Completed Thesis and Projects 2016

Thesis:

Title: Outcomes of a Driving and Community Mobility "Boot Camp" for Teens and Young Adults with Autism Spectrum Disorder
Researchers: Rebecca Case and Danielle Ozment; Under the direction of Dr. Anne Dickerson
Purpose: These studies explored the effectiveness of occupational therapy intervention strategies within the context of a Driving and Community Mobility Boot Camp for Teens and Young Adults with High functioning Autism Spectrum Disorder.
Method: In addition to baseline evaluations, pre and posttest measures were used to determine if significant changes occurred as a result of the interventions. The primary interventions included use of an interactive driving simulator; diverse interactive activities; scanning tasks using the Vision Coach®; and the Interactive Metronome®.
Results: Results from the use of an innovative new tool for observation of driving suggested that the participants improved their driving abilities and skills on the driving simulator. Qualitative outcomes from observation of the activities indicated the participants enjoyed the camp and improved in their skills for community mobility. Surveys to assess the perceived effectiveness of the boot camp from both the participants and their parent's perspectives supported the positive outcomes of the boot camp for participants and parents.
Conclusion: The survey's results in combination with results from the interactive driving simulator suggest the **Boot Camp** was an effective intervention for increasing D&CM skills for young adults with HFASD.

Title: Effectiveness of the Interactive Metronome: Does Use Improve Cognitive and Motor Abilities of Healthy, Older Adults in Eastern North Carolina
Researchers: Lauren Christy and Rebekah Reilly; Under the direction of Dr. Leonard Trujillo
Purpose: The purpose of this study was to examine the relationship between healthy, older adults' participation in the Interactive Metronome and their scores on tests of cognition, attention, and motor performance.
Method: Data were collected through implementation of the Interactive Metronome protocol, as well as administration of the d2 Test of Attention, the Four Step Square Test, the Nine Hole Peg Test, and the Woodcock-Johnson III. The participants were healthy, older adults age 65 and older.
Results: Data analysis indicates that older adults' scores on the Interactive Metronome Long Form Assessment, d2 Test of Attention and Nine Hole Peg Test were significantly higher in the final posttest than in the baseline measurement. Analysis also indicates that the Short Form Assessment follows the same general trend as the Long Form Assessment.
Conclusion: These results indicate a relationship between positive percentage of change in scores on the IM protocol and positive percentage of change on both a cognitive and motor assessment.

Future studies should seek to more closely examine this relationship to determine if the IM can be used as a tool to improve cognitive and motor abilities in healthy, older adults.

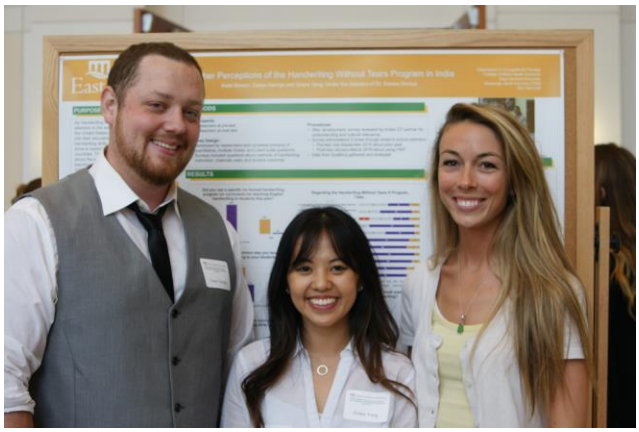
Title: Assessing Barriers and Facilitators to Parental Involvement in Care of Infants and Parenting Occupations during Infant Hospitalization
Researchers: Lauren Forrest (Thesis), Samantha Jones (Project), and Aaron Russell (Project); Under the direction of Dr. Denise Donica
Purpose: Identify primary barriers and facilitators to parent visitation and which infant care occupations parents participated in while their infant was hospitalized in the NICU or SCN.
Method: Parents were surveyed about which barriers and facilitators to visitation they experienced while their infant was hospitalized in the NICU or SCN at Vidant Medical Center. The survey also asked parents to report how many hours they spent with their infant and how many parenting occupations they participated in while they visited.
Results: Care of other children, living far away, and care of the home were identified as primary barriers to parental visitation. Observing the infant, stroking the infant, and talking to the infant were identified as occupations parents participated in most frequently.
Conclusion: Passive activities with limited infant handling were identified as the most common parenting occupations completed by parents at the NICU and SCN. Data also shows that the NICU parents visited on average 75% of the days. Although barriers have been identified by parents, survey results and visitation records suggest for many, primary barriers to visitation have been overcome. However, despite visitation, parents demonstrate limited involvement in active parenting occupations.

Title: Vision Coach: Effects of Standing versus Sitting on Visual Reaction Times
Researchers: Megan Miller and Josh Register; Under the direction of Dr. Anne Dickerson
Purpose: To establish normative data for a new dynamic, state-of-the-art interactive system designed to promote and enhance visual function, muscular coordination and neuromotor abilities. This tool has potential to be an effective assessment tool and training device however little research has been conducted.
Method: A mix method design was used to compare age, position, height, wingspan, and health rating in relation to reaction time speed on the VISION COACH. Participants included 121 healthy community living adults ages 21-79, grouped as young or old to compare age differences. The participants were randomly assigned to either a standing or sitting group with counterbalance measures to determine which position they would be in first. Each participant pressed 60 red lights each trial for a total of 8 trials (4 in each position). The four trails were averaged and compared in scatter plots to examine differences.

Results: Although the data analysis is ongoing, it appears there is little difference in performance between standing and sitting, but there are significant differences between age groups with older adults being slower in processing.
Conclusion: Results suggest that the VISION COACH can be used in either sitting or standing position. Age differences are important to recognize so that normative data can be gathered according to age. As more research is conducted this device has the potential to be used in driver rehabilitation to address some of the health issues older adults have like scanning and divided attention.

Projects:

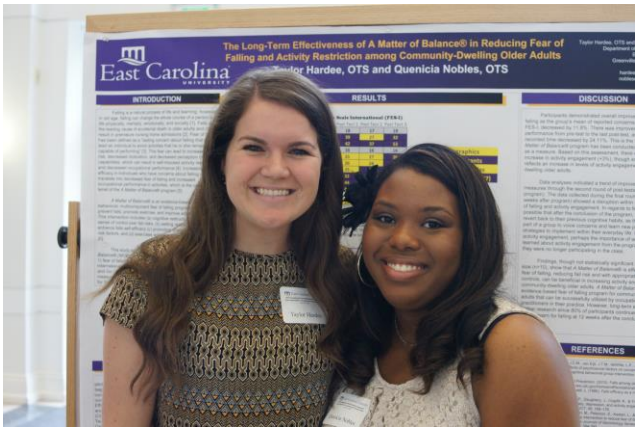
Title: The Influence of Occupational Based Activities on the Wellness of Aging Older Adults
Researchers: Jessica E. Boyter and Laura C. Steenberg; Under the direction of Dr. Leonard Trujillo
Purpose: The purpose of this ethnographic study is to discover through immersion and observation common themes that arise among a small group of older adults (over 65) as they participate in an occupational activity of choice/wood-carving group once a week for an hour and a half. We hoped to gain insight into the dynamics of volitional occupation at this stage in life.
Method: Weekly sessions were held with the participants in which they engaged in woodcarving projects. The group existed prior to the study. When they began the group, they all began on the same project to learn basic woodcarving techniques. As they individually progressed, they began to branch into projects of their own choice in conjunction with Dr. Trujillo. After each session, the graduate students conducted a de-briefing with their advisor to discuss field notes taken. Central themes were then identified and examples of each were discussed until a point of saturation with the data was reached.
Results: A series of themes was developed from the topics of conversation held each week. Six central themes were identified. They are humor, health, values (such as pride in work, prior military service, etc.), family, time (making the most of what is left), and hobbies.
Conclusion: The participants expressed a strong desire to be active participants in this activity, and often indicated they would prioritize their schedule to be able to attend. It was evident that they chose to participate due to the camaraderie that exists among the three primary men, but also their sense of accomplishment and learning of "new tricks for an old dog." Many topics of conversation occurred within the group and others that came to see what they were doing over the weeks. The inclusion of the pending life cycle ending was a regular topic as other residents had passed away. This appeared to be a normal accepted part of their life cycle at this point. This group created a sense of purpose for them beyond their daily routine at the CCRC.



Title: Teacher Perceptions of the Handwriting Without Tears ® Program in India
Researchers: Katie Bowen, Casey George, and Grace Vang; Under the direction of Dr. Denise Donica
Purpose: Little research has been done to explore the effectiveness of the Handwriting Without Tears® (HWT) printing curriculum outside of the United States. This study reviews the experiences of teachers in India after implementing HWT to teach English printing.
Method: Teachers from 7 different private schools in New Delhi, India, teaching Pre-K through 1st grade, were asked to complete a questionnaire regarding handwriting instruction methods and preferences prior to and after implementing the HWT program for one school year.
Results: The participants in this study identified that they spent more time teaching handwriting using the HWT curriculum, while whole class instruction increased in comparison to small group instruction. In regards to the HWT program, teachers agreed that they preferred HWT over the methods previously used to teach English handwriting. Most teachers found that not only did their students enjoy the program, but that their students' handwriting legibility improved after implementing HWT.
Conclusion: The teachers who participated in this study had a positive experience and indicated favorable perceptions of the program. This study supports the use of HWT program with early primary teachers in New Delhi, and warrants further cross-cultural research.

Title: Interactive Driving Simulator: Is it on Effective Occupational Therapy Tool for Older Adults?
Researchers: Kate W. Boyd, and Andrew D. Grossman; Under the direction of Dr. Anne Dickerson
Purpose: This study examined the driving performance of older adults on the interactive driving simulator.
Method: Fifty-seven community living healthy older adults between 60 and 79 years of age drove the interactive driving simulator for at least one scenario. There were two outcome measures: 1) data was extracted from the simulator report that includes measures such as reaction times, number of crashes, lane maintenance, and 2) a developed 5-point scale based on the critical incidents in the selected scenario. The data was analyzed to examine if there were any differences between the groups in terms of age (60's versus 70's), gender, or familiarity with technology using both sets of data. In addition, nine participants returned after at least 7 days to explore if their performance changed after practice on the simulator. Scores from the first drive were compared against the scores from the second drive with both outcome measures.
Results: Preliminary data indicates that there are few differences between the older adults in terms of the two age groups, familiarity with technology, or gender with either outcome measure.

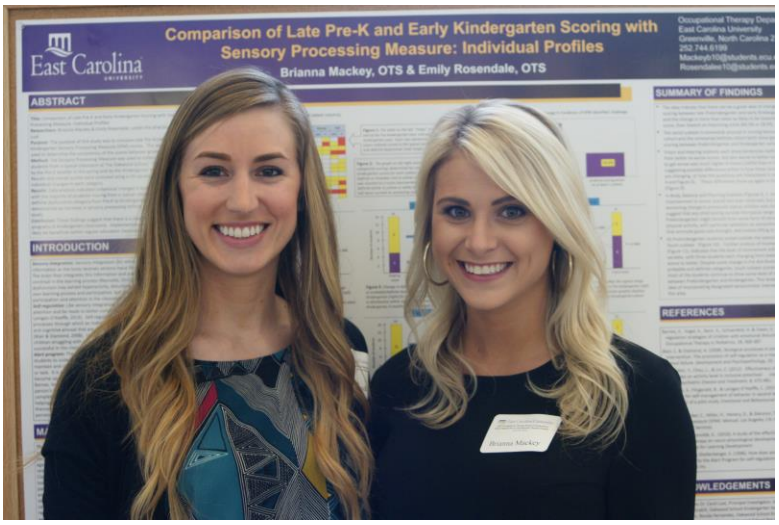
In terms of the nine participants who repeated the drives, the total score for the observational tool was significantly different as well as select critical incidents.
Conclusion: This preliminary data supports research using the interactive driving simulator. Even community living healthy older adults will make mistakes on the simulator and performance is not based on age, gender or familiarity with technology. The results also suggest a learning effect with the simulator.



Title: The Long-Term Effectiveness of *A Matter of Balance*® in Reducing Fear of Falling and Activity Restriction among Community-Dwelling Older Adults
Researchers: Taylor Hardee and Quenicia Nobles; Under the direction of Dr. Jane Patton
Purpose: This study determined if the evidence-based fear of falling (FOF) program for community-dwelling older adults, *A Matter of Balance*® (MOB), was effective in producing positive changes in: 1) FOF level measured by the FES-I; 2) fall risk measured by the TUG; and, 3) level of activity engagement measured by the CHAMPS.
Methods: Participants included 10 self-referred residents of a continual care retirement center, over the age of 65. A pre-test and three subsequent post-tests, collected one, six, and twelve weeks after conclusion of program, were administered.
Results: Participants demonstrated a FOF decrease (11.79%) measured by the FES-I; fall risk decreased (24.11%) measured by the TUG; and, an overall increase in activity engagement (+3%) measured by the CHAMPS.
Conclusion: Findings, though not statistically significant due to small sample size (n=10), show MOB is effective in decreasing FOF, reducing fall risk, and can be beneficial in increasing activity engagement in community-dwelling older adults. However, long-term effectiveness needs further research since 80% of participants continued to demonstrate a high concern for falling 12 weeks after the program.

Title: Activities Used During a Community Mobility Boot Camp for Individuals with Autism
Researcher: Kalyn Kaminski; Under the direction of Dr. Jennifer Radloff
Purpose: Teenagers and young adults with Autism Spectrum Disorder do not have many resources to help them develop the skills necessary for driving and successful community mobility. A *Driving and Community Mobility Skills Boot Camp* program was developed at East Carolina University by two professors and 5 graduate students from the occupational therapy program.
Method: The boot camp 1-week intensive consisted of 4 days with activity implementation while the 6 subsequent weeks participants received activity intervention twice a week for 30 minutes. Throughout the boot camp program approximately 20 different activities were designed to expand and enhance knowledge necessary for good performance on the driving

simulator as well increase exposure to community mobility skills and transportation methods available in the community.
Results: Two participants were successful in acquiring a driver's license, one participant was successful in use of public transportation, and the remaining participants improved skills and continue to work towards their individual goals of independence in community mobility.
Discussion: Specific activities will be presented for the purpose of occupational therapy practitioners to apply these concepts to their general practice settings. The program demonstrated the importance of a community-based intervention for this population as well as the need for further research in this area.

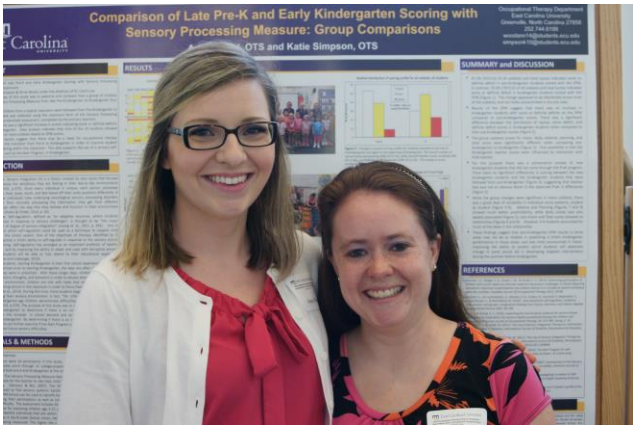


Title: Comparison of Late Pre-K and Early Kindergarten Scoring with Sensory Processing Measure: Individual Profiles
Researchers: Brianna Mackey and Emily Rosendale; Under the direction of Dr. Carol Lust
Purpose: The purpose of this study was to compare late Pre-Kindergarten and early Kindergarten Sensory Processing Measure (SPM) scores. The results were then used to determine the consistency of the scores between grade level changes.
Method: The Sensory Processing Measure was used to collect data on fourteen students from a regular classroom at The Oakwood School. The SPM was completed by the Pre-Kindergarten teacher in the spring and by the Kindergarten teachers in the fall. Results and overall scores were analyzed using a chi-square analysis, to determine individual changes in each category.
Results: Data analysis indicated behavioral changes in each category of the SPM, with the majority of students moving from a typical category to a probable or definite dysfunction category from Pre-K to Kindergarten. These results demonstrate an increase in sensory processing deficits between the two grade levels.
Conclusion: These findings suggest that there is a need for sensory self-regulation programs in Kindergarten classrooms. Implementation of the Alert Program® would likely be beneficial within regular education classrooms.

Title: Use of the Interactive Metronome to Improve Visual-Motor Skills during a Community Mobility Boot Camp for Persons with Autism Spectrum Disorder
Researcher: Danica Motuz; Under the direction of Dr. Jennifer Radloff
Objective: The purpose of this study was to determine if use of the Interactive Metronome improves attentional and visual-motor skills in persons with Autism Spectrum Disorder (ASD) that can relate to driving and community mobility performance. The project also aimed to determine the necessary amount of time needed to see improvement in IM outcomes and what client factors may indicate the best possibility of improvement.
Method: The study included 7 males who were 15 years to 19 years of age and had a diagnosis of high functioning ASD. The participants were introduced to the study through a referral process by a physician's office in eastern North Carolina. The participants were pretested and then assigned to an IM group or a different intervention group based on what intervention the researchers thought would benefit participants' most. The 4 participants receiving 12 sessions of IM training exercises over a 6 week period were compared with a group of 3 participants receiving a different intervention addressing visual scanning skills.
Results: All participants improved scores between pre-test and interim-testing. The IM group participants demonstrated continuous improvement from interim-testing to post-test scores on the Task Average and Super Right On measurements while the control group did not have significant changes.
Conclusion: The Interactive Metronome training appears to facilitate improvement in attentional and visual-motor skills as evidenced by performance improvements of scores in teens and young adults with ASD. Direct correlation to change in driving performance could not be determined.

Title: The Use of Vision Coach as an Intervention to Improve Driving-Related Skills in Teenagers with ASD
Researcher: Carina Norris; Under the direction of Dr. Jennifer Radloff
Purpose: To determine if teenagers and young adults with high-functioning Autism Spectrum Disorder (ASD) are able to improve visual scanning skills through training on the Vision Coach. In addition, to determine how much improvement can be gained with extended practice on the Vision Coach when compared to a short-term intervention.
Method: Seven teenagers with high functioning autism spectrum disorder participated in a driving and community mobility boot camp for seven weeks. Three out of the 7 participants were assigned to receive Vision Coach interventions for an extended period, while the other four participants were assigned to the control group. Participants were given a pre-, interim-, and post-test, and performance scores were compared.
Results: The intervention group performed better than the control group on both a simple, timed task and also a divided attention task. However, the difference between group means was not statistically significant.

Conclusion: Improvements were noted amongst participant's scores from pre- to post-testing. Vision Coach interventions two times per week for 15-30 minutes per session might not have been a great enough exposure to show a significant difference between the intervention and control group's scores.



Title: Comparison of Late Pre-K and Early Kindergarten Scoring with Sensory Processing Measure: Group Comparisons
Researchers: Katie Simpson & Anne Wood; Under the direction of Dr. Carol Lust.
Purpose: The purpose of this study was to examine and compare how a group of children scored on the Sensory Processing Measure from late Pre-Kindergarten to Kindergarten four months later.
Method: Fourteen children from a typical classroom were followed from Pre-Kindergarten to Kindergarten and data was collected using the classroom form of the Sensory Processing Measure (SPM), a standardized assessment, completed by the primary teachers.
Results: Overall, there was a significant increase in scores indicating some or definite deficits from pre-K to Kindergarten. Data analysis indicates that nine of the 14 students showed more deficits in two or more subtests based on SPM scores.
Conclusion: These results suggest that there may be a need for occupational therapy intervention during the transition from Pre-K to Kindergarten in order to improve student behavior and functioning within the classroom. This also supports the use of a sensory self-regulation program, such as the Alert Program, in Kindergarten.