

**Student Research and Creative Inquiry Forum****April 17, 2019****College of Health Professions****Poster #120****Title:** The Relationship Between Auditory Processing and Noise Exposure**Students:** Karina Ball, Karina Ball, Abigail Shimanovich**Faculty mentor:** Saradha Ananthakrishnan (Speech-Language Pathology & Audiology)

**Abstract:** Noise exposure can lead to deficits in auditory processing abilities. The aim of the current project was to compare the intensity levels of sound in participants' personal listening devices with their auditory processing abilities. Sound intensity levels in participants' listening devices were measured by placing earphones connected to the listening devices in the "ear" of a mannequin linked to a sound level meter. Auditory processing abilities were measured in the same participants by conducting the SCAN-3A test battery. The SCAN-3A consists of multiple auditory tasks such as listening in background noise, processing sounds presented simultaneously to both ears and recognizing degraded speech. These results will be used in addition to basic hearing threshold testing data, electrophysiological data evaluating neural function and questionnaire data yielding information on self-reported hearing ability to understand the impact of hearing habits on auditory function.

## Reference

Bellis, P.D. (n.d). Understanding auditory processing disorders in children. American Speech-Language & Hearing Association. Retrieved from <https://www.asha.org/public/hearing/understanding-auditory-processing-disorders-in-children/>

**Poster #121****Title:** Impact of Applied Electives in Sport Management Education & Careers**Student:** Emily Fornatora**Faculty mentor:** Jaime DeLuca (College of Health Professions)

**Abstract:** Experiential learning has become an important component of higher education as contributes to preparing students for success in their future endeavors. Given the highly competitive, saturated nature of the sport industry, providing opportunities for applied learning is essential as it bridges the gap between theory and practice (Surujlal & Singh, 2010). Internships and field experiences are the primary mechanisms through which sport management programs facilitate experiential learning. However, applied, innovative coursework can deliver similar industry and skill-based competencies to students by simulating the real-world environment (DeLuca & Minkove, 2015). Many sport management programs have begun to implement these types of opportunities for students as elective offerings within their curricula; however, there is a dearth of research regarding the efficacy of such experiences. Accordingly, this research seeks to assess the impact of experiential coursework on student learning and career preparedness through focus group and survey data collected from 46 sport management students enrolled in four applied elective courses (Sport Sales & Sponsorship, Applied Sport Marketing, The Business of Minor League Sports, and Strategic Sport Communication) during the fall 2018 semester. Results from this study will help faculty to better develop and refine curricular to meet student needs and promote student success

**Poster #122****Title:** Health and Physical Fitness Behaviors Among College Students**Students:** Katie Gettier, Erin Lerew, Cameron Russell**Additional faculty authors:** Professor Jennifer Moxley, Professor Andrea Barton, Dr. Tara Blackshear**Faculty mentor:** Jennifer Moxley (Kinesiology)

**Abstract:** Since the fall 2015 semester, the Exercise Science program has offered free physical fitness assessments to all University students. The event remains popular among students, especially students in the College of Health Professions. Students enrolled in KNES 265: Fundamentals in Health and Physical Fitness Assessment and KNES 364: Clinical Exercise

Assessment and Prescription serve as test administrators for the assessments. The assessments include measurements to determine resting heart rate and blood pressure, body composition, cardiovascular fitness, muscular fitness, and flexibility. In addition to the physical assessments, participants complete a survey that includes questions about health and physical activity behaviors. This project will focus on the growth of the assessments and outline findings of health and physical activity behaviors among college students.

**Poster #123****Title:** Greater Forearm Blood Flow is Associated with Better Walking Economy and Gait Speed in Older Adults**Student:** Kevin Hamidi**Faculty mentor:** Dr. Nicolas Knuth (Exercise Science)

**Abstract:** Gait speed decline is a well-established predictor of disability and mortality in older adults. Compromised energetic efficiency (i.e. walking economy) is a strong contributor to gait speed decline, but the underlying mechanisms influencing walking economy are undefined. Impaired blood flow is common with aging and thus may be an important contributor to the development of compromised walking economy and slow gait speed, yet the relationships among blood flow within skeletal muscle, walking economy, and gait speed in older adults are unknown. Therefore, the purpose of this project is to examine the relationship between measured forearm blood flow and (i) walking economy and (ii) gait speed in older men and woman. Resting blood flow will be measured in participants of the Longitudinal Aging Study at Towson using venous occlusion plethysmography. Walking economy will be measured during the final 2 minutes of a 5 minute treadmill walking test. Gait speed will be assessed during 2.5 minutes of normal-paced walking over a 20-meter course. We hypothesize that better overall blood flow will be related to enhanced walking economy and gait speed, and may lead to the development of interventions aimed at improving vascular health to benefit the maintenance of mobility with age.

**Poster #124****Title:** Sound Levels in Personal Media Players used by the TU Community**Students:** Katie Matzdorf, Toyosi Olokesusi**Faculty mentor:** Saradha Ananthakrishnan (SPPA)

**Abstract:** Excessive noise exposure at high intensity levels can lead to permanent hearing loss, but this resulting hearing loss can be prevented by increasing awareness about the risks of noise exposure and use of hearing protection. The aim of the current research project was to collect data related to the sound levels in personal media players used by individuals in the TU community. We collected the intensity levels of media in personal listening devices in 180 TU students using a sound-level meter attached to an interactive mannequin "CLARK." Each student inserted their headphones into CLARK's right ear, and the sound-level meter produced a reading of the intensity level measured in decibels. The results varied, with some students listening to their music around 30 dBA and some listening levels as high as 114 dBA. These results show us that students listen to their music at a wide variety of listening levels, but there are enough students listening at levels potentially damaging to their hearing. These data highlight the importance of providing the campus community with more information regarding hearing health and the damage that can result from high-intensity noise exposure.

**Poster #125****Title:** Barriers to Self-Monitoring for Healthy Weight Management**Students:** Kamilla Miller, Haile Argubright-**Faculty mentor:** Gerald. J. Jerome (Kinesiology)

**Abstract:** Background: Monitoring diet, physical activity, and weight are important components of a lifestyle approach to achieving and maintaining a healthy weight. A myriad of smart phone applications and electronic devices are supplanting paper-based tracking. However, the accessibility of these options is not well established. This study examined barriers and strategies to monitoring diet, physical activity, and weight among adults who are legally blind. Methods: Survey participants were recruited through low vision advocacy groups. In addition to completing phone based surveys, in person height and weight was obtained. Results: Among the participants (N=17) the average age was 32 years (SD=14), 39% were females, 47% had BMI 18.5-24, 23% had BMI 25-29, and 29% had BMI  $\geq$  30. All participants access the Internet, 89% use smart phones for Internet access, 94% have used the internet to look up health information, and 78% have used a smart phone to track health information. Participants reported on challenges and suggestions related to tracking physical activity, diet, and weight. Conclusion: Adults interested in a lifestyle approach to weight management should receive problem solving assistance to help them reach their health goal. Problem solving should be tailored to an individual's level of vision and technological savvy.

**Poster #126****Title:** The Correlation Between Sound Levels In Noise Level Personal Media Players & Auditory Brainstem Function**Students:** Rivkah Nakhon, Leah Latova, Frances Licia Ladaga**Faculty mentor:** Saradha Ananthakrishnan (Speech Language Pathology & Audiology)

**Abstract:** Excessive noise exposure can lead to hearing loss, which can have detrimental effects on overall health; increases in irritability, sleep disruption, hypertension, cardiovascular disease, and decline in cognitive achievement are some of the harmful ramifications of living with an unaided hearing loss. The overall objective of our research is to correlate participants' subjective and objective audiological metrics with their hearing habits (e.g. how loud is the music they listen to). Specifically, we aim to determine the correlation between sound levels in participants' personal media players and the Auditory Brainstem Response (ABR), which is an EEG-type response measuring the integrity of the auditory nerve. We measured sound levels in personal media players by inserting the earphones of each participant's listening device (while playing a song at a comfortable level) into the artificial "ear" of an interactive mannequin. The decibel level was recorded with a sound level meter connected to the mannequin. ABR latency and amplitude data were collected by placing electrodes on participants' scalps that could measure auditory nerve activity following auditory stimulation through earphones. These data form a subset of a larger dataset examining the overall hearing health profile of adults in the TU and surrounding communities.

**Poster #127****Title:** Patterns of Noise Level Exposure Questionnaires and Responses**Students:** Chiara Ponko, Elizabeth Dolan**Faculty mentor:** Saradha (Ananthkrishnan)

**Abstract:** Noise induced hearing loss is the second most common type of hearing loss. The overarching goal of this project is to construct an audiological profile of the average college student by measuring various aspects of their auditory function (self report, behavioral, neural) and hearing habits. The specific aim of this study is to measure sound levels in personal media players in a group of adult listeners, and correlate these data with the participants' responses on a noise exposure questionnaire. Data regarding listening levels in personal media players is being obtained using a mannequin (C.L.A.R.K.). The intensity level of sound in a listening device can be measured by placing an earphone in C.L.A.R.K.'s ear, which is coupled to a sound level meter. Participants are also required to complete the JAAA-NEQ questionnaire, which provides an estimate of their annual noise exposure. Data collection and analysis is ongoing. As mentioned before, the results of this study will serve to be part of a larger study aiming to build an audiological profile of the TU and surrounding community, and lead to the development of a noise awareness program on campus.

**Poster #128****Title:** Prescribed Physical Activity in Early Postpartum Period Helps Women Return to Physical Activity but does not Impact Weight Loss or Body Composition**Student:** Michelina Quartucci**Faculty mentor:** Jaime DeLuca (Kinesiology)

**Abstract:** BACKGROUND: The postpartum period and the transition to motherhood often represent a dramatic shift in women's lives and new mothers frequently report a lack of adequate physical activity (PA) due to a variety of constraints. PURPOSE: To evaluate the relationship between women's beliefs and behavior regarding PA with their measured PA level over the first year postpartum, and to evaluate the impact of a PA intervention in increasing postpartum PA level. METHODS: Ten postpartum women were recruited and randomized into control and intervention groups. The intervention group was instructed to engage in 150 minutes of MVPA each week and take 10,000 steps per day and the control group was given no PA prescription. Measures of body weight, body composition, and PA were made at 3, 6, 9, and 12 months postpartum. Women's beliefs and behavior regarding PA were assessed during a qualitative interview. FINDINGS: Interview data showed women in this study were health literate and understood the value of PA, however they explained an inability to prioritize PA. The intervention protocol was successful at increasing women's level of activity, but only at the 3 month postpartum visit as the intervention did not lead to more PA throughout the postpartum period.

**Poster #129****Title:** Determining the Expectations and Desires of Parents of Adults with ASD Related to Formal Support Systems**Student:** Julia Tenbus**Faculty mentor:** Kaitlyn Wilson (Speech-Language Pathology and Audiology)

**Abstract:** This study is designed to understand what social communication supports and services adults with autism spectrum disorder (ASD) are receiving or not receiving. The goal is to gather information from the parents of adults with ASD on supports needed and the best setting and modality for these services. Adults with ASD and their families often have difficulties obtaining services due to limited availability of supports, long wait lists, and more. It is important to understand this in order for professionals to provide effective and accessible services for individuals with ASD. A mixed methods design will be used to collect data including quantitative measures and semi-structured interviews.

### **Project #130**

**Title:** A New Twist on an Old Favorite: How Undergraduate Research Assistants in Exercise Science are Breaking Ground

**Students:** Jessica Welch, Lauren Mandelbaum, Sydney Ollinger, Brittney Ranti

**Additional Faculty Authors:** Professor Andrea Barton, Dr. Tara Blackshear, Professor Jennifer Moxley

**Faculty mentor:** Andrea Barton (Exercise Science)

**Abstract:** Physical fitness assessments (PFAs) give participants informative health-related metrics. Undergraduate students in Exercise Science at Towson University learn to conduct comprehensive PFAs, which follow the American College of Sports Medicine (ACSM) guidelines. Since 2015, Exercise Science students have put skills into practice by serving as test administrators for the campus-wide, bi-annual comprehensive PFAs. Due to popular success, senior-level undergraduate Research Assistants (RAs) were involved in the launch of a new fitness assessment model during the spring 2019 semester. To support innovation in recruitment and research approaches, targeted core courses allowed RAs to conduct individual fitness assessments. The purpose of this project is to explain a new PFA approach, disseminate outcomes using the model, and compare with traditional protocols used during the bi-annual event.

### **Project #134**

**Title:** SEX DIFFERENCES IN LOWER EXTREMITY BIOMECHANICS DURING OVERHEAD SQUAT AND SINGLE-LEG SQUAT ASSESSMENTS

**Student:** Joshua Berenbach

**Faculty mentor:** Pete Lisman (Kinesiology)

**Abstract:** The Overhead Squat (OHS) and Single Leg Squat (SLS) are two functional movement assessments that can be used to examine lower extremity biomechanics for injury risk screening purposes. The objective of this study was to determine if differences in lower extremity biomechanics exist between male and female collegiate athletes during performance of an OHS and SLS assessment.

### **Project #135**

**Title:** An Examination of the Differences in Cognitive Function and Blood Flow in Young and Old Adults

**Student:** Deana Dixon

**Faculty mentor:** Nicholas Knuth (Kinesiology)

**Abstract:** Reduced cerebral blood flow with age appears to be related to the development of cognitive impairment. A recent study found that active individuals had less cerebrovascular perfusion and poorer cognition than inactive individuals did. However, the connection between vascular function and cognition is not entirely clear. The purpose of our pilot study is to examine the differences in arterial blood flow and cognition between young and old adults. Cognition was assessed using tests from the NIH Toolbox Cognition Battery, including the Dimensional Change Card Sort Test (executive function), the Flanker Inhibitory Control and Attention Test (attention and inhibitory control), the Pattern Comparison Test (processing speed), and the Picture Sequence Memory Test (short-term memory). In order to assess cerebrovascular perfusion, arterial blood flow at the forearm was analyzed using plethysmography. Compared to younger individuals, older individuals had significantly lower performance on memory ( $396 \pm 33$  vs.  $560 \pm 41$ ,  $p < 0.01$ ) and executive function tests ( $7.0 \pm 0.5$  vs.  $8.8 \pm 0.5$ ,  $p < 0.01$ ). They also had significantly lower blood flow ( $2.2 \pm 0.2$  vs.  $18.1 \pm 0.6 \text{ mL} \cdot 100 \text{ mL tissue}^{-1} \cdot \text{min}^{-1}$ ,  $p < 0.01$ ) compared to younger individuals. This research will provide valuable information regarding aging and cognition and allow for the development of interventions aimed at preventing cognitive decline.