

Oral Presentations

Undergraduate Students

OU1: Georgia Sasser; Olivia Jarvis; Allie Jessee; Emma Best; Claire Abercrombie; Gracie Talbert

Presentation Title: "Find Your Voice: The Results of a Student-Lead Community Initiative on Sexual Assault Education"

Abstract: Find Your Voice is an initiative that focuses on sexual assault education and prevention. Our project is based on the foundation of Educating, Advocating, and Empowering survivors and the ECU community. This program originated in the Honors 2000/3000 seminars and is currently being pursued as a Signature Honors Project. Our first goal is to educate the student body and general public about sexual assault, the rights and resources available to survivors, and about being an active bystander. We use our Instagram page (@findyourvoice.ecu) to provide evidence-based material in a way that is accessible to readers and empowers them to share with their community. We also hold educational events for participants to discuss and ask questions about sexual assault and how they can help prevent it. Our second goal is advocacy for survivors of sexual assault by working with the campus community to promote safety and consent, as well as support and justice for survivors. We do this on our social media and through involvement in events and organizations on campus such as Pledge Purple. We have a blog to discuss current issues and educational media, as well as a podcast. Our third goal is to empower survivors to express their emotions and tell their stories. Our primary method of this is through our online art gallery, hosted on our website (<https://www.findyourvoiceecu.org/>), which is open for anyone to submit a piece of visual art, graphic art, poetry, spoken word, or just tell their story. We hold themed submission events throughout the year and work with other organizations to uplift survivor voices. The results of our project have included a steady increase in engagement and positive feedback on our social media posts, a gallery with submissions from many artists over multiple mediums, and a registered student organization to help us sustain the project long term. We plan to continue to foster a community that is supportive and inclusive, to use the arts as a way to promote advocacy and healing, and to empower people to action against sexual assault.

OU2: Dana Shefet; Beth Miller, PhD; Stephanie Nicely, EdD; Virginia C. Stage, PhD

Presentation Title: "Your Child is Overweight, Now What? Understanding How Head Start Staff Communicate With Low-Income Families About Childhood Obesity"

Abstract: Children (3-5 years) enrolled in Head Start (HS) are at increased risk for obesity. In an effort to prevent childhood obesity, HS implemented a Body Mass Index screening program in 2012. This program provides opportunities for HS to engage families by communicating information about children's weight status; however, limited research is available to describe the barriers and facilitators HS staff face when communicating this information to families. The objective of this study was to explore common experiences of HS Health/Nutrition Managers when communicating information to families about their child's weight status. Researchers conducted 29 telephone interviews with Managers across North Carolina and Ohio. Phenomenology was used to guide study design and analysis. Interviews were recorded and transcribed verbatim. Researchers identified significant statements through open-coding and grouped them into themes focusing "what" and "how" participants experienced the phenomenon. Researchers identified four themes: Family Background, Communication and Educational Opportunities for Families, Staff Support and

Counseling Resources and Family Awareness, Reaction, and Engagement. Programs used different methods to communicate about children's weight (e.g. letters, meetings, no communication). Parent reactions to children's weight status often dictated communication methods chosen; negative reactions often resulted in limited communication. Managers perceived parents' backgrounds (socioeconomic status, education) and the "shame" associated with having an overweight/obese child as communication barriers. HS and community-based educational/counseling opportunities for families were identified as supportive of Manager efforts to communicate about children's weight status. Participating HS programs acknowledged the importance of communicating with parents about their children's weight status. However, findings also indicated parents' personal feelings about their child's weight status may influence the type of communication they receive and their willingness to utilize other educational/counseling opportunities. More research is needed to explore parents' perceptions of HS communication methods, and effective strategies for supporting and educating parents.

Masters/Clinical Doctorate Students (i.e., MS, DPT, AuD)

OM1: Rebecca Auten; Hannah Bebber; Melissa Thomas; Keely Price; Kelly McGloon, PhD

Presentation Title: "The Role of a Child's Tolerance for Error on Active Participation in Upper Extremity Neurorehabilitation"

Abstract: Intro: The "just right challenge" is the balance of the demands of a task and the skills of a person. Therapists' ability to weigh the impact of various factors to meet this balance have rarely been investigated in terms of participation in therapy. The aim of this research was to determine the impact of a child's perceived tolerance for error on the amount of active participation in constraint-induced movement therapy (CIMT) among children with cerebral palsy. We hypothesized that greater perceived tolerance for error would increase active participation in a CIMT program. **Methods:** Children eligible to participate in the study were aged 4-10 with the ability to follow simple 2-step directions to participate in therapy activities; at least 10° of active range of motion in the wrist and 20° for the elbow and shoulder. Children completed 5 days of therapy for 6 hours each day. The Dimensions of Mastery Questionnaire (DMQ-9) was completed by the participant's parents prior to camp to help determine the child's perceived tolerance for error during tasks. Active participation in therapy was tracked by occupational therapy students according to the number of repetitions completed in each activity. **Analysis:** The results of our linear regression indicated that tolerance for error was statistically significant ($p=0.023$), predicting 33.8% ($R^2=0.338$) of the variation in total repetitions. **Discussion:** This article discusses the contribution of a child's tolerance for error on their active participation in therapy. Based on our findings, occupational therapist clinical decision making in creating the "just right challenge" should not be solely based the child's tolerance for error as it only accounts for approximately a third of active participation in treatment. Other factors impacting participation should further researched and considered in clinical reasoning.

OM2: Stacey A. Meardon, PhD; Margaret Marshall, SPT; John David Willson, PhD; Lauren Alexis Stubbs DPT; Richard W. Willy, PhD

Presentation Title: "Gait Modification Effects on Subject-Specific Tibia Stress during Running in Males and Females"

Abstract: Purpose: Tibia bone stress injury (BSI) rates are high in populations that regularly participate in running. Increasing step width, using a forefoot strike (FFS) pattern, reducing step length and reducing impact loads during running are suggested to modify biomechanical factors related to tibia BSI. The aim of this study was to compare acute gait modification effects on tibia

stress during running in males and females. Methods: 40 healthy runners participated in this study (20 F; 27.7 ± 14.5 km/wk). Motion capture data were collected for 20 sec while subjects ran on an instrumented treadmill in five running conditions. Following a preferred run condition (2.88 ± 0.24 m/s), subjects were cued using real-time visual feedback in a random order to increase step width 5% of leg length (WIDE), use a FFS, reduce step length 10% (SHORT) and lower vertical ground reaction force load rate 15% (LOW). Tibia MR images were obtained for subject-specific bone modeling. Motion and force data from each condition were input to a musculoskeletal model to estimate subject-specific tibia stress at the distal 1/3 tibia using cross-sectional finite element analysis. Peak tibia compression, tension, and shear stress and load rates were compared between conditions and sexes using mixed model ANOVAs and Bonferroni-adjusted pairwise comparisons ($\alpha=0.05$). Results: No sex by condition interactions were observed for peak stress or load rates ($p>.05$). Gait modification influenced all peak stress components and compression load rates ($p<.01$). WIDE decreased peak compression 4% ($p=.03$) and tension 3% ($p=.01$) whereas FFS increased peak compression 8% ($p<.01$), tension 6% ($p<.01$), and shear 27% ($p<.01$). FFS also increased compressive load rate 14% ($p=.03$). SHORT decreased peak compression and tension 6% ($p=.01$, $p<.01$, respectively). LOW decreased tension 3% ($p=.01$) but increased shear 21% ($p<.01$). Conclusions: Step length reduction, followed by increasing step width, appeared most effective in reducing running-related tibia stress. Running with lower impact forces resulted in mixed effects while using a FFS increased tibia stress, so caution should be used with these gait modifications. Gait modification effects did not vary by sex. Future work should examine the long-term effects.

OM3: Victoria Penna; Anne Dickerson

Presentation Title: "Visual Reaction Time Differences Between Medically-at-Risk Adult Drivers and Controls."

Abstract: Introduction: Visual and cognitive abilities are crucial to the performance of driving. Visual perceptual skills are conceptualized as a hierarchy of skills that work together to help process our visual information. Individuals with impairment in visual perceptual skills, specifically scanning or processing speed, will likely have difficulty with judgement and reaction to on-road events. Currently, there are limited assessments for visual processing speed. However, there is emerging evidence for the Vision Coach™ to be an appropriate and reliable tool for analyzing this process with previous research having established normative data and confirmed that as healthy individuals age, reaction times begin to slow. Design: A cross sectional quasi-experimental design will be utilized to examine if significant differences in visual reaction times exist between healthy drivers and medically at-risk drivers with a wide variety of conditions. Research questions: This presentation seeks to answer 1) is there a performance time difference between medically at-risk individuals and the established norms, 2) which medical conditions are associated with slower speeds that impair driving, and 3) will the Vision Coach™ be an effective tool for determining fitness to drive. Procedure: Data collection for the present study was part of a comprehensive driving evaluation (CDE) that determines fitness to drive. Using the Vision Coach™ "Full Field 60" task, reaction times (the amount of time to complete the visual task) were compared between the current participants (medically at-risk drivers) and the norms. The "Full Field 60" task required participants to tap 60 red dots that would randomly illuminate on the board. The dots would appear one at a time and would not disappear until the participant had tapped the dot. Four trials were conducted, with the first trial acting as a practice round. Statistics will be used to compare the two groups (at-risk drivers & norms) to identify if there are any differences regarding reaction times.

OM4: Sydney Romer

Presentation Title: "Effects of Background Music on Experienced Driving Performance in Individuals with Autism Spectrum Disorder Compared to Neurotypical Individuals"

Abstract: Purpose: Achieving a driver's license is essential for teens in order to achieve independence and begin the process of working, going to college, and participating in their community. Individuals with Autism Spectrum Disorder (ASD) often have difficulty achieving licensure. Research also demonstrates that individuals with ASD have more driving performance errors compared to their neurotypical peers. Music is another factor that can affect driving performance. Studies have found that music can negatively affect driving performance by diverting attention, causing aggression, and changing perception of time and speed. However, studies have also found that music can help treat some of the psychological challenges those with ASD face. There is a significant gap in the research on how music may affect those with ASD when they drive. The purpose of this study was to address this gap by investigating the effects that self-selected background music has on the driving performance of individuals with ASD compared to neurotypical individuals. Design: A 2 (autism/neurotypical) x 2 (music/no music) x 2 (hazards/wayfinding) factorial design was used. Participants included 34 neurotypical adults and 5 adults with ASD. Method: All participants completed a basic questionnaire, driving history questionnaire, and the Adult Sensory Profile before completing four different driving scenarios (two hazard and two wayfinding) on the driving simulator. During two of the drives, the participant listened to self-selected music. The order the participant completed the drives/music was counterbalanced to prevent learning effects. The dependent variable of driving performance was measured by the Performance Analysis of Driving Ability (P-Drive). Results: Repeated measures ANOVA showed no significant difference in driving performance between music conditions ($p = 0.760$), however there was a significant difference between drive ($p=0.000$) and group ($p=0.049$). No significant interaction effects were found. Conclusion: Results of this study indicate that music does not significantly affect driving performance, contradicting previous evidence that music negatively affects driving performance. When working on driving with individuals with ASD, therapists can consider including music.

OM5: Carley Overman

Presentation Title: "Inpatient Rehabilitation Services and Physical Activity Level"

Abstract: Patients in inpatient rehabilitation facilities are required to attend three hours of therapy on five of seven consecutive days. The members of the rehabilitation team including occupational and physical therapists, and speech-language pathologists use different approaches in therapy, yet have a similar aim in the wellbeing of the patient. The common ground between different types of therapy is that the therapy interventions may increase the patient's activity level through occupational participation and physical activity. However, despite the opportunity that therapy provides for physical activity, many patients are spending too much time sedentary during their inpatient stay. Research suggests that sedentary time is associated with chronic diseases and has been linked to poorer functional outcomes. The objectives of this study are to determine the difference in physical activity level between occupational therapy, physical therapy, and speech-language pathology services, the difference in physical activity level between the time of receiving rehabilitation services and the time not receiving rehabilitation services, and the difference in physical activity level between the days receiving rehabilitation services and the days not receiving rehabilitation services in patients in inpatient rehabilitation. Fifty participants will be recruited from Vidant Medical Center's inpatient rehabilitation facility for this prospective, repeated measures study. Participants will be screened for moderate-to-severe cognitive impairments and will wear an activity tracker to monitor physical activity for a duration of up to two weeks. While the time allotted

for therapy sessions is limited, the findings of this study may highlight the necessity of providing the patients with generalizability or adaptations of therapy interventions that can be implemented during non-rehabilitation times without a therapist present. Additionally, these findings may indicate a need for individualized programs for patients that can be completed during non-rehabilitation times and post-discharge in order to further increase and promote overall daily physical activity levels and maximize the effects of rehabilitation services.

Research Doctorate Students (i.e., PhD)

OR1: Wyatt Bunner; Erzebet Szatmari; Robert Hughes

Presentation Title: "Design and development of optogenetic reporters to study neuronal signaling in health and disease"

Abstract: More than 90% of excitatory synapses in the mammalian brain occur on dendritic spines. These highly dynamic structures undergo structural plasticity or remodeling induced by synaptic activity and changes in synaptic strength. Recent studies on animal models of aging and on postmortem human brains, suggest that spine number, shape and morphology change with aging. Importantly, these changes include selective loss of thin spines and elimination of excitatory synapses in brain areas involved in memory and cognition. In the human brain affected by Alzheimer's disease (AD), toxic A β -oligomers and tau will further accelerate spine elimination and deeply affect both long-term potentiation (LTP) and long-term depression (LTD), the biological basis of learning and memory. Other pathological features of early AD include deficits in synaptic mitochondria (such as reduced density, impaired transport and respiratory function, increased permeability transition) and aberrant reorganization of the spine cytoskeletal apparatus. Based on these observations, AD is now considered a disorder of the synaptic function ("synaptopathy"). Proteins involved in synaptic dysfunctions associated with neurodegeneration can be coupled with optogenetic reagents to create rapid and sensitive reporters, providing insight into the biochemical processes involved in neurodegeneration, including Alzheimer's Disease (AD). We recently developed a novel optically responsive tool (the 'CofActor' system) that couples cofilin and actin (key players in early stage cytoskeletal abnormalities associated with neurodegenerative disorders) with light-gated optogenetic proteins to provide spatial and temporal resolution of oxidative and energetic stress-dependent biochemical events. CofActor is a light-activated, genetically encoded redox sensor that can be activated with precise spatial and temporal control. Here we provide evidence that CofActor reports stress-related cytoskeletal dysregulation in live neurons treated with A β 42. In future experiments we will use this sensor in neurons isolated from transgenic mouse models of AD and/or mice KO for proteins involved in AD to advance our understanding of the molecular basis of early cytoskeletal dysfunctions associated with neurodegeneration.

OR2: Imani Gilbert, B.S.; Jamie Perry, PhD

Presentation Title: "The Impact of COVID-19 on Evidence-Based Practice"

Abstract: Introduction: Evidence-based practice (EBP) serves as the cornerstone for optimal patient care across a variety of disciplines, including the discipline of communication sciences and disorders (CSD). EBP is the direct and sensible use and application of current best research evidence when making decisions regarding patient care (Sackett et al., 1996; Spek et al., 2013). As part of the process to implement evidence-based decision making in their professional practice, clinicians and students must identify the "best" research manuscripts. To overcome the barrier of subjectivity as it relates to "best" evidence, the Canadian Task Force on the Periodic Health Examination introduced the Levels of Evidence, a framework for categorizing research based on a variety of criteria (e.g., study design methodological quality, and validity). To ensure that best evidence is readily available to

all professionals within the discipline, CSD researchers and scientists have to design studies and publish on data that are of higher qualities or stronger evidence levels when appropriate. On 11 March 2020, the World Health Organization (WHO) declared the presence of COVID-19 as a global pandemic. Many research-based institutions had to close temporarily, leading to an inevitable decline in research productivity for many CSD-researchers. This decline likely has had a direct impact on the type of new evidence that will be readily available to CSD students and professionals now and in the upcoming years. Methods: Manuscript publications in the top four peer-reviewed scholarly CSD journals were evaluated for evidence levels. Manuscript submissions were only evaluated if they were originally received between April 2020 and February 2021 and resulted in a publication within the same timeframe. April 2020 was used as the received cutoff date due to when COVID-19 was declared a global pandemic, impacting research productivity. Manuscript submissions between April 2019 and February 2020 were also evaluated so that publication trends could be examined. Results: Published manuscripts are being examined for evidence level and analysis of publication trends are ongoing and will be completed in April 2021. Potential Impact: The results of this project will provide insight into how COVID-19 has impacted research manuscripts and subsequently the available best research for practicing professionals and students who are trying to achieve optimal patient care.

OR3: Abigail E. Haenssler; Robert Mann, MD; Xiangming Fang, PhD; Jamie L. Perry, PhD

Presentation Title: “Anatomical and Physiological Changes Following Primary Palatoplasty Using the Buccal Flap Approach”

Abstract: Background: Primary palatoplasties using the Anatomic Cleft Restoration Concept uses the buccinator myomucosal flap (buccal flap) to correct the tissue deficiency within the cleft palate malformation. The surgical approach consists of dividing the hard and soft palate junction and creating a defect that is reconstructed using the buccal flaps, which are raised from the inner aspects of the cheek. The surgical approach aims to close the palate without tension, lengthen the palate, reconstruct the levator muscular sling, not inhibit craniofacial growth and achieve proper resonance for speech. The purpose of the study was to characterize the anatomic and physiologic changes as a result of the buccal flap surgical approach in comparison to non-cleft controls to determine if the use of the buccal flap creates a more normal velopharyngeal (VP) system for adequate VP closure.

Methods: Magnetic resonance imaging was used to analyze VP and craniofacial variables for 10 adults with cleft palate who received a primary palatoplasty using the buccal flap approach and 10 age-matched adults with non-cleft anatomy. An ANCOVA was used to compare the values obtained between the two groups. Results: Significant differences for effective velar length, effective VP ratio, sella-nasion-subspinale angle, sella-nasion-supramentale angle and velar stretch were noted between the two groups. The effective velar length and effective VP ratio increased from the non-cleft group to the buccal flap group. There were no significant differences for velar thickness, velar length, VP portal depth, nasion-sella-basion angle or subspinale-nasion-supramentale angle.

Conclusions: This study defined anatomic changes resulting from primary palate repair using the buccal flap approach. Results from the study suggest that the buccal flap surgical approach increases effective velar length, which places the levator veli palatini muscle in a more favorable position for VP closure. This study highlights the utility of using MRI to quantify the changes that occur to the VP anatomy following the buccal flap surgical approach and may help improve diagnostic and treatment approaches for individuals with cleft palate. Funding: ECU College of Allied Health Sciences Dissertation Research Grant

OR4: Eshan Schleif; Katherine Willoughby; Colin Brady; Joseph Williams; John Riski; Jamie L. Perry, PhD

Presentation Title: "Quantifying Changes in Speech and Velopharyngeal Function Following Lefort I Maxillary Advancement and Distraction using Perceptual and Instrumental Assessment"

Abstract: Background: Treatment of maxillary hypoplasia with osteotomy is required in 25-40% of patients with a history of cleft lip with or without cleft palate. Advancement of the maxilla can increase the size of the velopharyngeal (VP) port resulting in incomplete VP closure and VP insufficiency, which is characterized by hypernasality. The effect of maxillary advancement on speech and VP function in the population with repaired cleft lip and palate remains controversial. Methods: Our study included 45 (38 males, 7 females) individuals between 7 and 22 years of age (M = 14.16 years, SD = 3.03). Pre- and post-operative speech assessment include perceptual ratings of articulation, resonance, and VP function. Nasalance scores were calculated using the Nasometer from three speech samples (sustained nasal sound, nasal sentence, oral sentence). Paired-samples t-test and independent t-tests were used to analyze between-group data. Results: The results showed a significant ($p < 0.05$) increase in nasalance scores for all speech samples following maxillary advancement and distraction. There is a significant difference ($p < 0.05$) in perceptual ratings of VP function. Of those who presented with hypernasal resonance pre-operatively, 36% became more hypernasal while 45% remained hypernasal post-operatively. Of those who presented with normal resonance pre-operatively, 65% developed hypernasal resonance post-operatively and 35% maintained normal resonance. Results show a significant increase in nasalance scores for individuals without previous speech surgery ($p = 0.039$) and for individuals undergoing distraction ($p = 0.005$). Conclusion: We conclude that pre- and post-operative speech assessments should include perceptual and instrumental assessment. Providers should incorporate patient counseling for those at risk for developing VPI post-operatively. Maxillary advancement and distraction can result in approximately 11-15% increase in nasalance scores, and deterioration in VP function. Individuals with previous speech surgery may demonstrate less deterioration in VP function following maxillary advancement and distraction, compared to those without previous speech surgery.

OR5: Taylor Snodgrass, M.S.; Jamie Perry, PhD; Erin Stieber, JD; Hugh Brewster, MeD; Ruben Ayala, MD; Usama Hamdan, MD

Presentation Title: "The Impact of COVID-19 Across Major Organizations Involved in Cleft Care"

Abstract: Background: Sars-CoV-2 (COVID-19) impacted the healthcare field in many ways, including shortages of personal protective equipment and limited availability of hospital beds (McKenney et al., 2020; Ranney, Griffeth, & Jha, 2020). As a result of the pandemic and the associated shortages, many medical facilities reduced the number of elective surgeries offered (Diaz et al., 2020). This directly impacted comprehensive care for individuals with cleft palate, especially in low and middle-income countries where there are additional pre-existing barriers that may prevent patients from receiving timely and comprehensive care (Kassam et al., 2020; Massenburg et al., 2016). Many non-governmental organizations (NGOs) work to reduce barriers in low and middle-income countries and to improve the standard of care (Chanine et al., 2020; Kassam et al., 2020). The purpose of this study was to investigate the impact COVID-19 had across major NGOs involved in comprehensive cleft care and the impact COVID-19 may have on global cleft care moving forward. Methods: A qualitative design was utilized for this study. Four individuals from four different major NGOs involved in global cleft care were interviewed. Detailed notes were taken during the interviews, and these notes were analyzed for themes. Results: Participants reported a shift in care as a result of COVID-19 which included halting international travel, cancelling surgeries, and transitioning to telehealth. Many pre-existing barriers in low and middle-income countries were

exacerbated as a result of the pandemic, and participants reported increased anxiety for both providers and families. Concerns were reported regarding the level of training new and local healthcare providers are receiving and the number of surgeries that had to be cancelled as a result of the global pandemic. Conclusions: COVID-19 impacted how NGOs aid in providing comprehensive cleft care in many ways. Sustainability of cleft care may be impacted as a result of the pandemic, as many children have not been able to receive surgical palate repairs and local professionals may not be receiving training in cleft care.

OR6: Neda Tahmasebifard; Patrick M. Briley, PhD; Charles Ellis, PhD; Jamie L. Perry, PhD

Presentation Title: "Early Nutrition Among Infants with Cleft Lip and Palate Admitted to the NICU"

Abstract: **Objective:** The objective of this study was to determine the odds of breastfeeding at discharge in infants admitted to a neonatal intensive care unit (NICU) with cleft lip and palate (CLP). **Method:** Data from the 2018 National Vital Statistics System were used for this project. The sample consisted of infants admitted to NICU with CLP and those without CLP. For baseline comparisons, Chi-square tests of independence were used to compare categorical variables, and independent sample t tests were used for continuous variables. The logistic regression models were performed to determine the odds of breastfeeding at discharge in infants admitted to NICU with CLP. **Results:** The sample included 345,429 infants admitted to NICU of which 660 had CLP. Baseline comparisons indicated significant differences between the two groups related to: mother's race, mother's education, maternal smoking, delivery method of birth, maternal pre-pregnancy, five-minute (appearance, pulse, grimace, activity, and respiration) APGAR, multiparity, gestational age, and gestational weight. The logistic model results indicated differences between the two study groups. Infants admitted to the NICU with CLP had a lower probability to breastfed at discharge compared to infants admitted to the NICU without CLP (OR = .543; 95% CI .455, .648) after controlling for significant covariates. **Conclusion:** Results from the current project suggest a lower odds of breastfeeding at discharge among infants admitted to NICU with CLP compared to those without CLP. These findings indicate that nutrition through breastfeeding in infants admitted to NICU with CLP may be reduced compared to infants without CLP.

Poster Presentations

Undergraduate Students

PU1: Rebecca Davis; Andrew Vermiglio; Virginia Driscoll; Kylee Shapiro; Erin Kokinda; Hannah Osborne; Reyse Stirrett

Presentation Title: "Speech Recognition in Noise Abilities between Musicians and Non-Musicians"

Abstract: The purpose of this study was to examine the differences between musician and non-musician participants' speech recognition skills in various maskers. Musician and non-musician participants completed an online protocol that included the AzBio sentence lists paired with noise and music backgrounds. Results showed that musical experience did not provide benefit for speech recognition in noise abilities.

PU2: Erin Kokinda; Andrew Vermiglio; Virginia Driscoll; Hannah Osborne; Reyea Stirrett; Rebecca Davis; Kylee Shapiro; Kacey Sturdivant

Presentation Title: "Impact of Listener Dialect on Speech Perception in Noise"

Abstract: The main objective of this study was to investigate speech recognition in noise performances across listener dialect groups. The participants completed an online dialect quiz that determined the geographical location of their dialect. Speech perception in noise was evaluated using AzBio sentence lists presented in five types of background noise. It was hypothesized there will be a statistically significant difference between dialect groups for speech perception in noise ability. The results showed no statistically significant differences between groups for speech recognition in noise ability across all the masker conditions.

PU3: Delcina Loyd Eaton; Robert Campbell

Presentation Title: "Kotter Change Management Model and A3 Thinking effects on Reducing the Number of Cigarettes Smoked Per Day: A Single-Subject Research Study"

Abstract: This single-subject research study focuses on a 48-year-old female interested in reducing the number of cigarettes smoked per day to zero. This research study aimed to evaluate the effect the Kotter Change Management Model and A3 Thinking (Toyota Model) had on reducing the number of cigarettes smoked per day. For this study, smoking a cigarette was defined as putting a cigarette up to the mouth, lighting it, and inhaling at least one drag of smoke. E-cigarettes, pipes, and cigars were excluded from the study. Kotter's Change Management model contains eight steps that facilitate individual and organizational change. The eight steps include: establishing a sense of urgency; creating a guiding coalition; developing a vision and strategy; communicating the change vision; empowering broad-based action; generating short-term wins; consolidating gains and producing more change; and anchoring new approaches in the culture. A3 Thinking uses four steps: Plan, Do, Check, and Act (PDCA). Like the scientific method, in A3 Thinking, hypotheses are developed, experiments designed, experiments conducted, measurements collected, the results interpreted, and suitable actions are taken. Kotter's model was used to facilitate change, and the A3 report was used to develop a vision and strategy for the research study. A review of the results showed a clear correlation between physical activity and reducing the number of cigarettes smoked per day. When comparing the baseline period, the nicotine patch alone successfully reduced the number of cigarettes smoked per day but was only 41.67% effective. Combining the nicotine patch with drinking 16 ounces of water to mimic the hand gesture made when smoking and initiate a waiting period was only 50% effective but lead to more consistent control of nicotine cravings. Combing the nicotine patch and waiting period with physical activity proved the most beneficial, at 100% effective, for controlling the subject's nicotine cravings. The physical activity led to a consistent drop in nicotine cravings by producing endorphins that provide a good feeling, like the feeling the subject got from smoking. Substituting smoking with walking exchanged like feeling for like feeling and thus was more successful in reducing the number of cigarettes smoked.

PU4: Rachel Mansfield; Julia Scott; Madeline Funke; Saryu Sharma; Erika Johnson; Natalia Jaworska; Kathrin Rothermich

Presentation Title: "Implications on Mental Health Due to COVID-19 in Patients with PD"

Abstract: The COVID-19 Pandemic has affected millions worldwide, severely impacting those with underlying neurodegenerative conditions such as Parkinson's disease (PD). Due to the global pandemic, preventative methods, such as quarantine, have been put in place to stop the spread; however, this has increased feelings of loneliness and isolation among all individuals. Social isolation can frequently lead to a decrease in one's typical daily activities and outdoor endeavors, which may prompt a less active lifestyle, decreased mobility, and the worsening of PD (Bhidayasiri et al, 2020).

Existing evidence reveals health decline in individuals with PD due to the pandemic, but there is a lack of data available on the impact of COVID-19 restrictions on mental health, communication challenges, and access to health care within the PD population. In the current study, participants diagnosed with PD completed an online questionnaire regarding their mental health, coping abilities, communication difficulties, and health care barriers related to the pandemic. A first analysis shows that within our pilot sample (N=22), an average of 74% of participants with PD reported an increase in anxiety, depression, and stress compared to before the pandemic. A second analysis revealed that 64% of participants with PD report difficulties with hearing due to decreased loudness of communication partner related to mask-wearing, while 27% report challenges due to the inability to lip read. When asked about health care appointments during the pandemic, 36% of participants report that they canceled appointments due to fear of contracting the virus. Our preliminary findings shed light on the impact of the COVID-19 pandemic on patients with Parkinson's Disease and reveal the need to provide telehealth opportunities, counseling, and support to individuals with PD, specifically in rural regions of the US such as Eastern North Carolina.

PU5: Nainika Nandigama; Megan Pajski; Chris Byrd; Alyssa Fennell; Anna Seguin; Emily Seguin; Ted G. Graber

Presentation Title: "Calcium Handling Abnormalities in Aging Muscle Associated with Declining Physical Function"

Abstract: In the next 30 years, the population aged 65 and older will double, ushering in an increased prevalence of age-associated diseases such as diabetes, frailty (inability of the body to maintain homeostasis), and sarcopenia (age-related loss of muscle mass and strength). Frailty and Sarcopenia contribute to the progressive loss of functional ability, resulting in a lower quality of life and eventual loss of independence for older adults. Exercise is a treatment for these diseases, but not a cure, so investigations into the underlying molecular mechanisms of aging and exercise are needed. Previously, our lab found evidence that calcium handling in skeletal muscle is altered with age. Calcium re-uptake to the sarcoplasmic reticulum by the SERCA pump promotes muscle relaxation after contraction. Sarcolipin (SLN) negatively regulates SERCA by preventing calcium pumping but not ATP cycling. SLN is upregulated in older mice (28+ months old) nearly 12-fold compared to adult (6-month old) and is associated with declining physical function ($R=-0.55$). In this study, we determine the skeletal muscle gene expression of SLN (as well as myoregulin and phospholamban--proteins with similar molecular function to SLN) following four months of two modes of endurance training in both adult (10-months old) and older (26-months old) mice (voluntary wheel running, n=8 per group; high intensity interval training, n=10 per group; and sedentary controls, n=8). We isolated RNA from gastrocnemius muscle, quantified mRNA expression using q-rt-PCR, and determined sarcolipin protein content with Western immunoblotting. We hypothesized that increased sarcolipin contributed to muscle dysfunction with age, but that exercise training might mitigate expression--consequently helping to restore older muscle health. Compared to the controls, there was significant improvement in the physical function and body composition in both exercise groups. We believe this study will improve our understanding of mechanisms of both exercise and aging, with potential for the future development of therapeutic targets.

PU6: Puja A. Patel; Oyinlola T. Babatunde, PhD

Presentation Title: "Knowledge and Perception of Aging and Older Adults Among Allied-Health Students"

Abstract: Background The population of older adults (65+) is rapidly increasing globally. The demographic shift is becoming a public health concern due to the demands on the healthcare system to support this vulnerable population to age healthily. However, published work have reported

misconceptions and stereotypes, which may impact future healthcare workers' choice to work in geriatrics. Professionals are a vital part of the workforce, but compared to other health sciences, there are few published works on the knowledge and perception of older adults. The purpose of this study was to evaluate ECU College of Allied-Health Sciences (CAHS) students' knowledge and perception of aging and older adults. Methods A cross-sectional study design, using the Revised Palmore Facts on Aging Quiz (FAQ),¹⁰ administered online via Qualtrics assessed CAHS students' knowledge and perception of older adults and aging. Demographic data was collected. Data was analyzed using SPSS 27 with significance set at $p=0.05$. Results A total of 130 students, [mean age 26.30 (S.D. 7.39)] from all the CAHS majors (undergraduate/graduate) completed the survey. Majority of the participants were female (91%). The total correct responses on the FAQ ranged from 11-41 [mean 27.83 (S.D.5.58)]. Correct responses were categorized into three groups, similar proportion (36.6%) had low (≤ 26) and medium (27-31) scores, and 26.2% scored ≥ 32 (high). Age and number of gerontology focused courses previously taken made significant contributions to the total FAQ score ($p = 0.026$). Discussion Based on the findings, knowledge of older adults and aging was low among the participants, similar to other published work. Researchers recommend that increasing knowledge about the aging population may help improve perception towards the elderly and possibly gain interest in geriatrics to meet the workforce demand. Considering number of gerontology focused courses taken contributed to total knowledge score, including coursework about aging and experimental learning in the curriculum might promote positive perception towards older adults and attract allied health graduates to respond to the workforce need. The gender difference, a limitation in the study, is a representation of ECU and CAHS student demographics.

PU7: Tyler Phinizy; Chia-Cheng Lin, PhD; Swati M. Surkar, PhD

Presentation Title: "Effects of Dual-Task Training on Cognitive-Motor Learning and Cortical Activation in Healthy Young Adults"

Abstract: A dual-task (DT) paradigm requires concurrent performance of two tasks, usually a cognitive and motor task that can be performed independently and have distinct goals. Since attention needs to be divided, limited central processing capacity results in interference and functional performance deficits. Numerous studies have investigated the effects of DT training in healthy adults as well as individuals with neurological disorders. However, the DTs included are limited to simple tasks that do not involve complex interactions of various systems required for dynamic postural control. Moreover, there is a paucity of knowledge in understanding the effects of complex DT training on cortical activation. Hence, the purpose of this study is to assess the effects of dynamic stability DT training on performance and prefrontal and vestibular cortical activation in healthy young adults. Dynamic postural stability is an integral aspect of postural control, which involves complex interaction of somatosensory, vestibular, and visual systems. It is important to systemically study the interference of an additional attention-demanding task on interaction of these systems. Moreover, it is important to investigate if complex DT training can reduce motor-cognitive interference and improve postural stability. Our DT paradigm involves balance on a dynamic stability platform combined with a simple and complex auditory reaction time task. The motor task requires participants to keep the platform as level as possible. The cognitive task requires response to auditory stimuli. Prefrontal and vestibular cortical activation is assessed with a neuroimaging technique, functional near-infrared spectroscopy. Baseline testing involves performance of each task and cortical activation while performing tasks. 20 adults will receive training for 5 consecutive days (practice of 18 DT trials). Post-training performance on the same baseline measures is assessed immediately after 5 days of training and again 1-week post training to assess retention effects. Preliminary analysis showed improved balance performance, reaction time, and DT performance

across visits, suggesting promising effects of DT training in healthy young adults to improve postural stability and reduce cognitive-motor interference.

PU8: Hannah Ring; Mackenzie Rountree; Elizabeth Simmons; Stephanie Wallio; Kathrin Rothermich, PhD

Presentation Title: “Dynamic Social Perception in Adults with Autism Spectrum Disorders”

Abstract: Autism spectrum disorder (ASD) is a neurological condition that is typically diagnosed by the age of three-years-old. ASD can have a profound life-long impact on social perception, the maintenance of relationships, and communication abilities (Marshall et al., 2008). These impairments have been associated with issues with Theory of Mind (ToM), perspective taking, and executive dysfunction, as well as structural brain differences when compared to neurotypical adults. The ToM account is most important for our research question, and it states that individuals with autism are often unable to attribute mental states to themselves and/or others. This deficit is apparent through a failure to take other people’s mental states into account (Frith, 1989). While many studies, such as Whyte and Nelson (2015), have described the effects of ASD on social perception in children, there is a lack of research involving adults with ASD. Additionally, there is a need for assessment and training tools that encompass ecologically valid, dynamic stimuli. A video inventory (Relational Inference in Social Communication or RISC) to test the perception of social intentions such as sarcasm, teasing, and prosocial lies allows for the investigation of interpersonal communication in both neurotypical adults and clinical populations. The current study uses the RISC videos to examine how adults with ASD and neurotypical adults understand nonliteral language and social intentions. We will also analyze how individual differences in empathy and perspective taking influence the way adults with ASD evaluate social intentions using a set of standard questionnaires. We expect that people with ASD will show a deficit in recognizing the speaker’s intention, especially when being confronted with nonliteral language such as teasing and sarcasm. We also predict that participants with higher empathy scores will have an advantage when evaluating what the speaker is intending. The study is currently in the recruitment and data collection phase, and the goal is to create a case study.

PU9: Kylee Shapiro; Andrew Vermiglio; Virginia Driscoll; Rebecca Davis; Erin Kokinda; Hannah Osborne; Reyse Stirrett

Presentation Title: “Relationships Between Grammar Performance and Speech Recognition in Various Maskers”

Abstract: The purpose of this study was to determine the relationships across speech-in-noise measures and Grammar Mixed Test results. Young native English speakers were recruited. All participants completed the online Grammar Mixed Test to determine the individual’s utilization and knowledge of grammatical rules. Participants completed an online AzBio speech perception test in the presence of Steady-state speech-shaped Noise, Ten-talker Babble, and three musical backgrounds. No significant correlation was found between grammar proficiency and speech recognition in noise abilities.

PU10: Kacey Sturdivant; Andrew Vermiglio; Virginia Driscoll; Reyse Stirrett; Rebecca Davis; Kylee Shapiro; Hannah Osborne; Erin Kokinda

Presentation Title: “The Impact of a History of Otitis media on Speech in Noise Abilities”

Abstract: The purpose of this study was to investigate the effect of a history of otitis media on speech recognition in noise ability. Participants included young adults whose native language was English and who reported no difficulty hearing speech in a quiet environment. Participants completed an online questionnaire and reported their history with otitis media. Speech-in-noise

tests were conducted online using the AzBio sentence lists presented with non-music and music maskers.

Masters/Clinical Doctorate Students (i.e., MS, DPT, AuD)

PM1: Alayna Allred; Megan Warfield; Joseph Houmard; G. Lynis Dohm; Terry Jones

Presentation Title: "Plasma lactate and skeletal muscle fatty acid oxidation in individuals that are overweight"

Abstract: Individuals that are overweight (BMI 25-30 kg/m²) exhibit a high risk of becoming obese and developing metabolic diseases. Our overarching hypothesis is that skeletal muscle in individuals that are overweight have a "metabolic program" which predisposes them to obesity. This metabolic phenotype could result in increased reliance on anaerobic glycolysis in skeletal muscle. This suggests they are metabolically inflexible. An indicator of anaerobic glycolysis is fasting lactate concentrations. The higher the fasting lactate the higher the level of anaerobic glycolysis. There is evidence that individuals that are lean adjust to a preference for fat oxidation within 3 days of a high fat diet and those that are obese do not. We studied individuals that are overweight (BMI 25-30 kg/m²) with low fasting plasma lactates and individuals that are overweight with high fasting lactates. These individuals ate a high fat diet for three days to see how exposure to lipids impacted their skeletal muscle with respect to fatty acid oxidation. Fatty acid oxidation was measured on homogenates from muscle biopsies. plasma lactate was measured in blood drawn in the fasting condition. We also measured plasma lactate to examine the relationship between fatty acid oxidation and plasma lactate. Plasma lactate was measured in blood drawn in the fasting condition.

PM2: Grace Baker; Alex Durland

Presentation Title: "Appropriate Referral and Non-Operative Management of a Posterior Rim Acetabular Fracture"

Abstract: Background and Purpose: In recent years, there has been a 2.4 fold increase in the incidence of acetabular fractures among patients > 60 years old. Although information is lacking in regard to acetabular stress fractures, many authors have agreed upon the importance of an early and appropriate diagnosis in order to ensure a quick and safe recovery. Current literature supports the use of direct access physical therapy to provide appropriate referrals. A study of 50,000 patients seen by military PT's in direct access encounters reported no adverse events or malpractice litigations. Another study found that 26% of PCP referrals for imaging were considered inappropriate, whereas a different author discovered that only 9% of imaging referrals by military PT's were considered inappropriate. The purpose of this case study is to describe the successful referral for imaging and non-operative management of a patient with a posterior rim acetabular fracture. Case Description: In this case study, a 60 y/o female presented through self-referral to a physical therapy clinic with right hip pain after tripping and falling in an extended hip position. The patient was seen and evaluated 7 weeks post-injury and demonstrated decreased step length during ambulation, pain with hip flexion, pain with manual muscle testing, anterior hip pain with joint testing, and was tender to palpate over the right AIIS. The patient was referred by the physical therapist to an MD with concern for a possible avulsion fracture. Outcomes: after imaging, the patient was discovered to have sustained a posterior rim acetabular fracture and was treated conservatively for 1 year. Initial imaging revealed a cortical defect involving the posterior lateral right acetabulum and suspected nondisplaced fracture without arthropathy. Over the span of 1 year, the patient demonstrated improvement in symptoms with conservative care. Discussion: Through non-operative treatment, the patient was able to manage the injury conservatively and achieve successful outcomes with minimal exacerbation in symptoms. The outcomes of this case report

support direct access to physical therapy services and the use of conservative management to guide clinical decision making for individuals who desire non-operative treatment.

PM3: Emily Berrier; Virginia Middleton

Presentation Title: “Exploring the Role of Telehealth to Improve Writing Self-Perception in 7–12-Year-Old Students”

Abstract: Handwriting is an important skill for students. Good writing skills are needed to communicate with peers, demonstrate classroom knowledge, and prepare children for higher education. Children with handwriting deficits struggle to demonstrate their knowledge in the classroom. These deficits not only lead to poor classroom performance but can also result in a student’s negative perception of academic capabilities and lower self-esteem. Early handwriting intervention addressing letter legibility, shape, size, orientation, alignment, proper postural control, and pencil grip can greatly improve a child’s handwriting skills, classroom performance, and perception of performance. Occupational therapists are equipped to address each of these handwriting difficulties. While these interventions traditionally take place in-person with the therapist physically near the student to provide physical assistance and verbal guidance as needed, during the age of COVID-19, occupational therapy students at East Carolina University explored the use of telerehabilitation services to address this previously identified need. A group of five students between the ages of 7-12 participated in an 8-week long program to address writing skills. Each week students participated in a group warm-up session that incorporated speech and occupational therapy skills followed by two individualized therapy sessions: one with an occupational therapy student addressing handwriting skills and another with a speech-language pathology student addressing spelling skills. After assessing the student’s beginning skill level and self-perception, students received unique interventions specifically addressing areas for growth. After the 8-week intervention program, students were reassessed. This poster session will center on the occupational therapy-focused portion of this program. The session will explain the selection and use of Handwriting Without Tears intervention techniques to address specific clients’ needs, use of The Print Tool and Here’s How I Write assessments for this population, and an indication of how students’ outcomes related to their perception of personal writing skills. Recommendations for future studies will also be included.

PM4: Margaret Bitter; Elizabeth Earley

Presentation Title: “Normative Data for DriveSafety”

Abstract: DriveSafety is an advanced car driving simulator that can be used to test participants’ ability to drive in a variety of environmental and traffic conditions. Currently, no research has been conducted to find the normative data for the scanning and multitasking tasks on the DriveSafety simulator. Scanning and multitasking are essential for safe and effective driving and thus are the focus of our research study. Participants in the study completed 7 different DriveSafety simulator tasks which targeted scanning and multitasking skills and got progressively more difficult with each task. The tasks required participants to maintain their speed and lane position while responding to the brake lights of another vehicle as well as to environmental distractors. Data was collected from these tasks in order to establish norms in these areas. Our population consisted of 29 females ranging from 22-30 years old. Therefore, norms from this research pertain to that population. All participants were able to complete the 7 tasks with minimal difficulty and had optimal scores for position in lane, speed, and simulation tasks. Participants were allowed one failure of a task (less than 80%), however only 2 participants needed to repeat a task. Repetition of the task was not due to inability to participate in the task requirements, but due to inadequate force on the brake pedal. Establishing this normative data is important for future research studies. For instance, this data can

be used in the future to compare similar subjects who have had an illness or injury that may affect their ability to drive. Clinically, this will help evaluators to see how these subjects perform in comparison to their population norm.

PM5: Chris Byrd; Megan Pajski; Nainika Nandigama; Alyssa Fennell; Emily Seguin; Anna Seguin; Ted G. Graber

Presentation Title: "Increasing Physical Activity to Preserve Function in Older Adults: Lessons from Mouse Models of Endurance Training"

Abstract: One inevitable consequence of aging is the deterioration of physical function and exercise capacity, often accompanied by sarcopenia (age-related loss of muscle mass and strength). Though the exact etiology of sarcopenia is unknown, there are many interworking contributory processes including changes to motor unit organization, α -motor neurons, and the neuromuscular junction. Exercise to increase physical activity may help to mitigate progression and outcomes of this disease by helping to preserve muscle mass and improve function in older humans. However, the underlying molecular mechanisms of age-related muscle dysfunction and exercise as an intervention remain unclear; thus, we need investigation with pre-clinical models. In this study, we compare functional abilities of older (26 months old) and adult (10 months) male C57BL/6 mice following four months of individualized endurance training: voluntary wheel running (VWR, n=8), or a high intensity interval training (HIIT, n=10) mimetic on a treadmill. We hypothesized both exercises would improve function, but HIIT would promote more extensive adaptation. Additionally, we hypothesized the adult mice would receive greater benefit from an equal exercise dosage than older mice. During training, the VWR mice spent 4 days per week with a running wheel (outcome is km/day) and the HIIT group ran 3x/week on a progressively difficult protocol based upon their maximum treadmill running speed. There was significant improvement ($P < 0.05$) in measurements of physical function and body composition in both exercise groups, comparable to that expected by older adult humans undertaking a similar training protocol. Our lab will be performing biochemical and transcriptomic/proteomic experiments to determine mechanisms and potential therapeutic targets, with the hopes of translating these valuable conclusions into clinically relevant evidence. We conclude our mouse models will be useful for future mechanistic investigations of the intersection of aging, exercise, and functional decline.

PM6: Heather Chambers, SPT; Kasey Cooke, SPT; Kalen Volger, SPT; Christine Lysaght, DPT

Presentation Title: "Leaders of a Doctor of Physical Therapy Pro-Bono Student Run Clinic Perceive Greater Leadership and Educational Benefit Than Non-Leaders"

Abstract: Many DPT programs are incorporating pro-bono clinics into their curriculum. In most clinic designs, a subset of students assumes leadership and administrative roles which may lead to perceptions different to students who participate in patient care. Previous studies support that students' perceptions of involvement in pro-bono clinics are positive however less is known about the effects of leadership on students' perceptions. The purpose of this study was to compare perceptions between students with and without administrative leadership responsibilities within a pro-bono student run clinic. Our hypothesis is that students with leadership positions would perceive higher benefits. Methods: An anonymous survey was distributed via Qualtrics to all students (3 separate cohorts) at one university's DPT program and repeated over a three-year period. Three specific questions related to student perceptions were utilized to perform analysis comparing leaders and non-leaders using a 5-point Likert scale. Data was analyzed using the Mann U Whitney test to compare student leaders' vs student non-leaders' perceptions of mentorship, leadership, and

educational benefit. Sub-analysis was performed to determine differences based on student year in program with $\alpha=.05$ for all analyses. Results: In the first year of the survey, student leaders perceived a higher benefit than non-leaders in leadership and educational benefit ($p=.002$; $p=.002$). The second year of the survey, there was a trend towards increased perceptions of leadership and educational benefit for leaders ($p=.083$; $p=.059$). In the last year of the survey, only perceptions of leadership were higher for leaders vs non-leaders ($p=.026$) Conclusions: Perceptions were positive overall for each survey year, but trended toward reductions in survey year 2 and 3. This may be due to increased time requirements and decreased novelty of clinic. Additionally, the academic year 2017-2018 the clinic requirements were integrated into the curriculum. Students with leadership roles may experience greater benefits from involvement in the pro bono clinic. However, conclusions are limited due to response bias, data from one university, and potential differences among cohorts.

PM7: Fernando L. Chivela; Ashley E. Burch; Elisabeth Lee; Paul Shackelford; Paul Bolin

Presentation Title: "Predictors of COVID-19 vaccine uptake among adults in eastern North Carolina"

Abstract: Introduction Uptake of the COVID-19 vaccine will be critical to the trajectory for improved population health and economic recovery from the COVID-19 pandemic. Despite the apparent need for containment of COVID-19, many individuals have rejected the non-pharmacologic measures for mitigating the risk and impact of the COVID-19 pandemic, and new evidence suggests many Americans might also refuse the COVID-19 vaccine. Thus, as public health officials strategize to improve vaccine uptake in the coming months, we conducted this study to identify the factors associated with COVID-19 vaccine willingness and previous acceptance of an influenza vaccine for the 2020-2021 flu season. Results from this study may also inform public health campaigns on strategies for addressing vaccine hesitancy. Method: Using a cross-sectional, regional platform, we surveyed a sample of adults residing in eastern North Carolina in December 2020 to understand and compare predictors of willingness to accept a COVID-19 vaccine and previous acceptance of the influenza vaccine for the current flu season. A series of univariate logistic regressions were employed to model predictors and calculate odds ratios. Predictors and odds ratios of vaccine acceptance included demographic variables, health, insurance status, healthcare utilization, COVID-19 testing, and the perceived risk of contracting COVID-19. Results: Participants ($N=946$) who were male, older, had a higher education level and income, reported greater vaccine willingness. Behaviors that reduce the spread of COVID-19 (e.g., testing) and the perceived risk of COVID-19 infection were associated with vaccine willingness. Among those who visited a healthcare provider in the last year, willingness to receive the COVID-19 vaccine was nearly twice as high, and flu vaccine acceptance was more than 2.5 times greater than those who had not visited a healthcare provider in the previous year. Notably, participants who believed they were "highly likely" to be infected were eight times more likely to endorse willingness to be vaccinated. Conclusions: Education tailored to demographic groups with low vaccine uptake should focus on the high degree of communicability associated with COVID-19. In this study, recent healthcare utilization was related to improved vaccine uptake. Implementing mobile healthcare screenings could remove barriers to healthcare, thereby improving health equity.

PM8: Amber Christensen; Caroline Sloan; Young Kim, PhD

Presentation Title: "The Relationship between Total Activity Count and Assistance Level of Adults Receiving Inpatient Rehabilitation Services"

Abstract: Background: Adults admitted to inpatient rehabilitation facilities receive 3 hours of therapy a day and are expected to show improved functional outcomes upon discharge. Previous research has indicated that increased physical activity outside of therapy may demonstrate improved

functional outcomes. However, while in the inpatient rehabilitation facilities, individuals are sedentary for a large percentage of time not in therapy. Objective: This study investigated the relationship between the functional outcomes of adults receiving inpatient rehabilitation services and discrepancies among their levels of physical activity while in therapy versus times they are not in therapy. Method: Participants' (n=30) physical activity levels were measured by Total Activity Counts (TAC) from ActiGraph during occupational therapy, physical therapy, and speech-language pathology services separately. Their functional outcomes were measured by the assistance levels on the self-care and mobility scales from the Medicare CARETool. The TAC were standardized to reflect the amount of activity a participant engages in per minute, which varied due to the durations of time that the participants wore the ActiGraph while receiving inpatient rehabilitation services. Results: Overall, the self-care score improved from 3.66 (SD=0.63) to 5.17 (SD=0.63) and mobility score improved from 3.29 (SD=0.53) to 5.01 (SD=0.69) between admission to discharge. There was no significant correlation between TAC discrepancies and functional outcomes during any therapy services ($p > .05$). Conclusion: Inpatient adults' physical activity levels inside and outside of therapy may not be associated with changes in functional outcomes. Adults receiving inpatient rehabilitation may need time to rest following the intensive therapy that they receive. These adults may not be active enough during therapy and non-therapy times.

PM9: Courtney Collins; Ryan Wedge

Presentation Title: "Real-time Metabolic Energy Expenditure to Study Gait Changes"

Abstract: Energy expenditure has been studied extensively across different species and regardless of the objective, metabolic energy expenditure (MEE) is an important factor when it comes to concepts pertaining to "energy optimization". Human bipedal locomotion is of interest regarding MEE and energy optimization because we may be able to improve rehabilitation and device design. Several gait parameters are altered in order to prioritize MEE such as preferred gait speed, step width, step length and stride time asymmetry.^{2,3,4} MEE optimization may no longer take priority, however, when stability is at risk such as during sloped walking or over uneven terrain.⁵ Special populations, such as people who have suffered a stroke or amputation, also fit into this concept of increased MEE with altered stability secondary to disability-related gait impairments.^{6,7,8} Indirect calorimetry is the most widely used method to determine MEE, and a limitation of indirect calorimetry is that participants need to maintain steady state conditions for three to five minutes, therefore it limits research of MEE regarding abrupt changes in gait parameters.⁹ Presently, there is not a standard method available to produce similar MEE measurements to indirect calorimetry in real-time. The first purpose of this study is to determine what variables (e.g., center of mass work, muscle activity) can represent MEE that closely resembles measures of indirect calorimetry and obtain these measurements in real-time. This could become an important tool to help special populations alter mechanics to find gait patterns that may decrease MEE. To see if this is possible, another purpose of this study is to investigate the use of visual biofeedback to alter gait mechanics and see if it alters MEE in able-bodied and special populations.¹⁰ We hypothesize that the use of COM measurements in combination with EMG data collection can produce real-time MEE measurements that approximate values obtained from indirect calorimetry. Data processing is currently ongoing to test this hypothesis by analyzing different models of muscle groupings and data groupings to best predict energy expenditure when compared to indirect calorimetry measures.

PM10: Lindsey Davis, SPT; Patricia Hodson, DPT

Presentation Title: "Clinical Instruction Survey of Doctor of Physical Therapy and Physical Therapy Assistant Programs in North Carolina and South Carolina"

Abstract: Introduction: The Carolina Clinical Education Consortium (CCEC) works to promote quality clinical education for Doctor of Physical Therapy (DPT) and Physical Therapy Assistant (PTA) students in North and South Carolina. The purpose of this project was to investigate the challenges of clinical education in DPT and PTA programs in NC and SC. Methods: A ten-question survey was emailed to the director of clinical education (DCE) for all DPT and PTA programs in NC and SC. Survey consisted of multiple-choice, free response, and ranking questions that pertained to information about each program, clinical placements, and challenges regarding clinical education. 26 DPT and PTA programs in NC and SC were emailed the survey through Survey Monkey. 58% response rate with 8 DPT and 7 PTA programs. Results: Responses demonstrated that competition from other programs and recruitment of clinical instructors are the most difficult factors in establishing and maintaining clinical placements. 73% of programs do not have a city/regional clinical placement consortium available for them. 100% of participants reported that inpatient hospitals and acute care are the most difficult clinical sites to establish. Responses demonstrated that alternative clinical placements were not needed until the COVID-19 pandemic in March 2020. Conclusion: Clinical education plays a vital role in DPT and PTA's students professional development and education; therefore, increased awareness and assistance should be provided to DPT and PTA programs in NC and SC to improve quality clinical education.

PM11: Rachel Dodson; Olivia Thiery; Vishwanath Vasudev Prabhu; Wyatt Bunner; Tuan Tran; Erzsebet Maria Szatmari

Presentation Title: "Understanding the role of Rab10 in neuronal resilience"

Abstract: Purpose: Advanced age and presence of ApoE epsilon allele are major risk factors for Alzheimer's disease (AD). However, a small percentage of elderly and carriers of ApoE epsilon, do not develop AD ("AD resilient" individuals). The molecular basis of resilience to AD is not fully understood. Recently, a loss of function mutation in Rab10 gene was shown to confer a 40% reduction in AD risk, even in patients homozygous for ApoE epsilon allele. Rab proteins are critical for spatial and temporal control of neuronal trafficking, including receptor trafficking during synaptic plasticity, axonal growth, and dendritic arborization due to its regulatory role in clathrin-independent trafficking and vesicle recycling. Here we describe our results on cellular, molecular, and behavioral characterization of Rab10^{+/-} mice, that we created to study the mechanisms of Rab10-dependent neuronal resilience in a mouse model of AD on Rab10^{+/-} background. Results: The level of Rab10 in the brain of Rab10^{+/-} mice was reduced by approx. 50% compared to their Rab10^{+/+} litter mates. We performed a battery of behavioral testing, demonstrating that Rab10^{+/-} mice perform significantly better in OIP task that tests hippocampus-dependent spatial memory. Conclusions: Rab10 functions as a negative regulator of hippocampal learning and memory formation. Future directions: a. transcriptomics studies to elucidate the molecular basis of enhanced memory formation and identify memory enhancement drug targets; b. crossing Rab10^{+/-} mice with the 3xTg-AD model, to further dissect the molecular basis of Rab10-dependent resilience to AD. Clinical Relevance: Understanding the molecular mechanisms of neuronal resilience to disease may hold important clues for the design of novel neuroprotective strategies.

PM12: Abigail Donahue; John D. Willson, PhD; Kristin Tharrington; Anna Becker; Stacey A. Meardon, PhD

Presentation Title: "Ankle Joint Loads during Triple Hop Landing in persons with Chronic Ankle Instability"

Abstract: Purpose: The purpose of this study was to compare internal joint contact forces (JCF) between individuals with and without CAI during the landing phase of the triple hop test. Methods: 20 CAI (15F, 22.9±4.1 yrs, BMI 22.6±3.0 kg/m²) and 20 matched controls (15F, 21.4±1.9 yrs, BMI

23.5±3.1 kg/m²) participated in this protocol. CAI and control groups were created using the International Ankle Consortium position statement for patients with CAI in controlled research. Participants completed the Cumberland Ankle Instability Tool (CAIT) and Foot and Ankle Outcome score (FAOS). Following warm-up, gastroc and soleus length, heel-rise work, and vertical jump height were tested. 3D kinematics (200 Hz) and ground reaction forces (2000 Hz) were collected during the final landing phase of 3 triple hop for distance tests. Motion data were input to a musculoskeletal model to estimate 3D ankle, knee and hip JCF in the study limb. Peak resultant and component JCF in the first 100 ms following landing were identified. Triple hop distance and peak JCF were compared between groups using independent t-tests ($\alpha = .05$). Muscle length, heel-rise work and max vertical jump height were also compared. Results: The CAI group displayed greater disability on the CAIT [mean difference (Mdiff) = -13, CI (-10, -16), $p < .01$] and FAOS [Mdiff = -18%, CI (-10, -26), $p < .01$]. Group differences were observed for hip JCF. The CAI group demonstrated lower peak resultant [Mdiff = -1.87 BW, CI (-0.71, -3.02), $p < .01$], axial [Mdiff = -1.66 BW, CI (-0.72, -2.60), $p < .01$], and anteroposterior [Mdiff = -0.86 BW, CI (-0.13, -1.56), $p < .01$] hip JCF. Resultant ankle to hip peak JCF ratios were greater ($p < .01$) in individuals with CAI [M = .65, CI (.59, .71)] compared to controls [M = .55, CI (.50, .61)]. Conclusions: Individuals with CAI, when compared to matched controls, displayed comparable plantarflexor muscle capacity, jump performance, and internal ankle joint loads but lower hip joint loads during landing. Ankle to hip ratios suggested that people with CAI loaded their ankle relatively more than their hip during unilateral landing when compared to controls.

PM13: Samantha Droese; Allison King

Presentation Title: "Predictors of Physical Activity Level During Therapy Times in Adults Who Are Receiving Inpatient Rehabilitation Services"

Abstract: Background: Physical activity has numerous health benefits. However, it is unknown what factors may predict physical activity levels during therapy times among adults receiving inpatient rehabilitation services. Objectives: To identify the predictors of physical activity during therapy times among adults in an inpatient rehabilitation facility. Methods: A prospective, repeated measures study design across three rehabilitation services [occupational therapy (OT), physical therapy (PT), and speech-language pathology (SLP) services] was conducted at inpatient rehabilitation units. Thirty adults receiving inpatient rehabilitation were recruited via convenience sampling. Participants wore the ActiGraph GT9X on their wrists during their stay in inpatient rehabilitation to collect data on their physical activity level. Standardized Total Activity Counts (TAC) were used to quantify the participants' average active movements during therapy times. Therapy times were classified as combined-rehabilitation, OT, PT, and SLP services. Results: Mean age was 63.3 years (SD=13.0), Mean length of stay in inpatient rehabilitation was 13.3 days (SD=3.9) and average number of diagnoses was 10.3 (SD=4.8). Significant associations were found between standardized TAC for combined-rehabilitation and age ($r = -0.477$, $P = 0.008$), acute care length of stay ($r = -0.390$, $P = 0.033$), and Johns Hopkins Fall Risk Assessment score (JHFRA) ($r = -0.392$, $P = 0.032$). Significant associations were also found between standardized TAC for OT and age ($r = -0.429$, $P = 0.018$) and JHFRA score ($r = -0.460$, $P = 0.011$). Lastly, significant associations were found between standardized TAC for PT and age ($r = -0.513$, $P = 0.004$) and acute care length of stay ($r = -0.419$, $P = 0.021$). No significant predictors of physical activity level during therapy times were found. Conclusions: Our study showed that age, acute care length of stay, and the JHFRA scores had statistically significant negative associations with TAC for combined-rehabilitation, with some of the same factors associated with solely OT or PT. This study also provides preliminary information for future studies to build upon to determine predictors that will help practitioners determine physical activity levels.

PM14: Alexander Durland, DPT; Chi-Cheng Lin, PhD; Deah McRae, SPT; Erin Ogden, SPT

Presentation Title: "Using Computerized Balance Error Scoring System as Baseline Concussion Testing in Collegiate Dance Majors"

Abstract: Background and Purpose: Concussion management has taken off as a critical component of managing athletes at all levels. This begins with preseason baseline testing scores allowing comparison of objective scores following an event to make the diagnosis of concussion. While popular with contact sports which concussion is more common, it is less frequent in non-contact sports such as dance. With increasing frequency of concussion in the dance department, baseline computerized Balance Error Scoring System (BESS) was incorporated into pre-participation screening for all dance majors at East Carolina University. The purpose of this case study is to report on a case of concussion in a university dance major, and the benefit of baseline concussion testing for identification and management. Description and Outcomes: A 21-year-old female collegiate dancer sustained a suspected concussion during rehearsal after colliding with another dancer. A member of the dance faculty identified the possibility that she may have had a concussion and contacted our faculty run physical therapy clinic for assessment. The PT assessment was performed two days after her concussion and revealed oculomotor function impairments, gait instability and dizziness with reports of nausea, headache, and fogginess. Her score on the Post-Concussion Symptom Scale (PCSS) was 33/132, suggesting a moderate concussion. Performance on the BESS declined at average sway index 1.21 with 16 errors, compared to her baseline testing scores of an average sway index of 1.1 and 7 errors. Treatment was initiated including oculomotor exercises, involving saccade, smooth pursuit, and convergence exercises. At follow up, 7 days after evaluation, she reported a reduction in concussion symptoms with PCSS score decrease to 15/132. Oculomotor movements were less provocative, and she was able to perform 12 minutes on an exertional protocol. Discussion: Bringing awareness to the faculty and students with education on concussion management, was integral in allowing for quick initiation of assessment and treatment for this patient. By having a baseline BESS test score, a comparison allowed her physical therapist to evaluate her postural control after concussion. Pre-participation BESS score can easily be collected and should be integrated into all pre-participation screening programs at university level dance departments.

PM15: Danielle Goldberg; Olivia Fisher; Zoe Shirk; Mackenzie Thorley

Presentation Title: "Effects of a Collaborative Occupational Therapy Interactive Vaulting Program on Executive Function and Group Participation in Children with Disabilities: A Pilot Study"

Abstract: Children with disabilities often present with challenges in executive functioning skills, especially those with autism spectrum disorder, attention-deficit hyperactivity disorder, and intellectual disabilities. Executive function is needed to problem solve, use and manipulate information, manage distractions, and control impulsive thoughts. Poor executive function can inhibit the development of positive relationships with others, lead to safety risks or injury, and ultimately widen the social gap between children with disabilities and their neurotypical peers. Examining the efficacy of contemporary approaches such as equine assisted activities (EAA) is vital to provide additional opportunities to develop and practice skills needed to become socially connected individuals in their communities. Various EAA have been found to decrease symptomology of emotional and behavioral disorders. Interactive vaulting (IV) is an EAA that includes a social component that incorporates group problem solving games to improve teamwork of children, and each child learns how to perform gymnastic movements on the horse. Most evidence supporting EAA has focused on social and physical outcomes in children with autism and cerebral palsy. Rigorous studies are scarce, and few studies deliver interventions using specific frameworks making

replication and generalization difficult. Further, research has not been done to examine changes in group behavior and executive function for children with a range of disabilities in an Interactive Vaulting program. Therefore, the aim of this 10-week pilot collaborative Interactive Vaulting occupational therapy program was to determine the influence on executive function and social skills in children with behavioral disorders. This quasi-experimental one group pretest posttest design utilized the Cognitive Orientation to daily Occupational Performance in Occupational therapy approach to structure interventions. Results indicated significant improvements in executive function as indicated by the Behavioral Rating Inventory-2 by the IV instructor, but this trend was not mirrored by parents. Significant improvements were also found in the participants in activity participation, social interaction, and group membership as measured by the Social Profile.

PM16: Alyssa Gray; Paige Asbury; Carly Castillo; Kristin Heyward; Lynne Murphy
Presentation Title: "Occupational Therapy Patient Education Material Assessment for Universal Design for Learning and Health Literacy"

Abstract: To facilitate effective rehabilitation of clients facing varying challenges, occupational therapists frequently use patient education materials to optimize performance in many occupations. The materials are chosen to fulfill a specific need; however, the unique learning needs of the client are typically not considered. To address these learning needs, frameworks such as Universal Design for Learning (UDL) and health literacy support client learning and successful health care outcomes. UDL is an educational framework that promotes flexible approaches to teaching and learning (CAST, 2020). It has been used in K-12 and higher education to improve learning outcomes of all students, rather than to modify education for people with disabilities. When applying UDL principles to occupational therapy in a school based setting, "services were perceived as more equitable, supportive, and accessible" (Campbell et al., 2015, p.14). Health literacy, which is used to address learning needs within health care settings, describes the ability of individuals to understand basic health information, facilitating appropriate health decision-making. Although there is some evidence for using health literacy and UDL strategies in medicine and health education, this is limited in occupational therapy. Therefore, this research sought to answer the following questions: 1) To what degree do patient education materials used in occupational therapy follow health literacy guidelines, and 2) To what degree do patient education materials used in occupational therapy follow UDL guidelines? This will lay the groundwork for future exploration of learning outcomes in patient education within occupational therapy. Researchers gathered existing occupational therapy patient education materials and modified them according to health literacy and UDL guidelines. Pre and post measures of these factors were explored in a descriptive case study approach of four printed patient education handouts. Preliminary results indicate improvement in health literacy (understandability, actionability, literacy demands, learning stimulation) and improved adherence to UDL guidelines. Materials from published or copyrighted sources tended to demonstrate higher pre-test scores, but were less suitable for modification. Clinician created forms had lower pre-test scores, but allowed for more meaningful improvements. Further case analysis of patient learning outcomes and use in clinical practice will be explored.

PM17: Kristen Harrison, SPT; William Johnstone, III; Anne Nye, DFM; Janice Daugherty, DFM; Chia-Cheng Lin, PhD

Presentation Title: "The Characteristics of Patient's participating in the Interdisciplinary Falls Clinic"

Abstract: Purpose/Hypothesis: The purpose of this retrospective study is to assess the patient's characteristics of an interdisciplinary fall's clinic. The interdisciplinary falls clinic includes a physician, pharmacist, and physical therapist. During the clinic visit, patients are evaluated for any underlying

health conditions, poly pharmacy and provided a thorough physical therapy evaluation for falls risk. Following evaluation patients are provided extensive education and referred to follow up appointments to other medical professionals and physical therapy as needed. Number of Subjects: 23 Materials/Methods: We identified patients who had Falls Clinic visits between 2015-2019. Patients were assessed for risk of falls by assessing past medical history, a risk evaluation scale which included evaluations for depression, vision, hearing, function, home safety and incontinence, as well as a fall risk questionnaire, list of medications, number of falls in the past year and postural hypotension. The physical therapy evaluation included tests and measures to determine patients risks for falls based on participants strength, balance, vision, proprioception, and vestibular systems. Results: Currently, 23 participants with 19 female and 4 male participants were reviewed. The average age range for participants was 78 ± 12 years. Of the 23 participants the average reported number of falls for a year was 4 (range: 1-20 times) falls a year. Patients were on average taking 14 medications. The average score on the falls risk questionnaire was 7.74, studies have shown that patients who score > 4 are at an increased risk for falls. 20 patients were educated to increase water intake and only 8 out of 23 patients were recommended to have physical therapy intervention Conclusion: Patients who visited Falls clinic had higher risk of falls based on their characteristic analysis. Our next step is to examine the effect of interdisciplinary falls clinic approach to reduce fall risk.

PM18: Sascha Jilg; Megan Ferderber; William Urbanek; Jennifer Shaw; Shelby Boatwright; Alyssa Adamkowski; Shellie Zsoldos, PhD ; Chia-Cheng Lin, PhD

Presentation Title: "Factors Associated with Concussion Prognosis—A Retrospective Chart Analysis"

Abstract: Purpose: Individuals suffering from concussions have a variety of symptoms. Symptoms include headaches, nausea and dizziness, insomnia, anxiety, depression and amnesia. Studies have assessed prognostic data but most focus on sports concussions. Other studies question validity of baseline measures of concussion severity for those with ADHD, indicating they may have a lower baseline and should not be held to normative values. The purpose of this study was to identify prognostic indicators following concussions to help clinicians better treat patients who may be at risk for decreased recovery. Furthermore, this study sought to determine if ADHD proved to affect symptom severity in concussion. Number of Subjects: A total of 132 patient medical charts with concussion were reviewed. Materials/Methods: The medical records of 132 individuals with concussion were analyzed for variables that may affect concussion outcomes. Variables included, gender, ER visit, prior concussion, ADHD, migraines, dizziness, headaches, depression, and presence of BPPV. PCSS scores $\leq 7/132$ were considered "recovered" from concussion. All variables were assessed utilizing Chi-square and Fisher exact tests to determine significance of variables on outcomes ($\alpha < 0.05$). Results: Fisher exact test revealed two variables had a significant effect on prognosis for successful recovery. A history of ER visit was associated with poor prognosis ($p=.012$) and a history of migraine had a significantly higher rate of PCSS >7 at discharge ($.021$). ADHD had no significant impact for concussion recovery, however having ADHD did affect in initial measures of near point of convergence (NPC) ($p.024$) and higher initial heart rates ($p=.024$). Conclusions: This retrospective chart analysis suggests that history of an ER visit or migraines places individuals at risk for prolonged or decreased concussion recovery. Although ADHD may cause patients to have higher initial heart rates and lower NPC scores it does not impact the overall symptomatic recovery. A larger sample size and prospective research design is needed to generalize these results to the general population.

PM19: Fatima Jebahi; Saryu Sharma; Jamie Elizabeth Bloss; Heather Harris Wright
Presentation Title: "Effects of Tamoxifen on Cognition and Language in Women with Breast Cancer: A Systematic Search and a Scoping Review"

Abstract: Objective: Breast cancer treatments bring adverse consequences that interfere with everyday functioning. Importantly, some of these treatments are associated with cognitive and language changes. Tamoxifen is a selective estrogen receptor modulator and is a common endocrine therapy treatment for breast cancer. The current review examines the specific domains of cognition and language affected by the use of tamoxifen in women with breast cancer. Methods: We conducted a systematic search that examined cognitive and/or language functions in chemotherapy-naïve women with breast cancer taking tamoxifen. PubMed, Cochrane CENTRAL, Cumulative Index to Nursing and Allied Health (CINAHL) Complete, PsycINFO, Scopus, EMBASE, and the Grey Literature Report (greylit.org) were searched. Covidence Systematic Review software (covidence.org) was used to manage the screening process of study titles and abstracts as well as full texts. A total of 18 studies were included in the review. Results: A range of cognitive and language domains were reported in women with breast cancer taking tamoxifen and were grouped into 7 broad domains: attention, memory, speed, executive functioning, verbal abilities, visual abilities, and language abilities. Each domain comprised of several specific domains. Results showed that there is compelling evidence that specific domains of memory and speed are negatively affected by the use of tamoxifen. Additionally, there was a pattern of change in domains of executive functions and verbal abilities. Conclusions: Tamoxifen affects specific cognitive and language domains. Language domains beyond semantics have not been studied and thus conclusions related to these domains, and language in general, could not be made. Studies exploring the effects of tamoxifen on the different domains of language in women with breast cancer are recommended.

PM20: Molly Kerr; Stacey Meardon, PhD

Presentation Title: "Progressive Load Bone Stress Injury"

Abstract: Bone stress and strain are primary determinant of bone adaptation. However, mechanical loads of sufficient magnitude, duration and frequency without adaptation are associated with BSI. This is supported by Meardon et al. who reported greater bone stress in runners during running with a history of fracture Bone stress injury (BSI) is common in athletic and military populations. The tibia is a common site of BSI with a high recurrence injury rate. A previous history of tibial BSI increases likelihood of subsequent injury up to 3.7 times indicating a critical need for proper post-injury management. While the initial management of BSI involves a phase of reduced physical activity to limit BSI progression, an ensuing progressive exposure of bone to mechanical loads during rehabilitation is required to condition bone for safe return to activity and decrease the risk of re-injury. Many reports exist pertaining to gait mechanics and BSIs, but there is a scarcity of studies that focus on specific bone loads across progressive conditions in young adult populations to guide exercise prescription. Knowledge of bone stress across progressive task demands will enable the development of evidence-based training routines. The purpose of this ongoing study is to quantify bone specific loads across a spectrum of sports and exercise-related activities using a validated model of bone stress. Secondly, outcomes will be input to design a sample return to participation program that progressively loads the tibia and reduces the risk of reinjury based on the acute to chronic workload ratio (ACWR). ACWR quantify current workload relative to historical workload and represent an individual's preparedness for sport/activity.

PM21: Hayden Lundahl; Jaclyn Farrior Woodall; Sarah Johnson

Presentation Title: "Effects of Physical Therapy After Tendon Ultrasound Guided Percutaneous Tenotomy and PRP Injection in a Runner with Chronic Bilateral Hamstring Tendinopathy"

Abstract: Proximal hamstring tendinopathy (PHT) is an exertion injury that is most prevalent in endurance athletes. It presents as pain in the lower gluteal region typically felt during running at a faster pace and with prolonged sitting. Pain usually begins without any sudden trauma and gradually becomes worse affecting athletic performance. There is limited evidence regarding the best conservative management of PHT. Tenotomy and platelet-rich plasma (PRP) are two non-conservative approaches for treating PHT. Tenotomy is a surgical approach that has been shown to have positive effects and lead to successful return to sports in individuals with PHT. PRP is a non-operative approach and has also been shown to be an effective treatment for PHT if conservative treatment fails. Though these approaches have shown to be effective, little research has been done to examine the effects of additional conservative treatment through physical therapy following these non-conservative approaches. The purpose of this case study is to determine the effects of physical therapy after tendon ultrasound guided percutaneous tenotomy and PRP injection in a runner with chronic bilateral hamstring tendinopathy. Research on running biomechanics reveal that the hamstrings are active during the entire gait cycle with peak muscle activation occurring in late swing and early stance phases of gait. PHT can result from high torques of hip extension and knee flexion that occur secondary to peak ground reaction forces (GRF) occurring during early stance phase as well as a forceful hamstring eccentric contraction while reaching maximum length during late swing phase. We hypothesized that because PHT is most likely to occur as the result of repetitive swing-to-stance phase transition when running, then decreasing the magnitude of eccentric strain in late swing phase and decreasing knee flexion moment during initial stance to midstance phase will offload the hamstrings and reduce injury susceptibility. This can be achieved through run form changes and glutes, quadriceps, and submaximal hamstring strengthening.

PM22: Christina M. Moore, SPT; Swati M. Surkar, PhD

Presentation Title: "Capacity Versus Performance of Lower Extremity Activities in Children with Unilateral Cerebral Palsy: A Study Protocol"

Abstract: Background: Capacity is defined as what a person can do in a standardized, controlled environment, whereas performance is what a person does in his or her daily environment. Children with unilateral cerebral palsy (UCP) may have differences in the capacity and performance of their lower extremities (LE). Such differences may contribute to poor correlation between in-clinic therapy gains on standardized assessments and actual performance of children in daily life. Capacity and performance of the LEs may be affected by differences in strength and power in the affected and unaffected LEs. The specific aims of this protocol are to determine the difference in strength and power between the affected and unaffected limb and determine if results of standardized assessments accurately correlate to the results of objectively measured use of bilateral LEs during daily life in children with UCP. Methods: Ten children between the ages of 6-13 years with a diagnosis of UCP will be recruited. Each child will complete the 10 Meter Walk Test, Gross Motor Function Measure, and isokinetic testing on the quadriceps and hamstrings to measure capacity for bilateral LE use, as well as complete the Pediatric Evaluation of Disability Inventory for a measure of participation. Performance will be measured using bilateral LE accelerometers. Accelerometers will be worn around each ankle and record acceleration and amplitude of LE movements over a 24-hour period. Data analysis will determine if there is a significant difference in the use of the affected versus unaffected LE in children with UCP, as well as if the results from standardized assessments correlate to recordings from accelerometers Discussion: This protocol investigates the correlation between capacity and performance in the LEs of children with UCP. If hypotheses are supported, the future step will be to explore the effects of task-specific interventions and determine which interventions translate to real world improvements.

PM23: Lauren Leclerc, B.S.; Andrew Vermiglio, AuD; Meagan Thornton, B.S.; Hannah Osborne, B.S.; Elizabeth Bonilla, B.S.

Presentation Title: "The Effect of Musical Experience on Speech Recognition in Noise (SRN) Ability"

Abstract: Introduction: Previous investigations reported better speech recognition in noise (SRN) ability for musicians than non-musicians (Parbery-Clark et al, 2009; Brown et al, 2018). These investigations used a standard response protocol where the participants repeated the target speech and the investigator determined whether the sentences were repeated correctly or not. Saunders et al (2004) administered the Hearing in Noise Test (HINT; Nilsson et al, 1994; Vermiglio, 2008) using an alternative response protocol where the participants reported whether or not they heard all of the words in each sentence. It was hypothesized that the musicians would report better speech perception in noise ability than the non-musicians while utilizing the alternative response protocol. Methods: Forty-seven young native English speakers with normal pure-tone thresholds participated in this study. The musician group included individuals with prior musical experience. The nonmusicians group reported no experience with a musical instrument. SRN ability was determined using the Hearing in Noise Test. The HINT sentences were presented in three masking conditions: steady-state speech-shaped noise, four-talker babble, and twenty-talker babble. The maskers were presented at 65 dBA. For each sentence presentation, the participants indicated whether they heard all of the words or not. Results are reported as thresholds in dB SNR. Results: A repeated measures ANOVA revealed a significant main effect for group ($p = 0.003$). A post hoc analysis was conducted using independent samples t-tests. The musicians performed statistically better than the control group on the HINT thresholds for all masker conditions ($p < 0.01$). Discussion: Significantly better SRN performances were found for the musician than the non-musician group across all masker conditions. This is consistent with the hypothesis and the results of previous studies (Parbery-Clark et al, 2009; Brown et al, 2018).

PM24: Kathryn Moore; Lynne Murphy, EdD; Anne Dickerson, PhD

Presentation Title: "Maintaining Social Participation and Quality of Life Through Community Mobility After Driving Cessation With Transportation Planning"

Abstract: As older adults experience visual, physical, and cognitive changes related to aging, they must ultimately retire from driving. The literature identifies resulting declines in quality of life (QOL) and social participation for older adults who cease driving and resources to address their community mobility needs are often underutilized or insufficient. Therefore, occupational therapy practitioners can address this need through transportation planning by collaborating with older adults and their caregivers to meet their unique needs. This research utilized a case study approach to explore the influence of transportation planning on social participation and QOL for older adults who must restrict or cease driving. Participants were identified following a comprehensive driving evaluation, and then participated in individualized transportation planning. Measures of community mobility exposure, QOL, and social participation were completed after the recommendation to restrict driving. A transportation plan was created through a hybrid format with discussions in-person and over the phone. Resources from the literature, universities, insurance companies, and websites were utilized in a collaborative problem solving process. Measures of QOL and role participation were again gathered several weeks after implantation of the plan. Although inferential analysis of results was not appropriate due to small sample size, descriptive case study analysis identified important trends representing challenges and experiences of those making the transition out of the driver's seat. While social participation remained relatively stable, QOL increased for individuals that ceased or restricted driving, which was in stark contrast to the decline facing older adults identified in the

literature. The findings of this study support the valuable potential for individualized, client-centered transportation planning to preserve or enhance the health and wellbeing of older adults who retire from driving. Further study of the value and outcomes of transportation planning for older adults is warranted to fully explore the significance of this occupational therapy intervention, and to promote comparison to a control group. Abundant opportunities exist in occupational therapy to support client engagement in meaningful occupations and overall QOL through exploration of transportation plans and strategies beyond driving years.

PM25: Hannah Osborne; Andrew Vermiglio; Virginia Driscoll; Reyse Stirrett; Erin Kokinda; Rebecca Davis; Kylee Shapiro; Kacey Sturdivant

Presentation Title: "Speech Perception in Noise and Working Memory Performances for Musicians vs. Non-Musicians"

Abstract: Objectives The purpose of this study was to evaluate the relationship between speech recognition in noise (SRN) ability and working memory (WM) for musicians vs. non-musicians. SRN ability was measured using the AzBio test (Spahr et al., 2012). WM ability was measured using three Human Benchmark tests. Rationale Previous studies have suggested that SRN and WM abilities are related (Parbery-Clark et al., 2009; Gordon-Salant & Cole, 2016). The relationship between SRN performances for musicians vs. non-musicians has been investigated by Parbery-Clark et al. (2009), who reported that participants with formal music training performed better than those without. Based on these studies, it was hypothesized that 1) statistically significant relationships would be found between SRN vs. WM performances for all participants and 2) overall, musicians would perform better on SRN and WM tasks than non-musicians. Design Thirty young, native speakers of English participated in this study (mean = 20.38 years, SD = 0.79). The participants included 20 musicians and 10 non-musicians. Musicians were defined as having had formal music training, while non-musicians had no formal music training. Participants completed all tasks using their personal computer and binaural headphones (Qualtrics, Provo, UT). A calibration measure was completed prior to SRN testing to ensure target sentence audibility. The AzBio ten sentence lists used were reported by Schafer et al. (2012) to have equivalence in difficulty. The AzBio background noise included a ten-talker babble and a steady-state noise. WM was evaluated using three Human Benchmark tests, including Number Memory, Visual Memory, and Verbal Memory tests. Results No statistically significant relationships were found between any SRN vs. WM measures. Overall, musicians performed better on SRN and WM tasks than did non-musicians. Conclusions The study results do not support the first hypothesis that there would be a statistically significant relationship between SRN vs. WM performances, but did support the second hypothesis that musicians would perform better on SRN and WM tasks than non-musicians.

PM26: Monica L. Piszczor; Stacey A. Meardon

Presentation Title: "Injury Potential with High-Intensity Interval Training and Prolonged Running"

Abstract: Introduction: Vigorous physical activity is associated with many health benefits. However, individuals who participate in vigorous physical activity, like running and high intensity interval training (HIIT), experience high rates of lower extremity musculoskeletal injury. To be considered HIIT, a workout must be a mix of short periods of intense exercise and intermittent periods of recovery. HIIT is associated with intense load on the lower extremities for a short period of time. Prolonged running, for the purpose of this literature review, is defined as low intensity exercise for a longer period of time. Prolonged running is associated with moderate to intense loading for a longer duration than HIIT. Because of differences in intensity and load, exercise types may affect bone and joints, as well injury potential, differently. The purpose of this scoping literature review was to examine the differences in loading biomechanics between walk-run based high intensity interval

training and prolonged running to provide inference on injury potential. Methods: We systematically searched PubMed using a strategy of titles and abstracts comprised of terms related to physical activity youth and adults, high-intensity interval training, running and gait mechanics. For example, variants of (“adult*”[tiab]) AND (“HIIT*”[tiab]) AND (“Run*”[tiab]) AND (“Biomechanic*”[tiab]) were combined and searched. From the results, the titles and abstracts were screened for inclusion criteria: peer-reviewed journal, English language, inclusion of injury statistics or biomechanics walking, running, sprinting, and walk/run based HIIT protocols. General review and articles that did not provide specific comparisons of exercise types will be excluded from analysis. Literature review results will be reported narratively and in a tabular format. Results: Our search strategy yielded 484 articles. Of those, 40 were included in preliminary review. We intend to present a tabular summary of articles that includes the following headers: population, intervention (HIIT vs Run), and outcomes. A narrative summary will summarize the primary purpose of the studies as well as the search results with regard to loading intensity and injury potential. Conclusion: Knowing the biomechanical effects of the activities and their injury potential will provide evidence based recommendations for intensity and load to rehabilitate patients with lower extremity injuries.

PM27: Alex Pearson-Moyers, SPT; John D. Willson, PhD

Presentation Title: “Meta analysis of lower extremity joint contact force profiles after ACL reconstruction”

Abstract: Anterior cruciate ligament reconstructions (ACLR) appear to increase risk for early onset osteoarthritis (OA), particularly in the incident knee. Altered joint contact forces (JCF) appear to hasten development of OA. However, changes in the lower extremity JCF are poorly understood following ACLR and it is unclear if changes depend on the activity type (walking vs running), the comparison limb (uninvolved limb vs control group) or time since surgery. The purpose of our meta-analysis was to investigate the estimates of lower extremity JCF after ACLR as a function of time, activity type, and comparison limb. A Pubmed literature search was conducted for studies reporting peak ankle, tibiofemoral (TF), patellofemoral (PF), or hip JCF following ACLR during walking or running compared with either the contralateral limb or a control group. When possible, meta-analyses were performed and forest plots with weighted mean differences (WMD) and 95% confidence intervals were explored for changes in JCF over time after ACLR. Fifteen of 722 articles assessed for eligibility were included in the meta analysis. Medial TF JCF inter-limb symmetry during walking was established within 6 months after ACLR [WMD=-.16; CI -.38,.07]. However, compared to a control group, decreased medial TF JCF during walking seems to persist over time [WMD=-.34; CI-.48,-.20]. Similarly, during running, inter-limb medial TF JCF symmetry was observed [WMD=-.02; CI-.68,.64] but decreased medial TF JCF was observed when compared to a control group [WMD=-.61; CI-.89,-.33]. Decreased PF JCF inter limb symmetry during running was identified at both 1.5 years [WMD= -.60; CI -1.1,-.01] and 4.5 years [WMD=-.43; CI -1.27, .41] after ACLR. No literature was available to estimate changes in ankle or hip JCF at any time or any activity after ACLR. These results demonstrate the contralateral limb may not represent pre-injury TF kinetics during walking or running as lower TF JCF compared to a control group was observed. Thus, restoring inter-limb symmetry after ACLR may not restore preinjury joint loading profiles. Overall, more comprehensive comparisons of lower extremity joint load profiles during walking and running are necessary to inform targeted interventions to reduce the personal and health care burden of OA after ACLR.

PM28: Andrew Newnam, SPT; Caroline Yeomans, SPT; Stacey A. Meardon, PhD; John D. Willson, PhD

Presentation Title: “Inertial Sensor Predictions of PFJ Contact Force During Running”

Abstract: Patellofemoral joint (PFJ) force during running contributes to the etiology of PFJ pain, one of the most common running-related orthopedic injuries. However, PFJ force estimates require laboratory-based biomechanical modeling techniques that are not accessible in the clinic or an athlete's natural training environment. The purpose of this study was to derive a PFJ force surrogate suitable for use in the clinic or field using easily obtained wearable inertial sensors. PFJ force for 43 recreational athletes (21 females), 18-30 years old, was estimated by inputting 3D lower extremity kinematics and ground reaction forces, collected using laboratory-based motion capture methodology, into a biomechanical model. Model-based peak PFJ force and force impulse during the stance phase of 6 running trials were averaged for analysis. Simultaneously, wireless inertial sensors placed on the sacrum, thigh, tibia, and foot of the right leg recorded 3D segment orientations, accelerations, and joint angles. Time synchronized inertial sensor segment and joint angles at initial contact, peak angles during stance phase, and segment accelerations were extracted and correlated with peak PFJ force and impulse. Inertial sensor variables displaying statistically significant univariate correlations with PFJ peak force and impulse were entered into a stepwise multiple linear regression to identify the most parsimonious set of predictors for each PFJ criterion ($\alpha=0.05$). Participant sex and four inertial sensor-based discrete variables (stance duration, peak posterior sacral acceleration, knee flexion angle at initial contact, and hip flexion angle at initial contact) yielded PFJ peak force and PFJ force impulse predictions within 16% of laboratory-based values. Inertial sensor-based variables and sex accounted for 60% of the variability in peak PFJ force ($R^2 = .60$, $P < .001$, $SEE = 0.91$ BW) and 70% of the variability in PFJ force impulse ($R^2 = .70$, $P < .001$, $SEE = 0.10$ BW *s). Inertial sensor-based measurements during running produce estimates of PFJ kinetics that are accurate, clinically feasible, and conducive to analysis of athletes in their natural environment. These methods may provide a technique for improved identification of runners with elevated PFJ kinetics with the aim of providing more targeted rehabilitation. Further validation of these methods appears justified.

PM29: Mackenzie Rountree; Julia Scott; Emily G. Ritter; Kimberly S. Fleck; Havan L. Harris; Madison Capps; Kathrin Rothermich

Presentation Title: "The Impact of Parkinson's Disease on Social Communication: Behavioral Evidence"

Abstract: Parkinson's disease (PD) is the second most common neurodegenerative disease that affects more than 10 million individuals worldwide. PD is characterized by progressive motor symptoms with existing treatments primarily focusing on the pharmacological and surgical management of these motor symptoms. However, people with PD also experience non-motor symptoms, including social perception deficits and cognitive impairments. Social perception dysfunction often precedes the development of motor dysfunction in PD, presenting the opportunity for early detection of PD. These deficits often manifest as difficulties interpreting facial expressions and prosody, which negatively impact social relationships and quality of life. However, there is no clinical standard for assessing or treating these deficits. In the current study, we determined the impact of PD on social perception and the influence of cognitive skills. Neuropsychological evaluation of 14 patients with mild to moderate PD was conducted using the Cognitive Linguistic Quick Test (CLQT). The CLQT tests five different cognitive domains: attention, memory, language, executive functions, and visuospatial skills. Social perception was tested using videos from the Relational Inference in Social Communication (RISC) database. The RISC database consists of short video clips exemplifying different literal and nonliteral speakers' intentions (literal, blunt, sarcasm, and jocularity). We also tested 13 healthy controls (HC) matched with each PD patient based on age, gender, and education level using the RISC in an online survey. The participant's task was to indicate if the person in the video was being literal or being sarcastic/jocular. Preliminary results show that in

general, participants have a harder time identifying nonliteral statements such as jocularity as insincere. A group analysis for accuracy demonstrated a higher percentage correct for identifying literal and blunt videos for HCs compared to PD patients. Correlation analyses for the PD group revealed positive correlations between several cognitive domains, such as attention, memory, and performance on the social perception task. Our results show that people with PD seem to have difficulty identifying literal statements as sincere. We will discuss the results within the context of theories concerning executive deficits (e.g., McKinlay et al., 2009) and social-cognitive impairments (Berg et al., 2003) in PD.

PM30: Sarah Sedaghat, SPT; Swati Surkar, PhD

Presentation Title: "A Comparison of Upper Extremity Capacity vs. Performance Measures in Children with Unilateral Cerebral Palsy"

Abstract: Introduction: Unilateral cerebral palsy (UCP) is a leading cause of childhood disability. Due to early brain injury to one side of the cortex, children with UCP have sensorimotor dysfunction, which impairs upper extremity function and affect bimanual coordination. The standard clinical outcomes to assess the upper extremity (UE) function measure the child's capacity. However, there is a significant knowledge gap whether measures of capacity accurately captures the child's real-life performance. Objectives: The purpose of this proposed observational study is to assess the relationship between UE capacity vs. performance in children with UCP. We hypothesize that the UE clinical assessments will have poor correlation with bilateral real-world UE activities in children with UCP. Thus, the standard clinical assessments will not accurately depict a real-life performance of bilateral activities in these children. Methods: We will recruit 35 children, aged 6-12 years, with a diagnosis of UCP and a GMFCS level I-III. Each child's bilateral UE capabilities will be assessed with the Assisting Hand Assessment, grip strength, nine-hole peg test, and Jebson's hand function test. We will also use PEDI to assess the child's participation. Bilateral UE performance will be assessed with accelerometers. The outcomes collected through accelerometry will include use ratio, magnitude ratio, median acceleration, and number of movements. The children will wear accelerometers on bilateral UE for 24 hours to collect bilateral UE activity. Expected Results: We will use Pearson's correlation analysis to find correlation between capacity and performance measures. We expect to find poor correlation between Assisting Hand Assessment, grip strength, nine-hole peg test, and Jebson's hand function test with accelerometer measures such as use-ratio, magnitude of arm movements, and number of UE movements within 24 hours. Conclusions : The result of this study will inform clinicians, patients and families on the relationship of clinical outcome measures and functional daily activities. This will further necessitate the alterations in assessment and treatment strategies for children with UCP to accurately assess and improve real-life bimanual performance.

PM31: Jenny Shaw; Brian Sylcott; Rui Wu; Shanyue Guan; Chia-Cheng Lin

Presentation Title: "Comparing Brain Activity Between Sitting and Standing Positions while Performing Concurrent Cognitive Tasks in the Presence of Optic Flow"

Abstract: Purpose/Hypothesis: Postural control requires attention and sensory integration. Functional near-infrared spectroscopy (fNIRS) studies showed increased prefrontal cortex (PFC) and temporoparietal junction (VEST) activity is associated with sensory integration balance conditions. We compare reaction time and activation pattern of PFC and VEST when visual (optic flow) and cognitive (reaction time tasks) stimulation are present between sitting and standing conditions. Materials/Methods: 33 healthy adults participated. Two sets of fNIRS devices measured changes of oxyhemoglobin concentration by source-detector arrays. Participants performed simple reaction time (SRT) or choice reaction time (CRT) tasks while experiencing optic flow (OF) at speeds of 0m/s

(static), 5m/s (slow), or 20 m/s (fast) through VR goggles. Six test trials: SRT+staticOF, SRT+slowOF, SRT+fastOF, CRT+staticOF, CRT+slowOF, and CRT+fastOF were performed in sitting (visit 1) and standing (visit 2) with block design (A-B-A-B-A-B-A-B-A) to elicit hemoglobin changes in brain regions of interest. Each block was 30 seconds, totaling 270 seconds per trial. FNIRS data were analyzed using NIRS Brain AnalyzIR Toolbox. RT was computed per trial. Repeated measure ANOVA examined main effect of RT task, OF speed, position, and interactions. Level of significance= ≤ 0.05 . Results: Increased activation occurred with standing in leftVEST for trials 1,5,6, and rightVEST for trials 1,3,5. No statistical difference was found in right or leftPFC activation between sitting and standing with SRT or CRT. Repeated measure ANOVA showed main effects of RT task, OF speed, and RTxOF interaction ($p < 0.001$) indicating CRT was 132 milliseconds slower than SRT, and RT in slowOF was 15 milliseconds faster than static and fastOF. RTxOF interaction showed no difference between SRT among OF conditions while CRT+slowOF was shorter than RT in static and fastOF. Conclusions: VEST cortex activated more in standing than sitting. During CRT+slowOF, reaction time was shorter than static and fastOF, suggesting attention shifted from visual to auditory while both VEST cortexes were activated. Vestibular physical therapy intervention in standing with OF will elicit greater VEST cortex activation, multisensory integration, and outcomes.

PM32: Ashley Skutka, SPT; Riley Horn; Summer Kenny; Emma Blount; Stacey Meardon, PhD, Kevin O'Brien, PhD; Chia-Cheng Lin, PhD

Presentation Title: "Fall-Specific Somatosensory Thresholds (FASST) for Improving Steadi Fall Risk Screening Algorithm"

Abstract: Purpose/Hypothesis: The Stopping Elderly Accidents, Deaths, and Injuries (STeADI) has been promoted by the CDC to prevent falls in elderly. However, the STeADI does not include sensory screening. The purpose of this study was to identify sensory cut off values for pressure sensation (PST) and vibration perception threshold (VPT) associated with abnormal balance to complement STeADI screening. Materials/Methods: A set of monofilaments and hand-held bio-thesiometer were used to measure PST and VPT among one hundred and twelve participants, respectively. VPT and PST were measured at 6 sites bilaterally (big toes, 1st metatarsal, 5th metatarsal, medial arch, and calcaneus), and averaged for each foot and across both feet. Dynamic gait index (DGI) and Sensory Organization Test (SOT) were used to assess dynamic and static balance. The cutoff score for abnormal findings was $DGI < 19$ and SOT less than age-match controls. Receiver Operating Characteristic (ROC) curves were utilized to compute sensitivity, specificity, and the area under the curve (ROCA) to identify the cutoff values based on balance ($\alpha < 0.05$). Results: The results showed 5 subjects with abnormal DGI scores and 37 subjects with abnormal SOT results. PST cutoff values were 3.62 for right foot, 3.89 for left foot, and 3.75 for the averaged PST (sn=100%, sp=80%, ROCA=0.95, $p < 0.01$) to predict abnormal DGI values. The VPT cutoff values were 11.53 volts for right foot, 11.10 for left foot, and 11.53 for the averaged PST (sn=100%, sp=84%, ROCA= 0.93, $p < 0.01$) to predict abnormal DGI values. The PST cutoff values were 3.46 for right foot, 3.37 for left foot, and 3.36 for the averaged PST (sn=65%, sp=59%, ROCA= 0.65, $p < 0.01$) to predict abnormal SOT values. The VPT cutoff values were 6.42 volts for right foot, 6.21 volts for left foot, and 6.42 volts for the averaged VPT (sn=60%, sp=63%, ROCA=0.63, $p < 0.05$) to predict abnormal SOT values. Conclusions: Our results suggested a possible PST and VPT thresholds for abnormal static and dynamic balance performance. Incorporating screening for diminished sensation into the STeADI may improve early identification of elderly with potential fall risk.

PM33: Reyse Stirrett; Andrew Vermiglio; Virginia Driscoll; Hannah Osborne; Rebecca Davis; Erin Kokinda; Kylee Shapiro; Kacey Sturdivant

Presentation Title: "The Relationship between Speech Perception in Noise Ability and Reading Comprehension and Reading Speed"

Abstract: Background: Brady et al. (1983) studied speech perception in noise abilities in good and poor readers. Their results indicated that poor readers performed worse on the speech-in-noise test. Ziegler et al. (2009) found that children with reading age at least 18 months below the norm had poorer speech perception in noise ability when compared to a control group. The purpose of this study was to evaluate the relationship between speech perception in noise ability, reading speed, and reading comprehension. It was hypothesized that a statistically significant relationship would be found between: reading speed, reading comprehension, and speech perception in noise ability. Methods: Twenty-six native speakers of English from East Carolina University participated in the study. The study was completed through Qualtrics due to COVID-19 restrictions. Speech perception in noise ability was evaluated using the AzBio speech-in-noise test presented in various background maskers at fixed SNRs. Reading comprehension and reading speed were evaluated using the Readingsoft.com online test. Results: Contrary to the study hypothesis, statistically significant relationships were not found for AzBio scores vs. reading speed or reading comprehension. Statistically significant relationships were also not found between reading speed and reading comprehension. Discussion and Conclusion: The study results did not show a statistically significant relationship between speech-in-noise and reading measures. These results are not consistent with Brady et al. (1983) who reported that poorer readers performed markedly worse in speech perception in noise tests than the good readers. They are also not consistent with Ziegler et al. (2009) who found that children with poor reading ability had poorer speech perception in noise ability when compared to a control group. The contradictory results may be related to differences in the measurement of reading ability.

PM34: Margaret Weiss; Forrest Best; Linda E. May; Amy Gross McMillan

Presentation Title: "Influence of Maternal Exercise During Pregnancy on Infants' Neuromotor Skills Across the First Year"

Abstract: Purpose/Hypothesis: Exercise during pregnancy contributes to improved cardiovascular health, anthropometric measurements, and neuromotor outcomes in infants. Infants of women who exercised during pregnancy had higher neuromotor scores at 1 and 6 mos on the Peabody Developmental Motor Scales, 2nd Ed (PDMS-2) when compared to non-exercising controls. Purpose: To determine if effects of maternal exercise on infant neuromotor development persist across the 1st year, and if different types of exercise contribute varying effects. Hypothesis: Effects of maternal exercise on infants' neuromotor skills will persist over 12 mos, and that infants whose mothers performed resistance exercise would score higher than those who performed aerobic or no exercise. Number of Subjects: Healthy pregnant women (n=42) were randomized to four groups: control (CTRL, n=10), Aerobic (AER, n=16), Resistance (RES, n= 8), or Combination (COM, n= 8). Women exercised 3x/wk under supervision; CTRL group participated in non-exercise yoga sessions. Results: All Stat% scores increased from 1 to 6 mos (significant for RES and COM groups, p<0.000) but decreased from 6 to 12 mos. RES and COM Stat% scores were higher at 12 mos vs 1 mo. For Loco% there was a significant overall effect of Time (p=0.03) with all groups lower at 6 mos vs 1 mo, then returning to baseline/1 mo scores at 12 mos. There was a significant Group X Time interaction, with COM group scoring higher at 12 mos vs 1 mo (p=0.01) and vs 6 mos (p=0.02). Loco% scores for RES and COM groups were consistently higher than scores of CTRL and AER groups. Results for GMQ showed significant effects for Time x Group, with RES GMQ lower at 12 vs 6 mos (p=0.01) and COM

GMQ higher at 12 vs 1 mo ($p=0.005$). GMQ scores for COM group were consistently higher than scores for CTRL ($p=0.006$) and AER ($p=0.004$) groups. Results for GMQ% were similar to those for GMQ. Clinical Relevance: Healthy pregnant women should be encouraged to perform regular exercise during pregnancy, including some form of resistance training. Prenatal exercise improves infant cardiac and anthropometric outcomes as well as neuromotor outcomes throughout the first year.

PM35: Taylor Whaley; Sarah Woodlief

Presentation Title: "Use of WebEx versus Teams for Group and Individual Writing Interventions for 7-12 Year Old Students"

Abstract: Handwriting is a fundamental skill used daily by children and occupational therapists (OTs) are qualified to provide interventions to improve these skills. There is existing evidence supporting OT's role in improving handwriting skills; however, evidence is limited regarding the delivery of intervention virtually. The COVID-19 pandemic altered the way therapy has been conducted. This study reviewed the use of a virtual interprofessional writing program for children ages 7-12 that addressed both handwriting (OT) and spelling (speech language pathology) skills. This program was trialed in person in Spring 2020 but was restructured to a virtual format for Fall 2020, due to the pandemic. This allowed a broader audience of students to participate, including students who may have had barriers to participating such as living out of town. This study examined the feasibility of two virtual platforms for providing telehealth services. The program included 8 weekly sessions using Microsoft Teams (first 4 sessions) and WebEx (last 4 sessions). This provided a unique opportunity to explore the features of conducting telehealth to students in both group and individual formats through two different platforms. A parent survey was conducted to gauge overall family satisfaction with the program as well as learn about platform preferences. The information gained from this research study provides beneficial knowledge for all health care practitioners as it explores the features associated with two common virtual platforms. This information can help guide informed decisions regarding choice of platform when conducting therapy services through telehealth. This study increases the knowledge base regarding features of virtual platforms as well as information regarding the efficacy of virtual handwriting interventions. This poster will detail various features of WebEx and Microsoft Teams that were used to provide both group and individual interventions. Features that contributed to the ease of use and challenges that arose from the therapists' perspective will be discussed. Additionally, results from the parent satisfaction surveys, detailing opinions on both strengths and weaknesses will be included. Findings show that all respondents were satisfied with the virtual program overall.

PM36: Caroline Yeomans; Andrew Newnam; Stacey A. Meardon; John D. Willson

Presentation Title: "Medial Tibiofemoral Joint Kinetic Predictions During Walking Using Wearable Sensors"

Abstract: Medial compartment knee osteoarthritis (OA) is a common cause of pain and disability and tibiofemoral joint (TFJ) contact force contributes to the development of knee OA. Laboratory-based biomechanical assessment accurately estimates TFJ contact force. However, more available clinical surrogate measures may facilitate identification of individuals appropriate for interventions to alter medial TFJ kinetics. The purpose of this study was to identify inertial sensor (IMU)-based predictors of medial compartment TFJ contact force during walking. 3D lower extremity kinematics and ground reaction forces of 44 recreational athletes (22 females) were recorded using laboratory-based motion capture technology and input into a biomechanical model previously validated against in vivo loads to estimate medial compartment TFJ contact force during walking. Model-based peak

medial TFJ force and force impulse during the stance phase of 6 trials at 1.5 m/s (+/-5%) were averaged for analysis. Wireless IMUs placed on the right leg simultaneously recorded 3D segment orientations, accelerations, and joint angles. Time synchronized IMU segment and joint angles at initial contact, peak angles during stance phase, and segment accelerations were correlated with peak medial TFJ force and impulse. IMU variables correlated with medial TFJ peak force and impulse ($p < .05$) were entered into a stepwise multiple linear regression to identify the set of predictors for each medial TFJ force criterion ($\alpha = 0.05$). Five IMU-based discrete variables produced medial TFJ peak force predictions within 8% of model-based values ($R^2 = .70$, $P < .001$, $SEE = 0.23$ BW). Three IMU-based variables produced medial TFJ force impulse predictions within 7% of model-based values ($R^2 = .79$, $P < .001$, $SEE = 0.67$ BW). IMU-based measurements produce accurate and clinically feasible estimates of medial TFJ compartment kinetics previously identified as contributors to OA onset and progression. Further testing of these methods among people with TFJ OA or risk factors for OA is needed. Accurate clinical methods to identify individuals with elevated and/or asymmetrical TFJ kinetics facilitate targeted rehabilitation and gait training efforts when most appropriate. As well as, aiding workload monitoring and the development of physical activity recommendations to prevent future injury.

PM37: Ryan D. Wedge; Ashleigh Andrejchak; Stacey Meardon

Presentation Title: "Coordination Variability in People With and Without Unilateral Transtibial Amputation"

Abstract: People with lower extremity amputations have a structural asymmetry which leads to movement asymmetries.¹⁻⁶ Current rehabilitation focuses on regaining kinematic symmetry but due to prosthesis limitations with push off and stability, an asymmetric gait pattern may be more functional for those with unilateral transtibial amputation.^{1,2,4-7} It is unclear if asymmetry in people with amputation leads to less adaptability within the motor system. Motor system flexibility is measured through coordination patterns and its variability, which can range from high, reflecting poor control, or low, reflecting restricted degrees of freedom.^{2,3,6,8-10} The purpose of this study is to compare segmental coordination variability and preferred stance time asymmetry for people with and without transtibial amputation, in order to discern preferred coordination patterns. We hypothesize that thigh-shank coupling angle variability in people with unilateral transtibial amputation will demonstrate more time spent on intact limb and less coordination variability on the prosthetic limb. We collected preferred walking speed data on a treadmill for 3 people with unilateral transtibial amputation due to non-vascular causes rated at a K3-4 (3 men, 1.79 ± 0.04 m, 81.8 ± 3.2 kg) and 2 people without amputation (2 men, 1.79 ± 0.11 m, 68.3 ± 7.6 kg). Kinematics were collected through marker-based motion capture at 240 Hz and Visual 3D was used to calculate segment angles. Coupling angle variability (CAV) was calculated for thigh-shank segments on each limb during 15 consecutive strides and analyzed at portions of the stride [early: 1-20%, mid: 21-40%, late: 41-60%, terminal-swing: 85-100%]. T-tests ($\alpha = .05$) and effect sizes (d) were used to analyze interlimb and intralimb CAV differences. At preferred walking speeds (1.00 ± 0.27 m/s and 1.48 ± 0.11 m/s), people with amputation ($3.5 \pm 0.5\%$) had greater stance asymmetry than able-bodied people ($1.6 \pm 0.2\%$) ($p = .003$, $d = 5.3\%$). There were no consistent differences between limbs across all phases of the stride, but during mid and late stance, CAV was significantly lower for the prosthetic limb than the intact and able limbs, potentially due to prosthesis limitations.

Research Doctorate Students (i.e., PhD)

PR1: Amelia D. Saul, MS; Matthew T. Fish, PhD

Presentation Title: “Just Breathe: The Efficacy of Paced Breathing to Decrease College Students’ Anxiety”

Abstract: College students in the United States report anxiety as their most common concern. Excessive anxiety for college students can adversely impact their learning, performance, memory, and processing capacity. This study employed an experimental design that randomized participants into control and experimental groups. All participants completed pre-session and post-session assessments for the first and last session. The study investigated the effectiveness of a two-week Heart Rate Variability Biofeedback Training (HRV-BT) and paced breathing intervention to reduce college students’ anxiety symptoms. Assessment measures included a state-anxiety (S-A) inventory and Heart Rate Variability (HRV)—psychophysiology measure. This study included college student participants (N = 35) randomized into an experimental group (n = 17) that completed two-weeks of prescribed paced breathing and a control group (n = 18) that continued with business as usual for the two-weeks. Repeated measures ANOVA indicated a statistically significant difference in mean S-A scores between intervention groups, $F(1, 32) = 4.07, p = .05$. Also, a significant interaction of group by time for S-A scores, $F(3, 96) = 5.613, (p > .001)$. For HRV, there were no significant between-group differences for mean SDNN scores, $F(1, 33) = 0.67, p = .42$. The pairwise-comparison revealed no significant differences between-groups ($p = 0.42$). The repeated measures ANOVA demonstrated no significant group by time interaction for SDNN, $F(1, 33) = 0.20, p = .66$. Overall, the results indicate a significant decrease in S-A scores for the paced breathing group when examining differences between Time-1 and Time-2 and Time-3 and Time-4. Control group participants demonstrated no significant changes over time for S-A ($p < 0.05$). Participants in both groups demonstrated no long-term, 2-week changes in S-A scores. For HRV, there were no significant differences in SDNN from session-1 to session-2 ($p > 0.05$). Between-group SDNN changes were not significant as well ($p > 0.05$). Ultimately, we suggest future research include larger sample sizes, varying prescriptions of paced breathing to examine the effectiveness, and the inclusion of home-based biofeedback training devices.

PR2: Saryu Sharma; Fatima Jebahi; Heather Harris Wright

Presentation Title: “Tamoxifen effects on Cognition and Language in women with Breast cancer”

Abstract: Objective: To study the trajectory of cognitive and language changes during early period of adjuvant endocrine treatment (tamoxifen) in women with breast cancer (BC) at two time periods (pre-treatment and two months after treatment begins). Participants and methods: Data from four women with BC and ten cognitively healthy age-matched controls were collected. The inclusion criteria for BC group were: (1) women newly diagnosed with BC with estrogen receptor positive (ER+) tumors; (2) no prior history of chemotherapy; and (3) negative history of other cancers (except basal cell carcinoma), neurological disorders (i.e., dementia, stroke, Parkinson’s), moderate or severe head trauma, and/or psychiatric disorders. The control group included women who were age-, education-, and race/ethnicity-matched to the participants in the BC group. Cognitive assessment: Ecological momentary assessment (EMA) method was used to assess fatigue, sleep, and/or pain in BC participants and assess cognitive health for both the groups longitudinally. Cognitive testing was done using ambulatory cognitive assessments via smartphones. A measurement-burst design that included multiple measurements during a short time period (i.e., 5 days), repeated at two time periods (i.e., pre-surgery and two months post-treatment), was applied. Participants completed three cognitive tasks – symbol search, dot memory, and colored dots and the cognitive constructs measured were processing speed and working memory. Response times were recorded in milliseconds. Each task was completed within one minute or less. Language assessment: Two wordless picture books - Good Dog Carl (GDC) and Picnic were used to collect discourse samples from study participants. Participants viewed the book and narrated the story. Core lexicon analyses

were used to assess the discourse samples. Results: Preliminary analyses showed cognitive variability across all three EMA tasks for the BC group. Processing speed responses were slower for women with BC as compared to the control group for Period 2. Significant differences were not seen in the language for both the groups post-treatment ($p < 0.08$). Further analyses need to be done to study the trajectory of cognitive and linguistic changes in women with BC.

PR3: Susan G. Sherman, Ph.D.; Margaret P. Sanders, MS; Ralf Schuster, M.Ed.;
Monica Bloomberg, BA; Peter Eischens, MS; Lauren Bethune-Scroggs, MS; Luke
Limbrunner, MBA, MS

Presentation Title: "Perceptions of Vocational Rehabilitation Professionals Regarding Workforce Innovation and Opportunity Act Policy Changes and Employment Outcomes"

Abstract: The following study investigated VR professionals' perceptions of recent policy changes under the Workforce Innovation and Opportunity Act (WIOA) of 2014. As a consequence of WIOA amendments, the minimum education requirements have changed; thus, perceptions of education level and professional certification on successful outcomes were two primary areas of interest. Findings from 209 survey participants across State agencies revealed VR professionals believe WIOA changes have impacted employment outcomes within six central domains: caseload, quality of services, pre-employment transition services (pre-ETS), counseling/consumer relationships, documentation of counselor/consumer interactions, and services provided, and VR agency management. Obtaining a master's degree and/or Certified Rehabilitation Counselor certification was perceived as beneficial for overall employment outcomes by improving aspects such as counselor qualifications, counselor-consumer relationships, and quality of services provided. The focus of this article is to explore the frequency of these perceptions and to provide recommendations for future study and considerations regarding WIOA implementat