

Research Symposium Abstracts 2012

Power Point Presentations:



Title: Occupational Therapy Intervention to Reduce Phantom Limb Pain in Vascular Amputees.

Researchers: Helen Houston, OTR/L; under the direction of Dr. Anne Dickerson.

Purpose: The objective of this study was to investigate the effectiveness of combining two interventions, Farabloc technology to eliminate electromagnetic fields and Mirror Therapy to assist in the sensory cortex reorganization, to decrease or eliminate phantom limb pain in vascular amputees.

Methods: Fourteen older adults with a unilateral vascular amputation participated in the study. Nine individuals started the intervention within 48 hours of surgery and were compared to five individuals who were approximately 18 months post-surgery. Measures of residual limb edema and temperature, phantom limb pain variables, activities of daily living and quality of life interference were completed pre and post intervention and 4 weeks after the end of therapy.

Results: All fourteen subjects reported an overall decrease in phantom limb pain using a visual analogue scale. For the acute group, wound healing and edema reduction decreased time to prosthetic fitting from 12 weeks to eight weeks, improved functional ambulation, return to work and decreasing wheelchair mobility dependence. Activities of daily living and quality of life variables both showed significant differences.

Conclusion: Use of this combined treatment protocol shows promising results for not only acute amputee intervention, but also improved perception of pain and improved quality of life for amputees with chronic phantom limb pain. Implications for activities of daily living and quality of life are discussed.



Title: Does Practice on a Driving Simulator Improve Self-Efficacy and Performance Among Novice Drivers With and Without Disabilities?

Researchers: Claire Monroe & Amanda Lytz; under the direction of Dr. Anne Dickerson

Purpose: This pilot study examined the viability of using an interactive driving simulator as an intervention to increase self-efficacy of driving for novice drivers with and without disabilities.

Method: This was a pretest-post test design using the *Adelaide Self Efficacy Scale* and a 10-point Likert scale for measuring anxiety. Other quantitative data collected included: Performance results on the driving simulator and heart rate analysis. Eight young adults who either did not drive or were new drivers completed the four-session intervention using an interactive driving simulator. The participants identified themselves as having 1) ADHD, 2) Asperger's, or 3) no diagnosis, but anxious about driving. The sessions consisted of using the simulator with therapist intervention to recognize and correct driving errors.

Results: Using a paired t-test, results did not show any change in anxiety or heart rate, but there were significant differences in two of the 12-item self-efficacy scale. There did not seem to be any association between results and diagnosis or if the participants had more or less experience driving. Qualitative results indicated most participants felt the experience assisted them in preparing for driving, but the quantitative outcome measures varied in direction for each participant.

Conclusion: Qualitatively, driving simulator appeared to be an effective tool for increasing self-efficacy in these participants. However, the quantitative measures used in this study did not capture the changes and other outcomes measures may need to be developed or used.



Title: Carry-Over Effect of Handwriting Readiness Programs on Handwriting-Related Skills of Students One Year Following Intervention

Researcher(s): Anna Call and Whitney Lear; under the direction of Dr. Denise Donica

Purpose: The purpose of this study was to determine if children who participated in the implementation of occupational therapy-based handwriting readiness programs in Head Start would demonstrate continued improvements in handwriting-related skills one year following the

implementation.

Method: Data was collected during two follow-up sessions using the Shore Handwriting Screening, BOT-2, and Test of Visual Motor Integration. Descriptive data about parents' perceptions of their child's handwriting abilities was also collected through a survey.

Results: Data analysis indicates that the Fine Motor and Early Writing experimental group showed the greatest gains on the manual dexterity subtest of the BOT-2 while the Handwriting Without Tears group showed the greatest gains on the Shore Handwriting Screening. Although results were not statistically significant, positive trends were observed in both experimental groups.

Conclusion: Children who participated in both handwriting programs continued to show greater improvements in handwriting-related skills one year following intervention when compared to the control group. Due to the small sample size, further research is needed to support these results.



Title: Comparing Drivers' Braking Behaviors and Physiologic Responses across the Lifespan

Researcher: Danielle Brown and Kristen Davis under the direction of Dr. Anne Dickerson

Purpose: Since driving is an instrumental activity of daily living, it is a critical area for assessment and intervention. The overall goal of this study is to examine the use of a driving simulator as an occupational therapy assessment and intervention tool. This study considers how older adults respond to critical incidents on a driving simulator by comparing their performance with young adults, specifically using response time, as measured by heart rate and braking reactions.

Method: Sixty subjects (30 young, 30 old) will complete three scenarios (2 training and 1 testing) on the STISIM Drive Driving Simulator WT-2000. The testing scenario involves a complex driving environment, which necessitates reactions to emergency situations. Measurements were recorded of brake reaction time and force, time to peak heart rate after appearance of each critical incident (response), and time back to baseline heart rate (recovery). Independent t-tests were used to determine differences between the two groups and paired t tests were used for comparisons between measures.

Results: For both heart rate reaction and recovery time, there is no statistical significance between old and young drivers with one exception. There was a significant difference in the physiologic recovery for old and young drivers for one incident due to three outliers in the old driving group. There were no significant differences between old and young for force and simple brake reaction. However, there was significant difference ($p=.02$) between complex brake reaction measures of the old and young participants.

Conclusion: Overall, age does not affect the physiologic reaction and recovery time, although there are individual differences. Age also did not have an effect on simple brake reaction or force of braking.

However, driving within the complex environment on a driving simulator, there was an age difference. This foundational work will add to the research base for increasing occupational therapy knowledge about interactive driving simulation, brake reaction timers, and force for intervention and assessment in driving rehabilitation.

Posters



Title: The Development of Media Training Videos for Use with the Wounded Warrior IM/TRX Protocols.

Researchers: John Elam III and Matthew Morgan; under the direction of Dr. Leonard Trujillo

Purpose: The purpose of this study was to develop media training videos for use with the Interactive Metronome® (IM) and TRX® Suspension exercises for members of the Wounded Warrior Battalion at Camp LeJeune, North Carolina who have sustained mild traumatic brain injuries.

Method: A series of meetings were held by IM® trained professionals to develop training videos of the sequence of TRX® routines reflective of the rhythmic patterns of the IM routines. The videos demonstrate proper techniques for each TRX exercise and stretch to be paired with the corresponding IM exercises.

Results: Videos were developed that demonstrate proper techniques to be used for the IM® when paired with the TRX®. The TRX® exercises demonstrated, compliment the IM® exercises for the existing protocol. The addition of the TRX® produces an increased neurological challenge to the client's system where the IM® serves as a foundation for that change to occur. In addition the physical nature of the TRX® adds a sense of competition between the two clients who are completing each session jointly.

Conclusion: Using a small pilot group of volunteers, the combined video and demonstration options add greatly to the potential of enhancing the proper following and implementation of the designed protocols.



Title: The Analysis and Examination of Results Gained on the Nine Hole Peg Test and Jebsen Hand Function Test by Post-Stroke Clients Using the Interactive Metronome®

Researchers: Kevin Griffin and Whitney Wilson; under the direction of Dr. Leonard Trujillo

Purpose: The purpose of this project was to analyze data from a previously conducted study on the benefits of IM® post-stroke, as measured by performance on the Nine-Hole Peg Test (NHPT) and the Jebsen Hand Function Test (JHFT). Additionally, data was examined from the post-test survey given to the participants.

Method: A statistical analysis of pre- and post- test scores on the NHPT and JHFT was conducted, in order to determine the presence of statistical significance or clinical meaningfulness. Measures of central tendency were run on the qualitative survey data.

Results: Statistical significance was found on the JHFT Writing Right-Hand and JHFT Stacking Checkers Right-Hand. Although statistical significance was not found on any other test, the NHPT showed a high correlation between IM intervention and Improvement pre- and post- test, which is clinically meaningful for the use of IM with stroke survivors. Based on the survey data, the participants identified that they improved not only on the IM, but also in other activities. They agreed that they would recommend the IM to others and wished to continue using the IM.

Conclusion: Based on the results, the IM should be used with post-stroke patients to improve upper extremity functioning. Further research is recommended to examine the specific benefits of IM in upper extremity function and other areas.



Title: Comparing the Effect of Animal Interaction and a Preferred Fine Motor Activity on the Electrodermal Response of Individuals with Profound Intellectual Disabilities (PID).

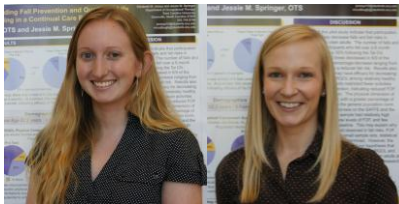
Researcher(s): Kayley Strum & Kati Soleil; under the direction of Dr. Beth Velde

Purpose: To determine the effectiveness of three different interventions [dog and occupational therapy student (OTS), OTS only, and fine motor activity presented by OTS] on the arousal level of a client with profound intellectual disability.

Method: Single subject alternating treatment design using the Nexus 10 and Biotrace + software to measure Electrodermal Activity (EDA) during the three interventions randomized using counterbalancing. Data was collected once a week over 6 weeks. Each session started with a 2 minute baseline, followed by each intervention for 8 minutes with a 2 minute recovery between each for a total of 30 minutes.

Results: Results were inconclusive.

Conclusion: Further research is needed to address the effects of the animal-human interaction within this population, whether the interaction impacts arousal, and should include behavioral measures.



Title: Tai Chi Effectiveness Regarding Fall Prevention and Quality of Life Among Seniors Living in a Continual Care Facility.

Researchers: Elizabeth M. Jersey, OTS and Jessie M. Springer, OTS; under the direction of Dr. Jane Painter

Purpose: This pilot study explored the efficacy of Tai Chi in preventing falls, decreasing fear of falling (FOF), and improving health-related quality of life (HRQOL) and balance in older adults.

Method: Thirty-minute Tai Chi classes were conducted twice weekly for 16 weeks. Ten participants completed pre- and post-testing: Survey of Activities and Fear of Falling in the Elderly (SAFFE); 36-Item Short Form Health Survey, version 2 (SF-36v2); Timed Get Up and Go (TGUG) Test; and Wii Fit Balance Board or Four Square Step Test.

Results: Data analysis indicates a reduction in falls and FOF-related activity restriction. Improvements were seen in the physical dimension of HRQOL. TGUG results showed 1.9%-20% decrease in recorded time, which suggests improved balance.

Conclusion: Results indicate Tai Chi may be an effective intervention for preventing falls, improving HRQOL, and reducing fall risks and FOF among older adults. Further research with generally healthy older adults is warranted.



Title: The Role of Occupational Therapy in Faith-Based Organizations

Researchers: Leslie Anderson & Jessica Marsh under the direction of Dr. Anne Dickerson

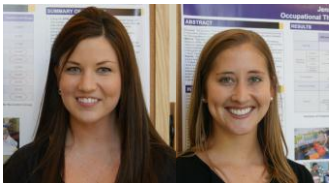
Purpose: The purpose of this study was to explore the needs of older adults within faith-based organizations in Greenville and to provide resources which may assist the organizations in meeting those needs.

Method: Using the Greenville city newspaper as a resource, 73 faith-based organizations were contacted at least three times to elicit participation in the project. In order to gain a broad overview of the perception of older adult needs within faith-based organizations, two surveys were developed for this project. Leaders of ten organizations consented and completed the initial survey, which included questions regarding demographics of the organization and the leader, the importance of meeting identified needs of the older adult members, and the organization's effectiveness in meeting those needs. Of the ten surveyed, three leaders allowed the researchers to survey older members of the organization. This additional survey was intended to gain a more personal understanding of the organization's ability to identify and meet the needs of

older members. A total of 19 older adult surveys were completed. Relevant resources were distributed and presented to the three churches which provided older adult participants.

Results: Analysis of the surveys completed by older adults revealed that all needs rated as *important* were also being effectively addressed by the organizations. By contrast, results of the surveys completed by church leaders suggested that, although considered *important*, the following needs were not being addressed effectively: caregiver support, promotion of healthy eating/exercise, fall prevention, and education on safe driving.

Conclusion: Due to the small sample size, these results are limited in scope. However, the research process resulted in a better understanding of how to enhance the partnership between faith-based organizations and the field of occupational therapy. It is the hope of the researchers that this partnership will be further explored in order to improve the wellness of older adults by effectively meeting their needs in the community.



Title: Effectiveness of Implementing the Alert Program® into a Kindergarten Classroom – Year Two

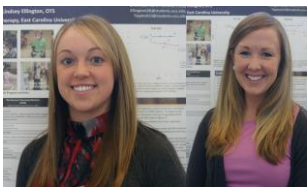
Researcher: Jenna Hudson & Casey Reinecke; under the direction of Dr. Lust

Purpose: The purpose of this study was to explore the effectiveness of implementing the Alert Program® to influence kindergarteners' ability to recognize arousal levels and apply strategies for self-regulation to improve learning and social interaction.

Method: Data was collected through standardized assessments. The Sensory Processing Measure (SPM) – School & Home Forms were completed by the parents and primary classroom teachers. The School Function Assessment (SFA) was completed by classroom teachers. The participants were kindergarten students in a typical classroom.

Results: Data analysis indicates that the experimental group had more gains than the control groups based on pre-test and post-test SFA mean scores. Both groups showed improvements in multiple areas of the SPM – School Form, with no significant change in SPM – Home Form scores. The impact of the Alert Program was best detected in overall SPM, rather than in any one subcategory.

Conclusion: These results verify the effectiveness of the Alert program in improving overall student classroom performance, as measured using the SFA. In addition, the multisensory basis of the alert program is reflected best in overall SPM scoring, and appears to be effective in generating larger overall gains in sensory processing measures.



Title: Comparison Between Parent's and Teacher's Pre and Post-test Scores Using the Sensory Profile – Short Form for Sensory Processing in a Kindergarten Classroom

Researcher(s): Lindsey Ellington & Katie Tippins; under the direction of Dr. Carol Lust

Purpose: The purpose of this study was to determine whether either the Sensory Processing Measure Main Classroom Form (SPM-MC).or the Sensory Processing Measure – Home Form (SPM-H) were reliable in assessing kindergarten student sensory processing abilities when compared to the Sensory Profile – Short Form (SPSF) assessment. .

Method: Before and after completion of 6 months of weekly 1-hour multi-sensory activity sessions implementing strategies from the Alert Program for Self-Regulation® with 24 kindergarten students, ages 5-6, parents of participants completed the SPSF and SPM-H while teachers of participants completed the SPSF and the SPM-MC.

Results: Comparison of pretest and posttest scores indicated a difference between parent and teacher ratings on both the SPM and SPSF. A linear regression analysis was used to examine how respondents answered comparable items from each assessment. The main result was that neither SPM form accurately predicted

outcomes using the SPSF, although there was better reliability in the teacher scoring than in parental scoring both in pretest and post-test settings.

Conclusion: Results suggest that the SPM instruments may not be adequate substitutes for the SPSF assessment, but if used, the SPM classroom form is more reliable than the home form assessment.



Title: Handwriting without Tears: Analyzing the Efficacy of a Handwriting Program in a Private Elementary School

Researchers: Simone Cowan and Anne Thomas: Under the direction of Dr. Denise Donica

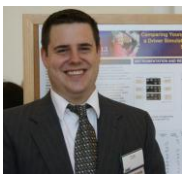
Purpose: The purpose of this study was to compare the development of handwriting skills in kindergarteners that received instruction using the

D'Nealian style of writing with those that received the structured multi-sensory Handwriting Without Tears® curriculum.

Method: The Test of Handwriting Skills-Revised was administered to the control group at the end of their kindergarten year and to the experimental group at the start and mid point of their kindergarten year. For the experimental school year, the kindergarten teachers were trained in the Handwriting Without Tears® curriculum which they incorporated daily in their lesson plans. Additional support from the OTR or OTS was provided once a week during handwriting instruction time.

Results: When comparing the mid-year performance of the experimental group to the end-of-year performance of the control group, the experimental group had a higher mean raw score than the control group on 5 out of 10 subtests.

Conclusion: From these results we expect the experimental group to out score the control group on all subtests by the post-test at the conclusion of the kindergarten year.



Title: Comparing Young and Old Adult Performance on a Driver Simulator and Computer-Based Driver Screening Tools

Researcher: Cyrus Ridenour under the direction of Dr. Anne Dickerson

Purpose: The overall goal of this study is to examine the usefulness of an interactive driving simulator, Useful Field of View test (UFOV), and Attention Network Test (ANT) for occupational therapy driving assessment and intervention. The UFOV is an evidence-based cognitive and perceptual tool used to predict crash risk. The ANT is also a computer based tool that has similar qualities to the UFOV and is free to users.

Method: Data was collected from 30 younger subjects (mean age=25) and 30 older subjects (mean age=67). The driving simulation involves a complex environment, which necessitates reactions to emergency situations. Using a counterbalance measures, participants completed the UFOV and ANT after testing on the simulator.

Results: Data analysis is ongoing, but it is expected that the ANT and UFOV will show high correlations to each other as well as illustrate age differences in results. Due to the complexity of interactive driving simulation, this data analysis is ongoing.

Conclusion: The results of this study will build the knowledge base for assessment and screening in driving rehabilitation. Since driving and community mobility is an important instrumental activity of daily living for occupational therapy, such foundational research is critical for addressing the rapidly growing population of older drivers