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# Examination of structured physical activity on students with special needs

Arianna Sparano

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**EXAMINATION OF STRUCTURED PHYSICAL ACTIVITY ON STUDENTS  
WITH SPECIAL NEEDS**

by

Arianna R. Sparano

A Thesis

Submitted to the  
Department of Educational Services and Leadership  
College of Education  
In partial fulfillment of the requirement  
For the degree of  
Master of Arts in School Psychology  
at  
Rowan University  
April 23, 2015

Thesis Chair: Terri Allen, Ph.D.

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## **Dedication**

*I would like to dedicate this manuscript to my wonderful, supportive family and boyfriend, Ryan.*

## **Acknowledgements**

I would like to express my appreciation to Professor Terri Allen for her unconditional guidance and help through this journey.

## **Abstract**

Arianna Rey Sparano

### **EXAMINATION OF STRUCTURED PHYSICAL ACTIVITY ON STUDENTS WITH SPECIAL NEEDS**

2014/15

Terri Allen, Ph.D.

Master of Arts in School Psychology

The purpose of this study was to explore the relationship of a structured physical activity, Rowan Unified Sports Basketball organization, for children with special needs and the positive impact the physical activity will have on their social skills. Past studies have proven that exercise has many beneficial effects mentally, physically, and socially. The effects reflex on children and adults. Not only does physical fitness promote good health, it relieves stress and anxiety. Social skills will be analyzed using the Social Skills Improvement System (SSIS) Rating Scale, the parent form version. A pretest was given at the beginning of the season and a post test was given at the end of the season. Pretest scores and post test scores will be compared. The pretest scores had a mean of 75.90 with a standard deviation of 17.64. The posttest scores had a mean of 93.10 with a standard deviation of 7.29. The t test was 3.046,  $p = .014$  which indicates a significance difference between pre and posttest.

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## **Chapter 1**

### **Introduction**

#### **Need for Study**

Exercise is beneficial for individuals mentally, physically, and socially. It has many positive effects for children and adults. Not only does physical fitness promote good health, it relieves stress and anxiety. Physical exercise has the same positive effects as antidepressants for individuals suffering from depression (Stathopoulou, Powers, Berry, Smits, & Otto, 2006). These effects are not as immediate as medicine but is a more natural treatment. Exercise should be a vital component in everyone's life. Many studies have shown the positive effects of exercise on adults and children but there is not a lot of published information on exercise for children with special needs and the social skills correlation that occurs. There could be many positive effects of physical fitness in the special education population.

#### **Purpose**

There is a great amount of information on exercise and its effect on stress, anxiety, depression, and overall health (Stathopoulou, Powers, Berry, Smits, & Otto, 2006). Even for children in school, physical fitness has many positive effects such as intellectual alertness, academic performance, and enhanced concentration (Rasmussen & Laumann, 2013). Physical fitness is a teaching process of social skills. Children learn through interaction taking place through motor, cognitive, social and emotional aspects (Hashemi, Roonasi, Saboonchi & Salehian, 2012). Individual and/or team physical fitness experiences enhance social skills but there is a lack of valid studies conducted that show

a positive correlation between physical fitness and social skills on children with special needs.

### **Hypothesis**

Regular participation in a structured physical activity will positively impact social skills for students with special needs.

Rowan Unified Sports Basketball, which is a structured basketball organization for children with special needs, will positively impact their social skills due to physical activity.

### **Operational Definitions**

*Special education/special needs:* students or children who need specially designed instruction (IDEA, 2004).

*Rowan Unified Sports Basketball:* a competitive sports club where Rowan University students and Special Olympics Athletes come together to play on the same team for basketball. The goal of the Rowan Unified Sports Club is to promote friendship and inclusion through sport while still keeping a competitive atmosphere (The Rec Center at Rowan University).

*Social Skills Improvement System (SSIS) Rating Scales:* an assessment of individuals to help evaluate social skills, problem behaviors, and academic competence (PreK-16 Education and Special Needs, 2014).

*Positively:* tending towards progress or improvement (Positive, 2014).

*Intellectual Disability:* a person who has an IQ below 70-75, significant limitations exist in two or more adaptive skill areas, and conditions manifests itself before the age of 18 (Definition of Intellectual Disability, n.d.).

## **Assumptions**

It is assumed that the parents will understand the questions asked of them and respond truthfully. It is assumed that the parent participating in the study has direct knowledge of their child's behavior and social skills. The answers from the student's parents will be valid and truthful.

## **Limitations**

There is an inherited self-report bias in questionnaires. Sample size is going to be limited to the demographic where I am conducting the survey. Since the basketball team I will be observing is a mix of disabilities and ages, I cannot focus on one specific disorder or a certain age group. Throughout the season, a participant may miss a game which could alter results.

## **Summary**

Physical fitness is good for all students especially students with special needs. It may help to calm their anxiety (Srinivasan, Pescatello, & Bhat, 2014), improve their social skills (Participation Improves Athlete Social Skills and Employment Opportunities, 2015), give a sense of belonging (McHugh, 1995), and improve problematic behaviors (Srinivasan, Pescatello, & Bhat, 2014). Exercise promotes good health and helps to lower the risk of cardiovascular disease, diabetes, and other diseases (Haskell et al., 2007). It also helps with cognitive skills, lowering the chances of depression and keeping anxiety at a minimal level (Stathopoulou, Powers, Beryy, Smits, & Otto, 2006). In conclusion, physical activity has been proven to improve health, anxiety, depression, mood, and academic achievement in children (Bailey, 2006).

## **Chapter 2**

### **Literature Review**

#### **Physical Activity**

Physical fitness is involved in many parts of an average person's life. Taking the trash out, walking to the car, and taking the dog for a walk are all physical activities. The Center of Disease Control and Prevention (CDC) defines physical activity as "any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above a basal level. In these Guidelines, physical activity generally refers to the subset of physical activity that enhances health" (Physical Activity for Everyone: Glossary of Terms, 2011, p. 1). Any movement that gets heart rate elevated is considered physical fitness. There are guidelines for children, adults, and older adults that should be followed to live a healthier life that the CDC has created. For children and adolescents, they should complete sixty minutes or more of physical activity every day. The main type of exercise for that age range is aerobic exercise (Physical Activity for Everyone: Guidelines, 2011). Aerobic activity is "cardio". It is movements that get the heart rate faster and breathing quickened (Physical Activity for Everyone: Glossary of Terms, 2011). Children and adolescents also need to incorporate muscle strengthening activities at least three days a week into their weekly routine (Physical Activity for Everyone: Guidelines, 2011). These movements are pushups and squats. Muscle strengthening is a physical activity that increases their muscles strength, power, stamina, and mass (Physical Activity for Everyone: Glossary of Terms, 2011). Along with aerobic and muscle strengthening activities, children need to do at least three days a week of bone strengthening activities as part of their weekly workout (Physical Activity for Everyone:

Guidelines, 2011). An example would be running or jumping rope. Bone strengthening activities are anything that increases the strength of bones that make up the skeletal system (Physical Activity for Everyone: Glossary of Terms, 2011).

Adults and older adults have similar criteria to follow under the Center of Disease Control and Prevention but with greater standards. Adults and older adults should complete two hours and thirty minutes of moderate to intense aerobic activity and two or more days of muscle strengthening exercises every week. Another option is to complete one hour and fifteen minutes of vigorous to intense aerobic activity and two days or more of muscle strengthening training every week (Physical Activity for Everyone: Guidelines, 2011). Moderate- intensity aerobic activity is an exercise that will raise the heart rate and break a sweat. This includes riding a bike or playing tennis. Vigorous- intensity aerobic activity is exercises that get the individual breathing faster and heavy. The heart rate quickens during this type of physical activity (Physical Activity for Everyone: Glossary of Terms, 2011). Running and swimming laps are examples of vigorous- intensity aerobic activity. Of course, all of these guidelines are for generally healthy individuals with no limiting health problems and exceeding the minimum will only result in more health benefits.

In 1995 the Center of Disease Control and Prevention and American College of Sports Medicine published physical activity guidelines that have been recently updated. The changes were made in order to provide more thorough and clear health recommendations for adults from ages 18-65. Since 1995 there has been many studies done that prove the benefits of physical activity (Haskell et al., 2007). The new recommendations are given to encourage regular physical activity which promote and

maintain health and reduce the risk of chronic disease and premature mortality. Physical activity and good health together can improve personal fitness, reduce the risk for disabilities and diseases and prevent unhealthy weight gain (Haskell et al., 2007).

### **Benefits of Physical Activity of Adults: Biologically**

Regular participation in a structured physical activity is important for a long healthy life. It reduces the risk of a variety of diseases, improves psychological and emotional health. Exercise inactivity is a leading cause of death, disabilities, and a poor quality of life (Bailey, 2006).

Erikssen et al., (1998), studied the effects of consecutive changes in physical activity on mortality. The study followed men over a twenty two year span. 1756 participants began the study and 1428 men completed the study. Many men died or failed to respond throughout the whole twenty two years. Through surveys, clinical examinations, and an exercise electrocardiographic (ECG) over the years, their results showed that physical activity and the extent and direction of changes in activities is important information on the risk of death. The study also concluded that good physical fitness correlates the presence of normal cardiovascular function, efficient oxygen intake and outtake, muscular and skeletal functions, and psychological wellbeing (Erikssen et al., 1998). All of these conclusions are evidence that physical fitness is a strong predictor of overall health. A limitation of the study is that men were not randomly assigned from the population. Healthier men were the ones who voluntarily participated in the study. Also the study took place in Norway. In general, European populations are considered healthier than those of the United States (Erikssen et al., 1998).



People who exercise regularly have a decreased risk of mortality, cardiovascular disease, type II diabetes, cancer, high blood pressure, excess body weight, low bone density, and elevated blood lipids (Rankinen, 2002). Consistent physical activity over a lifetime is best for reducing the risk of cardiovascular disease. Physical activity and type II diabetes have a strong relationship because exercise with a healthy diet helps to prevent impaired glucose tolerance from turning into type II diabetes (Rankinen, 2002). The President's Council on Physical Fitness and Sports studied past studies that saw the relationship between regular physical fitness and health outcomes. The minimal activity to reduce the rate of all-cause mortality by 30% is 1,000 calories burned a week. 1,000 calories can be burned in one day if the exercises is efficient, so that calorie amount is a very minimal amount.

There are many benefits of regular physical activity on primary and secondary preventions of diseases. Studies indicate that the incidence of cancer is lower due to individuals who are active (Rankinen, 2002). Many studies, 71% of them, concluded that physical activity has a preventive effect with colon cancer (Rankinen, 2002). Mild to moderate intense aerobic training reduced blood pressure. Diet and exercise is normally known to maintain and reduce body weight. Evidence proves that physical activities is effective at maintaining bone mass in postmenopausal woman. High density lipoprotein, the good cholesterol, shows a strong relationship with the increase of levels from physical activity. Low density lipoprotein, the bad cholesterol, shows a decrease in levels from physical fitness (Rankinen, 2002).

## **Benefits of Physical Activity of Adults: Psychologically**

Numerous studies documented the psychological benefit of physical activity (Penedo & Dahn, 2005). Studies revealed that depression and anxiety is less likely to develop with frequent use of physical activity (Etnier, Nowell, Landers, & Sibley, 2006). Short term studies with subjects who had mild to moderate depression and anxiety showed that aerobic activity improves symptoms as well as pharmacological products (Rankinen, 2002). Stathopoulou, Powers, Beryy, Smits, & Otto (2006) conducted a review of studies on depression and anxiety. For depression, eleven studies were reviewed. A positive relationship was found in newer studies that exercise with pharmacological treatment showed a strong beneficial effect. It can also be another type of intervention for clinical depression. Anxiety also had the same relationship with medication and physical activity (Stathopoulou, et al., 2006).

Exercise induced analgesia is a theory that states that acute exercise helps to reduce sensitivity to pain in healthy people. Naugle, Fillingim, & Riley (2012) examined this theory on exercise and pain perception through a review of many studies, looking at three different types of physical activity and its effectiveness with pain reduction. Aerobic exercises are cycling or running, isometric exercise is isometric resistance movements that the joint angle does not change known as a plank, and dynamic activities are resistance exercises that involve muscle contractions that the joint does move, for example a squat (Naugle, et al., 2012).

Results suggested that aerobic exercises reduced pain sensitivity but the best results were found from pressure stimuli like the treadmill. Pain threshold was assessed after isometric exercises and concluded that the exercise reduced pain perception in all

types of exercises used. Dynamic exercises showed a small decrease in pain sensitivity after exercises like a bench press or a leg press (Naugle, Fillingim, & Riley, 2012). All three types of exercise showed a reduction in pain perception, the largest effect in aerobic exercises. These results proved that exercise induced analgesia does occur through activation of the endogenous opioid system which produces endorphins in the body. In conclusion the studies proved what science has already determined, exercise produces endorphins which helps the body feel good.

At a certain point in our lives, our cognition abilities weaken. Kelly, Loughrey, Lawlor, Robertson Walsh, and Brennan (2014) did research to find a possible relationship between high levels of exercise and the reduced risk of cognitive declines in aging adults. The relationship found was between physical activities that included aerobic fitness with resistance training. Those types of exercise were most beneficial in executive functioning. Resistance training improved the performance on reasoning and aerobic fitness improved the performance on attention, processing speed, and the effect on working memory. This study was conducted over many trials and used multiple tests to observe higher functioning skills (Kelly, et al., 2014). These findings support the Center of Disease Control and Prevention recommendations for the best type of physical activity to maintain a healthy life.

### **Benefits of Physical Activity of Children: Biologically**

Children may also have different benefits of physical activity compared to adults. “Population studies indicate that most North American children fail to meet the current physical activity recommendation of 60 minutes of daily moderate to vigorous physical activity” (p. 554). There is a significant decrease in childhood physical activity and a

large increase in overweight and obese children (Larouche, Boyer, Tremblay, Longumir, 2013). Even though children are a more vulnerable population there is an abundant amount of studies done with children and the benefits of physical activity. Past research has shown that physical activity has positive effects on children's physical health (Bailey, 2006). Especially since the obesity increase, attention has been put on getting children physically active. Physical inactivity is linked to coronary heart disease and has been associated with premature mortality and obesity (Bailey, 2006). Studies previously done concluded that physical activity and sport participation in childhood is a predictor of that child's later well-being (Rankinen & Bouchard, 2002)

Janssen and LeBlanc (2010) systemically reviewed the biological effects of exercise on children. They examined at seven health outcomes: cholesterol, depression, injury, bone density, blood pressure, obesity, and metabolic syndrome. The review showed that in obese children or children with high blood pressure, aerobic exercise showed a change in cholesterol and blood lipids. Aerobic exercise only showed a decrease in at least one blood lipid. However, in the category of high blood pressure there were improved results with aerobic exercise. Aerobic exercise reduced the systolic blood pressure and diastolic blood pressure. Resistance training and circuit training reared insignificant changes (Janssen & LeBlanc, 2010).

Metabolic syndrome, and exercise has recently been studied with exercise. This is a factor is related to diabetes and blood sugar. All studies that used direct cardiovascular exercise concluded strong results with the relationship between metabolic syndrome and cardio. The relationship of physical activity and reductions of metabolic syndrome is more sufficient in males (Janssen & LeBlanc, 2010). Metabolic syndrome has to do with

insulin and the review of studies showed significant improvement in at least one or more of the insulin variables (Janssen & LeBlanc, 2010). All studies that showed this relationship was aerobic with one study finding a significant relationship using resistance training or circuit training. The studies for obesity in children showed strong results. There were significant relationships between physical activity and lessened body mass index (BMI). Aerobic exercise showed the largest decrease in BMI and total body fat. Other studies showed the same result using circuit training and other types of exercise but the effected size of those studies tended to be smaller. For obesity the correlation is stronger in males than females (Janssen & LeBlanc, 2010).

Research indicates a relationship between physical activity and continuous normal bone development and bone density. Consequently, the Center for Disease Control and Prevention advises three days a week of bone density building exercises for children (Physical Activity for Everyone: Guidelines, 2011). Studies conducted found that ten minutes of moderate exercise, two to three times a week, alone can have an impact on bone density increase (Janssen & LeBlanc, 2010). The combination of minimum bone density increasing from exercise and weight bearing exercises were beneficial for cardiovascular health and obesity prevention (Janssen & LeBlanc, 2010). Janssen & LeBlanc (2010) found that “injuries are a leading cause of disability and mortality in young people”. The studies reviewed looked at children who participate in physical activities. Studies indicated a relationship between an increased activity level and an increase of injury percentage. The more vigorous the sport, the greater the risk of injury can be concluded through everyday knowledge. Hence, the importance of physical

activity to improve bone density is suggested as children become more involved in sports (Janssen & LeBlanc, 2010).

Cross sectional and longitudinal observations of studies have concluded that children who participate in relatively high levels of physical activity have less adiposity, or fat, than non active youth (Strong et al., 2005). Programs of moderately intensive exercise 30 to 60 minutes lead to a reduction of total body fat in overweight children. These results suggested that higher levels of exercise for normal weight children will have to be done in order to see these same results (Strong et al., 2005). Metabolic syndrome is a cluster of many problems that a child can have due to a combination of abdominal obesity, elevated triglycerides, blood pressure, fasting glucose, and reduced high density lipoprotein cholesterol level. A review of past studies done has shown that vigorous physical activity for 40 minutes, three times a week improved some aspects of metabolic syndrome in obese and non-obese populations (Strong et al., 2005). Even though studies have concluded evidence, the recommended exercise criteria to help reduce metabolic syndrome is not yet known.

Asthma is another condition that is increasingly prevalent in youth. A review of studies found that exercise did improve asthma conditions. Other studies in that review did not conclude the same effect, that asthma is improved with exercise (Strong et al., 2005). Controlled aerobic activities resulted in improvements in aerobic and anaerobic fitness in children with Asthma (Strong et al., 2005). Experimental studies using muscle strength training activities showed a significant relationship to improvement of muscular strength and endurance in youth. Other studies proved this same relationship, but longitudinal study done showed that routine physical activity increased upper body

muscular endurance (Strong et al., 2005). Skeletal tissue has been proven to have a relationship from weight bearing activities and strength and resistance training.

Numerous studies have shown the positive effects of physical activity on the skeletal health. The benefits are bone mineral content, bone mineral density and bone mineral apparent density (Strong et al., 2005).

Larouche, Boyer, Tremblay, & Longumir (2013) studied 491 students in grades four through six. Examining a possible link between fitness tests or motor skills when associated with physical activity. All students wore a digital walker for a week and steps taken by each student were used as a baseline for their fitness tests. Their health levels were tested using basic exercise movements such as trunk flexibility relative to their BMI index. Additionally, their motor skills were tested using an obstacle course. The results showed that aerobic fitness and motor skills benefited from physical activity. Participants who had lower scores on the fitness band took more time on the obstacle course and had to retake it multiple times. There was a moderate correlation between a greater step count during the week and predicted course time and aerobic power (Larouche, et al., 2013). A limitation of this study was that an obstacle course was the only motor skill assessment. The physical fitness tests included aerobic power, plank time, handgrip strength, waist circumference, trunk flexibility, and overall weight. The study only looked at obstacle score and obstacle time or motor skills. There should have been other tests run to see if the motor skills relationship was as strong at the fitness relationship.

### **Benefits of Physical Activity of Children: Psychologically**

There is fairly consistent evidence that regular physical activity has a positive effect on psychological well-being of children and youth. Regular physical activity and

an inner self esteem appear to correlate (Strong, et al., 2005). Additionally, associations have been seen on other psychological well-being including decreased anxiety, depression, and stress (Bailey, 2006). When completing physical activity properly the result is an increase of competence and self-esteem may be influenced by an individual's perception of completion.

Ortega, Ruiz, Castillo, and Sjostrum (2008) reviewed prior studies and found that physical activity in high intensity sessions positively affect depression and self-esteem. However, the low intensity group did not show significant improvements. Studies found a strong relationship between depression and anxiety improvements and exercise (Strong et al., 2005). Previous reviews showed that aerobic exercise for 60 to 90 minutes per week decreased at least one symptom of depression (Janseen & LeBlanc, 2010). There has proven to be a significant decrease in physical activity around ages 10-16, especially in girls (Strauss, Rodzilsky, Burack, & Colin, 2001). Comparing genders, boys constantly show to be more physically active then girls (Ridgers, Salmon, Parrish, Stanley, & Okely, 2012).

A study of physical activity looked at the relationships between health benefits, self-efficacy, social support, sedentary activities and physical activity levels of children (Strauss, Rodzilsky, Burack, Colin, 2001). This study looked at the correlation between physical activities and a child's self-esteem. The study examined 92 children ages ten to sixteen. Physical activity was monitored for one week, which is a possible limitation of the study, using a motion detector. Treadmill tests were done to determine activity level, moderate or high. All other factors were tested using surveys. This age group, 10 to 16, used for the study conducted spent 75% of their day inactive (Strauss, Rodzilsky, Burack,



Colin, 2001). This inactivity included watching television, sitting at a computer, and doing homework. Only 1.4% of their day was spent in high activity levels. Self-assessment surveys of self-efficacy, feelings that one can accomplish their goals, scores showed a positive relationship with time spent in highly vigorous activities. This relationship was also seen in social influences. High levels of exercise produced improved self-esteem. The higher level activities correlate a high self-esteem, social influences, and self-efficacy in children (Strauss, Rodzilsky, Burack, Colin, 2001).

In addition to examining the relationship between physical activity and a healthy intellectual functioning, Bailey (2006) also looked at physical, lifestyle, affective, social, and cognitive improvements through exercise. Since exercise increases the blood flow in the body, this process of the blood flow reaches the brain and activates the areas responsible for intellectual functioning. This process enhances mood, increases mental alertness, and improves self-esteem. Although studies have linked this behavior in adults as well, the link with regards to children is also crucial. In children as in adults, regular physical activity has a positive relationship with intellectual functioning. This relationship has been reproduced in academic achievement (Bailey, 2006). Significant information is found through past research that shows a relationship that academic achievement is maintained or improved when there is an increase in physical activity. Even when time is being taken from the academic classroom there is no decrease in academic performance (Bailey, 2006).

There is much debate about academic achievement and physical activity and their relationship. Fedewa and Ahan (2011) reviewed 59 studies that was conducted ranging from 1947 to 2009. 39 of the 59 studies used physical activity such as resistance training,

motor skills training, aerobic training, and any combination of training. In the twenty remaining studies they used measures of physical activities like strength, total fitness, development, flexibility, and aerobic development. All were done at a classroom level functioning. The results indicated a significant and positive relationship of physical activity on children's cognitive outcomes and academic achievement (Fedewa & Ahn, 2001). The 39 studies differed in their experimental set up. All except for the flexibility programs produced significant positive results on cognitive and academic functions. The twenty correlational studies showed the same results. In some cases total fitness levels were examined and saw a positive effect on academic and cognition also. The relationship of children who are more physically fit tend to have higher academic achievement and cognitive functioning. Fedewa and Ahn's results were the same as other reviews of this topic. The relationship for physical activities is consistent from many studies (Fedewa & Ahn, 2001).

Social variables can also be effected by physical activities. Five social variables were identified using a systematic review (Ridgers, Salmon, Parrish, Stanley, Okely, 2012). Perceived encouragement conduced the strongest relationship. A positive correlation between physical activity and perceived encouragement was found. The encouragement stemmed from parent, friends, family, and schools. Higher levels of perceived encouragement was associated with higher physical activity levels (Ridgers, Salmon, Parrish, Stanley, Okely, 2012). This relationship is especially relevant during recess and school activities.

Mood is another factor that can be affected by physical activities. A study was conducted using 64 nine and ten year olds (Williamson, Dewey, Steinberg, 2001). They

responded to self-report surveys about mood after two different types of aerobic activities and after a fifteen minute video. One activity consisted of a “fun run”. The children could run around the gymnasium whichever way they wanted for fifteen minutes. The second activity was playing with volleyballs and big bouncy balls. The children could sit and bounce around or also jump rope. The video presented was a campaign for anti-smoking. The students were divided into three different groups and the three groups rotated their participation (Williamson, Dewey, Steinberg, 2001).

Results showed that significant increases in positive mood was found after the two exercise groups. Negative mood also decreased after the other exercise groups. The video had the opposite effect on the children. After the fifteen minute video children had a decrease in positive mood and an increase in negative mood (Williamson, Dewey, Steinberg, 2001). Between the two exercise groups there was no significant difference in the self-mood survey. This study concluded that any form of exercise is linked with increasing positive moods and decreasing negative moods (Williamson, Dewey, Steinberg, 2001) There is no specific activity for children that has the best effect on these factors but for children aged nine to ten years old having fun with peers seemed like a strong relationship to render these results.

The majority of studies done on adults that show a positive relationship with physical activity along with another factors can be applicable with the child population. If children are healthy there is no harm that should occur from moderate exercise. Moderate to high intensity activities showed positive results for children on health benefits, diseases, anxiety, depression, mood, and academic achievement.

## **Benefits of Physical Activity of Special Needs Population**

There exists an enormous amount of research on children with Autism. Physical activity for children with Autism has many positive effects. When exercise is increased so does a child's physical health, intellectual functioning, awareness, behavior, emotions, and personality (Lang et al., 2010). A recent review of all students performing a physical activity and having Autism Spectrum Disorder was done and results concluded that there were positive effects. There were improvements in behavior, academics, physical fitness, and an increase in willing to exercise. The largest change was seen in the reductions of stereotypic behavior such as flapping of the arms and their self-stimulatory behavior. (Lang et al., 2010). The main exercise used within the study was walking or running, and some used a stationary bike.

Even short intervals of exercise decreases stereotypical behavior of children with Autism. The smallest amount of time jogging that had an effect was five minutes. Some of these decreases in behavior carried through to the next few days. An increase in on-task behavior in the classroom was seen as well as academic performance (Petrus et al., 2008). Other behaviors were decreased such as getting out of their seat at inappropriate times.

Other types of exercise has been researched on children with Autism. Swimming and aquatic therapies have shown a decrease in antisocial behavior (Srinivasan, Pescatello, & Bhat, 2014). Swimming reduced aggressive behaviors in children that displayed them, improved social responding, and peer interaction and relationship when participating in water activities. Pool exercise and horseback riding have been used to increase motor coordination in children with Autism (Srinivasan, Pescatello, & Bhat,

2014). Past studies have been done on horseback riding and all conclude the same positive effects.

Other populations of children with special needs have been studied. Pontifex, Saliba, Raine, Piccietti, Hillman conducted a study with children who have Attention Deficit Hyperactivity Disorder (ADHD) (2013). They compared twenty children with diagnosed ADHD. Children participated in bouts of moderate intensive aerobic exercise which included twenty minutes of a treadmill aerobic activity or twenty minutes of seated reading. The participants wore an electrode cap to monitor brain function and then were given task instructions. They assessed the children using the Wide Range Achievement Test (WRAT) after participant's heart rate dropped down to normal. The electrode cap showed more activity all throughout the brain with a focus on the front lobe post exercise compared to post reading which only saw activity in the rear part of the brain. Response accuracy was much higher in the children who exercised (Pontifex, Saliba, Raine, Piccietti, Hillman, 2013). This study showed the positive effects physical activity has on children who have ADHD.

The quality of life can be improved due to exercise. When adults exercise their health increases which improves their quality of life. In children with "mental retardation" a study was done to assess their quality of life before exercise and after an exercise program (Ilhan, Kirimoglu, Filazoglu- Cokluk, 2013). A total of 145 children participated, 88 with special needs participated in a ten week special education program. The other 57 children were in the control group who did not complete any physical activity. The exercise group would warm up, do functional exercise for the core, back, etc., then played a sport. The Pediatric Quality of Life Inventory (PedsQL) was used to

collect data on their quality of life for both groups. If children were not capable of filling out the survey their parent or guardian did. Both groups' score on the pretest were very similar. Results showed that post exercise program scores increased in all areas of the survey (Ilhan, Kirimoglu, Filazoglu- Cokluk, 2013).

Johnson (2009) reviewed youth with developmental disabilities and the benefits of exercise on that population. All types of disabilities and physical activity were looked at. Water aquatics showed an improvement in bodily function. Horseback riding and therapeutic riding was reviewed for children with Cerebral Palsy (CP). These studies showed improvement of muscle symmetry, improved gross motor skills, and improved function in the home and surrounding environment (Johnson, 2009).

A study done using intense structured activity such as downhill skiing on children with Cerebral Palsy found improvements in gross motor skills (Johnson, 2009). Group exercise programs were reviewed and found a general improvement in cardiovascular function, strength, gait speed, mobility, improved perception, and high levels of satisfaction (Johnson, 2009). These improvements were seen in as little as four weeks on youth with Cerebral Palsy.

Group exercise shows improvement in children with CP as well as children with other types of developmental disabilities (Johnson, 2009). One community exercise program for these children showed significant improvements. Others showed improvements in walking, strength, satisfaction and function when in the group class. Group programs for children with Down Syndrome were also reviewed. There was a found decrease in heart rate during a stress test given and a decrease in blood pressure. A study done for girls with Rhett Syndrome showed a significant difference in heart rate,

functional skills, in walking and motor functioning after a treadmill session daily for two months (Johnson, 2009). The results of this review showed the phenomenal effects exercise can have on all types of special populations.

### **Social Skills**

Social skills is an area of research that is growing for children with special needs. These skills need to be explicitly taught, reinforced, and promoted for these children (Vidoni & Ulman, 2012). For children without special needs the proper social skills and interactions can be taught through their own observations, parents or friends and through trial and error. These skills are not as automatic as they could be with children with special needs. Social skills is defined as "...social skills represent learned, situation specific actions resulting in interpersonal effectiveness." (Kavale & Forness, 1996, p.227). Social skills are actions shown in specific social situations requiring skilled performance. The under development of social skills can cause unhappiness, anxiousness and maladjustment. Those children are also more likely to be unpopular with their peers (Kozlowaski, Matson, Beleva, 2012). The Social Skills Improvement System surveys defines social skills as "socially acceptable learned behaviors used to promote positive interactions while simultaneously discouraging negative interactions" (PreK-16 Education and Special Needs, 2014, p.1).

For a child with Autism or a Learning Disability (LD) social skills may be difficult for them. Children with Learning Disabilities experience social difficulties as well as other facets of difficulties. A review was done on students with learning disabilities and their social skills deficits (Kavale & Forness, 1996). More male were subjects because LDs are more common in males. Teacher's perceptions were that the

lack of social functioning was a normal part of the disorder. They also noticed that students with LDs socially interact less than their non LD peers (Kavale & Forness, 1996). As perceived by teachers a student with a Learning Disability, the major social deficits with this disorder are academic incompetence and less social interaction. For peer interaction, they noticed that children with LDs are rejected more often than non-learning disabled children. In a self-assessment children viewed themselves as having social skills deficits that separate them from their peers. In conclusion, about 75% of children with learning disabilities can be distinguished from their peers without a disability through measures of social competence (Kavale & Forness, 1996).

Social skills for children with Autism Spectrum Disorder is a difficult task to master. It is one of the disorders main deficits. Young children with Autism may have social skills delays in the amount of eye contact, social smiling, joint attention, and pointing. Older children with Autism may have deficits in maintaining conversations, seeing others point of view, social reciprocity, reading nonverbal messages, making and keeping friends (Bohlander, Orlich, Varley, 2012). Autism and Asperger Syndrome share those similar social skills difficulties. The scores of adaptive/appropriateness, inappropriately assertive/overconfident, and hostile in social situations was compared in children with Autism and Asperger's (Kozlowaski, Matson, Beleva, 2012). Hostile and adaptive/appropriate factors were the two main factors that differentiated between the two disorders. Children with Asperger's had greater endorsement in the two factors. This shows that children with Asperger's have greater impairments in social situations when hostility is involved and less difficulties when appropriateness or adaptability is required (Kozlowaski, Matson, Beleva, 2012).



Social skills for social situations can be taught through various ways to increase social skills. Some children need instruction on how to properly communicate. Peer mentoring is one strategy to make social improvements. This is a good one on one strategy. Social skills groups of children with Autism and non-Autistic children is another form (Kozlowaski, Matson, Beleva, 2012). They can mimic and learn from each other. Video modeling is good for higher functioning Autistic children. This is especially helpful when recognizing others nonverbal body cues. Social stories is another way in which they have to interact the different scenarios they are given. Picture books is the final social skills training. This is also good for nonverbal and practicing social cues (Kozlowaski, Matson, Beleva, 2011).

Play and physical interactions can also enforce social skills. Bekker, Strum and Eggan developed three designs to support this type of social interaction (2010). “Provide motivating feedback to player’s behavior..., creating opportunities for players to define their own game goals and rules..., creating social player-interaction patterns by designing various opportunities for players to collaborate and compete with each other using interactive play objects.” (Bekker, Strum and Eggan, 2010, p.386).

These play objectives can be used for play with younger children or sports with older children. Special Olympics found that improvements in social skills and social relationships are dramatically increased. 90% of family members who have a participant in Special Olympics report social improvements. Coaches reported a 95% increase in social skills and social relationships. For younger participants these skills learned through this program are very likely to carry over into other aspects of the athlete’s life (Participation Improves Athlete Social Skills and Employment Opportunities, 2015).

Exercise in these type of athletic programs for special needs individuals improves physical health, intellectual functioning, awareness, behavior, emotions, and personality (Lang et al., 2010). The interaction in a sports program and the exercise create a perfect combination to improve health and increase social skills.

## **Chapter 3**

### **Methodology**

#### **Participants**

Rowan University's Unified Sports special needs athletes participated in this study. They played basketball through the organization. Participants aged from 16 to 24. They have intellectual disabilities ranging from mild to severe. Ten children with special needs were observed by their parents during the games. All participants were members on the Brown Team of the program and had previously opted to participate in the sports program. No athletes who joined the program were excluded, anyone could participate.

#### **Materials**

Parents filled out the parent version of the SSIS trademark of Pearson Education, a social inventory scale that measures: social skills, problem behaviors, and academic competence. The survey is evidence based in a multi-component system that helps to develop, improve, and maintain important skills. It reads at a fifth grade level. The main focus of the survey was the social skills section which looked at communication, cooperation, assertion, responsibility, empathy, engagement, and self-control (PreK-16 Education and Special Needs, 2014). There are 46 questions relating to social skills and the child's behavior. Each question could be answered "my child never", "my child seldom", "my child often", and "my child almost always". The surveys' goal is to identify and classify prosocial behavior and aid in designing a plan to intervene with problematic behaviors. Age and sex of the child was the only other information disclosed in the survey. This information is important when determining the raw score because it correlates with the participant's age.

Scores are reported using the standard scores and percentiles. Standard scores are developed from scores on a nationally representative level of the individual's age. They have a mean of 100 and a standard deviation of 15 (PreK-16 Education and Special Needs, 2014). The questions were broken into different behaviors: communication, cooperation, assertion, responsibility, empathy, engagement, and self-control and each subscale has a score also.

The communication subscale includes actions like making eye contact when talking to someone, saying "please" and "thank you". There are seven of these types of questions. The cooperation subscale includes following rules and completing tasks independently. There are six of these types of questions. The assertion subscale includes asking for help when needed and declaring if there is a problem. There are seven of these types of questions. The responsibility subscale includes questions about respecting the property of others and are they well behaved when alone. There are six of these types of questions. The empathy subscale includes, trying to comfort others when upset and feels bad when others are sad. There are six of these types of questions. The engagement subscale includes inviting others to join in activities, making friends easily, and introducing oneself without supervision. There are seven of these types of questions. The self-control subscale questions include, staying calm when teased and uses appropriate behaviors when upset. There are seven of these types of questions (PreK-16 Education and Special Needs, 2014).

The SSIS has good internal reliability and test-retest reliability. It also has good criterion validity and convergent validity. The medium scale reliability is high with social skills falling in the mid to upper 90 percentile. This scale indicates the scale scores are

relatively not influenced by random error. The medium subscale reliability for the parent form is satisfactory at mid 80 percentile. This scale is satisfactory enough to analyze strengths and weaknesses to develop intervention plans (Gresham & Elliot, 2011). Average scores have been kept and maintained for test-retest following a second administration. For inner reliability the subscale forms were moderate to good reliability. In content validity the survey is based off a broad survey of empirical evidence. There has been plenty of previous research including late models of the SSRS. The internal social skills subscale correlates at a positive and moderate to high correlation. Also the author's predictions were consistent among scales and subscales (Gresham & Elliot, 2011).

### **Design**

The hypothesis is that Rowan Unified Sports, which is a structured basketball organization for children with special needs, will positively impact their social skills. The null hypothesis is that Rowan Unified Sports, which is a structured basketball organization for children with special needs, will not positively impact their social skills.

The Independent variable is exercise or structured physical activity, which is the categorical variable. The Dependent variable is social skills and/or the SSIS survey, which is the continuous variable. The seven variables in the study are communication, cooperation, assertion, responsibly, empathy, engagement, and self-control.

### **Procedure**

Parents started by signing a consent form to participate in the described study. Once consent was given parents were informed about the initial survey and the post season survey. Then they were asked to complete the Social Skills Improvement Scale

(SSIS) parent version of the survey. Parents will fill out the SSIS parent survey given to them. Once consent is granted their child can participate in Rowan Unified Basketball. The parent completed one survey at the beginning of the season on February 7, 2015 and another survey at the end of the season on February 28, 2015. The study was filled out while their child played basketball at the Rowan Rec Center Gymnasium on Main Campus. Games took place every Sunday throughout the month. There was a total of four games throughout the regular season. There is minimal psychological or physical risk or harm to parents or the children participating in the sports program.

Data was graded using the grading system provided with SSIS on the computer. Each participant was coded using a letter of the alphabet to keep information confidential. After computer scoring the SSIS scores, the data is entered into SPSS, a statistical software. The parametric test was used to find a correlation. A paired samples t-test was used also known as a repeated measures test. A paired samples t-test is used when trying to compare changes within the same population being tested at one time and then at another time. The samples are related because it is the same group of parents filling out the survey who are being tested both times. After information was inputted in the computer software standard scores and their percentile ranking was analyzed.

## Chapter 4

### Results

The study examined the correlation between a structured physical activity, a basketball organization for children with special needs and the positive impact it will have on their social skills. The relationship was examined using the SSIS survey for parents to complete on their child with an intellectual disability playing basketball during the season.

There were seven male students and three female students being observed and reported. The age ranged from 17-21. Ten pretest scores on February 7 and ten post test scores on February 28 were analyzed by the SPSS computer software. A paired samples t-test compared structured physical activity and social skills. The pretest scores had a mean of 75.90 with a standard deviation of 17.64. The posttest scores had a mean of 93.10 with a standard deviation of 7.29. The pretest posttest group paired samples score had a standard deviation of 17.86. The significant level came to  $p = .014$  which indicates a significance difference between pre and posttest. The t -test was 3.046. All scores are based off of the parent rating survey using the standard score to find a correlation. Figure 1, Figure 2, and Figure 3 show t test results.

Student A, male, age 21 had a pretest standard score of 60 and a post test score of 95. Student B, female, age 20 and a pretest standard score of 54 and a post test score of 91. Student C, male, age 18 had a pretest standard score of 70 and a post test score of 94. Student D, female, age 19 had a pretest standard score of 69 and a post test score of 94. Student E, male, age 20 had a pretest standard score of 65 and a post test score of 96. Student F, male, age 19 had a pretest standard score of 73 and a post test score of 94.

Student G, male, age 19 had a pretest standard score of 76 and a post test score of 93.

Student H, male, age 17 had a standard pretest score of 86 and a post test score of 92.

Student I, female, age 21 had a standard pretest score of 91 and a post test score of 76.

Student J, male, age 17 had a standard pretest score of 115 and a post test score of 106.

Eight out of ten students had an increase in their results throughout the basketball season.

We will then reject the null hypothesis, because a significant difference was found which is: Rowan Unified Sports Basketball, which is a structured basketball organization for children with special needs, will not impact their social skills due to physical activity comparing before and after scores. Figure one shows the mean of pretest compared to the mean of the post test scores.

Table 1.

*Paired Samples Statistics*

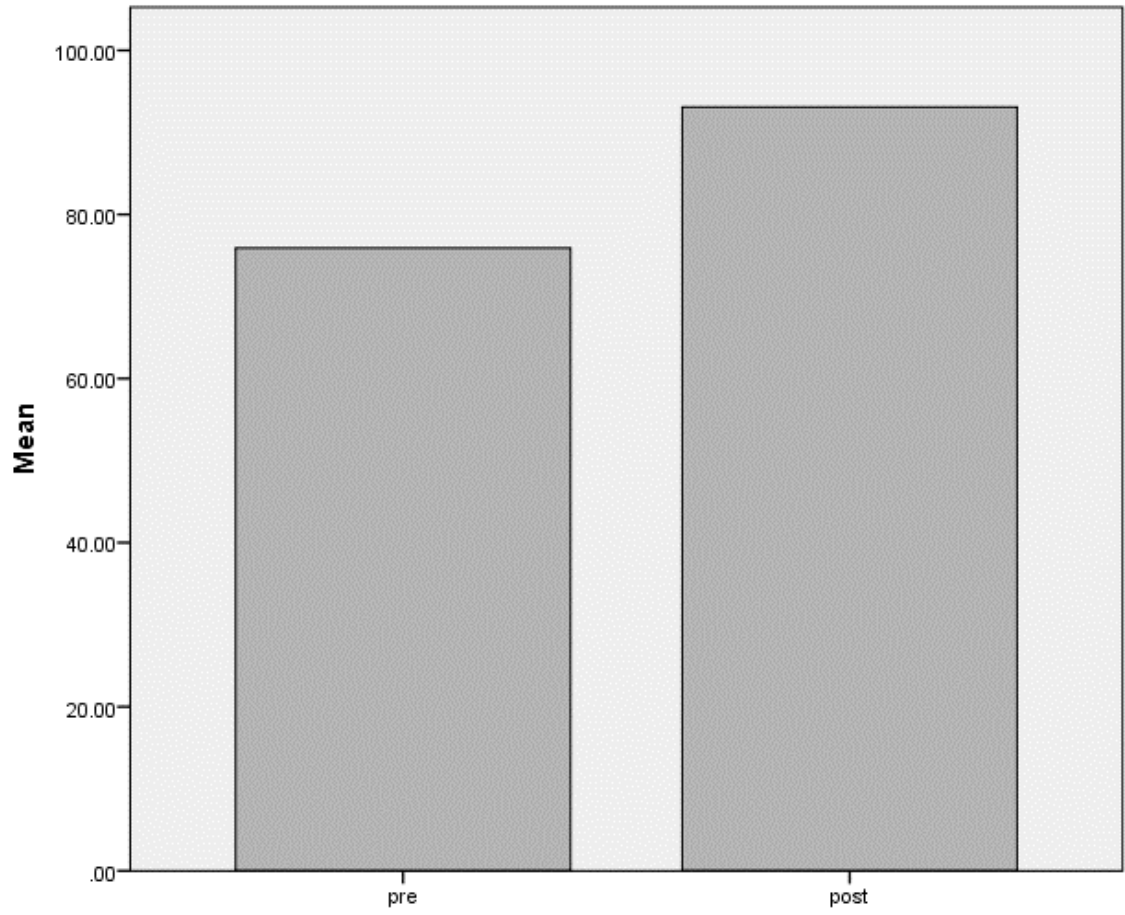
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pre	75.9000	10	17.64118	5.57863
	post	93.1000	10	7.29459	2.30675



Table 2.

*Paired Samples Test*

		Paired Differences			95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	pre - post	-17.2000	17.85622	5.64663	-29.97357	-4.42643	-3.046	9	.014



*Figure 1.* Pretest Post Test Scores

## **Chapter 5**

### **Discussion**

#### **Summary**

Many studies exist that focus on the correlation between exercise and academic achievement. However there is a lack of studies done that show a positive correlation between physical fitness and social skills, especially the effect physical fitness has on children with intellectual disabilities. This study was done to prove that Rowan Unified Sports Basketball, a structured physical activity organization for children and adolescents with special needs, will positively impact the participant's social skills due to the physical activity.

There were seven male students and three female students being observed and reported. The age ranged from 17-21. Ten pretest scores were recorded in the beginning of February and ten post test scores from the end of February were analyzed in SPSS software. A paired samples t-test compared structured physical activity and social skills scores. The pretest scores had an average of 75.90 and the posttest had an average score of 93.10 with a significant level of .014. This shows an increase in social skills scores from the beginning of the basketball season to the end. Eight of the ten students had a positive increase from pretest to posttest score. These results conclude there was a positive increase in social skills due to the structured physical activity. The scores increased over the month long basketball season.

#### **Explanation**

The t-test results showed a significant level of .014. This represents the 8 out of 10 of the students who played basketball had an increase in their social skills from the

beginning of the season to the end. The structured physical activity influenced their social skills. The program included strict basketball rules for the participants to follow while interacting with other peers, non-disabled and disabled. The eight participants who started the season with low scores and ended with a higher score could have been experiencing the positive impact exercise has on people. The two students who did not have an increase in their social skills scores could have started the season on a great day for them. Their social skills score was very high on that first day. They also may have had an upsetting day on the final day of the season, thus affecting their score. Other factors that could have influenced the scores are age, maturity, and even the severity of the students' disability.

A parent stated at the beginning of the season, "The interaction between a non-disabled and a disabled student gives the disabled student the feeling that they fit in and they can do whatever their peers are doing". (Student A's mother). The sex of the basketball player could also affect their social skills. Males more than females in a larger group size show greater success in inter-group tasks. Since the basketball team had a large roster, the correlation between males and a larger group size could have produced the higher social skills score in the male group. In contrast, females form isolated one-on-one relationships (Benenson, Markovits, Hultgren, Nguyen, Bullock, & Wrangham, 2013).

The survey used had good internal and test-retest reliability and good criterion validity and convergent validity. Reliability is the surveys' ability to generate consistent scores across different situations where there is not much variation in the subject tested. Validity is the surveys' ability to measure what it is intended to measure (Greshman &

Ellio, 2011). In previous studies using the Social Skills Improvement Scale, large populations produced median scale scores which were high indicating the scoring is not influenced by random error. Scores on a test-retest study showed the average score remained average the second time. Content validity was established using a task force team who closely followed the DSM-IV. The survey is based off of empirical literature (Greshman & Ellio, 2011).

### **Integration**

The physical activity benefits include: “learning to depend on one another, enhancing self-esteem and self-confidence, building a sense of teamwork and responsibility, developing the “whole person”, and instilling “good sportsmanship” (McHugh, 1995). All of these benefits are meaningful social skills for children and adolescents and can be conducted in the Rowan Unified Sports setting.

Children and adolescents with disabilities are more likely to not engage in physical fitness activities, be overweight or obese, have high blood pressure, and receive less social emotional support (Disability and Health, 2014). The physical activity of basketball or any type of physical fitness or exercise can help decrease weight in those who are overweight and lower blood pressure. Special needs students playing the basketball game through Unified Sports, a branch of Special Olympics, with their peers who are non-disabled could help to expand their social emotional support system. The Special Olympics concluded that the improvements of social skills and relationship skills through exercise has a significant effect on the participant with a disability. The skills learned in the physical activity setting carry over into the participant’s everyday life (Participation Improves Athlete Social Skills and Employment Opportunities, 2015).

The social skills of the students increased over the season. The study supports the research that physical activities are important for special needs individuals. It improves psychological well-being (Gondoh et al, 2009), overall physical health (Sallis, Prochaska, Taylor, 2000), and social skills (Participation Improves Athlete Social Skills and Employment Opportunities, 2015). A study compared the social skills of children with special needs participating in gymnastics and found significant gains in social skills from pretest to posttest. (Hashemi, Roonasi, Saboonchi, Saleian, 2012). The study's population was three or six year old children, which is a much younger sample group than the sample age studied. Another study compared social attributes in a Unified Soccer program. Results suggested that the exercise increased their social competence (Ozer, Baran, Aktop, Nalbant, Aglamus, Hutzler, 2012). The study did not solely focus on social skills but the spread of information collected was a friendship scale, adjective checklist and behavior checklist. The current study done will improve the previous findings by adding to the collection of minimal available information on special needs children and the effect exercise has on that population.

### **Implications for Findings**

The findings imply that social skills are positively affected by a physical activity. This area of study is valid and should be studied more, especially for children with Autism. Since Autism's main characteristic trait is a lack of social skills, the implications from this study could warrant expanding the study to include that specific population. The results add to the small amount of literature available on social skills and physical activity in special needs populations. Other programs geared for special needs students should implement a physical activity in some form such as walking or kicking a ball to

improve behavior. Even in school systems a physical activity in between subjects or halfway through the day is a good way to improve academic achievement. Studies have shown “1) increased time in PE does not impede students’ classroom academic performance, 2) increased time in PE may contribute slightly too academic performance, 3) decreased time for PE in favor of academic work does not necessarily result in improved academic performance” (Pate et al., 2006).

To improve this study the sample size could have been larger and the time frame from the beginning to the end of the season could have been longer. Also since this is a sports club they could require a practice session at least once a week. That would make the program more structured and could render stronger results.

### **Limitations**

Generalizability of study results are limited due to the small sample size. The sample size was smaller than anticipated. The initial handout of the survey should have been done in the meeting before the season, not on the day of the first game. Since the population was small and varied in disabilities it was difficult to pinpoint a specific characteristic of a disability. That could have caused the increase or decrease in their social skills score. No information about the student’s disability was disclosed. The participant could have started the season on an “off” day or ended the season on an “off” day. Everyone has “off” days, especially people with intellectual disabilities.

### **Future Directions**

This type of study should be done on a greater level, including the entire Unified Sports Basketball at Rowan. If parents were to feel comfortable disclosing a diagnosis, it would be very beneficial to correlate with the participants social skills score. The

diagnosis could be another independent variable to correlate. Even a look at social skills with the older population of Special Olympics, or the younger population in the Young Athletes, a division of Special Olympics, is another potential level of study. Special education schools specifically geared toward students with intellectual disabilities could track a yearlong program of incorporating play time or exercise time into the day. Even with non-disabled children a physical activity program will promote social skills. Activity in the physical education setting is well suited for social interaction because the children are interacting in ways not standard in the academic classroom (McHugh, 1995). There are many more studies to be done that can conclude the same positive results.



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