Physical Activity, Cognition, and Multiple Sclerosis

The authors examined the relationship of physical activity and cognitive functioning for people with multiple sclerosis. The 33 participants wore a physical activity monitor for one week and underwent neuropsychological assessment. It was found that physical activity impacted cognitive processing speed more than learning and memory after controlling for age, sex, and education. Practitioners should take note about processing speed when developing exercise regimens. Researchers could evaluate why cognitive processing speed is impacted by physical activity more than learning and memory or examine the impact of exercise training on cognitive processing.


Teaching Global Positioning Systems to Students With Visual Impairments

According to Lowenfeld (1948), blindness imposes three basic limitations on an individual: the range and variety of experiences, the ability to get around, and the control of the environment and the self in relation to it. These limitations can be greatly diminished with the use of Global Positioning System (GPS) devices. However, issues such as cost and an overreliance on technology for persons with visual impairments have become issues of concern, particularly from orientation and mobility specialists. The focus of this article was to explore considerations and methodologies for teaching GPS usage with individuals with visual impairments. Orientation and mobility specialists, as well as teachers of students with visual impairments, expressed a number of concerns with utilizing GPS devices, specifically cost and the intimidation of using a new form of technology as potential issues. The findings of this study may be of interest to APAQ readers as it offers further insight on the importance of such devices for persons with visual impairments or blindness as they engage in a physically active lifestyle.


 Interruption and Redirection for Vocal Stereotypy in Children With Autism

Vocal stereotypy is defined as a pattern of persistent, fixed, and repeated speech or movement that is apparently meaningless and is characteristic of some mental conditions. Response interruption has been shown to be effective in reducing various
characteristics of vocal stereotypy. The use of a variation of response interruption, referred to as response interruption and redirection (RIRD), has recently become an area of investigation. The purpose of this study was to systematically replicate and extend previous research by evaluating the effects of RIRD using directions that required motor responses on the vocal stereotypy of two children with autism examining measurement of time spent in treatment, procedures to facilitate and assess the generalization of behavior reduction, and assessment of social validity. Results suggest that RIRD can be an effective intervention technique in decreasing the vocal stereotypy in children with autism without the use incompatible responses. The findings of this study may be of interest to APAQ readers as they offer further insight into the different ways in which behavioral interventions can positively engage children with autism exhibiting vocal stereotypy.


### Accelerometry: Measuring Individuals With Chronic Physical Conditions Activity

In this report, the researchers depict the impact of a variety of chronic physical conditions on accelerometry-based levels of everyday physical activity (PA) to identify high-risk conditions and compare objectively assessed PA levels with PA levels estimated by rehabilitation physicians. Participants included 461 individuals with 18 chronic physical (sub)conditions identified through a Dutch hospital or rehabilitation center, and 96 able-bodies participants ranging, all between the ages of 7-82. The researchers assessed active monitoring in daily life postures, PA, and transitions between postures. Accelerometers were placed in three areas of the body (thigh and skin over sternum) and one extra for those in wheelchairs (wrist). Physicians estimated the level of activity of persons with chronic conditions through a questionnaire. Results indicated that only four conditions had normal activity levels, whereas three conditions had severe deficit PA levels. Additionally, in comparison to the objective measure, physicians either overestimated or underestimated the level of activity in patients. Information from this study was intended to bring forth awareness of the PA levels amongst persons with chronic conditions in hope for management adaptation.


### Benefits of Therapeutic Camps for Children With Disabilities

In this qualitative research study, the authors examined respite benefits experienced by parents whose children attended a 3-day residential therapeutic camp for individuals with disabilities. Nine parents of campers with varied disabilities participated in the study located. Parents were interviewed by the lead researcher either in home or at their place of employment. Interviews lasted 45-60 minutes
and questions were open-ended. All data were transcribed using a professional transcription service and coded by the lead researcher. Results brought out two major themes: (a) respite benefits both during and after camp attendance and (b) camp LIFE qualities that contribute to respite benefits. Parents felt that providing an opportunity for their children to stay overnight gave them time to relax and feel rested upon their child’s return. Additionally, parents felt comfortable in that their children would be safe mentally and physically while attending camp. It is suggested that there are benefits for an entire family through therapeutic camps (overnight) that provides a space for individuals with disabilities to learn skills, have fun, and be safe.


### Disability Related Decreased Energy Expenditure Deconditioning Syndrome

In this article, the authors highlight individuals with neuromuscular disabilities having higher rates of sedentary behavior, predisposing them to severe deconditioning and significant health risk. The authors describe this as Disability-Associated Low Energy Expenditure Deconditioning Syndrome (DALEEDS) and believe it to be one possible explanation for accelerated declines in health and physical functioning. Using the World Health Organization’s International Classification of Functioning, the authors illustrate many of the physiological effects associated with DALEEDS. Of particular interest are declines in fitness (decreases in strength, aerobic fitness, and flexibility) and increases in cardiometabolic risk factors (decreased insulin sensitivity and increased hypertension). In an effort to decrease the risk of DALEEDS, the authors recommend multiple bouts of low intensity physical activity to increase overall energy expenditure. One method of doing this is through the use of virtual exercise environments, which would allow individuals with disabilities increased opportunities to be active. With many individuals with disabilities having limited access to some individual and team sports as well as certain leisure activities, the authors believe a virtual environment could provide them with more opportunities.


### Resistance Training and Metabolism after Spinal Cord Injury

For this study nine adult males with chronic, traumatic motor complete spinal cord injury were randomly placed into two groups (resistance training and diet or diet alone). The resistance training program consisted of leg extensions using surface neuromuscular electrical stimulation and ankle weights twice a week for 12 weeks. For diet, all participants were asked to follow a standard diet (45% carbohydrate, 30% fat, and 25% protein). Magnetic resonance imaging and a whole-body dual-energy x-ray absorptiometric images were obtained before and one week after intervention. Variables of interest included whole body fat-free mass, fat mass,
carbohydrate, and lipid profiles. Results indicated skeletal muscle hypertrophy in the whole thigh, knee extensors, and flexors in the resistance training and diet group compared with the diet group. Fasting triglycerides and cholesterol decreased in the resistance training and diet group. Significant improvements in insulin profile and lipid metabolism were noted in the combined resistance training and diet group compared with diet alone.


**Effect of Trunk Strength on Paralympic Wheelchair Starts**

The International Paralympic Committee utilizes classification systems to promote competition by classifying participants based on comparable degree of activity limitation. The T54 wheelchair racing class comprises athletes with normal arm muscle strength and trunk strength ranging from partial to normal. This study examined the validity of the T54 class by assessing the strength of association between trunk strength and wheelchair acceleration. Thirteen (10 male) international wheelchair athletes with normal isometric arm strength participated. Of the 13 participants, six had normal trunk strength and seven had impaired trunk strength. Acceleration was measured as the distance covered at one, two, and three seconds in an explosive start on a regulation track and on a custom-built ergometer. Results indicated no significant differences between athletes with and without full trunk strength in distance covered after any of the time intervals. Correlations between trunk strength and wheelchair track acceleration were nonsignificant and low, explaining 7%–10% of variance in performance. These results support the validity of the T54 class by providing evidence that impairment of trunk strength has minimal effect on wheelchair acceleration.


**Circuit Training for Children With Cystic Fibrosis**

Cystic fibrosis is a progressive disease resulting in excess mucous in the lungs, liver, and pancreas. As a result, pulmonary function is impaired. In a randomized controlled design, 22 participants with cystic fibrosis (all in stable clinical condition and of low-moderate severity) participated. Of the 22, the 11 in the control group were instructed on the benefits of physical activity and instructed to continue their usual physiotherapy sessions. The 11 participants in the training group received the same physiotherapy in addition to a combined circuit weight and aerobic training program for three days a week for eight weeks. All participants were evaluated on cardiorespiratory fitness and muscular strength. In addition, pulmonary function, weight, body composition, functional mobility, and quality of life were measured. The intervention group significantly increased their cardiorespiratory fitness. No significant changes were observed within the control group. Significant improvements were also observed after training for all strength tests. These improvements were not significantly decreased after a four-week detraining period.
in the intervention group. There were no significant training benefits for any of the secondary outcomes.


**Repeatability of Aerobic Capacity Measurements in Parkinson Disease**

The purpose of this study was to examine the reliability of obtaining VO$_{2\text{peak}}$ values during a maximal-effort graded exercise test in individuals with Parkinson Disease. The reliability of this measure in Parkinson disease has not been established. Seventy healthy middle-aged and older individuals with Parkinson Disease (Hoehn and Yahr stage 1.5–3) underwent a screening/acclimatization maximal-effort treadmill test followed by two additional maximal-effort treadmill tests with repeated measurements of VO$_{2\text{peak}}$. Results indicated VO$_{2\text{peak}}$ measurements were 2.4% higher and statistically different in the second test compared with the first test. The intraclass correlation coefficients (ICC) for VO$_{2\text{peak}}$ measured as kilogram per minute or as liters per minute were highly reliable, with ICC of 0.90 and 0.94, respectively. The maximum heart rate (ICC of 0.91) and final speed achieved during the tests (ICC of 0.94) were also highly reliable. The respiratory quotient was the least reliable parameter measured (ICC of 0.65). Together these results demonstrate the measurement of VO$_{2\text{peak}}$ is reliable and repeatable in individuals with mild to moderate Parkinson Disease.


**Overweight and Obesity Among Adults With Intellectual or Developmental Disabilities**

The study examined the prevalence of obesity and overweight among a random sample of 8,911 adults with an intellectual disability (ID), aged ≥ 18 years, receiving institutional, community, or home-based services and drawn from 20 U.S. states that participated in the 2008-2009 National Core Indicators program. The data indicated high levels of obesity and overweight in the sample, with two thirds of the sample overweight or obese (BMI ≥ 25.0) and one third obese (BMI ≥ 30.0). Eight percent of the sample had their BMI equal or greater than 40. These data were similar to the 2007-2008 nationally representative sample of typically developing adults, aged ≥ 20 years. Higher prevalence of obesity was found among women with an ID, individuals with Down syndrome, and those with a milder ID. Obesity prevalence differed by living arrangement, with institutional residents having the lowest prevalence and individuals living in their own home the highest. The differences were reduced when level of an ID was taken into account, but some remained significant, especially for individuals with a milder disability. For obesity and overweight combined, prevalence was lower for males with an ID than for the typically developing population but similar for women. This abstract would particularly be of interest to researchers studying obesity and physical activity patterns of individuals with developmental disabilities. It also adds to the literature promoting physical education services for children with developmental disabilities.

Stancliffe, R. J. et al. (2011). Overweight and obesity among adults with intellectual disabilities who use intellectual disability/developmental disability services in 20
Activity Participation, Sensory Responsiveness, and Competence in Children With Autism Spectrum Disorders

The study explored activity patterns in children with autism spectrum disorders (ASD) and the role of sensory responsiveness in determining children’s level of competence in activity performance. Data were collected from parents of 26 children with high functioning ASD and 26 typically developing (TD) children, aged 6–12 years, using the Sensory Profile and the Child Behavior Checklist. Results suggest that compared to TD children, children with ASD were reported to have fewer jobs and chores overall, and most chores were in the categories of Kitchen and Meal Prep. They had less involvement in chores such as animal care, babysitting, and general cleaning and engaged more frequently in solitary leisure tasks such as play with transportation vehicles, construction activities, reading or writing books, video games, and using the computer. Significant differences \( (p < .001) \) were seen in overall level of competence in activities, social, and school performance. Children demonstrating more frequent Sensory Sensitivity and Sensory Avoiding had significantly lower \( (p < .001) \) competence scores than children with fewer behaviors in these domains, suggesting that sensory responsiveness may impact the ability to participate successfully. The authors suggested children with high functioning ASD differ from TD peers in both the quantity and type of activities in which they participate. This abstract would particularly be of an interest to researchers and practitioners studying or working with children with ASD, specifically occupational therapists.


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