

Completed Theses and Projects 2023

Theses:



Examining Visual Processing Speed Reaction Time as a Predictor for Driving Fitness

Researcher: Meagan Denny under the direction of Dr. Anne Dickerson

Purpose: This research examined visual processing speed reaction times between medically-at-risk drivers and healthy controls with the purpose of determining its relationship with the outcomes of a comprehensive driving evaluation. Three research questions were specifically targeted: (1) is there a statistically significant difference of reaction times on the Vision Coach™ between the age groups of the healthy controls, (2) is there a statistically significant difference in visual processing speed reaction times across age groups between the healthy controls and medically-at-risk, (3) does the Vision Coach™ demonstrate adequate

sensitivity and specificity to predict driving fitness outcomes?

Method: Data collection consisted of a comprehensive driving evaluation including an on-road component for medically-at-risk adults with a fitness to drive outcome designated as “pass” or “fail.” The Vision Coach™ Full Field 60 task collected visual processing speed reaction times of the medically-at-risk adults as well as healthy controls to compare between the two groups, between age groups, and determine predictability between driving fitness outcome.

Results: One-factor ANOVA showed a significant ($p < .001$) difference in visual processing speed reaction times between all age groups of the healthy controls. Two-factor ANOVA showed a significant ($p < .001$) difference between age groups of the healthy controls and medically-at-risk as well as between the two groups as whole. Using the default cut point of 0.5, a logistic regression model determined the Vision Coach™ accurately predicted 86.4 percent of the driving fitness outcomes. The AUC was significant ($p = .001$) at .905 for outstanding diagnostic performance.

Conclusion: Results of this study show that medical risk for driving impacts visual processing speed reaction times, regardless of age. The Vision Coach™ is a reliable and valid tool to assess and improve this discrete ability and can be used by generalists and specialists to help determine driving fitness.



Examining Multi-Tasking Ability on an Interactive Driving Simulator Task to Differentiate between Fit and Unfit Drivers

Researcher: Alec DuCharme under direction of Dr. Anne Dickerson

Purpose: The purpose of this study was to examine the use of the DriveSafety™ interactive simulator and a functional object detection (FOD) protocol as an assessment of multitasking. The goal was to answer the questions: 1) is the performance of individuals on a driving-simulator assessment of multitasking correlated with their fitness-to-drive, and 2) does the performance of individuals on a driving-simulator assessment of multitasking differ between medically at-risk and healthy controls?

Method: Data were collected from a group of medically at-risk adults (N=124) and a group of healthy control adults (N=131) from the DriveSafety™ simulator. These data were used as a measure of participants' multitasking abilities. Data on fitness to drive classification for the medically at-risk adults was determined with a comprehensive driving evaluation. Simulator outcomes were compared both between medically at-risk and healthy control participants and between fit to drive and unfit to drive participants.

Results: Chi-square analyses found a significant difference ($p < 0.001$) in simulator performance between fit to drive and unfit to drive individuals. Chi-square analyses also found that there was a significant difference ($p < 0.001$) in simulator performance between medically at-risk and healthy control individuals

Conclusion: Differences in simulator performance between the medically at-risk and healthy control groups were consistent with the available literature, helping to validate the driving simulator protocol as an assessment of multitasking ability. Furthermore, the simulator results being closely linked to fitness to drive means that occupational therapists could use this assessment to inform their recommendations regarding fitness to drive and/or whether it may be appropriate to see a more skilled occupational therapist driving rehabilitation specialist.



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The Social and Emotional Influence of Group Engagement in Occupations among Cancer Survivors

Researcher: Heidi Kreis under the direction of Dr. Lynne Murphy

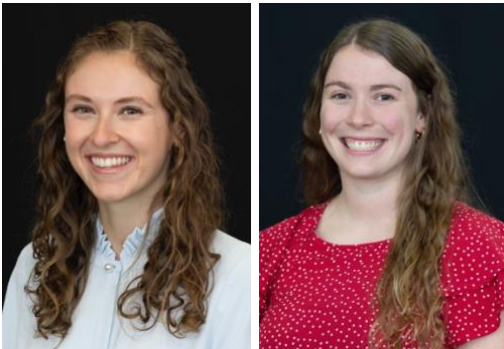
Purpose: This study explored the effect of group engagement in meaningful occupations on the psychosocial wellbeing of adult cancer survivors. Specifically, this study aimed to examine differences in pre- and posttest measures of distress, meaning and purpose of life, and the positive psychosocial impact of illness.

Methods: This study utilized quasi-experimental one-group pretest-posttest design. Participants were three female breast cancer survivors between the ages of 63 and 71 with varying courses and timelines of cancer treatment. Participants completed pretest data collection, eight weekly occupation-based group sessions, and posttest data collection. The research team facilitated eight 90-minute sessions, each with a different occupational focus centered around leisure. The general structure of the weekly sessions included an introduction to the activity and group goals, engagement in a meaningful leisure activity, and guided reflection. Psychosocial wellbeing was analyzed using three quantitative measures to measure cancer-related distress, perceptions of meaning and purpose of life, and the positive psychosocial impact of illness. Pre- and posttest measures of the three quantitative measures were compared using three Wilcoxon signed-rank tests.

Results: The current study did not yield statistically significant changes in the three measures of psychosocial wellbeing in response to the occupation- and group-based intervention. However, individual measures of distress, meaning and purpose of life, and the positive psychosocial impact of illness demonstrate a need for occupation-based intervention addressing psychosocial wellness.

Conclusion: Although measures of psychosocial wellbeing between pre- and posttest data collection did not identify significant change, findings from this study provide guidance for ongoing research in occupation-based cancer survivorship care.

Projects:



Driving and Community Mobility Bootcamp for Young Adults with Autism Spectrum Disorder: Perceptions of Law Enforcement

Researcher: Lindsay Diab and Madison Rogan under the direction of Dr. Anne Dickerson and Dr. Lauren Turbeville

Purpose: The purpose of this study was to examine how young adults with autism spectrum disorder perceive law enforcement before and after personal interactions with police officers during a Driving and Community Mobility Bootcamp.

Method: The participants (N=13) participated in a five-day Driving and Community Mobility Bootcamp (occupational therapy intervention) for teens and young adults with high-functioning autism spectrum disorder. Data were collected through a written survey and analyzed to measure changes in perception of law enforcement before and after an interactive activity with law enforcement officers which included a simulated traffic stop.

Results: Findings indicated that participants' comfortability talking to officers and respect towards law enforcement significantly increased after personal interactions with police officers.

Conclusion: This study provides insight into how interactions with law enforcement in a safe and positive manner influence comfort with talking to law enforcement and respect for the police in teens and young adults with autism spectrum disorder.



Driving and Community Mobility Bootcamp for Young Adults with Autism Spectrum Disorder: Participants' Perception of Bootcamp as an Occupational Therapy Intervention

Researcher: Skylar Rogan and Charli White under the direction of Dr. Anne Dickerson and Dr. Lauren Turbeville

Purpose: The purpose of this study was to determine if the Bootcamp as an occupational therapy intervention is perceived by participants as an effective intervention to improve their driving and community mobility abilities.

Method: To examine participants' perceptions on knowledge of skills in driving and community mobility, driving ability and skills, and future driving and community mobility skills, pre and post-test surveys were conducted at the start and end of intervention. Over 55 participants completed the surveys in 2015, 2016, 2018, 2019, 2021, and 2022. Data were collected and analyzed using SPSS paired t-tests.

Results: Results indicate that there were significant changes in perception of knowledge and skills about driving and community mobility, but no changes in their behaviors associated with autism spectrum disorder.

Conclusion: Participation in the Driving and Community Mobility Bootcamp increased self-efficacy and knowledge of driving for participants with autism spectrum disorder.



Using Digital Literacy Tools to Enhance Virtual Handwriting Interventions

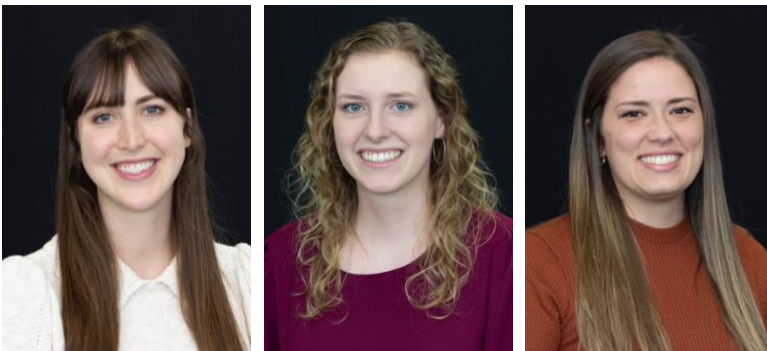
Researcher: Larymi Beck and Kathryn Mumford under the direction of Dr. Denise Donica

Purpose: We examined performance-based praxis skills of third and fourth grade students with and without handwriting difficulties.

Method: Praxis and handwriting legibility were examined in 33 third and fourth grade students at a local elementary school using five praxis tests from the Evaluation in Ayres Sensory Integration and the Handwriting Legibility Scale. Participants were categorized into two groups based on their handwriting legibility scores: students with handwriting difficulty (n=6) and students without handwriting difficulty (n=27).

Results: There were statistically significant differences in three of the five praxis tests (praxis positions, sequences, and oculomotor praxis) when comparing students with and without handwriting difficulties.

Conclusion: Preliminary findings support a relationship between praxis and handwriting legibility which may inform occupational therapy interventions for students handwriting difficulties.



Activity Levels and Perceived Exertion Changes during Instrumental Activities of Daily Living and Physical Activity in Community-Dwelling Older Adults

Researcher: Kendyl Finley, Paige Lawrence, and Madison Vodicka under the direction of Dr. Young Kim

Purpose: This study examined the relationship between activity levels and perceived exertion changes during IADLs, in comparison to physical activity, in healthy older adults.

Method: Participants (N=18) were healthy older adults aged 65 years of age or older and without cognitive impairment. Participants were required to stand and complete 30 minutes of moderate intensity physical activity. Activity levels were defined as 1.0-1.5 METs and measured using ActiGraphs during bed-making, vacuuming, and walking 2.5 mph activities. Exertion levels were

measured using the Borg Rating of Perceived Exertion before and after each activity. Participants were observed first in an occupational therapy apartment setting, then within respective participant homes.

Results: There were no significant associations between activity levels and the changes in perceived exertion in older adults ($p = .3-1.0$; $rs = 0.01-0.27$).

Conclusion: In order to individualize activity recommendations for older adults, a holistic view of the client is necessary to provide physical activity recommendations by considering both activity level measures and perceived exertion changes during physical activity.



Surviving to Thriving: Qualitative Perspective on an Occupation-Based Cancer Survivorship Group

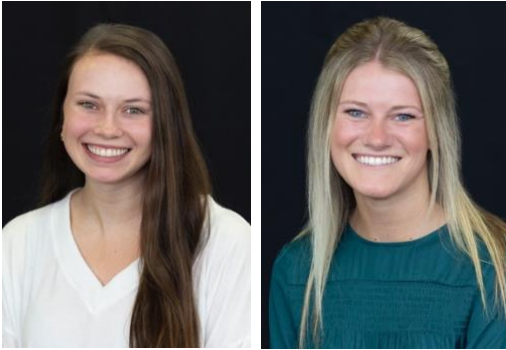
Researchers: Ayoola Ajani and Logan Leggett under the direction of Dr. Lynne Murphy

Purpose: This study examined the lived experience of group engagement in new occupation among adult cancer survivors to provide evidence to support best occupational therapy practices.

Method: A qualitative phenomenology was utilized to understand the lived experiences of cancer survivors who participated in an 8-week group that introduced new occupations. Over 8 weeks, three female breast cancer survivors engaged in 60 minutes of novel activities led by an occupational therapy team, followed by 15-minute guided reflection regarding participants' experience and insights. At the group's conclusion, semi-structured interviews gathered data regarding participants' lived experiences. Interviews were transcribed and descriptive, pattern, and thematic coding by the research team identified themes.

Results: Primary themes emerging from the data included the following: 1) Permission and opportunity to explore described the role of the group in discovery and purpose in new and meaningful activities that fostered confidence and empowerment; 2) Fostering camaraderie explored the meaning of the relationships, common experiences, and emotional sharing that emerged during the group; and 3) Reconsidering occupational identity described motivation to resume valued activities and behaviors that promoted long-term connections and life participation.

Conclusion: Engagement in the cancer survivorship group increased participation in meaningful occupations, as anticipated. However, the emergent themes added a deeper understanding to the personal connections, behaviors, and activities that supported continued recovery and re-discovery of each individual within the group. Exploration of doing and being ultimately led to a sense of becoming more than they were before the group. As this intervention was designed for those who were no longer actively undergoing medical treatment, the need for continued intervention, with an occupational focus, was supported as a means to support psychosocial well-being.



Exploring Readiness for Mobility Transitions Among Older Adults Being Evaluated for Fitness to Drive

Researchers: Claire Gardiner and Phoebe LaCroix under the direction of Dr. Lynne Murphy

Purpose: This study aimed to determine 1) Is there a relationship between readiness for mobility transition and satisfaction with social roles and activities? and, 2) Is there a relationship between anticipatory anxiety, perceived burden, avoidance, and adverse situations

related to transitioning out of driving and driving recommendations?

Method: A cross-sectional design was used to explore the attitudes of older adults being evaluated for fitness-to-drive, related to social participation in their communities (as measured by PROMIS-Satisfaction with Social Roles and Activities) and readiness to restrict or cease driving (as measured by Assessment for Readiness for Mobility Transition [ARMT]). Kendall’s tau-b analyzed relationships between those factors, or between readiness for mobility transition and fitness-to-drive recommendations. The 16 participants live in Eastern North Carolina and have a mean age of 71.8 years (SD 10.9).

Results: Statistical analysis revealed a moderate, positive association between social participation, as measured by the PROMIS, and the concern about mobility transition out of driving, as measured by total scores of the ARMT ($\tau_b = 4.1, p=.03$). Additionally, a moderate, positive association was identified between social participation, as measured by the PROMIS, and the concern about the adverse situation subsection of the ARMT, indicating a severe impact of driving cessation on quality of life ($\tau_b = .40, p=.04$). No significant relationships were identified between the readiness for mobility transition and the recommendations regarding fitness to drive.

Conclusion: This preliminary study suggests that people who are highly satisfied with their social roles and participation demonstrate higher attitudinal and emotional barriers to restricting or ceasing driving. Further research of these barriers is needed for greater engagement and effectiveness of the transportation planning process to facilitate continued social participation and quality of life for older adults.



Effects of an Occupational Therapy Ground-Based Horsemanship Program on Executive Function and Social Participation in Children and Youth with Disabilities: A Pilot Study

Researchers: Dani Campbell, Jill Donaldson, Ella Duffy, Lydia Mead, and Ashley Wilhite under the direction of Dr. Heather Panczykowski

Purpose: This research aimed to explore the influence of a ground-based horsemanship program on executive function and social participation in children with disabilities.

Method: This study utilized a quasi-experimental one-group pretest-posttest design to explore the impact of a collaborative occupational therapy group utilizing unmounted work with horses to target executive function and social participation goals for seven children with disabilities over a 10-week period. Interventions were designed using the Cognitive Orientation to daily Occupational Performance (CO-OP) approach where participants and parents collaborated to design their goals for the program. Weekly group sessions were designed to challenge participants to initiate, navigate, and respond to social situations through novel team building activities in a safe environment. The Behavior Rating Inventory of Executive Function (BRIEF-2) was administered to evaluate the domains of behavioral, cognitive, and emotional regulation using parent and teacher questionnaires. The Social Profile was used to objectively assess behavioral interactions of children to evaluate level of activity participation, social interaction, and group membership. The Wilcoxon signed-rank exact test was used to compare pretest-posttest results on both the BRIEF-2 and Social Profile.

Results: Although no significant results were found on the BRIEF-2 teacher and parent results, significant results were found on the Social Profile. The Social Profile results indicated improvements in the areas of activity participation, social interaction, and group membership.

Conclusion: This study provides preliminary evidence supporting the effectiveness of a collaborative occupational therapy ground-based horsemanship program utilizing the CO-OP Approach for improving social participation among children with disabilities. A potential area of future research is to examine how social skills learned in a ground-based horsemanship group can be generalized to school, home, and community settings.



Parent Perceptions of Effects of a Driving and Community Mobility Bootcamp in their Children with Autism Spectrum Disorder

Researchers: Emily Kron and Kelly Oglesby under the direction of Dr. Lauren Turbeville

Purpose: The purpose of this study was to explore the parent's perception on their child's knowledge, abilities, and/or skills related to the instrumental activity of daily living of driving and community mobility.

Method: This study used a pretest-posttest design. Participants consisted of parents of teens or young adults with autism spectrum disorder that participated in the Occupational Therapy Driving and Community Mobility Bootcamp at East Carolina University in the summers of 2015, 2016, 2018, 2019, 2021, and 2022. Parents were surveyed prior to the start of the bootcamp and at the conclusion of the bootcamp.

Results: Across the sample (N=62), significant differences were found in changes in parent's perceptions on the child's understanding of traffic rules and regulations ($p = .001$), being a safe and



adequate driver ($p = .04$), reading a map ($p = .02$), using public transportation ($p = .01$), using a taxi service ($p = .02$), and being an independent driver ($p = .02$). Overall, there were also significant differences found in changes in parent's perception of the child's driving ability skills following the bootcamp. However, there were not significant differences in the parent's perception of their child's executive functioning skills.

Conclusion: These results demonstrate that a driving and community mobility bootcamp for teens and young adults with autism spectrum disorder is likely an effective method to improve, skills, knowledge, and abilities in the IADL of driving and community mobility, as perceived by their parents.