undergraduate & graduate
RESEARCH SYMPOSIUM
2022
Welcome to Angelo State University’s
Fall 2022-Undergraduate and Graduate Research Symposium
Friday, November 18, 2022
CJ Davidson Conference Room, Houston Harte University Center

Schedule of Events

Poster Session.......................................................noon – 1:30 pm

The Undergraduate and Graduate Research Symposium is coordinated by the Office of
Research and Sponsored Projects

Dr. David Bixler, Dean, College of Graduate Studies and Research
Elizabeth Randell, Director of Student Research
Jan Heinen, Assistant Coordinator
Table of Contents

Did PPP Loans Effect Executive Compensation ................................................................. 3
Ease-y Money?: Evaluating the Environmental Protection of the Tax Deduction for Conservation Easements ......................................................................................................................... 3
The Connections Between Blockchain Cryptocurrencies and the Stock Market .............. 4
A Survey of the Parasites of Freshwater Turtles in the Concho Valley .............................. 4
Reevaluating the subspecies designations of Bewick’s wrens in Oklahoma, New Mexico, and Texas ........................................................................................................................................ 5
The effects of urban stimuli on the exploratory behavior of Acheta domestica .................. 6
Estimating the effects of Winter Storm Uri on birds in Oklahoma and Texas ................. 7
Using citizen science data to estimate the impacts of Winter Storm Uri on resident birds in Texas ........................................................................................................................................ 8
Assessing the accuracy of automated sound classification software for the identification of yellow-billed cuckoos in the Trans-Pecos of Texas ................................................................................................................ 8
Efficacy and Reusability of Magnetized TiO2 Nanoparticles in Water Purification ........ 9
Green Extraction Techniques for Natural Products .............................................................. 10
Machine Vision: A Tool for Automated Sign Language Interpretation .............................. 11
NFT Data Analysis ............................................................................................................... 12
Generalizing Effective Approval Voting Strategies to Ranked-Ballot Elections ............... 12
Mapping The Relationship between Success and NFTs ...................................................... 13
Test Optional Admissions: The Case for a Change in Higher Education Admissions ...... 14
Check Yes or No: The Importance of Consent Education in Higher Education ............... 15
Instructional and Assessment Design Plan 3rd-5th Phonics Training .............................. 16
Previous Triplane Ankle Fracture in a 22-year-old Female Basketball Player ................. 17
Tenosynovial Giant Cell Tumor Removed from Right Knee of 37-year-old Active Military Female ................................................................................................................................................... 18
The Utilization of Electronic Medical Record Templates and the Effects on APRN Job Satisfaction ................................................................................................................................................... 20
Is School-based Telemedicine Trustworthy or Treacherous?: A Systematic Review ...... 21
Standardizing Seizure Assessment & Documentation .......................................................... 22
Reverse Two-Stage Testing: A Detailed Implementation Strategy and Preliminary Results ................................................................. 23
Alanna Blackstock .............................................................................................................. 23
Investigating an Unknown Mineral Within a Texan Pegmatite ........................................ 24
Modeling, Constructing, and Testing an Electromagnetic Rail Gun with Python ............ 24
CRUSTAL-SCALE, REACTIVATED BOUNDARY BETWEEN WALKER LANE AND CENTRAL NEVADA SEISMIC BELT REVEALED BY GEOLOGIC MAPPING .................................................................................................................. 25
Detailed Mapping of the Geologic Controls on Karst Development in the Central Edwards Plateau ........................................................................................................................................ 26
Magnetic bound states using rotating magnets .................................................................. 27
Students’ beliefs about the implications of direct conferencing following sexual misconduct... 28
Associations between social power, invulnerability, and self-perceived mate value ........ 29
An Evaluation of Texas UIL PML Low Clarinets Solos ..................................................... 30
Did PPP Loans Effect Executive Compensation

Addison Sullivan

Faculty Mentor: Dr. Russell Calk
Department: Accounting, Economics and Finance

The goal of this research is to determine if the Paycheck Protection Program had a significant impact on executive compensation. The Paycheck Protection Program was implemented to prevent job loss during the COVID-19 pandemic, but only part of the funds had to be used for labor costs. I collected data from small to medium businesses that took the PPP loan and compared the amount of executive compensation before, during, and after the collection of the loan and compared it to the amount of the loan given.

Ease-y Money?: Evaluating the Environmental Protection of the Tax Deduction for Conservation Easements

Kaylee Crawford

Faculty Mentor: Dr. Renee Foshee
Department: Accounting, Economics and Finance

As public concerns about the consequences of climate change increase, so does the importance of evaluating the efficacy of the United States' existing environmental policies. The tax deduction for conservation easements, which is intended to subsidize the protection of environmentally valuable parcels of land, has become controversial due to its role in recent tax-avoidance schemes. This poster draws on information from court cases and land trust publications in order to evaluate the legal and logistical issues involved with holding landowners who claim the tax deduction accountable for easement violations. It raises questions related to the enforcement of conservation easements that could be explored in further research. It also suggests that the problem of tracking conservation easements could potentially overlap with topics such as ESG disclosure and natural capital accounting.
The Connections Between Blockchain Cryptocurrencies and the Stock Market

Jennifer Paige Burks

Faculty Mentor: Dr. Biqing Huang
Department: Accounting, Economics and Finance
Sponsorship: Undergraduate Research Faculty-Mentored Grant

Blockchain cryptocurrencies have become increasingly popular in recent years with Bitcoin leading the crypto market. These decentralized means of exchange are openly traded on the stock market along with other public stocks, such as Tesla and Walmart. Recent research shows that cryptocurrencies are largely affected by users and other important individuals. This leads to the determination of the effects of the stock market on cryptocurrencies and vice versa. This study aims to answer the question of whether cryptocurrencies have the ability to influence the stock market by analyzing trends in indices as well as individual stocks.

A Survey of the Parasites of Freshwater Turtles in the Concho Valley

Makayla Easley

Faculty Mentor: Dr. Michael Dixon
Department: Biology

Parasites are found in all vertebrate species, including turtles. Parasites could have significant pathology in freshwater turtles and studying this parasitic relationship could lead us to a better understanding of the behavioral and physiological changes these turtles face. In this study, we examined 79 freshwater turtles for internal and external parasites: thirty-eight red-eared sliders (Trachemys scripta elegans), seventeen Texas river cooters (Pseudemys texana), eleven common musk turtles (Sternotherus odoratus), seven Texas map turtles (Graptemys versa), four spiny softshells (Apalone spinifera), and two common snapping turtles (Chelydra serpentina). An external examination was done, as well as an internal examination including the organs: gastrointestinal tract, the heart, lung, liver and bladder. External parasites collected include one species of leech. The internal parasites retrieved included species of nematode (n=7), acanthocephalan (n=3), and cestode (n=1). The parasite survey results show differences in parasite prevalence and intensity between localities, sexes, gravid and non-gravid females, and species.
Reevaluating the subspecies designations of Bewick’s wrens in Oklahoma, New Mexico, and Texas

Jeff Roth

Faculty Mentor: Dr. Ben Skipper
Department: Biology
Sponsorship: Texas Academy of Science, Oklahoma Ornithological Society, Southwestern Association of Naturalists

The subjectivity and thus utility of subspecies has been debated since its inception in the 19th century. This controversy stems from subspecies traditionally being based around morphological characteristics with the implication that phenotypic variation represents genetic variation. This has been shown to not always be the case potentially obscuring conservation efforts. Modern advancements in sequencing technology now allow for fine scale analyses of genetically distinct populations to test subspecific boundaries at a genetic level. Despite this, many avian subspecies have not undergone reevaluation since their designation decades ago. Small non-migratory birds contain the highest average number of subspecies per polytypic avian species. Focusing on this group will best aid in understanding what drives subspecies on a genetic level. The Bewick’s wren (Thryomanes bewickii) is a small wren species in North America made up of 15 subspecies described by, based on variation of dorsal coloration. The diagnosis has been questioned because some specimens used in Phillips’ assessment suffered from foxing or were soiled skins, necessitating reassessment. Of the described subspecies, four occur across Texas, Oklahoma, and Eastern New Mexico (T. b. pulichi, T. b. cryptus, T. b. eremophilus, T. b. sadai). Population structure based around the subspecies will be tested using a combination of molecular methods, screening DNA for single nucleotide polymorphisms and sequencing of the ND2 mitochondrial gene. Across New Mexico, Oklahoma, and Texas 68 individuals were captured and blood was extracted from the brachial vein. A haplotype network generated around the ND2 gene will be presented for the symposium.
The effects of urban stimuli on the exploratory behavior of *Acheta domesticus*.

Benjamin Crowley

Faculty Mentor: Dr. Ben Skipper
Department: Biology

The effects of urbanization are a concerning reality of the modern world. Modern diseases, sleep irregularities, and behavioral patterns are all human consequences of an urban world. Consequences to animal life must also be considered. In this study, we considered how urban stimuli affects neophobia (the fear of new situations and stimuli) in *Acheta domesticus*. The experiment was conducted in a laboratory with two artificial environments containing crickets selected by simple random sampling. The control environment featured a 12-hour day and 12-hour night cycle with no audio stimuli. The experimental environment consisted of a 20-hour day and 4-hour night cycle with constant audio stimuli. For five weeks, crickets were selected by simple random sampling and tested in an apparatus individually. Using this apparatus, we measured the time it took the crickets to emerge from a dark chamber into the external environment. We recorded and interpreted these times to find patterns. The results of the experiment show no statistical significance to the question of urbanization affecting neophobia in *A. domesticus*. These findings may represent a variety of other organisms and imply important details concerning the modern world.
Estimating the effects of Winter Storm Uri on birds in Oklahoma and Texas

Francisco Fuentes

Faculty Mentor: Dr. Ben Skipper
Department: Biology

Winter Storm Uri occurred in February of 2021 and impacted areas across the United States and Northern Mexico. For a period lasting more than a week, below freezing temperatures and persistent ice and snow were experienced. It is believed that this storm had major effects on wildlife populations across the United States. Although all populations of wildlife were likely impacted, some were likely more resilient to the harsh conditions than others. This research aims to investigate the effects of Winter Storm Uri on avian populations in Texas and Oklahoma. Aspects of diet, body size, and migratory patterns will be explored to determine if life history traits conferred advantages that allowed certain species to fare better than others. This research will utilize data from the North American Breeding Bird Survey for the period between 2000 and 2021 to estimate the impact of this winter storm on passerines. From this dataset, ten bird species with differing traits will be selected to investigate the relative abundance of each species in the states of Texas and Oklahoma over the time outlined. Linear models will be created for each species using the WildlifeR package in R. The linear models for each particular trait investigated will then be compared using Tukey’s range test to determine if there is a statistically significant difference between the bird population trends.
Using citizen science data to estimate the impacts of Winter Storm Uri on resident birds in Texas

Dimas Sanchez

Faculty Mentor: Dr. Ben Skipper
Department: Biology

In February 2021 Winter Storm Uri brought extreme cold and freezing precipitation to almost all of Texas. This storm presented many challenges to wildlife populations and likely affected all species, though possibly some species more than others. Using citizen science collected data (eBird) from 2018-2022 this research will investigate population trends across then species of resident birds with differing life history traits (e.g., large vs. small, insectivore vs. granivore). The proportion of complete checklists submitted by citizen scientists with the focal species will be comparer across years impacted by Winter Storm Uri (2021) and Those not impacted (2018-2020, and 2022).

Assessing the accuracy of automated sound classification software for the identification of yellow-billed cuckoos in the Trans-Pecos of Texas.

Andrea Burt

Faculty Mentor: Dr. Ben Skipper
Department: Biology

Wildlife surveys in remote areas are often logistically difficult and therefore are infrequently performed. Few and infrequent surveys can miss rare and elusive species like the western yellow-billed cuckoo (Coccyzus americanus). To perform more continuous monitoring, an array of passive acoustic monitoring (PAM) devices was deployed in the Trans-Pecos region of Texas from May to September in 2021. Each PAM recorded a 10-minute sample of ambient sounds from 6 a.m. to 10 a.m. each morning. The computer program BirdNET was used to automatically classify sounds to a likely species of bird. Each identified sound was then given a confidence value ranging from 0 to 1. The purpose of this project was to determine the accuracy of this software across a range of confidences by manually identifying each vocalization. The results were then compared to the program’s results to see whether the conclusions corresponded. If successful, this program would allow for effective tracking and monitoring of other rare and elusive species.
Efficacy and Reusability of Magnetized TiO$_2$ Nanoparticles in Water Purification

Christian Bell

Faculty Mentor: Dr. Saravanan Ramasamy
Department: Chemistry and Biochemistry
Sponsorship: The Welch Foundation; Research Travel Fund

The photocatalytic property of titanium dioxide (TiO$_2$) to produce free radicals in an aqueous medium is known to enhance the breakdown of organic contaminants in water. In the presence of UV light, TiO$_2$ demonstrates water-remediation from a variety of biologically harmful contaminants such as pharmaceuticals, industrial dyes, and even pathogenic microorganisms. However, the recovery of TiO$_2$ particles from water and the subsequent reuse of the particles proves to be very challenging, as current methods such as centrifugation, filtration and sedimentation are not efficient or compatible to all volumes. Also, despite its proven ability to decontaminate several harmful organic contaminants, the use of this photocatalyst to treat oil-contaminated water remains an underdeveloped research area. With the increased prevalence of offshore drilling and recent incidents of ocean oil spills having severe consequences, it is important to human and marine health and biodiversity to develop methods of purifying seawater contaminated with the components of crude oil when accidents inevitably occur. Current methods involve the absorption, skimming, on-site burning of oil slicks, and of course the natural, but much slower, process of uncatalyzed photodegradation by sunlight. These traditional methods tend to be time-consuming and inefficient and thus increase the risk of harm to the ecosystem.

To improve the recovery of the TiO$_2$ nanoparticles, we instilled a magnetic core beneath the photocatalytic shell. The addition of a magnetic core allows for the efficient removal and reuse of particles in the presence of a strong magnet following the purification process. To investigate the application, we synthesized Fe$_2$O$_3$-SiO$_2$-TiO$_2$ nanoparticles of different sizes that, when irradiated with UV light, demonstrated a successful photocatalytic decontamination of organic dyes. We then examined their efficacy to purify water samples contaminated with crude oil in a lab setting as well as water samples contaminated from a leaky oil well in West Texas. Finally, the subsequent removal and reusability of these particles in successive water treatments were studied.
Green Extraction Techniques for Natural Products

Samantha Daigle, Matthew McCann

Faculty Mentor: Dr. Shanmugapriya Dharmarajan
Department: Chemistry and Biochemistry
Sponsorship: Faculty Research Enhancement Program; Research Travel Fund

The use of petroleum-based solvents for the extraction of natural products is still a common practice, despite the potential impact on human and environmental health. The rising awareness of chemical activities created an immense need for sustainable development schemes and strategies to address the environmental impact without compromising yield. To align with the recent trends in green extraction techniques, we focused on developing alternative solvents and automating methods for extracting natural products, such as plant oils. We surveyed green solvents by comparing their oil extraction performance and examined the green analytical techniques such as pressurized fluid extraction, microwave-assisted extraction, and ultrasound-assisted extraction. The extracted plant oil products were qualitatively and quantitatively analyzed using advanced spectroscopic methods to assess the efficiency of the green solvent and techniques.
Machine Vision: A Tool for Automated Sign Language Interpretation

Jason Watson

Faculty Mentor: Dr. Roya Choupani
Department: Computer Science

The goal of this research was to interpret the first four letters in the American Sign Language fingerspelling alphabet using artificial intelligence and neural networks that can run efficiently on mobile devices. 170 photos of the signs for A, B, C, and D were collected in various locations. The dataset was augmented using filters to negate the importance of skin tone and lighting. A pre-trained Tensorflow model (ssd_mobilenet_v2_fpn-lite_320x320_coco17_tpu-8) was used to train a neural network that identified signs from video in real-time with a mean average precision of 80%. A larger dataset would improve precision and help the model generalize. This research has shown that given a sufficiently large dataset, machine vision could be used to interpret static sign language gestures.
NFT Data Analysis

Cameron Ley

Faculty Mentor: Dr. Erdoğan Doğdu and Dr. Ruben Ceballos
Department: Computer Science

The main goal of this study is to examine certain data characteristics of NFTs such as Social Media Presence, Category, Currency and more in order to determine what makes NFT’s successful. We are measuring success in terms of number of sales and price per unit. The main goal is to find a guideline in which we can determine what makes an NFT successful? Of course, shoutouts by influencers should cause an NFT’s price and popularity to increase, by what measure does it actually impact the NFT price and popularity? The information on NFT’s can be very limited and untrustworthy simply due to the nature of NFT’s and the fraudulent history that has followed them. To help combat this, hopefully we can provide some insight into reasons for NFT success and a guide for those new to the NFT scene. We are using the API from website Rarible in order to collect data about various NFT collections. We are also planning to use the Google API to piece together popularity regarding NFT collections and use various collection methods to grab information about social media platforms that are provided by the NFT collection creators on their Rarible page. Our findings thus far is that the more information and light placed on the NFT means it will perform better according to our metrics.

Generalizing Effective Approval Voting Strategies to Ranked-Ballot Elections

Joel King

Faculty Mentor: Dr. Rob LeGrand
Department: Computer Science

Using computers to simulate many different electorates, and an algorithmic design for strategizing ballot selection, we describe certain voting strategies for Approval and Hare election methods that, under certain conditions, result in individual voters achieving more pleasing outcomes according to their personal preferences. Prior work in this area developed a strategy (named "strategy A") for Approval elections. We used this strategy as inspiration for a more generalized multi-stage strategic framework of swappable options that change the behavior of the overall voting strategy. Within this framework we confirmed that strategy A is the most effective strategy for Approval elections. We also found a different set of options that, when used to strategize in a Hare election results in happier individual voters.
Mapping The Relationship between Success and NFTs

Diego Sanchez

Faculty Mentor: Dr. Ruben Ceballos, Dr. Roya Choupani and Dr. Erdoğan Doğdu
Department: Computer Science

NFTs (Non-Fungible Tokens) represent an important turning point in the eCommerce and crypto sphere. The qualities and characteristics that make NFTs valuable and popular are overlooked. In the present work, we investigated characteristics pertaining to NFTs that focused on price data and social media presence. The data were gathered by use of an API (Application Programming Interface) in sets of 1000 NFT collections. The data was analyzed with a focus on price fluctuations over a specified period of time as well as social media impact on the NFT collection. A relationship between success (defined as NFTs minted/sold) and the aforementioned NFT characteristics (price/social media presence) was developed, with NFT characteristics representing the independent variable and success representing the dependent variable. Generally, NFT projects that were present on many forms of media tended towards success, while projects that did not establish social media presence saw less success. Additionally, collections whose media presence was established saw more freedom in setting the price of their NFT.
Test Optional Admissions: The Case for a Change in Higher Education Admissions

Lydia Dillen

Faculty Mentor: Dr. Amy Murphy
Department: Curriculum and Instruction

In this project, the current topic of discussion regarding test optional policies for higher education admission is analyzed to reveal the future direction for admissions requirements and the results of omitting standardized test scores from college applications. Providing background on the topic, the test optional movement’s beginnings and heavy growth as a result of the Covid-19 pandemic are detailed. Current journals, articles, and news websites contribute to the collection of information related to the topic and its outcomes, citing current examples of universities with test optional policies and perspectives from personal interviews with higher education professionals. Current literature regarding outcomes of the switch, though limited, does not indicate one clear result from a switch to test optional admissions since different types of universities utilizing the process seem to indicate different results. As this issue evolves, more information will likely emerge in order to reveal whether test optional admissions have the intended effect of improving opportunity for underserved students and bolstering campus diversity. Given the current state of continued test optional admissions at most universities in the United States, these policies seem to indicate an overall change in direction for admissions, straying from traditional standardized test requirements. In light of the information gathered from professional interviews and existing literature, a need for subsequent result tracking is necessary to maintain up-to-date information regarding test optional admissions policies in practice.
Check Yes or No: The Importance of Consent Education in Higher Education

Katherine Homminga

Faculty Mentor: Dr. Amy Murphy
Department: Curriculum and Instruction

Through interviews and literature reviews, this project looks at how consent education impacts students and student affairs professionals on campuses. Incoming students are learning to handle new situations like attending parties where alcohol may be present. The Covid-19 pandemic has affected how students are gaining knowledge about consent and sexual assault. The Violence Against Women Act (VAWA) requires sexual assault prevention programs; therefore, colleges should offer consent education to their students as a means to expand the discussion about sexual assault prevention. A NASPA initiative, Culture of Respect, is working to provide means for colleges to incorporate consent education into Title IX training for students, faculty, and staff. Literature shows that the input of student affairs staff is vital to developing programs that are grounded in student development. Studies show that peer education is an inexpensive and effective way for colleges to reach students. Future research should look at consent education as it applies to racial and gender minorities. Research should also look at how alcohol and other substance use affects discussions about consent and consent cues.
This is a proposal for a phonics training that will target 3rd - 5th grade Reading teachers. This training will be beneficial to teachers whether they are teaching a lesson over short vowels or a more complex lesson over multisyllabic words. The purpose of this phonics training is that teachers leave with a toolbox that will allow them to continue to help their striving readers, and utilize the content presented when creating lesson plans or assessments for their phonics instruction.
Previous Triplane Ankle Fracture in a 22-year-old Female Basketball Player

Makenzie Cramer

Faculty Mentor: Dr. Chelsea Procter-Willman and Dr. Yo-Rong Chen
Department: Health Science Professions

Background: A current 22-year-old female experienced a triplane ankle fracture in high school. She participating in a preseason basketball game and was diving for a loose ball when she was jumped on from behind. The patient heard a loud “pop” in her left ankle. When she began to get up, she had an intense amount of pain and throbbing present. Due to the lack of an athletic trainer, her coach’s initial treatment option was to place her into an ice bucket. The patient had issues keeping her ankle in the ice bucket and after 15 minutes in the ice, the patient elevated the foot. At that point, ecchymosis began to form along with rapid swelling located along the lateral aspect of her ankle. The patient had no prior instability or injury to the left ankle.

Differential Diagnosis: Tillaux Fracture, ankle dislocation, Triplane fracture.

Treatment: The patient underwent radiographs to rule out a fracture of the growth plate and was placed in a splint from the walk-in clinic. Once the x-rays were reviewed, it was noted in the oblique view that a fracture was present through the medial malleolus extending up to the physis. On the lateral view, a suspected Salter II type fracture with what appeared to be a 2mm slippage along the anterior physis of the distal tibia. However, a possible Salter IV fracture might be present instead of the initially suspected Salter II. After examination, the patient was then sent to the emergency department to get further diagnostic imaging. A CT scan was obtained to confirm that it was a Salter-Harris type IV fracture involving the distal metaphysis epiphysis of the tibia. There was approximately 3.2 mm posterior displacement of the distal fracture fragment. The fracture line extended along the base of the posterior malleolus and through the lateral and mid aspect of the physis and extended obliquely across the medial malleolar epiphysis. The final diagnosis was Triplane Fracture, and the following day the patient underwent surgery to stabilize the injury. The surgery performed was a closed reduction with percutaneous screw fixation.

Uniqueness: A Triplane fracture represents 5%-10% of pediatric intra-articular ankle injuries that are typically seen in children from ages 12-17 years of age. This fracture can be characteristically described in the distal tibia and only eight such fractures have been reported in the literature. A triplane fracture can be described as a distal tibial epiphyseal plate fracture and can also be partially classified within the Salter-Harris classifications. The Salter-Harris classification for this particular injury includes a fracture in which the plane crosses some distance across most of the growth plate up through the metaphysis. However, this injury is typically referred to as a transitional injury and cannot be properly classified within the Salter-Harris classifications alone. This is a multiplanar injury with three classically described fractures extending through the transverse,
the sagittal epiphysis, and coronal anatomic planes, which ultimately disrupt the articular surface of the ankle. **Conclusion:** As healthcare professionals, Athletic Trainers need to be mindful of the signs that an injury could be more than it initially appears. Radiographs alone may not be capable of producing an accurate diagnosis. A triplane fracture can cause damage that needs to be evaluated as soon as possible. In this case, an Athletic Trainer was not present to provide aid with the initial injury. Athletic Trainers are important members of any team and provide quicker response to injury, appropriate evaluation, and patient advocacy throughout the injury process.

**Tenosynovial Giant Cell Tumor Removed from Right Knee of 37-year-old Active Military Female**

Osvaldo Roman-Kastler

Faculty Mentor: Dr. Chelsea Procter-Willman
Department: Health Science Professions

**Background:** A 37-year-old female patient who had been actively serving in the army for 15 years presented with posterior knee pain. She first felt pain in 2015 but felt it was due to exercise and did not seek medical attention until 2019 and finally received a diagnosis in 2020. Her sister was the person who first noticed the lump on the posterior side of her knee, which then grew anteriorly and medially. During the first clinical visit the Physician Assistant ordered radiographs for a possible bone spur, but imaging was negative. They did find signs of early onset osteoarthritis. Multiplanar multisequence MRI of the right knee was then performed. No acute fractures, osteochondral defects or bone lesions were found. However, within the joint space, a large intraarticular mass was identified posterior to the posterior cruciate ligament and femoral condyles. The mass had also extended into the anterior and posterior aspect of the medial tibial plateau, inferior patella pole, infrapatellar fat pad, medial femoral condyle, and posterior to the lateral femoral condyle. Aside from range of motion restrictions, the tumor also compressed her PCL, ACL, patella and patellar tendons, hamstring tendons, and peroneal muscles. **Differential Diagnosis:** ACL sprain, PCL Sprain, Synovial Plica, Popliteal Bursitis, Pigmented Villonodular Synovitis, Intraarticular Lipoma with Fat Necrosis, Bone Spur, Tenosynovial Giant Cell Tumor. **Treatment:** The patient underwent an arthroscopy for initial inspection and synovectomy for mass removal. The mass was identified as a tenosynovial giant cell tumor (TGCT). Postoperatively, she began physical therapy to regain ROM, muscular strength, and return to pre-injury activities. Treatment consisted of electrical stimulation and heat before activity, and
range of motion exercises to regain full extension and flexion of the knee joint. The patient is still having difficulty with her gait and feels “pins and needles” that run down her gastrocnemius and soleus. The patient is still not able to fully extend the knee joint and has pain with flexion. The patient, aside from physical rehabilitation, also started radiation therapy due to the diffuse type tenosynovial giant cell tumor that was removed. This type of tumor has a reoccurrence rate 40-60% of cases, and in addition, rare cases with benign histology may develop metastases in the lungs or lymph nodes.

**Uniqueness:** This type of rare tumor can occur anywhere in the synovium and this tumor began to migrate anteriorly. Cases reported for TGCT have had tumors measure up to 4 cm, but the patient’s tumor size was over 15 cm, and these rarely occur in the intraarticular knee. Studies have reported that this condition is historically hard to diagnose and only four other cases of tenosynovial giant cell tumor were found in women ages 18 to 54 years. **Conclusion:** Presented was an active military female with removal of tenosynovial giant cell tumor in the right knee. The patient underwent an arthroscopy and other surgical interventions. She has participated in countless hours of physical rehabilitation with radiation therapy alternating. Tenosynovial giant cell tumor has a slow growth nature that monitoring for further growth has been indicated for this patient for easier management. Athletic Trainers generally manage and clinically diagnosis orthopedic injuries. Gaining an understanding of histological pathologies and referring early when an orthopedic clinical diagnosis cannot be determined can be beneficial to the patient.
The Utilization of Electronic Medical Record Templates and the Effects on APRN Job Satisfaction

Jillian Tate

Faculty Mentor: Dr. Denise Goddard
Department: Nursing

In the United States of America, healthcare costs are rising, provider burnout is rampant, and patient/provider ratios are increasing. Approximately 30% of primary care providers report burnout and would consider leaving the workforce within one year. It is estimated that by 2033, the primary care provider shortage will range between 17,800-48,000 providers.

American primary care providers spend more time documenting in the electronic health record (EHR) than in the room with the patient. Providers reported using their allotted lunchtimes to document, staying late to document, and taking documentation home after hours.

Methods such as using prefabricated templates in the EHR may significantly reduce documentation time. The additional time created through the reduction of documentation time can be spent treating more individuals, spending more quality time with patients, and taking adequate personal time.

The purpose of this systematic review is to demonstrate that using templates in the EHR reduces the time spent documenting and increases the quality of time with the patient. The review will also show that decreasing the documentation time and increasing time with the patient will improve the perception of job efficiency, reduce burnout, and increase job satisfaction. Decreasing burnout will decrease APRN provider turnover and aid in the solution to the primary care provider shortage.
The Covid-19 pandemic led to difficulties in healthcare delivery and disruptions in education, as well as an accelerated use of telehealth. In an effort to keep children in school, telemedicine models were adopted by many school districts. School-based telehealth is healthcare that is delivered virtually to a child in the school setting. The use of school-based telehealth may improve and expand a student’s ability to access health. Technology such as phones, laptops, and tablets may be used to facilitate appointments and may allow for increased efficiency. School-based telehealth reduces time spent away from class, so students can focus on learning and reduces time and travel costs for a child's parent or guardian. The benefits of school-based telehealth are clear; however, lack of physical contact is a concern. Additional concerns regarding school-based telehealth include communication of services rendered and the possibility of technology failure. School-based telehealth is a relatively new idea. With proposed benefits well documented, the question remains, in students who utilize school-based telemedicine, how effective are virtual visits compared to traditional in-person visits in regard to patient outcomes?
Standardizing Seizure Assessment & Documentation

Megan Schilling

Faculty Mentor: Dr. Melissa McDowell
Department: Nursing
Sponsorship: Research Travel Fund; Honors Program

The purpose of this evidence-based project was to determine if standardized assessment, interventions, and documentation of seizures improves patient outcomes. Seizures are a complex symptom of an underlying disease process and can be debilitating for patients. If not treated promptly and appropriately, seizures may result in “cardiorespiratory distress,” impaired neurological functioning, and decreased quality of life (Maguire et al., 2020). When seizures occur in the acute healthcare facility, nurses are often the first to respond and maintain patient safety during the episode. Nurses are also responsible for assessing and documenting the seizure activity that occurred. The findings were disseminated to an interprofessional team at an acute care facility with recommendations for the implementation of a standardized seizure assessment, intervention, and documentation tool to assist the interprofessional team to interpret characteristics of the documented seizure activity and determine effective patient interventions. The addition of a screening tool for psychogenic nonepileptic seizures was included at the recommendation of the interprofessional team.
Reverse Two-Stage Testing: A Detailed Implementation Strategy and Preliminary Results

Alanna Blackstock

Faculty Mentor: Dr. Elizabeth Koeman-Shields
Department: Physics and Geosciences
Sponsorship: Research Travel Fund

A classic two-stage testing model is when students take an individual exam for a portion of the class, and then are sorted into groups for a group test. This traditional two-stage model provides students the opportunity to reflect on mistakes and earn points back in an effort to score better on the exam overall. In the proposed reverse two-stage testing design, the purpose is to give students an opportunity to learn and discuss concepts with their peers in an exam setting before taking the individual exam. This gives students time to discuss and review concepts that they may not understand completely or forget to review and, instead of focusing on earning points back, gives students renewed desire to learn the testing material. In the traditional two-stage testing model students are usually given the exact same exam as the individual and group exams. In this study, we are using concepts from the group exam and building specific questions from those concepts for the individual exam. For the purpose of this study, group exams were weighed at 25% of the final exam grade, with individual exams weighing at 75%. This study details the process behind building the exams and the results concluded from compiling data over the course of four semesters of reverse two-stage testing in physical and historical geology classes. Future implementation of this testing model could be seen in upper-level geology classes, as well as introductory courses outside of geoscience.
Investigating an Unknown Mineral Within a Texan Pegmatite
Brandon Walters and Matthew Hernandez

Faculty Mentor: Dr. Elizabeth Koeman-Shields
Departments: Physics and Geosciences
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The Llano uplift is a located in central Texas, and it exposes the core of the Grenville age orogenic belt. Thirteen miles outside the city of Llano, there is an abandoned quarry on private property named Badu Hill. Exposed within the quarry are plutonic dikes filled with different minerals and rocks including silicates such as quartz, feldspars, and micas, a radioactive mineral uraninite, and igneous rocks such as granite. Found within the mix is a pegmatite covered in a strange and unique phyllosilicate that has been altered due to the regional and local metamorphism from the protozoic era. With similar hand sample properties of biotite, the phyllosilicate in question has a unique pseudo-hexagonal crystal habit that is not found throughout the outcrop. The golden and vitreous bladed mineral stands out compared to its silicate family members but cannot be identified without further examining the mineral’s chemical make-up and other physical properties. Five thin sections were made of the unknown mineral as well a biotite sample from the same pegmatite in order to examined using a petrographic microscope, and SEM/EDS. With analysis complete with thin sections, petrographic properties and SEM element analysis the unknown mineral has been confirmed as annite.

Modeling, Constructing, and Testing an Electromagnetic Rail Gun with Python
Nicholas Swartz

Faculty Mentor: Dr. Eddie F. Holik, III (Trey)
Department: Physics and Geosciences

A computational model was created to solve the coupled differential equations for projectile acceleration, current, and induced voltage of a rail gun. The final velocity is calculated based on projectile mass, capacitance, rail geometry, initial voltage, and resistance as input parameters. A small prototype rail and projectile was fabricated and characterized to verify the computer program and for use in physics outreach demonstrations.
CRUSTAL-SCALE, REACTIVATED BOUNDARY BETWEEN WALKER LANE AND CENTRAL NEVADA SEISMIC BELT REVEALED BY GEOLOGIC MAPPING

Matthew Hernandez

Faculty Mentor: Dr. Joseph Satterfield with Christopher Pluff and Collin Goulart
Department: Physics and Geosciences
Sponsorship: Geological Society of America funding; Research Travel Fund

The Sand Springs Range and southern Stillwater Range, in the western Great Basin, expose a long-lived boundary between the Walker Lane (WL) and central Nevada seismic belt (CNSB) that involves Mesozoic metamorphic tectonites, diverse Jurassic(?), Cretaceous, and Tertiary intrusions, and Oligocene – Miocene extrusive igneous rocks. Recent Basin and Range normal and oblique-slip faults as well as Walker Lane strike-slip faults cross-cut these rocks. The 1954 Fourmile Flat quake several km S produced right-lateral slip (Doser, 1986).

2019 undergraduate research and 2022 Angelo State University Field Camp 1:8000-scale mapping focused on the SW Stillwater Range. Fourteen students and six faculty at ASU Field Camp 2022 spent 5 weeks making geologic maps in the Big Bend of West Texas to Nevada. The most detailed published geologic map of this area is 1:250,000 scale (Willden and Speed, 1974). Techniques applied included: a) distinguishing and measuring flow foliations, compaction foliations, original sedimentary bedding, metamorphic foliations, and lineations, b) working out Mesozoic - Cenozoic stratigraphy, c) distinguishing igneous map units by phenocryst compositions and percentages, d) constructing a grid of cross-sections, and e) geochemical analysis of Cenozoic igneous rocks. Eighteen map units were distinguished: 4 Mesozoic meta-sedimentary units, 4 Tertiary ash flow tuff and lava units, including the capping 13 Ma Bunejug basalt, 7 Mesozoic and/or Tertiary intrusive units, and 3 Quaternary units. The meta-sedimentary succession of black meta-shale, quartz arenite, and meta-limestone correlates to similar late Triassic – Jurassic interval in the southernmost Clan Alpine Mountains. High-angle faults strike NW, NE, and E-W. Small Cretaceous and/or Tertiary andesite, gabbro, and diorite plutons intruded near and along mapped faults.

A long-lived, reactivated, and deep WL-CNSB boundary fault interpretation is supported by: a) diverse phaneritic plutons within fault zone indicate preferential intrusion along faults and rapid uplift after intrusion, b) unusual ENE, E-W fault orientations on faults cross-cutting Tertiary units, c) NW- and NE-striking faults crosscut Quaternary units. The E-W-striking gold-silver bearing Summit King fault is likely a reactivated Luning-Fencemaker thrust fault ramp.
The Edwards Plateau in West Texas is primarily made up of Cretaceous carbonate rocks that overlay Permian and Pennsylvanian facies underneath. Below that are Cambro-Ordovician sandstones, with the basement made up of Precambrian igneous and metamorphic rocks. These limestone facies are left over from reef deposits when the region was covered by a shallow sea 300 million years ago. The area has been fractured and uplifted by several events, the Devil’s River Uplift in the Paleozoic, the Carta Valley during the Laramide, and the Balcones Faulting during the Miocene. The stratigraphic units of the area are the Buda limestone, the Edwards Group Limestone, the Glen Rose limestone, the Boquillas Formation, and the Canyon Sandstone. Karst formations have been found within the Edward’s Group, such as the Caverns of Sonora and the Devil’s Sinkhole, but a comprehensive map of all karst features in the area has not been made due to lack of public data. There is a large amount of core data, however it has not been analyzed due to being from an area with small amounts of oil. A better understanding of the karst features in this region would give important information about the recharge locations for the Edwards-Trinity Aquifer that supplies the region’s water. A map of the surface and subsurface karst features in the area will be developed through studying satellite imagery, using LiDAR analysis, and field work of our study area. This knowledge of joints, sinkholes, springs, and other karts features will benefit water conservation efforts, as well as tell us more about how karst features form within the Edwards Plateau.
Magnetic bound states using rotating magnets

Christian Cannon

Faculty Mentor: Dr. Eddie F. Holik, III (Trey)
Department: Physics and Geosciences
Sponsorship: Undergraduate Research Faculty-Mentored Grant

When a permanent magnet is motionless, it is unable to create a local minima or maxima of potential energy in free space. This effect is negated when the magnets are in a non-static configuration. As a magnet spins at high speeds, a secondary magnet’s magnetic field is unable to properly align and prevents the attractive force from dominating at small distances. When the attractive, repulsive, and gravitational forces balance, the magnets produce an equilibrium point where both magnets are spinning with full degrees of freedom. This phenomenon creates a form of “Magnetic locking”, where two magnets stay at a fixed distance regardless of orientation.
Students’ beliefs about the implications of direct conferencing following sexual misconduct

Avery Ondechek and Arianna Quintero

Faculty Mentor: Dr. Tyler Livingston
Department: Psychology

Problem

Between 1.8%-34% of women and 4.8%-31% of men report unwanted sexual contact during their years at university (Fedina et al., 2018). Recently, some Title IX offices have adopted a restorative justice approach to conflict resolution in sexual assault cases that may involve direct conferencing between the alleged victim and offender (James & Hetzel-Riggin, 2021). We examined students’ sentiment toward direct conferencing in sexual assault cases.

Method

Participants were 73 university students ($M_{\text{age}} = 20.11$, $SD = 4.97$; 90.28% women). Most participants identified as White (54.80%) followed by Hispanic (28.77%), Black (6.85%), Asian (5.48%), and other/mixed race (4.11%). Participants read a vignette describing an allegation of sexual assault and responded to items assessing constructs drawn from the restorative justice model.

Results

Participants rated the appropriateness ($M = 3.68/7.00$, $SD = 1.45$) and benefits ($M = 3.66/7.00$, $SD = 1.19$) of conferencing below the midpoint of their respective scales. Students reported some concern for revictimization ($M = 4.53/7.00$, $SD = 1.17$) and physical endangerment for the victim ($M = 4.23/7.00$, $SD = 1.27$) due to conferencing.

Conclusions

Students perceived direct conferencing to be somewhat inappropriate and of relatively little benefit to victims and offenders, and expressed concern for adverse effects following conferencing. Direct conferencing might not be the ideal method for Title IX offices to address sexual assault allegations. Future research should test effects of case facts on perceptions of direct conferencing.
Associations between social power, invulnerability, and self-perceived mate value

Kelsi Rogers

Faculty Mentor: Dr. Tyler Livingston
Department: Psychology

Introduction
The current research examined the relationship between feelings of power and self-perceived mate value. We also explored whether feelings of invulnerability could mediate this relationship. We hypothesized that power would be positively associated with self-perceived mate value due to enhanced feelings of invulnerability.

Method
Participants \((N = 72)\) were university students \((87.5\% \text{ women, } 12.5\% \text{ men; } M \text{ age } = 20.11 \text{ years, } SD = 5.00)\) randomly assigned to describe a time they felt powerful \((n = 37; 51.39\%)\) or powerless \((n = 35; 48.61\%)\). Participants self-reported their feelings of power, invulnerability to harm, and mate value.

Results
There was a marginally significant negative association between power and mate value \((r = -0.21, p = .09)\). There also was a significant positive association between felt power and invulnerability \((r = 0.50, p < .001)\), but no association between invulnerability and mate value \((p > .10)\).

Conclusions
Our hypotheses did not receive support. Findings suggested there may be a negative relationship between power and mate value, although this relationship was only trending toward significance. We observed the expected positive relationship between power and invulnerability, but invulnerability was not related to mate value and thus did not mediate the relationship between power and mate value. Using a larger sample, future research should replicate and extend these findings to identify the actual mediating variable if the relationship between power and mate value exists. The correlation between felt power and invulnerability might have implications for behavior outside the context of mate value.
The typical band experience is almost entirely playing within an ensemble, and each instrument within the ensemble usually fulfills the same roles. Occasionally a student may have an opportunity to play a solo section in a piece, but that is normally restricted to the same few instruments. Solo repertoire is crucial to the development of musicality in intermediate band students. In the state of Texas, the University Interscholastic League (UIL) offers the Solo and Ensemble contest which provides an opportunity for students to compete with their solos. The Prescribed Music List (PML) was created by UIL and features all of the solo pieces that can be used for competition. This project “An Evaluation of Texas UIL Low Clarinet Solos” includes an analysis of every piece on the current list of Texas UIL solos for Bass Clarinet (132 entries), Alto Clarinet (62 entries), and Contra-Bass Clarinet (28 entries). Each annotation includes range, rhythmic figures, melodic figures, rhythm/meter changes, tonality/key(s), tempo changes, dynamic ranges, form, contemporary techniques, and difficulty of the accompaniment/ensemble in a concise ranking system. This project features a difficulty ranking system of each piece, recommended pieces for 8th-12th grade, composer diversity, and additional recommended pieces not on the PML.