along with the world economy. Consulting is pervasive, affecting nearly every other industry in some way. With the growth in the industry has come a growth in the research of management consulting. However, there is a lack of comprehensive studies about management consulting. The purpose of this study is to investigate the areas of research on management consulting. This information will be used to form a comprehensive definition of management consulting, a review of the duties of a management consulting firm, and a quantitative review of the existent research in the field of management consulting. Using a systematic literature review, the authors have reviewed 82 peer-reviewed articles about management consulting. Findings suggest that the main duty of consultants is to provide information to clients, but other duties include diagnosing and solving problems, training new professionals, restructuring business organizations, and implementing policies. This study can be useful for researchers, scholars, and young professionals who need a comprehensive background and related information about the subject of management consulting.
THE EFFECTS OF LAND USE CHANGE AND FLOODING ON A KARST MOUNTAIN WATERSHED, SOUTHWEST JAMAICA
Sarah LeTarte, Geospatial Sciences in Geography and Geology
Poster Session
Faculty Advisor: Bob Pavlowsky

The geomorphic effects of land use change and flooding on mountain streams in Jamaica are poorly understood, particularly in the karstic mountain watersheds along the southwest coast. This research presents preliminary results on understanding the geomorphic effects of colonial land use change and an extreme flood event in the Brighton-Blue Hole watershed near Belmont, Westmoreland, Jamaica (3.1 km²). The area was heavily deforested and streams in the area were possibly channelized during the colonial period from the late 1600s to the mid-1800s. A tropical depression produced 32 in of rain on June 12, 1979 resulting in channel incision, debris flows, and flooding in communities. The stream response in Brighton-Blue Hole differs from nearby streams, such as the Bluefields River. This report describes watershed characteristics, channel and spring networks, and landforms of the Brighton-Blue Hole watershed. Methods include land surveying using a total station and stadia and GIS analysis using a 5m2 DEM purchased from MONA GIS. In the lower portion of the watershed, the stream system flows through a marsh and mangrove forest before emptying into Bluefields Bay, a no-take fish sanctuary. Residential construction is presently disturbing the mangroves which has raised local concerns since cultural beliefs hold that mangroves protection is important to the health of the local fishery.

Investigations of the Magnetic Perpendicular Exchange Bias in L10 FePt/NiO Bilayer Thin Films
Zachary Leuty, Materials Science
Oral Presentation
Faculty Advisor: Robert Mayanovic

We report on the exploration of perpendicular exchange bias in iron platinum/nickel oxide (FePt/NiO) bilayer thin films grown using pulsed laser deposition (PLD) on MgO (100) substrates. Exchange bias is an important property for giant magnetoresistance, and, as such has promise for applications in spin valves, magnetic sensors and magnetic random access memory. The magnetic L10 phase of FePt is known for having high perpendicular magnetic anisotropy, tunable coercivity/grain size and large magnetic storage density. The FePt layer was first deposited directly on MgO, followed by the deposition of the NiO layer on top of the FePt layer. The coercivity of the L10 FePt layer was tuned during growth to form a hard or soft magnetic layer. The FePt/NiO thin films grown for this study exhibit perpendicular exchange bias at 5K, as quantified using our SQUID measurements. XRD confirms parallel plane ordering between the MgO (200), FePt (002) and NiO (111) atomic planes while cross-sectional TEM confirms the epitaxial growth of L10-FePt(001)<100>/MgO(100)<001> and the preferential growth of NiO on top of the FePt. Films of only FePt were grown to examine the surface architecture of the ferromagnetic layer and thus the interface of the FePt/NiO bilayer. The results from our XRD, TEM and magnetometry characterization of the FePt films and FePt/NiO bilayer thin films will be discussed.
SEARCH FOR THE LOST SOCIAL STUDIES: INTEGRATING SOCIAL STUDIES THROUGH LANGUAGE ARTS INSTRUCTION
Heather Lewis, Educational Leadership
Oral Presentation
Faculty Advisor: Donna Aldrich

John Dewey (1916), believed that children should be actively involved in challenges that foster their critical thinking skills in preparation for living and working in democratic societies and communities. One primary goal for elementary social studies instruction is to prepare students to be active and successful citizens. The purpose of this study is to observe the benefits of reconceiving social studies instruction through the use of integration into language arts instruction. The integration of social studies interwoven throughout the curriculum will focus specifically on the instructional strategy of the classroom read aloud. Social studies curriculum has been put on the back burner and left to be taught only when there is time left over from language arts and math instruction. For the current investigation, teachers were surveyed in regards their perceptions to the integration of language arts and social studies. In addition, students were surveyed on their perceptions of the inclusion of historical fiction read alouds into their daily instruction. Students were observed during the implementation of historical fiction read alouds in a fifth grade classroom in order to observe the learning process. Through the integration of historical read alouds into the social studies content students will be immersed and engaged in the learning process.

THE CHEMICAL AND STATISTICAL ANALYSIS OF KARST GROUNDWATER BASIN SIGNATURES – SPRINGFIELD, MO
Benjamin Lockwood, Geospatial Sciences in Geography and Geology
Oral Presentation
Faculty Advisor: Douglas Gouzie

Springfield, MO is located on the Springfield Plateau physiographic province. The Springfield plateau contains a number of Mississippian aged units and is usually capped by the Burlington-Keokuk limestone. The Burlington-Keokuk is a highly fossiliferous limestone with nodular and interbedded chert. Beneath the Burlington-Keokuk lie the Elsey, Reeds Spring, and Pierson Formations respectively which comprise the Springfield Plateau aquifer hydro-stratigraphic unit. Within the Springfield Plateau aquifer, a well-developed karst system includes springs, sinkholes, and caves with recharge primarily draining from springs and seeps. The Springfield Plateau aquifer is the predominant source for springs and seeps in the Springfield area. The purpose of this study was to understand the differences in water chemistry of what are thought to be individual karst groundwater basins in Springfield. The mixture of urban, industrial, and rural land use over the groundwater basins as well as minute differences in the Burlington-Keokuk suggest that enough difference in the water chemistry exists and a signature can be defined for each basin. Sampling was conducted at 12 sites in Springfield, MO from within what are believed to be five separate groundwater basins. Samples were collected over six months, and 11 variables were measured.
Perception of gender bias from the female athletic trainers’ perspective in the professional sport setting
Sara Lovse, Athletic Training
Poster Session
Faculty Advisor: Kristin Paloncy

Purpose of research: The purpose of this study was to gain a better understanding of the perception of gender bias in the athletic training professional sport setting from the female athletic trainers' perspective. Methods: The study utilized a phenomenological design with criterion sampling for subject recruitment. Participants were contacted by email from a member-only listserve from National Athletic Trainer’s Association based on practice setting. Those that responded reviewed the interview questions, and electronically signed an informed consent. Six participants participated in individual phone interview with open-ended questions. An open-coding process was then conducted for data analysis using two independent coders. The codes were then peer-reviewed by an expert in qualitative research. Results: Five themes associated with gender bias were identified from the interviews and the coding process: perception of age inequality (ageism), mentorship, communication, traditional expectations, and perception of gender inequality (sexism). Conclusion: The female athletic trainers expressed adversity faced throughout their career in the professional setting from age, gender, and the traditional expectations of male athletics. Utilizing open communication, mentorship, and inter-professional connections were found to be beneficial in overcoming the gender bias faced.

The Influence of Territoriality on Exploration in Two Woodland Salamanders
Colton Lynn, Biology
Oral Presentation
Faculty Advisor: Alicia Mathis

Territorial disputes are common among woodland salamanders (genus Plethodon). Southern red-backed (redbacks) and Ozark zigzag (zigzags) salamanders are territorial congeners that are ecologically similar, but zigzag salamanders show substantially higher levels of activity and agonistic behavior in laboratory trials. I tested whether males and females of both species also differed in exploratory behavior and whether exploratory behavior differed between territorial owners and intruders. Salamanders were tested in an exploratory apparatus consisting of five concentric rings: the rings created barriers that blocked the view of areas outside of the currently occupied zone and the salamanders had to climb over to gain access to the adjacent area. Zigzags were significantly more exploratory (shorter latency to move; shorter latency to cross the first ring; longer distance traveled) and redbacks were less exploratory and appeared more cautious, reversing back into previous zones significantly more often than zigzags. There was also an interaction of sex and species, with female zigzags reaching farther zones than male zigzags and male redbacks reaching farther zones than female redbacks.
An Overview of the Certified Registered Nurse Anesthetist (CRNA)
Sara Maffit & Matthew Jones, Nurse Anesthesia
Poster Session
Faculty Advisor: Monika Feeney

The knowledge of the field of Anesthesia and the role of the Certified Registered Nurse Anesthetist (CRNA) was assessed by evaluating a questionnaire given to 42 senior Bachelor of Science in Nursing (BSN) students, at Missouri State University. Student knowledge was assessed prior to and following an educational presentation explaining the field of Anesthesia and the role of the CRNA. Students were provided education on the following topics: anesthesia care models, CRNA history, licensure requirements, education, training, scope of practice, and continuing education requirements. The mean assessment scores improved by 8.1% from pretest (74.3%) to posttest (82.4%). The results suggest that the students initially demonstrated a lack of knowledge regarding the field of Nurse Anesthesia and the role of the CRNA. The study demonstrated that post presentation, student knowledge improved. Further studies are needed using a larger population size and stronger study methods. Key Words: Nurse Anesthetist, CRNA, Scope of Practice, Practice Privileges, Anesthesia

MAGNETIC AND ELECTRICAL STUDY OF MULTIFERROIC HETERO-STRUCTURES
Ahmed Mahbub, Materials Science
Oral Presentation
Faculty Advisor: Kartik Ghosh

Multiferroic hetero-structures have been a major focus for researchers in the last couple of decades. Multiferroic structure or shortly known as MF structure consist of at least two materials with ferroic properties such as ferromagnetism, ferroelectricity, ferroelasticity. We have investigated the magnetic characterization of 0.5BZT-0.5BCT/CFO/LSMO ferroelectric-ferromagnetic hetero-structures. Pulsed Laser Deposition technique was used to deposit the thin films on LAO substrates. High purity La0.7Sr0.3MnO2, 0.5BZT-0.5BCT and CoFe2O4 targets were used. Purpose of using a CFO thin film between a ferro-electric BZT-BCT and ferromagnetic LSMO was to enhance the multiferroic effects between them. XRD analysis on different samples established the epitaxial growth of the thin films. TEM and SEM-EDS analysis provided the structural and elemental composition of the hetero-structure. Superconducting quantum interference device(SQUID) was used to perform temperature and field-dependent magnetic characterization. At room temperature, ferromagnetic hysteresis loop was observed. Presence of CFO increased the coercivity of the LSMO thin film which was one of the goals. In addition, We examined the ferroelectric properties of BZT-BCT using C-V characterization. A change in remanent polarization and coercive-field was observed.
**Gender Differences in Glucose Tolerance**  
Hailee Marino, Cell and Molecular Biology  
Poster Session  
Faculty Advisors: Jianjie Wang, Randi Ulbricht and Tyler Morris

The ability to clear glucose from the blood stream differs between genders due to differences in body-weight composition and hormones. In this study glucose tolerance test were performed in male and female C57BL/6 mice to assess the ability to tolerate exogenous glucose. Mice were fasted for 5 hours on the day of the experiments. Using blood from the tail vein, the blood glucose levels were measured under fasting conditions at 10, 20, 30, 45, 60, 75, and 90 minutes after dextrose administration. The dextrose (50% w/v) was injected intra-peritoneally at the dose of 2g/kg per body weight. The blood glucose levels were measured using a glucometer and blood glucose test strips. The peak of increased blood glucose levels appeared at 20 minutes following the administration of exogenous glucose for both females and males while the amplitude of the peak was greater in females (n=3) than males (n=3). The preliminary findings suggest differences in glucose tolerance between genders. The conclusion for sex-specific difference in ability to clear glucose from the pilot study remains to be confirmed by further experiments.

**Preferential Listening Levels and Sound Output as Observed for Different Transducers**  
Ellen Marolf, Audiology  
Poster Session  
Faculty Advisor: Thomas Franklin

Noise exposure is a common cause of hearing loss. Listening to music on a personal listening device is a recreational activity that has the potential to cause noise induced hearing loss. This study aimed to determine if the sound output levels for preferred listening levels differ when using different styles of transducers, and whether a certain style of transducer is more likely to cause noise induced hearing loss. Forty-five participants had their preferred listening levels measured using probe microphone measurements in a real ear environment while wearing three different styles of transducers: supra-aural headphones, insertion earphones, and anatomical insertion earphones. Results showed that all three types of transducers are capable of producing hazardous levels of sound, but on average the preferred listening levels did not reach a dangerous level of sound output. It is the listening habits of the individual that determines the risk causing hearing loss. In conclusion, further research is needed to determine how listening habits and environment affect the preferred listening levels for different transducers.
Conspecific Scent Trailing in Juvenile Cottonmouths (Agkistrodon piscivorus)
Chelsea Martin, Biology
Oral Presentation
Faculty Advisor: Brian Greene

In temperate regions where winter severity is high, and suitable hibernacula are rare, there are considerable survival advantages for neonate snakes to locate suitable hibernacula. In neonatal rattlesnakes, orientation and subsequent navigation to hibernacula been suggested to occur via scent trailing of conspecific chemical cues. We investigated the ability of 32 captive born juvenile cottonmouths (Agkistrodon piscivorus) to trail cutaneous cues from maternal and non-maternal conspecifics in y-maze trials. Juveniles showed a preference for the maternal cue arm compared to a blank control (P=0.01, n=16), but also preferred to trail cues from unrelated adult females compared to those derived from their own mother (P=0.04, n=16). Our results are consistent with reports of scent trailing in neonate rattlesnakes and suggest that juvenile cottonmouths also trail conspecifics to hibernacula. However, the apparent preference demonstrated by snakes in our study for nonmaternal cues has not, to our knowledge, been reported in snakes. Given that post-partum mother-offspring affiliations have been reported to occur in cottonmouth litters, an attraction of juveniles for non-maternal cues is not easily explained. Future research on this topic would be of interest to elucidate a possible cause.

Exploring the Relationship Between Word Overlap and Single Word Norms when Predicting Judgments and Recall
Nicholas Maxwell, Psychology
Poster Session
Faculty Advisor: Erin Buchanan

Previous work conducted on judgments of associative memory (JAM) has shown these judgments to be highly stable and that they generalize well across different contexts. In a pilot study, the JAM paradigm was expanded to include semantic and thematic judgments, and it was found that judgments and recall could be predicted by the three-way interaction between network norms. The present study seeks to replicate these interaction findings while also controlling for several types of single word norms. Additionally, this study seeks to explore which single word norms are the strongest predictors of judgment and recall ability. Overall, the interaction replications were partially successful., and consistent with previous findings, associative relatedness was the strongest individual predictor for both judgments and recall.
Implementing Routine PTSD Screening on Civilian Adults in a Free Primary Care Clinic with a Vulnerable Population
Vanessa McConnell, Nursing
Poster Session
Faculty Advisors: Kathryn Hope and Kathryn Patterson

There is a two-way relationship between socioeconomic status and mental health disorder. Mental health disorders lead to employment and income reduction, entrenching poverty, in turn increasing the risk of mental disorder. A large majority of the homeless population suffer from serious mental illnesses and substance use disorder. Many homeless individuals have an increase exposure to traumas, assaults, and lack personal safety. Without insurance many treat their mental illness with substances. Substance abuse leads to homelessness. PTSD is a mental health disorder resulting from witnessing or experiencing life-threatening or traumatic events. These events can cause one to relive the experience, thus causing a multitude of issues, resulting in PTSD. PTSD screening is lacking among civilians and in the primary care setting. The literature supports the need for identifying PTSD due to increase risk of suicide, inability to function in society, cope effectively, and/or hold down a steady job and household. Many patients are misdiagnosed, leading to unidentified PTSD, causing lack of medical and counseling interventions. When patients are not diagnosed or misdiagnosed, they continue to suffer with the encumbrance of feeling like a failure or something is wrong with them and no one will listen. Therefore, if PTSD screening is administered more patients will be properly diagnosed.

Survey of Arboviruses in Free-Ranging Cottonmouths (Akistrodon piscivorus) in Southern Missouri
Ciera McCoy, Biology
Oral Presentation
Faculty Advisors: Brian Greene and Christopher Lupfer

Four arboviruses, Eastern equine encephalitis (EEEV), Western equine encephalitis (WEEV), Saint Louis equine encephalitis (SLEEV), and West Nile Virus (WNV), normally infect avian hosts but can be transmitted to various other organisms through mosquito vectors. Although infection risks are low, each virus is capable of causing significant central nervous system disease in humans. Cottonmouths may serve as important EEEV reservoirs because of their high population densities and primary association with wetlands where EEEV prevalence is highest. Because cottonmouths occur in a variety of aquatic systems, we hypothesized that the proportion of infected snakes may be population-specific and correlated with mosquito density. To determine if habitat type influences the likelihood of infection, we examined arbovirus prevalence in free-ranging cottonmouths from contrasting habitats with different mosquito densities: an upland landscape and a lowland floodplain. We predicted that the individuals sampled from the swampy habitat would have the highest prevalence of arboviruses. Blood samples were taken from free-ranging cottonmouths in the spring and fall and analyzed for all four arboviruses using qualitative PCR. Preliminary results indicate that cottonmouths from a lowland floodplain habitat exhibit higher levels of arboviruses when compared to those from an upland landscape.
Further Characterization of the Skeletal Phenotype in IDUA-W392X Knock-in Mice as a Model of Mucopolysaccharidosis Type-1
Anna McWoods, Cell and Molecular Biology
Poster Session
Faculty Advisor: Amanda Brodeur

Mucopolysaccharidosis type 1 (Hurler syndrome) is a rare, autosomal recessive disorder caused by the deficiency in the lysosomal enzyme a-L-iduronidase (IDUA). Hurler syndrome is characterized by cognitive disabilities, hearing impairment, and organ enlargement. Additionally, patients exhibit degenerative joint disease and bone deformities. It is a progressive disorder that involves multiple organ systems and leads to early neurological decline and death in childhood, if not treated. To improve quality of life, there are therapeutic options available. Despite available treatments improving the majority of symptoms, there are minimal improvements in the bone phenotype. As a result, diagnosed individuals continue to experience disabling, painful bone disease that often requires intense surgical intervention. Our lab examines the bone phenotype using a knock-in mouse model, which has a nonsense mutation analogous to the human IDUA mutation. To better understand the physiochemical composition of the bone, collagen content of the Idua mouse model can be indirectly quantified using a hydroxyproline assay. The aim of this study is to gain a greater understanding of the bone phenotype seen in Hurler syndrome through this assay.

The assessment of behavioral syndromes within cottonmouth snakes (Agkistrodon piscivorus)
Joel Medley, Biology
Oral Presentation
Faculty Advisor: Brian Greene

Behavioral ecologists have traditionally assumed that populations adapt in response to environmental conditions with one or more optimal strategies. However, recent evidence has shown that individuals of many species possess behavioral tendencies that are consistent across situations and are therefore analogous to personality traits. These pervasive behavioral tendencies have been described as behavioral syndromes. These syndromes have been characterized in diverse taxa, including all vertebrate classes and many invertebrate animals. However, important basic information, such as the taxonomic scope of behavioral syndromes and their various ecological consequences, have yet to be adequately documented. The objectives of this study are to assess cottonmouth snakes for evidence of behavioral syndromes by evaluating the consistency of individual responses across three ecologically relevant contexts: foraging, defense against a predator, thermal preference, and optimal thermal performance, as well as determining if different physiological and genetic mechanisms affect the behavioral variations in individuals. To evaluate the presence of a behavioral syndrome, I will test an array of a priori hypotheses using structural equation modelling in combination with an information theoretic approach to model selection. Preliminary data suggests individual repeatability within foraging.
Habitat Preference and Nesting Success of the Barn Owl (Tyto alba) in Southwest Missouri
Samantha Meilink, Biology
Poster Session
Faculty Advisor: Janice Greene

The Barn Owl (Tyto alba) is a cavity-dwelling species and has been known to inhabit natural cavities as well as artificial ones, such as nest boxes. The Barn Owl has a global distribution and can be found as far north as British Columbia and as far south as South America. In the United States, they have an overall stable population; however, their populations have been declining locally as well as across Europe over the past few decades. In order to assist conservation efforts, land cover needs to be assessed in order to determine the best locations to place nest boxes. I sought to assess nesting success and whether land cover influences the presence or absence of Barn Owls. Nine nest boxes at 8 locations were set up in and around Bois d'Arc Conservation Area. The boxes were monitored from February to October 2017. Of the 9 boxes, 5 hosted a Barn Owl pair. Clutch size varied from 5 to 8 eggs, but, on average, only 4 per nest fledged. Using ArcGIS and aerial images from 2016 obtained from NAIP, I categorized the different land covers as: cropland, forest, grassland, hay, shrub land, water, urban, and barren. The composition of these 8 categories were analyzed to determine if any category or combination is an important factor for the Barn Owl.

Behavioral responses of cottonmouths to conspecific cloacal gland secretions
Alex Meinders, Biology
Oral Presentation
Faculty Advisor: Brian Greene

All snakes possess cloacal glands from which they secrete malodorous substances during predatory encounters. These secretions have been suggested to facilitate a variety of possible chemosensory communication functions. The two main hypotheses proposed for the function of snake musk gland secretions are predator deterrence and as a social alarm cue. However, experimental evidence addressing these hypotheses is limited. The recent discovery of cryptic sociality in pitvipers has sparked renewed interest in the alarm cue hypothesis. I tested the alarm cue hypothesis by examining behavioral responses of juvenile cottonmouths (Agkistrodon piscivorus) for evidence of threat sensitivity during both feeding trials and simulated predation events. Preliminary results are consistent with snakes being wary when exposed to musk as evidenced by increased defensiveness at lower predatory threat levels compared to control trials. Preliminary results from feeding trials are inconclusive. A palatability test on mammalian carnivores will also be implemented in order to test the predator deterrent hypothesis. These experiments are currently underway and the data from these will be presented when trials have concluded.
A Relational Dialectics Approach to the Identity Development of Millennial Mothers  
Shawna Merrill, Communication  
Oral Presentation  
Faculty Advisor: Jake Simmons

Relational dialectics theory (RDT) says that identities and relationships are formed within the context of competing discourses, or cultural systems of meaning. Identities are developed by relating to an Other, and cannot be conceptualized as solely one's own. The goal of this interpretive qualitative study was to identify competing cultural and relational discourses surrounding the identity of millennial mothers. This research posits that being a mother and a millennial is itself a contradiction, and explores the discourses within each identity marker. Additional tensions of authenticity vs. persona and connectedness vs. autonomy are discussed. Further, management strategies for competing discourses are identified, and finally implications for identity are discussed. This project also utilizes autoethnography to explore the researcher's own experiences of discursive struggle.

Promoting student success outcomes: A comparison of two methods for holding a transnasal endoscope during endoscopy  
Makensie Millar, Communication Sciences and Disorders  
Virtual Oral Presentation  
Faculty Advisor: Klaas Bakker

A position statement by the American Speech-Language-Hearing Association states that performing transnasal endoscopy is within the scope of speech-language pathologists (SLPs). A challenge facing SLP graduate programs is the dearth of research available on best practices for transnasal endoscopy. As a result, the need for experimentally-proven best practices on which to build training programs for students is of high priority. This study describes success outcomes associated with two methods of holding a flexible endoscope during transnasal endoscopy. Five SLP graduate students experienced in endoscopy performed the procedure twice on a typical, healthy adult using two different grip placements on the endoscope. The order in which different grip placements were used was randomized in order to reduce bias toward the placement used in the second pass. After each pass, data were collected regarding the success of the procedure in terms of time to visualization, student's comfort, student's perception of success, and the patient's comfort. Results from this study indicated that no significant differences in terms of success outcomes exist between the grip placements. However, results did demonstrate significant improvement in the time to laryngeal visualization between passes. Consequently, recent relevant experience had a greater impact on success than grip placement.

CLINICAL PROTOCOL FOR TINNITUS MANAGEMENT  
Christy Mitchell, Audiology  
Poster Session  
Faculty Advisor: Wafaa Kaf

Tinnitus is a subjectively perceived sound in the ears or head that affects many millions of adults. The diagnosis and management of tinnitus falls within the audiology scope of practice and audiologists are uniquely skilled to provide comprehensive services to those with tinnitus. Various tinnitus management protocols have been published and used clinically, but there is no standardization. The Missouri State University Speech-Language-Hearing Clinic (MSU SLHC) currently does not have a standardized and comprehensive protocol in place and would benefit from such a protocol. For this study, a search of electronic databases, peer reviewed journals, and various clinical reports between 1980 and 2018 was conducted to review and analyze the available tinnitus management protocols. The literature shows three broad treatment areas using hearing aids from six manufactures, sound therapy using several devices to mask, habituate, and/or neuromodulate tinnitus, and behavioral therapy with four schools of thought. Following published tinnitus guidelines and framework, this study designed a customized, best-practices protocol for clinical use.
Implicit Bias Impact Reduction in Law Enforcement Use of Lethal Force

Glen Moore, Social Work
Oral Presentation
Faculty Advisor: Kenneth Tombley

Existing literature and research indicates the presence of implicit bias, and the potential for problematic results. Although the extent of the issue goes beyond law enforcement, the potential for catastrophic results and a demand for positive changes makes this an area of vital importance. There are few research-based suggestions for use of force training as it relates to implicit bias. With this in mind, a quasi-experimental design was established using a computer simulation in order to determine whether a certain quantity of training exposures could lead to a reduction in implicit bias response. Cognitive stressors, congruent with law enforcement encounters, were included in the computer simulation. Analysis of variance testing was conducted on the resulting data, with p-values above 0.05. Due to the p-value results, the data collected was not statistically significant and the null hypothesis could not be rejected. These results were consistent with a very low sample size (n = 5), and further research with a larger sample size could prove beneficial.

The anti-nociceptive effect of matrine on paclitaxel induced myalgia in Sprague Dawley rats. A potential treatment for succinylcholine induced myalgia.

Jerrid Morris, Nurse Anesthesia
Poster Session
Faculty Advisor: Tracey Poston

Abstract  Background: Myalgia is an adverse side effect from administration of the neuromuscular blocker, succinylcholine. Aim of the study: This was a pilot study aimed to assess the anti-nociceptive activity of matrine, on myalgia-type pain in Sprague Dawley rats. We hypothesized that a single dose of matrine (40 mg/kg), would have a significant effect on Von Frey paw withdrawal frequencies and laser paw withdrawal times. Material and methods: This was achieved by dividing 20 rats into five experimental groups and inducing the myalgia with the medication, paclitaxel. Matrine was delivered as a subcutaneous injection for this experimental design. Von Frey and laser paw test were used to assess for changes in mechanical and thermal nociception. Results: Statistical analysis was performed using a SPSS statistical software and assessed for areas of significance less than or equal to 0.05. Treatment with a single dose of matrine (40 mg/kg) did produce significant changes in paw withdrawal frequencies with a p-value = .052, but did not produce changes in laser withdrawal times, with a p-value = 0.382. Conclusion: Matrine possess anti-nociceptive activity on mechanical pain, but not thermal pain, when delivered as a subcutaneous injection in Sprague Dawley rats.
Effects of Electrofishing on Behavior of Two Age-Classes of Endangered Hellbenders
Stephanie Morrison, Biology
Oral Presentation
Faculty Advisor: Alicia Mathis

Electrofishing is a common prescribed method of freshwater fish sampling. Although electrofishing has been shown to negatively affect some fish species, the effects on non-target species have not been well studied. The hellbender, Cryptobranchus alleganiensis (state and federally endangered), is a non-target species that could be affected during fish censuses. We tested effects of electrofishing on behavior of captive-reared hellbenders. Post-metamorphic juveniles (about 3 years old) were tested in the lab, with individuals in higher voltage treatments having a significant greater incidence of skin secretions and longer latencies to right, move, and touch a cover object. Subadults (about 6 years old) were tested in both a lab and a natural river habitat. In lab trials, there was a significant difference among treatments, with individuals showing a higher incidence of skin secretions and longer latencies to right at higher voltage treatments. In the river trials, shocked subadults also had a higher incidence of skin secretions than control individuals. Electrofishing may cause short-term negative effects on hellbender behavior.

Stop, Drop, & Occupational Role: Self-Identified Roles of Firefighters in Southwest Missouri
McKenzie Morrow, Holly Hambuchen, Kristy Teague, Chance Keith, Kristen Path & Ciara Eastwood, Occupational Therapy
Poster Session
Faculty Advisor: Ashlea Cardin

Negative mental health is a rising concern among firefighters across the United States; role conflict and role fulfillment issues may contribute to unhealthy emotional or behavioral well-being. Currently, there is scant literature examining the self-identified roles of firefighters or their perception of role fulfillment or role conflict. The purpose of this study was to gather the personal narratives of professional firefighters in an attempt to explore their perceptions of the roles they identify with as well as any role conflict and role fulfillment issues they may experience. Researchers conducted semi-structured interviews with 107 professional firefighters in Missouri. Interviews were transcribed and themes were extracted through thematic analysis. Participants identified 216 distinct roles, which were organized into five themes. Reports of role conflict and role fulfillment issues, in addition to perceived reasons for a lack of role conflict and role fulfillment issues, were noted. The results provide occupational therapists with new perspectives on the self-identified roles of firefighters in Missouri, allowing for improved client-centered care when working with this population. Role management may be a potential area for occupational therapists, in both consultant and direct practitioner roles, to assist firefighters in mitigating negative mental health symptoms.
Urban and agricultural land uses are important sources of nitrogen and phosphorus which, if in excess, can cause eutrophication in lakes and rivers. There have been few studies of nutrient transport and storage in karst spring and reservoir connected stream systems draining the Missouri Ozarks. This study aims to link the nutrient contributions of Sanders Spring to the South Dry Sac River in Springfield, Missouri during baseflow periods. The results of this study will help us better understand how groundwater and surface water are connected in karst systems and how nutrient transport is influenced in Ozarks watersheds. For each season, water samples were collected and analyzed for total nitrogen, total phosphorus, and several general water quality parameters. Discharge was also monitored at sampling sites using calibrated stage gages and one USGS station. Nutrient budgets were calculated for sample days and water budgets were calculated for each month. Results indicate that flow from Sanders Spring likely comes from diffuse groundwater sources. The Valley Water Mill Reservoir is primarily acting as a sink for nitrogen and sometimes as a source of phosphorus. Flow from Sanders Spring only reaches the South Dry Sac River during periods of high baseflow and stormflow. These results highlight that management efforts should be focused on controlling phosphorus and sediment inputs.

Validation of a method for administering the ankle-brachial index in a seated position in an outpatient cardiac rehabilitation setting
Clay Murphy, Erin Keethler & Kellie Stringer, Physical Therapy
Oral Presentation
Faculty Advisor: Marcia Himes and Jeanne Cook

The ankle-brachial index (ABI) is used to screen for vascular disease and reduced lower extremity circulation. Purpose: Validity of the ABI in a seated position needs to be determined in an outpatient cardiac rehabilitation setting. Methods: Systolic blood pressure measurements were taken in the upper and lower extremities on the left and right arms and legs in the supine position. Following a five minute break, the same measurements were repeated in the seated position. The supine ABI was calculated standardly and by using an equation from Gornik et al. (2008). Results: The ABI in supine was compared to the corrected ABI seated measurement. The ABI supine and seated measurements were differed statistically significantly. During a follow-up analysis, the average difference between the supine and seated measurements were calculated and found to be .20 of a point, which exceeded the minimal clinically important difference of .18, based on 15% of the pretest mean. A variable was recoded, the seated ABI scores were increased by .20, the results were statistically significant. Finally, a Spearman rho compared the adjusted seated and supine ABI ratios (rs = .70) and found no statistically significant difference. Conclusion: ABI measurements can be obtained in sitting, but the ABI ratio should be adjusted by .20 in order to be a satisfactory predictor when compared to the seated ABI.
Identifying Immune Response to WNS in a Resistant Bat Species (Eptesticus fuscus)
Keslie Naffa-Wack, Biology
Poster Session
Faculty Advisor: Tom Tomasi

Since its arrival in 2006, white-nose syndrome (WNS) has had a devastating impact on bat populations in North America. Bats affected by WNS appear to die of starvation, possibly due to the increased metabolic cost, and fat reserve depletion, from immune system activation. During hibernation, mammalian immune systems are generally suppressed; however, once they are exposed to the responsible agent of WNS, Psuedogymnoascus destructans (Pd), the immune system seemingly produces a partial response. However, not all bat species are susceptible to this syndrome. Big brown bats (Eptesicus fuscus) have experienced relatively little mortality since the WNS debut, raising the question of how/if their immune system combats this pathogen. To investigate whether infected bats change their use of energy (fat), bats were inoculated with Pd and meloxicam (an immune suppressor). Metabolic rates (MR) were measured as O2 consumption during torpor, and arousals were monitored via temperature-sensitive dataloggers. Results for MR and torpor/arousal patterns are currently being analyzed. With this research, we hope to obtain a better understanding of energy expenditure in WNS-resistant bat species to compare to WNS-susceptible species and contribute to the conservation of susceptible bats as the disease continues to spread west.

Installation and geomorphic effects of engineered log structures for channel restoration in a Missouri Ozarks river
Joe Nash, Geospatial Sciences in Geography and Geology
Oral Presentation
Faculty Advisor: Robert Pavlowsky

Engineered log structures (ELS) composed of local tree logs have been installed previously in river channels in the Pacific Northwest as a restoration technique. However, ELS have not been tested for use in the Ozark Highlands. In October 2016 the U.S. Forest Service installed ELS at four sites to stabilize banks along the North Fork of the White River in Ozark County, Missouri. The purpose here is to report on monitoring efforts during and after construction and to assess geomorphic responses to three floods. Over a ten day period in April 2017 there were two bank-full floods, and on April 30, 2017 the largest flood of record occurred with a stage of 42–45 ft. Post-flood assessments show: (i) two ELS sites were buried by several meters of bar sediment from widespread gravel splay deposition; (ii) fluvial wood pieces in the channel doubled from 101 pieces in 2016, to 210 pieces in 2017 in the 700 m long study reach, (iii) the thalweg moved to the opposite side of the channel during the flood; (iv) two ELS sites trapped fluvial wood and enhanced sedimentation along banks; and (v) cable tie-downs are needed to secure logs since burial anchoring is limited due to shallow bedrock typical for Ozark rivers. ELS practices offer benefits to improve channel stability and enhance habitat, but more work is needed to identify the most effective designs and locations for deployment.
**Palliative Care in the Nurse Anesthesia Curriculum**  
Shannon Nguyen, Nurse Anesthesia  
Poster Session  
Faculty Advisors: Monika Feeney and Tracy Beckham

Current population trends show an aging population with an increase in chronic illness. Growing needs for palliative care could potentially benefit from anesthesia services. Education for specialized pain control for both providers and patients can improve patient quality of life. Historically nurse anesthesia programs do not include palliative care in the didactic curriculum. The study design included: pre-testing to assess base knowledge, educating registered nurses in the inpatient setting on a medical oncology unit with a presentation and a handout, and post-testing demonstrated and increase in knowledge. Nerve blocks and continuous catheter techniques could also benefit patients with intractable pain. Nurse anesthesia education should include palliative care techniques in the didactic curriculum. Keywords: palliative care, nurse anesthesia, nerve block, learning style.

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**Exploring the Impact of Exercise on Mental Health in College Students**  
Samantha Nickel, Social Work  
Poster Session  
Faculty Advisor: Qiang Chen

Exercise has been a focus of research as a mental health intervention as physical activity has shown to have a multitude of benefits for people struggling with mental health symptoms. This study has collected information on the following themes that are identified in the literature review: 1) social interaction and building a support system, 2) creation of a sense of meaning, purpose, and achievement, 3) improvement of mental health symptoms, 4) creation of a sense of identity, and 5) improvement of physical health. A survey was created through ‘Qualtrics’ and emailed to students at a Midwestern University. The survey collects demographic, exercise, and mental health information as well as a quantitative information about the themes mentioned above. The majority of respondents are female college students between the ages of 21-25 that are in their second year of their social work degree; these women work out about two days a week on average and mainly experience anxiety symptoms. All themes were present in the study as impacting mental health symptoms. Overall, exercise can have a positive impact as an intervention for those with mental health symptoms.
Role of RAD4 in DNA Repair and Its Interplay with Tetrahymena thermophila’s Telomeres
Emily Nischwitz, Cell and Molecular Biology
Poster Session
Faculty Advisor: Joshua J. Smith

Telomeres are repetitive parts of the genome that act as a protective end cap to the chromosomes, and help protect the integrity and stability of the entire genome. Telomeres are so critical to the overall integrity of the genome that ensuring they are properly repaired is crucial. One repair protein that has been understudied at the telomeres is Xeroderma Pigmentosum C (XPC), which plays a part in recognizing damage in the nucleotide excision repair pathway (NER). Due to the high amount of thymines found in Tetrahymena thermophila’s telomeres (GGGGTT), they are more susceptible to thymine dimers, which must be repaired by nucleotide excision repair. Much of the pioneering work for telomeres has been conducted in ciliates, and specifically in Tetrahymena thermophila, which makes this organism ideal for telomere repair studies. To further understand the interplay, RAD4 knockdown strains were established alongside a DIG-labeled probe telomere detection assay. This detection assay will be used to study the telomeres in the presence and absence of RAD4, and will help begin to elucidate their relationship.

Validation of the PLAIN Assessment: Focus Group Implementation
Logan Noe, Elizabeth Gannon, Breanna Green & Hannah Nabors, Occupational Therapy
Poster Session
Faculty Advisor: Ashlea Cardin

This project sought to increase content validity of the Promoting Life-Balance After Identification of Needs (PLAIN) Assessment (Carnes, Ivie, Wilbert, & Cardin, 2016) and contribute to the discussion of evidence-based occupational therapy practice in Plain communities. Plain communities encompass Amish, Amish-Mennonite, and Mennonite groups. Version 1 of the PLAIN Assessment used a top-down approach focusing on an individual's occupational performance. Informed by pilot results (Carnes et al., 2016), student researchers created Version 2 of the PLAIN Assessment, which used a bottom-up approach focused on biomechanical factors. Version 2 was divided into four sections: structures, occupations, performance skills, and a fill-in-the-blank sentence to identify the individual's primary occupational performance concern. A Bishop from a local Plain community assisted with the project, leading a focus group to gather perceptions of both Versions. Focus group participants preferred Version 2 based on its biomechanical approach, visual appeal, and comment boxes. Feedback from the targeted population identified relevance and acceptability of Version 2, which contributed to the tool's content validity. This project contributed to evidence-based occupational therapy practice by emphasizing cultural sensitivity and supporting the call for rigorous tool development by the profession.
Petrology and Geochemistry of the Bearwallow Mountain Andesite, Mogollon-Datil Volcanic Field, New Mexico
Conor O'Dowd, Geospatial Sciences in Geography and Geology
Oral Presentation
Faculty Advisor: Gary Michelfelder

The Mogollon-Datil volcanic field (MDVF) in southern New Mexico, is the result of punctuated volcanism and the transition between arc and rift magmatism. This project addresses the Bearwallow Mountain Andesite (BWA), to understand the petrogenesis of intermediate composition lava flows erupted from the MDVF and understand the petrologic conditions which allowed the transition between rhyolite dominated volcanism to intermediate composition volcanism. Studies on MDVF intermediate composition rocks are lacking and have yet to be integrated into the volcanic history of the MDVF. This study will review volcanism in western North America and test the hypothesis that basaltic magma rose through deep conduits, enabled by crustal extension, to produce the abrupt change in volcanic lithology from ignimbrites to basaltic andesites. We will test this hypothesis by determining whole-rock and mineral elemental compositions of BWA lavas.

Age modification of inflammation-induced hyporetinolemia in rural Zambian children
Sakinya Palakurthi, Public Health
Poster Session
Faculty Advisor: Maxwell A.Barffour

Vitamin A deficiency, defined as serum retinol concentration < 0.7 µmol/L, is associated with increased morbidity and mortality in children. In settings with a high burden of infections, the assessment of vitamin A status is complicated by the inflammation-induced hyporetinolemia, defined as the reduction in plasma or serum retinol concentrations during inflammation. We assessed potential age modifying effects on the associations between serum retinol and C-reactive protein (CRP) or a1-acid glycoprotein (AGP) using baseline data from Zambian children participating in a pro-vitamin A maize efficacy trial. Linear regression models with retinol as outcome were used to estimate the significance of age-CRP and age-AGP interaction terms. 974 children aged 43-104 mo. were assessed. Mean serum retinol concentrations (1.00 ±0.28 µmol/L) decreased significant with increasing CRP concentrations (β=-0.097; p<0.001) but not AGP (β=-0.05; p<0.356). The magnitude of the decline was age-dependent for CRP (P for interaction=0.078) but not AGP (p for interaction=0.398). The decline in retinol per unit rise in CRP were -0.06 (p<0.001), -0.06 (p<0.001), -0.05 (p<0.001), -0.04 (p<0.01) and -0.01 (p=0.635) in children aged 60, 60-71, 72-83, 84-96 and ≥96 months respectively. Our data suggests that the decline in retinol during the early stages of inflammation is age-dependent.
Factors Impacting the Grieving Process of Parents of Children With or Without Hearing Loss
Jenna Parrott, Communication Sciences and Disorders
Poster Session
Faculty Advisor: Christopher Craig

While it is generally understood that hearing parents who have a child with a hearing loss may experience some variation of a grieving process, it is equally important to understand the nature of this process for Deaf parents who have a child who is hearing. The purpose of this research is to investigate the professional literature and to gain insights from direct interviews with families to determine factors of grieving of Deaf parents with a child who is hearing. As a result of completing the above qualitative data collection procedure, it was determined that Deaf parents who have a child who is hearing included in the interviews did not experience the same process of grief as the hearing parents included in the study who have a Deaf child. Preliminary findings from this very limited sample size suggest that experiences of the Deaf parents are much more positive. The results of this preliminary study points to the need for further investigation of this important topic of inquiry.

The Feasibility of Rainy Day Funds as a Municipal Fiscal Strategy
Erin Parsons, Public Administration
Oral Presentation
Faculty Advisor: David Johnson

Budget stabilization funds, also commonly known as rainy day funds (or RDFs), are funds set aside by governments during strong economic times as a way to ease the financial burden of weaker economic times. By the end of 2015, most states had adopted some variation of a rainy day fund. Literature exists regarding state funds, but there is a noticeable lack of discussion of whether the same or similar strategies will work on a local level. This paper analyzes the structure of RDFs and compares aspects of state and local governments to propose that it is feasible to apply the evidence obtained from state analyses to the local level.

Who Uses the Career Center? A Pilot Study about the Users
Jennifer Patillo, Student Affairs in Higher Education
Oral Presentation
Faculty Advisor: Keri Franklin

The purpose of this study is to understand the reasons students use a career center at a large public comprehensive institution with a student population of 24,000. The participants consisted of students and alumni who came to the career center in spring 2018. At the completion of a career center session a survey was administered. In addition, one-on-one exit interviews were conducted with ten participants. The explanatory sequential design (Creswell, 2015) was used and the survey data was examined using correlations and cross-tabulations in Excel. The qualitative data will be analyzed using open coding (Strauss and Corbin, 1990). This research informed programmatic changes in the Career Center and improved their ability to collect reportable student information.
Novel colorimetric ligand for the detection of silver (I)
Leanna Patton, Chemistry
Oral Presentation
Faculty Advisor: Eric Bosch

Silver is increasing in commercial uses from antimicrobial fabrics to catalysis of common chemicals such as antifreeze, but with this increase come environmental concerns. When silver is not removed from wastewater before reentering the environment, it can lead to the death of aquatic microbes, algae, and fish. The detection of silver in wastewater is important for proper wastewater treatment and confirmation of successful water treatment. The best indicators are colorimetric, as these provide clear results, do not require additional instruments to read, and can therefore be implemented even in low-budget or technologically limited situations. We describe the multistep synthesis of a novel bidentate bipyridyl ligand. The ligand is designed to specifically bind silver (I), palladium (II), and platinum (II) cations with concomitant formation of a distinct visible color change.

Dietary Inclusion of Enriched Chicken Bone Broth Prevents Trigeminal Sensitization from Early Life Stress
Orion Peterson, Biology
Virtual Oral Presentation
Faculty Advisor: Paul Durham

Exposure to early life stress (ELS) has been associated with development of chronic pain conditions, including migraine, a prevalent neurological disease involving trigeminal nerve sensitization and activation. Chicken broth is used in many cultures to alleviate pain and speed recovery. The goal of my study was to examine the effects of ELS and enriched chicken bone broth (ECBB) on nociception in adolescent rats. Male rats were subjected to stress (swimming) and housed in proximity to breeding rats, pregnant rats, and weaned offspring. Changes in basal nociception in offspring was measured by head withdrawal response to mechanical stimulation. To mimic migraine pathology, some offspring were exposed to a pungent odor known to cause activation of trigeminal nerves. While no differences in basal nocifensive response was observed in male offspring, exposure of these animals to the pungent odor caused an increase in sensitivity that was inhibited by ECBB. In females, ELS resulted in greater basal sensitivity and increased nociception when exposed to the pungent odor. However, ECBB was sufficient to suppress basal and stimulated nocifensive responses. Results from my study provide evidence that dietary inclusion of ECBB prevents development of a sensitized trigeminal system by ELS, and thus should be beneficial as a non-pharmacological therapeutic option for managing migraine.
Molecular Dynamics (MD) Study of Creep Deformation in Nickel-based Superalloys
Sabila Kader Pinky, Materials Science
Oral Presentation
Faculty Advisor: Ridwan Sakidja

We initiated a development of a reliable creep model for Nickel based Superalloys. We investigated the roles of the strengthening agents inside Ni based superalloys, void dynamics to initiate creep mechanism by means of MD simulations, leading to creep ruptures. The role of grain boundary and the aggregation of voids to the deformation process and creep is discussed.

Perspectives Toward Recycling Within Audiology
Sydney Plummer, Audiology
Poster Session
Faculty Advisor: Abdullah Jamos

Plastic is frequently used in the production of single-use objects, especially in the health care field. Some findings conclude that plastic has detrimental downfalls, many associated with pollution after the object is no longer used. It has been suggested that health care providers increase their awareness of environmental impact, and consider what environmental effects their clinical practices may have. Many single-use plastic items are used in audiology, presenting audiologists with the opportunity to consider a reduction in their environmental impact. This study focuses on the analysis of practicing audiologists and Doctor of Audiology students’ personal and professional perspectives regarding recycling and environmental impact through the use of an anonymous 11-question online questionnaire administered through Qualtrics. The current study seeks to answer three research questions. Firstly, what are individual's attitudes toward recycling? Secondly, do individual's attitudes toward recycling differ between geographical regions? Finally, do individual's recycling perspectives differ between audiology practice settings? Data collection is currently in progress and will be complete and ready for presentation by May 2018.

Not Every Dream is a Nightmare; Not Every Nightmare is a Dream.
Neal Polallis, Visual Studies in Art and Design
Performance Presentation
Faculty Advisor: Sarah Williams

My current research examines the altered state of existence, a schizophrenic experience. When the person with schizophrenia suffers a psychotic break or the disease has progress to a certain point they can experience hallucinations, which can be auditory, visual, or both. Through my experience working in an Inpatient Psychiatric Unit and a family member of someone with the disease I have observed and interacted with people in this state of mind. Their reality at this point can be pleasant at times, but for others it is a nightmare. Either way, they are occupying two worlds. Using computer software, I combine photography, printmaking and drawing to create images, which explore the chilling loneliness, confusion and the darkness this world seem to hold.
Interactive Metronome®: Effects on Handwriting Assessed by the Evaluation Tool of Children’s Handwriting

Ashton Pratt, Katherine Cederberg, Sarah King & Tara Mueller, Occupational Therapy
Poster Session
Faculty Advisors: Sapna Chakraborty and Ashlea Cardin

Background: The purpose of this study was to determine if the Interactive Metronome® (IM) is a viable OT intervention for children with handwriting deficiencies. Methods: A single subject pre-/post-test study design was used. The study included six children (N=6; female, n=2; male, n=4) aged seven to twelve years of age. Handwriting performance, in terms of legibility, was tested using the Evaluation Tool of Children’s Handwriting (ETCH) before and after 12 IM sessions. Results: Statistical analyses were performed to compare the pre-/post-test ETCH legibility scores with the IM scores using Cohen’s d with a Dunlap correction. A small effect size was found for word (dc= .099), letter (dc= .0211), and numeral (dc= .069) legibility. Task averages for the IM generally declined over the course of the treatment for all participants. Conclusion: The results of this study suggest that, although there were improvements in IM scores, the IM intervention did not have a significant impact on handwriting legibility. Further research is needed to determine if the IM is a viable OT intervention for improving handwriting performance.

Development of multi-component EAM potential for Ni based Superalloys

Muztoba Rabbani, Materials Science
Oral Presentation
Faculty Advisor: Ridwan Sakidja

We initiated the development of multi-component EAM potential for Ni-based Superalloys. The goal is to utilise the MD simulation to further understand the deformation dynamics that contributed to the formation of voids and creep initiation. For this purpose, we constructed the raw data from ab-initio (molecular dynamics) MD simulations fed into the potential development code and used Nickel as the based metal with addition of a number of various elements including Aluminium, Chromium, Tungsten. We tested the deformation onto a model system of a single crystal and polycrystalline Superalloy. We gratefully acknowledge the support from DoE’s NETL (DE-FE0031554) and the computing support form NERSC.
Trauma Informed Care: Foster Parent’s Understanding of the Impact of Trauma on Foster Children
Chelsea Rainey, Social Work
Poster Session
Faculty Advisors: Michele Day and Qiang Chen

The purpose of this study was to survey individuals who had just completed their foster parent classes to determine if they were able to identify potential behaviors rooted in trauma and if they felt comfortable to handle the behaviors. The key sections within this study focused on trauma facing foster children, the impact of trauma on foster children, foster parents and current child welfare training, and trauma-informed care training for foster parents. The design of this study was a one-group posttest only design. The participants were recruited from a local foster care agency. The individuals were given a survey with ten questions that were a mix of qualitative and quantitative questions. This study had a sample size of eight. The results of the study showed that overall foster parents who had just complete their foster parent classes, felt that they were ready to take in foster children. From the results gathered, it is important to be aware of the fact that 100% of the participants did not currently have foster children in their care and 87.5% of participants had never had foster children in their care. When focusing on further research, it is important to gather information from agencies who specialize in trauma-informed care and compare the results to agencies that do not specialize in trauma-informed care.

Nurse Anesthesia Standards of Care: Informed Consent
Kris Rauchle & Ivan Kozhulenko, Nurse Anesthesia
Poster Session
Faculty Advisors: Tracy Beckham and Tracey Poston

There are eleven Standards of Care for Nurse Anesthetists. Informed consent for anesthesia care is one of the Standards of Care which student nurse anesthetists should understand and adopt early in their educational process. Through a video-based learning approach, both correct and incorrect examples of obtaining informed consent were demonstrated. The anesthesia provider (student or Certified Registered Nurse Anesthetist) and the patient engage in a patient-centered discussion to explore patient needs, expectations, preferences, and fears. First and second year Nurse Anesthesia students at Missouri State University completed a survey after viewing the informed consent video. The post survey results indicated an increase in knowledge regarding the informed consent process Standard of Care. Key Words: video-based learning, informed consent, nurse anesthesia practice, standards of care, anesthesia, anesthesiology
Collegiate Athletic Trainers Show Knowledge of the National Athletic Trainers' Association Consensus Statment on Psychological Concerns.

Haley Reiff, Athletic Training
Poster Session
Faculty Advisors: David Carr and Tona Hetzler

Context: Mental illness is on the rise. It is crucial athletic trainers (ATs) have the knowledge to recognize possible psychological concerns. However, it is unknown if ATs have knowledge of best practices outlined in the National Athletic Trainers' Association (NATA) Consensus Statement on Psychological Concerns Objective: Examine the knowledge of current collegiate ATs regarding the NATA Consensus Statement on Psychological Concerns Design: An online survey was distributed to 1000 randomly selected collegiate ATs via the NATA member database. The survey consisted of 23 true/false questions with a series of 4-point Likert scale items to assess self-confidence of each true/false response Setting: Online Qualtrics survey Patients of Other Participants: One hundred seventy-eight collegiate ATs completed the survey. These participants were recruited based on inclusion criteria of being a collegiate certified athletic trainer Main Outcome Measures: An ANOVA was conducted to assess raw scores of the survey and the overall confidence score of participants Results: Analysis found that there was a non-significant (p=.117) correlation between scores based on gender. Results also revealed roughly half (48%) completed psychologically related CEU courses, but that did not impact their score Conclusion: Collegiate ATs show knowledge of the Consensus Statement with an average 72% correct.

Sediment Budget Approach to Evaluating Legacy Deposits on Missouri Ozark Floodplains

Katy Reminga, Geospatial Sciences in Geography and Geology
Poster Session
Faculty Advisor: Bob Pavlowsky

Hydrologic disturbances due to land use and climate effects can disrupt river form and increase sediment transport. Ozark streams have been affected by accelerated sediment delivery and gravel bar deposition since early European settlement in the late 1800’s. However, the fate of fine-grained sediment released by historical soil and channel erosion and its potential for storage in floodplain legacy deposits has not been addressed. Big Barren Creek watershed (191 km2) drains the Salem Plateau in the Ozark Highlands of southeastern Missouri. It is hypothesized that episodes of legacy deposition may have occurred within this region in association with periods of (i) widespread logging of pine forests (1880-1920) and (ii) stream channelization for flood control along bottomland segments since 1960. Further, stratigraphic indicators will be used to create a sediment budget framework to identify historical sediment storages and evaluate the impact of recent channelization on the geomorphic stability of the headwaters of Big Barren Creek. Floodplain samples within the channelized segment will be analyzed for sediment texture, organic matter, Cs-137, magnetic susceptibility, and to assess buried soil and root crown elevations. Preliminary Cs-137 results from floodplain cores indicate post-1963 sedimentation rates of 0.28 cm/yr and 0.5 cm/yr for upper and middle Big Barren respectively.
Geomorphic effects of prescribed burning on headwater stream channels in Mark Twain National Forest, Missouri
Grace Roman, Geospatial Sciences in Geography and Geology
Poster Session
Faculty Advisor: Bob Pavlowsky

Mark Twain National Forest in the Missouri Ozarks has recently been using prescribed burning practices to manage forest resources and help restore shortleaf pine-oak woodlands. However, there are concerns about the effects of prescribed burning on runoff, sediment, and stream conditions in headwater watersheds. Despite this, there has been little work done to assess the effects of prescribed burns on headwater streams. The purpose of this thesis project is to compare geomorphic characteristics among headwater streams with varying prescribed burn frequency, including unburned stands, within the Big Barren Creek Watershed (190 km² drainage area). The watershed consists primarily of national forest land with 26% of the land being privately owned. A combination of LiDAR data, field measurements, and laboratory evaluations will be used to analyze (i) channel form; (ii) soil properties; and (iii) tree/down wood composition in headwater stream channels. Previous research in the Big Barren Creek watershed showed small differences in soil and forest characteristics between burned and unburned stand. This study hopes to quantify the geomorphic effects of prescribed burns, if any, on channel form and ecological conditions to improve our understanding of fire management on fluvial systems and to assist managers in evaluating fire management effects.

The Relationship Between Social Worker Burnout and the Use of Mobile Technology
Ryan Ropp, Social Work
Poster Session
Faculty Advisor: Ken Tombley

Burnout is a well-established area of concern among human services professions with evidence calling for the need of formal assessment tools in the early 1980’s. The contributing factors to burnout produce poor professional quality of life and poor service delivery at micro, mezzo, and macro levels within the field of social work practice. Therefore, triggering vast amounts of research indicating that burnout is a concern for social workers. This quantitative exploratory study investigated how mobile technology contributes to burnout within the social work profession. Ninety-three individuals participated in the exploratory survey which included the Copenhagen Burnout Inventory and self-designed questions measuring burnout factors related to mobile technology. The Copenhagen Burnout Inventory was selected as a standardized instrument to compare burnout levels to burnout factors related to mobile technology. No significant relationship was found between mobile technology and burnout. However, individuals who scored higher on the burnout inventory showed meaningful trends of burnout symptoms associated with use of mobile technology within the social work profession.
Influence of neighborhood history on metal concentrations in roadside soils, road dusts, and stream sediment, Springfield, Missouri
Kelly Rose, Geospatial Sciences in Geography and Geology
Poster Session
Faculty Advisor: Robert Pavlowsky

Urban watersheds can be exposed to toxic concentrations of metals in stream sediments and soils due to releases from past chemical applications and industrial emissions. Neighborhoods established before the 1980s are likely to be higher in Pb contamination due to leaded gas emissions and industrial activity. It is considered unsafe for human exposure if soils in residential areas contain >1,200 ppm lead (Pb). Soil Pb concentrations of 400 ppm within children’s play areas pose a risk to the central nervous system and brain development in children. This study assesses Pb, and Zn, levels in roadside soils and road sediments in Springfield, Missouri. Sampling was stratified between two neighborhoods, an industrial area, and three streams. These areas were established at different times and had varying levels of traffic use. An XRF analyzer was used to measure heavy metals, and LOI was used to measure organic matter. Both road soil and sediment samples were collected from each urban site. The highest concentration detected was 1,677 ppm Pb in a soil sample located along a commercial strip on the edge of the older neighborhood along a major road. Only two soil samples from the old neighborhood and none from the newer area exceeded the 400 ppm Pb limit which suggests a minimal health risk among the sites evaluated.

The Association Between Nonverbal Communication Sensitivity and Communication Apprehension in the Recently Certified Athletic Trainer
Jessica Rosenberg, Athletic Training
Poster Session
Faculty Advisors: David Carr and Tona Hetzler

Context: Recent research has shown employer’s dissatisfaction with newly graduated athletic trainer’s communication skills. A large portion of communication is based on nonverbal behavior; therefore recent graduates may be experiencing communication apprehension that is negatively affecting their nonverbal communication sensitivity. Objective: Explore the association between nonverbal communication sensitivity and communication apprehension in recently certified athletic trainers. Design: Non-experimental. Participants: Thirty recently certified (within the last 3 years) athletic trainers. (Male = 11, female = 19; age = 22 + 1.07 years). Intervention(s): Participants completed the Mini Profile of Nonverbal Sensitivity (MiniPONS) and the online Personal Report of Communication Apprehension (PRCA-24). Results: The results showed no significant association between nonverbal communication sensitivity and communication apprehension despite a weak positive correlation between increased communication apprehension and increased nonverbal sensitivity accuracy. Across the board, females were better able to recognize all forms of displayed nonverbal behavior than males in the MiniPONS. Conclusions: More research is needed in order to determine the association between communication apprehension and nonverbal communication sensitivity.
Functional Movement Screen (FMS): At-Risk Variables
Julia Roundtree, Athletic Training
Oral Presentation
Faculty Advisors: David Carr, Brandon Hetzler and Allan Liggett

Purpose: This study identified the number of asymmetrical scores, scores of 1, or scores of 0 (collectively termed as “at-risk variables”) within each FMS to include valuable information overlooked by the total composite FMS score in an attempt to utilize the information gathered by the FMS in a new way. Methods: Secondary data was compiled to determine the total composite FMS scores and their “at-risk variables” as well as the gender and age of each subject. This data was correlated to identify possible correlations. Results: pending Conclusions: pending

Family Stability and the Wraparound Process
Amy Sandell, Social Work
Poster Session
Faculty Advisors: Qiang Chen and Kenneth Tombley

Children's System of Care provide a strengths-based collaborative approach to reducing risks to children with behavioral health needs and involvement with child serving systems. Research points to these processes as helpful to families in establishing a sense of control over services and allowing them to feel empowered and achieve stability. The research study presented seeks to evaluate a system of care program which provides wraparound services, family and youth supported events, opportunities for families to become advocates, and education/training courses. Through qualitative and quantitative data collection, this study evaluates the effectiveness of intervention strategies, advocacy skills, and task completion to measure participants' stability and sense of empowerment. Family Empowerment Scales (FES) and caregiver completed surveys were used in combination with chart reviews to discover elements that work best to help caregivers experience success as evidenced by their child's ability to reduce incidences of entry into treatment homes, acute hospitals, foster care, and juvenile detention centers. Ten participants were interviewed. The highest correlation were found between family empowerment and task completion and stability and family empowerment. The results of this program can help in the development of future programs aimed at increasing advocacy skills and stability

Increasing Alligator Snapping Turtle Head-starting Success Through Captive Housing Enhancement
Kristen Sardina, Biology
Oral Presentation
Faculty Advisor: Day Ligon

The decline of Macrochelys temminckii populations throughout their range has spurred conservation efforts to head-start hatchlings, making them less susceptible to mortality after release. Studies have shown that growth rates of captive M. temminckii at Tishomingo National Fish Hatchery are lower than that of released individuals; however, the underlying cause of retarded growth in captivity is unknown. To determine whether suboptimal indoor housing conditions could slow growth, we divided 300 juvenile M. temminckii into four groups. Each group was given a different combination of cage enhancements: (1) a control group with submerged structures that mirrored past housing conditions, (2) floating mats simulating vegetation mats, (3) shade cloth simulating overstory canopy, and (4) both floating mats and shade cloth. Our trial lasted 7 weeks. The association of M. temminckii with flotant structure and overstory canopy are well established, but we found that only floating mats significantly increased growth rates, while canopy did not. Our results will be used to enhance husbandry conditions in head-start programs for the species.
Genetic Diversity of a Black Walnut Orchard and Development of a Mapping Population

Steven Schneider, Plant Science
Oral Presentation
Faculty Advisors: Chin-Feng Hwang and Li-Ling Chen,

Eastern black walnut (Juglans nigra L.) production stands on the brink of potentially great market expansion that can only be realized if tree improvement increases such that commercial production becomes feasible. Breeding black walnut for thinner shell, disease resistance, and predictable nut yield are just three of the many agronomically important traits that could be improved using marker-assisted selection (MAS). The goals of this study was to incorporate microsatellite markers to characterize (genotype) 11 cultivars and establish a mapping population from a cross between 'Football' and 'Sparrow' (Ft x Sp). Phenotypes of these two cultivars coupled with marker characteristics and phylogenetic analysis support the notion of a cross between these two to yield superior hybrids. Of the 51 simple sequence repeat (SSR) markers screened, 23 were polymorphic and useful for genotyping. A synonym was identified, and the final number of cultivars is now 10. Furthermore, seven of the 23 markers were used to identify 61 infraspecific hybrids of the cross Ft x Sp, thereby establishing the first mapping population of black walnut using SSR markers.

What are the Factors that Contribute to the Positive Outcomes of Youth who Experience Foster Care?

Nathan Seagrave, Social Work
Poster Session
Faculty Advisors: Michele Day and Qiang Chen

The hope is that all individuals will be raised in families where both biological parents are present and the children are not subject to circumstances of abuse and/or neglect. Unfortunately, this is far from reality, especially for youth in foster care. It is my purpose within this study to explore factors that contribute to the positive outcome of youth who experience foster care so that they are able to have a successful and positive transition into adulthood. The research was done with a qualitative focus and was carried out through interviewing the direct care workers who operate in the daily milieu of youth in foster care. The direct care workers contribute to the protection, education, and individual growth of each youth in care. Through transcribing and synthesizing the interviews, two factors were found that have an impact on the successful transition of youth from foster care into adulthood. One factor was that the individuals responsible for the youths care both perceived and believed that the youths were competent and capable of success. The second factor was the level of resilience within the youth. The conclusion that can be drawn from this research is that these youth have a natural ability to withstand hardship and rise above it, if their environment is rich with individuals who believe in their ability to become a unique and successful contributors to society.
Levels of Professional Stress in Missouri State University Sport Coaches
James Seratt, Health Promotion and Wellness Management
Poster Session
Faculty Advisors: Melinda Novik, Wayne Mitchell and Riley Galloway

Purpose: The purpose of this research was to determine levels of professional stress in Missouri State University sport coaches. Methods: This research utilized a Composite Stress Survey, a survey of the researcher's own design, developed by borrowing items from previously existing stress surveys. Forty-two MSU varsity sport coaches were invited, via email, to participate in this survey. Surveys were administered on-line, via surveymonkey.com, and sum score results were exported into SPSS for analysis and review. Responses were analyzed via multiple t-tests, comparing the mean scores for male versus female coaches along multiple categories, as well as between two of the source surveys. Results: Of the 42 coaches invited to participate in the survey, 19 coaches responded. With the exception of one category (over 40 years old), male coaches exhibited higher mean scores than did female coaches, as well as overall mean scores. Discussion: Overall, male coaches exhibited higher mean scores than did female coaches, indicating higher levels of professional stress. Both male and female coaches exhibited sum scores that fell within the "moderate" level of professional stress, suggesting that although MSU sport coaches are subject to stress, the levels thereof are not as high as what might be imagined, given the level of competition MSU sport coaches participate at.

SERS Detection of Photocatalytic Reduction-Oxidation in DNA-Bound Methylene Blue on a Plasmonic Nanostructure
Muhammad Shattique, Materials Science
Oral Presentation
Faculty Advisor: Maria Stepanova

Nano-biological systems interfacing solid nano-structured surfaces with biological compounds such as oligonucleotides or proteins are highly regarded as enabling materials for biosensing and biocatalysis applications. We developed a conjugate nano-biological system interfacing plasmonic gold nano structures with thiolated single-stranded DNA carrying an important reduction oxidation indicator, methylthioninium chloride, also known as methylene blue. Using surface-enhanced Raman spectroscopy, we have detected characteristic bands of DNA-bound immobilized methylene blue in sub-monolayer quantities. We also have detected reversible reduction-oxidation of methylene blue during laser excitation of the samples at neutral pH, in the absence of electrodes or chemical agents. Such bio-conjugate architectures may be useful to conduct future research on reduction-oxidation processes involving DNA-bound compounds on nanostructured plasmonic substrates.
Investigating the protein recruitment mechanism of dynamin-like Vps1
John Short, Biology
Oral Presentation
Faculty Advisor: Kyoungtae Kim

Intracellular membrane trafficking requires classical dynamins and dynamin-like proteins (DLPs), ubiquitous throughout the eukaryotic domain. Dysfunction of classical dynamins in humans is linked to Alzheimer’s and other neuropathies. Loss of ortholog yeast DLP Vps1 disrupts pathways of vesicle trafficking, which we use to investigate gene function. In vitro assays have shown that Vps1 interacts directly with membrane to exert its membrane-remodeling power. However, the molecular signal for the recruitment of Vps1 to target membranes has not been described. To investigate, genetic variants of Vps1 were N-terminally fused with mRFP and overexpressed in wild type (WT) and vps1? background with genomically-tagged GFP membrane-associated protein markers, and examined by confocal microscopy for colocalization. The Vps1 variants were sets of domain fragments alone and in combinations, serially shortened C-terminal truncations, and selected point mutations at suggested binding sites, which would reestablish or abolish Vps1 recruitment and function. Results showed that all tested variants abolished the normal phenotype, and no tested point mutations caused abnormality, suggesting that the fully-formed 3D shape with its intact catalytic and polymerization domains is essential to its ability to target membranes. Further structural analysis will narrow down possible binding patches.

FISH COMMUNITY ASSEMBLAGES IN THE OZARKS OF SOUTHERN MISSOURI
Stephanie Sickler, Biology
Oral Presentation
Faculty Advisor: Sean Maher

There are several potential mechanisms regarding fish community assembly, many of which can be related to habitat type. Basin and stream order can be important because some species are restricted to specific basin and some fish are only found in streams of certain sizes. Surrounding land use is another likely mechanism in structuring fish communities as it impacts stream habitat structure and water quality. We sought to assess the mechanisms of fish community assembly by comparing fish diversity in southwest Missouri, specifically asking 1) are fish communities structured by basin, 2) are they structured by stream order, and 3) how does land use at different spatial scales affect assemblage structure? We sampled 44 streams in the summer 2016 using a combination of seines and electroshocking. A total of 58 species were collected, including hornyhead chubs and duskystripe shiners that were found only in specific drainages, and smallmouth bass and striped shiners that were found in all three basins. Bray-Curtis distances between sites were calculated and used to determine whether the assemblages were structured by basin, stream order, land use, or a combination of these mechanisms.
The Morphological and Transcriptomic Impact of Silver Quantum Dots in Arabidopsis thaliana During Early Development

Natalie Smith, Biology
Oral Presentation
Faculty Advisors: Laszlo Kovacs and Alexander Wait

The use of engineered nanomaterials (ENMs) is exponentially increasing, but their ecological impact remains poorly understood. The impact of ENMs in plants is concerning since plants represent a likely route through which ENMs can enter the food chain and accumulate in higher biological systems. A phenology- and gene expression-based bioassay was developed to determine phytotoxicity of ENMs in plants. The assay utilizes Arabidopsis thaliana exposed to low concentrations of silver quantum dots (AgQDs) from germination through 14 days of growth. Phenology data across a concentration gradient was performed to determine toxicity threshold. RNA-seq and RT-qPCR validation at sub-lethal concentrations determined gene expression. Phenology data show a phenotype that has not before been reported in association with AgQD exposure where the rosette leaves of Arabidopsis are translucent green. This phenotype has been previously described to have association with the transcription factor Translucent Green and the aquaporin gene TIP 1-1. RNA-seq analysis revealed 674 differently expressed genes in response to AgQDs, but did not include Translucent Green and TIP 1-1. RT-qPCR experiments validated the RNA-seq results, but did not validate the involvement of these genes with the translucent green phenotype. Further experiments are being performed to determine the source of this phenotype.

Is Prone Lying the Best Self Stretch Position for Preventing a Hip Flexor Contracture Following a Transtibial Amputation? A Pilot Study Comparison.

Jennifer Smith & Lauren Kelley, Physical Therapy
Poster Session
Faculty Advisors: Jason Shaw, James Hackney and Sean Newton

Purpose: It is common to teach individuals following transtibial amputation to regularly lie prone to prevent a hip flexion contracture, which limits walking with a prosthesis. Pelvic tilt motion (PTM) is known to affect hip angle measurement. The Modified Thomas Test (MTT) controls for PTM while measuring hip extension joint range of motion (ROM). No studies have compared the MTT to prone lying (PL) while accounting for PTM as part of the hip angle measurement. The purpose of this pilot study was to determine if goniometry is a reliable tool for measuring hip extension joint ROM in PL and the MTT positions, and to compare hip joint angle measurements between the 2 positions. Methods: Nine participants with intact lower limbs were measured in PL by 6 raters and in the MTT position by 6 different raters, all blinded to each other's results. Results: An intraclass correlation coefficient demonstrated excellent intrarater reliability for MTT (.898) and PL (.986) measurements. Mean hip extension joint ROM was 9.8 degrees greater in the MTT position (p=0.0004). Conclusions: Goniometry is a reliable method for measuring hip extension ROM in the MTT and PL positions, and the MTT position may allow for greater hip extension ROM in healthy individuals. Future studies should compare hip extension ROM measurements in these 2 positions in individuals with transtibial amputation.
Does Rater Experience Affect Total Scores on the Functional Gait Assessment?
Andrea Sosa, Megan Barnes, Alyssa Heinsohn & Cody Spencer,
Physical Therapy
Poster Session
Faculty Advisors: Barbara Robinson, Marcia Himes and Jason Shaw

Introduction: The Function Gait Assessment (FGA) is a commonly used measure of postural stability for older adults. The FGA is a reliable and valid test of balance when scored by experienced physical therapists and physical therapy students with training in the management of individuals with vestibular disorders. Purpose: The purpose of this study was to determine if rater experience affects FGA scores when testing community-dwelling older adults. We hypothesized that there would be a significant difference between FGA scores as scored by experienced physical therapists (Expert PT Raters) and novice physical therapy students (Novice SPT Raters). Methods: Twenty-three individuals who were 55 years or older, with no history of neurological disorders, and well controlled chronic medical conditions participated. All participants completed two trials of the FGA, were guarded by an experienced physical therapist and video recorded. Two Expert PT Raters and three Novice SPT Raters scored the videos. Results: The correlation between each rater pair was good to excellent with a range of r = .809 to r = .939. A paired samples t-test compared the sum of Expert PT Raters with the sum of Novice SPT Raters. Expert PT Rater scores were not significantly different from Novice PT Rater scores. Conclusion: Rater experience did not significantly affect the FGA total score.

Narratives of Loss.
Carla Stine, Visual Studies in Art and Design
Performance Presentation
Faculty Advisor: Sarah Williams

My research revolves around impermanence, loss, and the grief that accompanies loss. My thesis work consists of digital collages interlaced with short stories, an interactive digital media piece, traditionally-made paper collages, a picture book, art objects, and an assortment of other supporting work. My ultimate aim is to employ both traditional techniques and digital skills to create visual narratives that supply glimpses into my personal history of loss and that speak to life's brevity.

ANALYSIS OF NEW GRAPEVINE VEIN CLEARING VIRUS ISOLATES
Li Su, Plant Science
Oral Presentation
Faculty Advisor: Wenping Qiu

Grapevine vein clearing virus (GVCV) is found in Missouri and causes economic losses. To study the function of each region on GVCV genome and improve the diagnosis of this virus, two new isolates of GVCV were sequenced. The two isolates have 99.8% identical nucleotide sequence, thus are considered as the same strain although they were isolated from two plants in different genera of the Vitaceae family. The conserved domains, secondary structure of leader RNA, and phylogenetic relationship were predicted among seven isolates. The results provide new evidence that GVCV spreads across plants in different genera. Thus, it is urgent to take measures for preventing virus spread.
Morphological Characteristics used to identify Container-Breeding Mosquitoes of the Ozarks
Sapana Subedi Chowi, Public Health
Poster Session
Faculty Advisor: David Claborn

In 2016, Zika became a nationally notifiable condition in the United States. It has led to an increased interest in surveillance of mosquito vectors, especially in under surveyed states like Missouri. This study provides information regarding the distribution and abundance of mosquito species that are present within the state. Mosquito larva were collected from artificial containers across the state, mostly south of Missouri river. They were grown to maturity in the laboratory then identified using standard dichotomous keys and morphological characteristics. An AmScopeTM MU 500 microscope camera was used to photograph important morphological characteristics. Three of the most common mosquitoes which are potential vectors of several human diseases caught in the study are: Aedes albopictus, Aedes japonicus and Aedes canadensis.

Chemical imaging of diamonds by ToF-SIMS
Tyler Sundell, Geospatial Sciences in Geography and Geology
Oral Presentation
Faculty Advisor: Gary Michelfelder

Diamonds are the only unaltered mineral from the mantle. This chemical resistance of diamond allows an in-situ study of the diamond source region within the mantle. Many studies define the mantle terrane sourced in each diamondiferous deposit. However, the spatial resolution and analytical precision for such a study require scientists to use a handful of labs around the world. This study evaluates Time-of-Flight Secondary Ionization Mass Spectrometer (ToF-SIMS) for the first steps of developing a new methodology in the stable isotope analysis of diamond. We used five diamonds from the Northwest Territories of Canada (Diavik mine) and one from Murfreesboro, Arkansas. Diamonds from the Diavik mine have published high spatial resolution data showing intracrystalline d13C variability. Five diamonds from Diavik were used as a control for evaluating the accuracy of ToF-SIMS analysis. Diamonds from Arkansas have no known high spatial resolution data. The Murfreesboro diamond was used as an unknown. Evaluation of the ToF-SIMS data includes the possibility to convert spectral intensity to chemical information, quality of spatial resolution, and application of chemical imaging to characterizing intracrystalline variation. We conclude that ToF-SIMS is a valuable chemical imaging technique due to its ability to analyze a region for the entire periodic table with 2 μm spatial resolution.
The Advocacy Coalition Framework: Mineral Extraction Policy in the Appalachian Region of West Virginia
Hannah Sybert, Public Administration
Oral Presentation
Faculty Advisor: David Johnson

Resource extraction is a prevalent policy area that continues to garner attention in today’s political climate. Policies of this nature can fall into the broader realm of environmental policy, and in the United States specifically, are subject to much disagreement. In the Appalachian mountain region of West Virginia, resource extraction policy is highly contested, but even with its controversial nature, is still very dominant in the state. The question is, how do these policies continue to prevail although they constantly experience significant pushback from coalition groups in the region? This paper will attempt to examine this question in more depth by analyzing the perceived success and failure of competing coalition groups through the use of the Advocacy Coalition Framework (ACF). This theoretical framework will attempt to assist in identifying key factors that attribute to the formation, learning, and organization of rival coalition groups in the Appalachian area of West Virginia, and how they have affected policy change.

Cost Effectiveness between Certified Registered Nurse Anesthetist, Anesthesiologists, and Anesthesia Assistants Post Affordable Care Act Implementation, A comparison study
Bryan Taylor & Charles Hallacy, Nurse Anesthesia
Poster Session
Faculty Advisors: Monika Feeney and Barbara Skibiski

Anesthesia providers in the US function under several care models. Anesthesiologist and Certified Registered Nurse Anesthetist (CRNA) can work independently or together in care teams. Anesthesia assistants (AA) can work under an anesthesiologist. All of the models are dependent on the scope of practice of each states professional regulations. In 2010 a study was presented comparing the cost-effectiveness among anesthesia providers. The study was performed before the implementation of the Affordable Care Act. In 2017 the same study was performed and was compared to the original study. The findings revealed that when it comes to the cost of education among the non-physician providers, the nurse anesthesia has a longer program by 2-3 months over the anesthesia assistant. However, the nurse anesthesia programs are still less costly by 20,000 dollars. When comparing the cost-effectiveness of providing anesthesia in the operating room between the pre and post implementation of the Affordable Care Act, the overall profit margin decreased significantly by a range of 33% to over 1000% after the implementation. The CRNA only model remained the most profitable with having the least profit decrease compared to the other anesthesia models. Key Words: Nurse anesthesia, anesthesiologist, anesthesiology assistant, labor statistic, reimbursement, payments and anesthesia subsidy
Increased forward lean as a result of aging, coupled with spinal curvature abnormalities, has been associated with increased risk of falls. However, accurate measures of cervical, thoracic, and lumbar curves analyzed in conjunction with forward lean and compared to fall risk outcomes assessments, such as the Timed Up and Go (TUG) have not been studied. The purpose of this study was to examine the relationship between spinal measures and increased fall risk among community-dwelling older adults. Participants were recruited from a community senior center. Spinal posture was measured using the Mid-Sagittal Contour Gauge (MSCG). Participants also completed the TUG. Forty-four older community-dwelling older adults were included in the study (mean age 71.5 years). A bivariate correlation with significance set at $p < .05$ (SPSS 24) was used to analyze the data. An increased Sagittal Index (SI) from the MSCG was positively correlated with increased TUG time ($r = .351, p = .019$) and vertical lean approached significance ($r = .294, p = .052$). The results indicate that community ambulating older adults with a higher SI, indicating increased variance of posture from the ideal, have a higher risk of falls. However, forward lean was not significant in this population of participants.

A semi-automatic leukocyte tracking (SALT) method for analysis of leukocyte rolling and adhesion in vivo.

Spencer Thomas, Cell and Molecular Biology
Oral Presentation
Faculty Advisor: Jianjie Wang

Leukocyte recruitment, rolling, and adhesion are hallmarks of inflammation. Traditionally, leukocyte tracking is accomplished by manual frame-by-frame analysis of time-lapse images. This method is time consuming, cumbersome and introduces bias. The aim of the project was to create a fully integrated semi-automatic leukocyte tracking (SALT) method for the quantification of leukocyte rolling and adhesion in vivo. Using the customized SALT module, leukocyte detection and leukocyte tracking was performed based on input criteria. Leukocyte flux, rolling, and adhesion were then quantified from leukocyte tracks based on a conditional decision algorithm. SALT data was validated by comparing data from Independent analysis and data obtained from the classical manual leukocyte tracking technique. The novel SALT method exhibited high inter-rater and intra-rater reliability for rolling velocity with no significant differences being observed ($P>0.05$). Correlation of SALT and ground truth measurements also revealed a strong correlation between manual measurements and SALT measurements for leukocyte displacement and velocity ($r = 0.96, r = 0.97; P<0.001$), total and rolling flux ($r = 0.81, r = 0.89; P<0.05$), and adherent cells ($r = 0.97, P<0.001$). Thus, the SALT technique will be implemented in the future, in the hope to eliminate subjective bias and increase high-throughput leukocyte analysis.
What Works? Civilians Working with Service Members in Therapy  
Shelby Thompson, Social Work  
Poster Session  
Faculty Advisor: Rose Korang

The structure of today’s U.S. military in utilizing voluntary workers, as opposed to the historical recruitment method using mandatory draft applicants, has expanded the diversity and uniqueness of today’s service members and the problems they face. This study utilized in-depth interviews to identify key catalysts and barriers that are important to both civilian practitioners and treatment-seeking service members in making their therapeutic relationship efficient and effective, specifically in mental health settings. Participants from both groups identified both barriers and catalysts that impacted mental health treatment involving service members and civilian practitioners. Key barriers identified were: lack of practitioner knowledge/competence of service-related impactors, access issues, conflicting values and beliefs about treatment, and treatment avoidance. Key catalysts identified in this study were: practitioner competence/knowledge of military culture and service-related issues and practitioner authenticity and transparency. The researcher compared the findings to past research with the goal of helping agencies that serve our military population in establishing best practices and practitioner trainings.

THE AUDITORY EFFERENT SYSTEM INVOLVEMENT IN SPEECH UNDERSTANDING IN NOISE  
Chelsea Tisckos, Audiology  
Poster Session  
Faculty Advisor: Abdullah Jamos

Objective: The current study investigated the relationship between contralateral distortion product otoacoustic emission (DPOAE) suppression and levels of difficulty understanding speech in noise (SIN). Methods: The study was conducted on 62 ears of normal hearing adults in the age range of 20 to 40 years old. SIN understanding was measured using recorded W-22 words in noise. SIN difficulty level increased with each list using different speech-to-noise ratios: +5, 0, and -5 dB. DPOAEs were recorded with and without contralateral broadband noise (CBBN). The suppression effect for each frequency was considered the difference in DPOAE amplitude recorded with and without CBNN. Results: The current study found significant suppression at 1500, 2000, and 3000Hz. In frequencies with significant suppression, the average reaction in DPOAE amplitude ranged from 0.7 - 1.05 dB. However, the present study did not identify a correlation between DPOAE suppression and speech understanding in noise. Conclusion: For now, the clinical significance of MOC reflex measurements remains yet to be translated to a real-world clinical and diagnostic setting. Future studies may want to take into account both perceived and measurable SIN deficits.
ESL Students' Comments on Teacher's Written Corrective Feedback in Freshman Composition  
Dung (Davy) Tran, English  
Oral Presentation  
Faculty Advisor: Yili Shi

This study explores ESL (English as a Second Language) Students' comments on teacher's written corrective feedback in freshman composition classes to find out whether they think positively about the feedback and how they perceive the power relationship with the teacher. First, the literature is reviewed in terms of definitions and types of written corrective feedback, arguments and pedagogical implications in giving written corrective feedback, teacher-student relationships based on written corrective feedback and the framework of critical discourse analysis. Second, the methodology includes the research design, the information regarding 13 participants who are ESL students in my freshman composition classes as well as the process of collecting data. Next, the results are detailed in light of 3 questions the participants are asked to answer. The discussion then reveals that all of them think highly of the effectiveness of the feedback, and most of them view the teacher as a person of great power. They appreciate the feedback tremendously and many of them intend to make changes based on those feedback.

Single Leg Power Symmetry in a Broad Jump  
Nicholas Van Valkenburg, Athletic Training  
Oral Presentation  
Faculty Advisor: Allan Liggett

OBJECTIVE: The purpose of this study is to identify and establish if there is symmetry or asymmetry in a single leg broad jump in healthy subjects. PARTICIPANTS: Healthy individuals were selected to participate in this research study. Participants age range vary from 18-35 years old. DESIGN: Inclusion criteria for this study demonstrate no medical history that would impair the participant's ability to perform the test as well as report no current restrictions from a physician. Once participants agree to be a part of the study each read, understand, and sign the consent form and demographic form. After this process, the participants undergo a warm-up before the broad jump testing. The broad jump testing consists of single leg jump off one leg while landing onto both. Participants hold the landing while the assessor takes the reading. There are three total jumps on each leg and the best score is taken from each for further analysis. RESULTS: The results are pending due to further data analysis in healthy subject scores and recruitment of more participants able to perform the study.
Salience of factors influencing undergraduate major selection: A mixed methods pilot study into career development
Maxwell Wagner, Student Affairs in Higher Education
Poster Session
Faculty Advisor: Keri Franklin

The purpose of this pilot study is to ascertain the salience of various internal and external factors influencing undergraduate major selection through an online, cross-sectional survey. The participants consisted of 50 undergraduate students in multiple sections of a 100-level career exploration class at a large, public comprehensive institution in the Midwest in March 2018. An explanatory sequential design (Creswell, 2015) was used and survey data was examined using open coding (Strauss & Corbin, 1990) and grounded theory (Glaser & Strauss, 1967; Charmaz, 2010) to identify themes in open-ended responses and utilizing the cross tabs tool in Campus Labs to examine correlations across demographic variables and calculate simple statistics (e.g. percentage of respondents). Results included revealing the most salient factors influencing the major selection process of current undergraduate students, insight into students’ perspectives on this dimension of career development, and identified additional factors to explore in a larger scale study being conducted in Fall 2018. This study is contributing to the research literature and is useful in combination with institutional data to help students succeed in college-to-career transition.

Reflection and evaluation of pre-service teacher preparation programs on teaching LGBTQ high school students
Megan Walcher, Educational Leadership
Oral Presentation
Faculty Advisor: Steven Jones

The purpose of this study is to explore how LGBTQ issues are being addressed in teacher preparation programs and to reflect on self practices regarding these issues before finally proposing suggestions for programs. Two science teachers within the first five years of teaching reflected on issues in their classrooms regarding lesbian, gay, bisexual, transgender and questioning students and issues to see how they had handled them, and how they could improve their practices in the form of a duo ethnography. They wanted to find out how prevalent these issues are in schools, how teacher preparation programs are addressing these issues, and learn some best practices for handling LGBTQ issues in the classroom. Teacher preparation programs are evaluated and then suggestions are made for future schools creating or adapting their curricula.
Effect of Practicing with External Feedback Device on Lower Extremity Biomechanics during Drop Jump
Clinton Wallis, David Smith & Jade McFarland, Physical Therapy
Oral Presentation
Faculty Advisor: James Hackney

Research shows high external knee flexion and valgus moments contribute to non-contact anterior cruciate ligament (ACL) injuries and patella-femoral pain in youth athletes. We designed a feedback device intended to help young, healthy people learn movement patterns to help decrease the knee moments that predispose athletes to these injuries. Participants were 21 healthy, young adults; a control group, and two exercise groups who did jumping and bounding four times per week. One exercise group used the device for the exercises; one group did the same exercises without the device. We tested each group before and after a four-week training period; and compared the pre-test and post-test difference for each group’s data for knee/hip flexion moment ratio and the knee valgus moment using 3-dimensional optical motion capture with two force plates. The knee/hip flexion moment ratio increased in all groups, which was opposite of what we hypothesized. There were no significant differences for the effect of exercise or the device on knee valgus moment; p = .92 between the device group and exercise group, and p = .22 between the device group and control group. These results do not support our hypotheses. However, all participants performed the exercises independently. It is possible that feedback is needed when using the device in order to change lower extremity movement patterns.

Effect of media on college students' suicidality and depression: The impact of 13 Reasons Why
Kalah Webb, Social Work
Poster Session
Faculty Advisors: Qiang Chen and Michele Day

Purpose: This study aimed to explore the impact the media has on suicide and depression on college students while specifically focusing on the show 13 Reasons Why. The hypotheses for this study are that the impact of the show is not as significant as the critics of the show believe and the show will have a greater impact on female viewers since the show revolves around the suicide of a young female. Method: This study administered an anonymous online survey through Qualtrics in which 33 surveys were included in the final analysis. Results: Nearly two-thirds of the participants in this study have suffered from depression and one third have had suicide ideology at some point in their lives which indicates that depression and mental health are major concerns for this population. Responses additionally indicated that the impact of this show was not as negative as critics believe. Implications: The media may potentially be a vital tool in spreading awareness about mental health professionals should be aware of this possibility.
Exploring Athletic Identity among College Athletes and The Effects of Different Competing Pressures on the Athlete
Staci Wickersham, Social Work
Poster Session
Faculty Advisor: Michele Day and Qiang Chen

The purpose of this study is aiming at furthering the knowledge of the social work profession in regards to Sports Social Work. A look at collegiate athletes and their perception of their athletic identity in respects to an injury is valuable when looking at the holistic view of the individual. A mixed methods design is implemented in this study utilizing the Athletic Identity Measurement Scale (AIMS) for information derived from quantitative research along with two open-ended questions. The sample of student-athletes came from the Mid-American Association in Track and Field Division II. Forty athletes participated in the study, and eight of the forty athletes had been injured during college that resulted in a medical redshirt season. Out of the eight athletes who had experienced a medical redshirt season, all eight athletes answered in the survey that they were depressed at the time of the injury. The physical injury that resulted in depression needs to be factored into the holistic view of the individual. This allowed significant results directed towards the continuation of research in Sports Social Work. For further research on athlete identity perception, more athletes in different educational levels such as high school, college, and professional athletes should be considered.

A Low-Water Crossing Impacts Longitudinal Movement Behavior of Two Fish Species in an Ozark River
Jeff Williams, Biology
Oral Presentation
Faculty Advisor: Debra Finn

Streams are complex networks that rely on connectivity to maintain natural function. The Current River, in Ozark National Scenic Riverways (OZAR), contains one low-water crossing that spans the main channel and a side channel, potentially disrupting longitudinal (upstream/downstream) movement of fishes. In July 2017, we tagged Northern hog sucker (N=50) and Knobfin sculpin (N=300) above/below the crossing and follow their movements monthly to determine potential impacts of the crossing on the movement behavior of a larger, stronger swimming species (sucker) and a smaller, weaker swimming species (sculpin). After nine months of the year-long study, suckers (N=3) moved only downstream-to-upstream and sculpins (N=10) only upstream-to-downstream through the culvert-lined crossing. Suckers below the crossing exhibited eight times greater mean movement than suckers above. On average, suckers moved away from the crossing with suckers below the crossing making larger downstream movements (1650m) than upstream (368m) and suckers above making larger upstream movements (217m) than downstream (34m). Sculpins showed opposite trends with mean movement above the crossing twice that of sculpins below the crossing. All sculpins, on average, exhibited two times greater downstream movement than upstream movement. Results from this study will help inform future management decisions in OZAR.
Geomorphic Relationships Between Stream Channel Form and Drainage Area in the Salem Plateau of the Ozark Highlands  
Daniel Williams, Geospatial Sciences in Geography and Geology  
Poster Session  
Faculty Advisor: Robert Pavlowsky

Watershed managers need to understand the hydrological and geological processes that shape river systems. However, most stream channels are not monitored or specifically mapped. Therefore, tools are needed to predict the size, shape, and behavior of stream channels in different ecoregions. Regional “regime” equations that predict channel characteristics based on the size of contributing drainage area have been developed for use in other regions, but not the Ozarks Highlands. The purpose of this study is to quantify and evaluate relationships between drainage area and geomorphic variables for streams in the headwaters of the Meramec and Black River basins along the western edge of the Ozark Dome in southeast Missouri. Cross-sectional stream channel surveys were completed for 39 sites along 17 streams. Regime equations were developed using regression analysis that describes the relationship between drainage area and channel width, average depth, width/depth ratio, cross-sectional area, and wetted perimeter. The channel relationships developed for the Ozarks will be compared to other sets of regime equations from other US regions.

SYNTHESIS, CHARACTERIZING, AND COMPARING AMMONIUM/PHOSPHONIUM CHITOSAN DERIVATIVES FOR INVESTIGATIVE DNA INTERACTIONS  
Quinton Wyatt, Chemistry  
Poster Session  
Faculty Advisor: Reza Herati

Chitin and chitosan are naturally abundant and renewable polymers that have excellent properties such as biodegradability, biocompatibility, non-toxicity, and adsorption. Due to its favorable physical and chemical properties, chitosan has been used in a vast array of widely different products and applications, ranging from biomedical and cosmetic products to water treatment and plant protection. However, chitosan is only soluble in acidic aqueous solutions. The aim of this work was to modify chitosan to improve its water solubility and to make it an effective vector for the purpose of gene delivery. More specifically, in this work, we have synthesized chitosan derivatives containing cationic groups for effective interactions with biomolecules as well as chitosan derivatives containing both cationic groups and poly(ethylene glycol) to improve its cellular uptake and its cytotoxicity. The chitosan derivatives made in this work have been characterized by IR and H NMR spectroscopies. The derivatives have also been characterized in terms of their ability to complex with DNA. Synthesis and characterization of these polymers and their interactions with nucleic acids will be outlined in this presentation.
The Effects of Sound Acclimatization on Acceptable Noise Levels in Males
Andrew Yenish, Audiology
Poster Session
Faculty Advisor: Thomas Franklin

Acceptable noise level (ANL) is a measurement of a person’s willingness to listen to recorded speech in the presence of background noise (BNL). A listener’s most comfortable listening level (MCL) is first established and BNL is introduced and increased until the ANL is established. This study focuses on an analysis of the effect of 15 minutes of loud noise stimulation, speech babble presented at 75 dB HL, on ANLs. Participants included twenty-six men with normal hearing from the Springfield community. Overall, ANLs were not significantly changed after loud noise stimulation. MCLs levels were significantly higher after loud noise stimulation. Knowing the effects of loud noise stimulation on ANLs and MCLs will contribute to further knowledge of hearing aid adjustments and fittings.

The Effect of Phosphorus Fertilization on Leaf Macronutrient Concentration of Winter Annual Cereal Grains
Taylor Young, Plant Science
Oral Presentation
Faculty Advisor: Will McClain

Missouri ranks #2 in cow-calf production, and forages play a vital role in the health and productivity of these animals. In many of these farmlands, soil is acidic and low in plant available nutrients. Proper soil fertility is important for adequate growth of plants grown for forage to ensure sufficient nutrient levels in leaf tissue for animal consumption. A common perennial forage, tall fescue, has been shown to respond to increased soil phosphorus (P) levels with increased growth and leaf concentrations of P, calcium (Ca), magnesium (Mg), and potassium (K). It is unknown if annual forage crops will respond similarly. The objective of this study is to examine annual forage crops, grown over winter for early spring forage production, and their response to different soil P levels. Oat (Avena sativa), winter wheat (Triticum aestivum), and cereal rye (Secale cereale) were planted in the fall at the MSU Shealy Farm and harvested the following spring. Treatments of 0, 25, 50, and 100 lbs/acre P were applied in early winter. This study was set up in a randomized complete block design with three replicate blocks for each species. Dry weight yield was obtained, and leaf nutrient concentrations were determined. Overall, P applications did not affect forage yield in all three species, but did improve P concentrations in the leaf tissue of all species compared to the untreated controls.

Nintendo Wii Fit and sEMG Muscle Activation
Timothy Younker & Darryl Mitchell II, Physical Therapy
Poster Session
Faculty Advisor: Sean Newton

The Wii Fit has become a popular tool in the rehabilitation of older adults with strength and balance deficits. Therefore, we used surface electromyographic (sEMG) muscle activity of the rectus femurs (RF) and the biceps femurs (BF) during various Wii Fit games. Hand-held dynamometer was used to measure effort during maximum voluntary contraction (MVC). Twenty-three healthy adult subjects between the ages of 21 and 31 were used. Surface EMG electrodes were placed on the subjects’ RF and BF and then a three-trial average MVC was calculated using the EMG. Subjects performed two minutes of activity on six different Wii Fit games while muscle activity was recorded using the EMG. Muscle activity generated during these games was expressed as a percentage of the subjects MVC. The RF and BF were both most active during the Hula Hoop game generating 14.6% and 13.0% of MVC, respectively. The six Wii Fit games used in this study yielded fairly low sEMG activity of the RF and BF. This research will provide clinicians guidance on which Wii Fit activities would best facilitate rehabilitation goals. Further research is needed using an elderly population and to assess sEMG activity of these muscles and other lower extremity muscles during training with Wii Fit activities to maximize rehabilitation goals.
Building an Object Recognition Robot-Model with Deep Neural Networks  
Junya Zhao, Natural and Applied Science  
Poster Session  
Faculty Advisor: Jamil Saquer  

Object recognition is a process for identifying a specific object in a digital image or video. Its algorithms rely on learning and matching using different machine learning techniques. This research builds a robot car for recognizing objects based on deep learning which is widely used nowadays for image recognition applications. To get a training data set, we utilized Google Images to find over 1000 images and trained the learning model. In order to build the physical body of the robot car, we use a raspberry pi 3 Model B to implement the operating system, an Adafruit Motor HAT to dive the car, and an Arducam add-on mini camera module to get the image data. Images are passed to a deep learning model that uses a deep convolutional neural network implemented using TensorFlow. In real life, this robot can be used in classifying different traffic signs for car navigation purposes.

A Computational Data-driven Model to Discover the Genotype to Phenotype Relationships in Autism Spectrum Disorders  
Junya Zhao, Natural and Applied Science  
Poster Session  
Faculty Advisor: Tayo Obafemi-Ajayi  

Autism Spectrum Disorder (ASD) is characterized by impairments in social communication and restricted or repetitive behavior or interests. Phenotypic heterogeneity could be one phenomenon complicating identification of genetic factors. We hypothesized that subgrouping individuals with ASD using different behavioral and biomarker data would create more genetically meaningful phenotype definitions. Previous studies have used specific ASD phenotype measures to obtain binary subgroups based on level of ASD severity. In this model, we use a multidimensional approach based on six specific ASD phenotypes to cluster a set of 500 ASD probands. Using a data-driven model, validated by rigorous statistical measures, we are interested in detecting genotype markers (Single Nucleotide Polymorphism(SNPs)) that are significantly associated with the derived ASD phenotypic subgroups. The data analyzed in this study were obtained from the Simons Foundation Autism Research Initiative (SFARI) – Simon’s Simplex Collection (SSC). The hypothesis is that this data-driven cluster analysis of phenotype and genotype data will provide a better understanding the complex issue of ASD phenotypic heterogeneity and identify etiologically meaningful subgroups that can be used for further ASD genetic studies.