University of Wisconsin-La Crosse

Graduate Studies

Instructional Strategies for Teaching Object Control Skills to Young Children with Down Syndrome

A Critical Analysis Project Submitted in Partial Fulfillment of the Requirements for the Master of Science in Exercise and Sport Science-Physical Education Teaching Adapted Physical Education Teaching Concentration

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ABSTRACT

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Young children with Down syndrome (DS) present delays in gross motor development that can hinder their physical activity levels. An important component of gross motor development for physical activity is the acquisition of object control skills such as kicking, throwing, catching, and striking. These skills provide a foundation for additional physical activity that assist with development and maintenance of a healthy and active lifestyle. In addition, these skills provide opportunities for participation in physical activity for a lifetime and lead to benefits in physical and mental health, social interactions, and quality of life. The purpose of this project was to create resources to provide guidance in effectively teaching object control skills to young children with DS. The first part of the resource consists of a written product including an extensive review of related research and teaching literature, as well as instructional and behavior management strategies. The second component of the project was an instructional video that provides demonstrations and explanations for effective teaching of object control skills and behavior management strategies. The comprehensive video was created by reviewing related research and teaching literature and is intended for general and adapted physical educators, parents, paraprofessionals, physical therapists, and others.

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CHAPTER I

INTRODUCTION

The Importance of Gross Motor Development and Physical Activity

Physical activity (PA) provides benefits including improved health, prevention of chronic disease, weight management, improved self-esteem, and overall improvement for quality of life. The foundation for PA begins to develop in the very early stages of childhood. During this time, gross motor skills (GMS) like walking, running, jumping, skipping, overhand throwing, catching, and underhand rolling develop. As children begin to acquire these skills, opportunities to participate in games, physical education, recreational activities, leisure, and team and individual sports increase. This participation is accompanied by social interactions, which elicit benefits as well, and takes place with siblings, peers, teammates, classmates, and friends. The steady improvement in GMS results in additional gains in intellectual and social skills (Haibach, Reid, & Collier, 2011). As GMS are refined, mastered, and specialized, the likelihood of participation at higher levels of fitness and sport activities increases. Children that develop a strong movement foundation will have the skill set and the confidence to be physically active on their own, with their families, and with peers (Harter, 1999).

As children become more skilled, they combine different GMS as they begin participating in different PA. Gross motor skills, including object control skills (OCS), like striking with an implement and underhand rolling a ball, can quickly turn into playing baseball or softball and joining a recreational bowling league. These activities offer opportunities for individuals to stay involved in PA for a lifetime. Children that perceive to have, and actually have, higher motor skill competency will more likely

continue to participate in PA (Stodden, Goodway, Langendorfer, Roberton, Rudisill, Garcia, & Garcia, 2008). A healthy and active lifestyle begins with the development of GMS that serve as a foundation for additional PA. Lifetime PA helps prevent obesity, promotes motor skill development and physical fitness, and provides opportunities for setting fitness goals, making new friends, and reducing stress (Stodden et al., 2008).

The development of GMS is essential for PA among children. As children get older, the skills required to participate in PA become more difficult. When skills are too difficult and a child is not successful in the activity, they will find PA less enjoyable and likely not want to participate (Harter, 1999). It is important to provide children with the GMS necessary to participate in PA, as well as be successful. Gross motor development is vital for all children, including those with disabilities.

Children with disabilities are less physically active than children without disabilities. However, PA is equally vital for them (Barr & Shields, 2011). Children with disabilities tend to learn in a variety of ways, similar to their nondisabled peers. This means instruction, presentation, and PA may need to be offered in alternative ways to meet individual learning needs. For many children with disabilities, the acquisition of GMS is delayed. This is often true for children with Down syndrome (DS). Down syndrome is a genetic abnormality that results in delays in motor and cognitive development (Periera, Basso, Lindquist, Silva, & Tudella, 2013). Individuals with DS are prone to obesity, leading a sedentary life, and an overall lower level of physical health.

It is vital for all children, including those with cognitive disabilities, like DS, to develop the necessary GMS that allow them to participate in meaningful and functional PA. Teaching these physical and motor skills is the responsibility of not only parents, but

also general physical educators, adapted physical educators, physical therapists, and any individual involved with the development of a child with DS.

Down Syndrome

Down syndrome occurs most commonly when an individual has a full or partial extra copy of chromosome 21 and has an incidence of 1 in every 800 births, making it the most common genetic condition. The additional genetic material alters development and causes the characteristics associated with DS. Some common characteristics include mild to moderate intellectual disabilities, low muscle tone, and higher chances for associated health issues (Meredith, 2013).

There is a general consistency about the characteristics that accompany DS, including medical concerns, vision and hearing disorders, upper respiratory issues, heart conditions, cognitive impairments, and physical traits. Many of these characteristics, specifically muscle hypotonia, visual and hearing disorders, memory difficulties, and cognitive functioning can affect the development of GMS in children with DS. These difficulties make it harder for children to access, understand, process, perform, retain, and learn information at the rate of typically developing children (Winders, 2014). These characteristics do not prevent children from learning, but does mean that learning will take longer, require more practice, and may need to be presented in alternative ways.

Importance of Gross Motor Development for Young Children with Down Syndrome

The characteristics associated with DS can impact an individual's ability to participate in PA. Children and adults with DS have decreased muscle strength and cardiovascular fitness compared with their peers with intellectual disabilities, but without DS, and demonstrate lower levels of motor development (Mahy, Shields, Taylor, &

Dodd, 2010). This means physical inactivity can result in more severe short and long term health issues in individuals with DS.

Barr and Shields (2011) state that 58% of children with DS do not meet the recommended amount of daily moderate-vigorous PA, compared to 44% of typically developing children (American Heart Association). Mahy and colleagues (2010) found that adults with DS are typically sedentary, and many do not participate in the recommended levels of PA per week. While obesity and secondary health concerns are common among this population, the opportunity to take control of these issues is presented in the early stages of development. Improving these statistics, in addition to preparing individuals with DS to meet these PA recommendations, begins with the development of GMS, including object control skills. With adequate gross motor development in the early stages of life, individuals with DS can increase their PA later in life. Additionally, opportunities for participation in adapted sport leagues, recreational PA, social interactions, family PA time, weight management exercise programs, and physical enjoyment is made possible.

While gross motor development in individuals with DS is vital, understanding the implications of the physical and health issues is equally important. When teaching children with DS, it is important to take into consideration the unique way in which each child learns and how to effectively teach to those learning styles. If this is done, children with DS have the potential of reaching the same gross motor milestones as typically developing children (Sacks & Buckley). Keeping in mind the implications of certain characteristics that accompany this condition, and utilizing strategies for effective instruction, children with DS can develop adequate GMS. This will equip them with a set

of fundamental motor skills for PA and an active lifestyle. The most common environment where children develop GMS is in physical education (PE). For children with DS, this environment is often specially designed PE or adapted PE.

Specially Designed Physical Education

The Society of Health and Physical Educators (SHAPE America) defines a physically literate individual as one that: has learned the skills necessary to perform a variety of physical activities, participates in regular PA, knows the implications of and the benefits from involvement in physical activities, participates regularly in PA, is physically fit, and values PA and its contributions to a healthful lifestyle (SHAPE America, 2014). When a young adult leaves school, it is paramount that they are leaving as a physically literate individual, so that they will remain physically active, seek out PA opportunities on their own, and recognize the value of PA. In order to prepare students to maintain a health enhancing level of fitness for lifetime, it is necessary first to provide them the knowledge and adequate opportunities to develop GMS, including OCS such as throwing, catching, kicking, striking, and rolling. These object control skills play a significant role in the future level of involvement in PA. These skills are important for all children, including those with disabilities.

The Individuals with Disabilities Education Act (IDEA) states that all students with a disability are entitled to specially designed instruction, at no cost to the parents, to meet the unique needs of a child with a disability, including instruction in PE (Yell, 2012). Additionally, IDEA states that PE is the development of physical and motor fitness, fundamental motor skills and patterns, and skills in aquatics, dance, and

individual and group games and sports (U.S. Department of Education, 2006). This definition highlights the importance of fundamental motor skills, including OCS.

Specially designed PE for children with DS should include goals that are achievable, appropriate, and will lead to lifetime PA. According to IDEA under part C, infants (aged 3-5) with diagnosed disabilities are entitled to begin receiving services, often known as early intervention. The sooner children can begin learning, the more likely it will be for them to have adequate time to develop certain motor skills and reach their maximum potential. Lloyd, Burghardt, Ulrich, and Angulo-Barroso (2010) advocated that early motor activity can be essential to the development of several critical subsystems of motor development, such as strength and coordination.

Development of Object Control Skills in Young Children with Down Syndrome

Gross motor development encompasses locomotor skills like running, skipping, and hopping, as well as OCS such as overhand throwing, catching, dribbling, and underhand rolling. Object control skills are introduced in preschool and elementary PE and continue to be a significant component of the curriculum throughout all school years. As these skills are developed, opportunities to participate in additional PA increase. When children have the physical skills, coordination, and cognitive ability to understand the rules and concepts of an activity, they are more likely to participate in formal activities (Stodden et al., 2008). With the knowledge, confidence, and ability to perform object control skills, children feel comfortable enough to immerse themselves in various situations that involve PA, and are more likely to interact with friends and family.

The development of OCS at an early age will contribute to the maintenance of a healthy and active lifestyle later in life. Development of these skills provide children with

a set of skills that gradually allow them to explore and participate in an array of physical activities, games, and sports (Stodden et al., 2008). Participation elicits improvements in quality of life, social interactions, maintenance of a healthy weight, and the enjoyment of being active. Ensuring that each child receives PE programming that provides them with the necessary GMS development early in life is vital. Young children with DS can participate in meaningful levels of PA, on team sports, in individual sports, and PA in general when equipped with essential OCS. In addition, teaching these fundamental building blocks can lead to their ability to acquire and refine them for common specialized PA like golf, tennis, baseball, volleyball, and basketball.

The purpose of this project was to present the most effective instructional strategies for teaching OCS to young children with DS, as well as strategies to manage behavior while teaching. In addition, a video was developed that can be utilized by a variety of individuals. The video presents instructional and behavioral strategies in authentic situations with children with DS. The written and video resources are intended for parents, general PE teachers, adapted PE teachers, physical therapists, and others involved in the motor development of young children with DS.

Need for Project

The importance of this project is based on the evidence of GMS delays in young children with DS and the lack of resources, such as instructional videos, for teachers, parents, and others to effectively teach OCS like throwing, catching, striking with an implement, and rolling. While there is research and teaching literature that explain the delays and difficulties associated with the development of GMS for children with DS, there is little information that provides practical and easy to transfer instructional

strategies for teaching these skills. Children with DS have tremendous potential in the area of GMS acquisition and refinement that needs to be developed in effective ways (Winders, 2014). As research suggests, it is possible for children with DS to achieve the same levels of motor proficiency as that of typically developing children, but what is missing is a resource that effectively illustrates how to reach that point (Winders, 2014).

Additionally, it is difficult to find a compilation of effective instructional strategies for teaching OCS to children with DS. More specifically, a resource is needed that reflects previous research and teaching literature, is easy to follow, is in video format, and that can be utilized by a variety of individuals. While there are resources available, including videos that address the gross motor development needs of children with DS, they are not all available or appropriate for parents, physical educators, physical therapists, special education teachers, and others that may be searching. Research and teaching literature may be difficult for parents to understand and transfer to their own unique situation. A video resource that is easy to access, straight to the point, and readily available is needed to effectively teach OCS to young children with DS.

Purpose of Project

The purpose of this project was to present the most effective instructional strategies for teaching OCS to young children with DS. Additionally, this project highlighted behavior management strategies that are proactive rather than reactive when dealing with common behavior issues when teaching young children with DS. The manual includes an overview of effective instructional strategies that should be utilized when working with young children with DS as well as effective behavior management strategies to aid in being proactive rather than reactive when managing behaviors.

The video resource that accompanies the manual provides demonstrations, real-life scenarios, and explanations for the effective instructional and behavior management teaching strategies listed above. The website location of the video is: https://www.youtube.com/watch?v=gfxSLFe54-M

Definition of Terms

The following are definitions used in the manual and video resources.

Down Syndrome

Down syndrome is mostly commonly caused when an individual has full or partial extra copy of chromosome 21 and occurs in 1 of every 800 births, making it the most common genetic condition. The additional genetic material alters development and causes the characteristics associated with DS. Some of the common characteristics include mild to moderate intellectual disabilities, low muscle tone, and higher chances for health issues (Meredith, 2013).

Gross Motor Skills

Gross motor skills are abilities usually acquired during infancy and early childhood that are important for major body movements like walking, balance, coordination, jumping, and reaching (Winders, 2014).

Object Control Skills

Object control skills are those that involve giving force to an object or receiving force from an object such as overhand throwing, catching, kicking, striking, dribbling, and underhand rolling (Coker, 2009).

Physical Education

Physical Education is the development of physical and motor fitness, fundamental motor skills and patterns, and skills in aquatics, dance, and individual and group games and sports (U.S. Department of Education, 2006).

Adapted/Special Physical Education

Adapted physical education is the process of developing, implementing, and monitoring a carefully designed physical education instructional program for a learner with a disability, based on a comprehensive assessment, to give the individual the skills necessary for a lifetime of rich leisure, recreation, and sport experiences to enhance physical fitness and wellness (Auxter, Pyfer, Zittel, & Roth, 2010).

Summary

Physical activity provides improvements related to health, social interactions, and mental functioning (Fiss, Effgen, Page, & Shasby, 2009). Participation in PA for a lifetime is influenced by the early development of GMS, specifically OCS like throwing, catching, dribbling, and rolling. The development of GMS is vital for all children, including those with disabilities. One of the most common genetic abnormalities resulting in a disability is DS. DS affects cognitive and physical development and causes delays in gross motor development. One of the most likely environments where children with DS develop GMS is in PE. Specially designed or adapted PE is a required part of special education for all children with disabilities. The development of OCS in young children with DS is part of a quality PE program.

The remaining parts of this project include an extensive review of related research and teaching literature about the gross motor development and teaching of OCS to

children with DS. Following the review of related research and teaching literature, strategies for teaching young children with DS OCS are presented. This includes ten effective teaching strategies along with six behavior management strategies. Next, a description of the project video and its content can be found. Finally, resources pertinent to teaching strategies, OCS, gross motor development, and individuals with DS in addition to a list of references used for this project are presented.

CHAPTER II

REVIEW OF RELATED RESEARCH AND TEACHING LITERATURE

Introduction

Gross motor development delays are very common in children with Down syndrome (DS) (Virji-Babul, Kerns, Zhou, Kapur, & Shiffrar, 2006). These delays are evident as early as birth and have effects that can last a lifetime. Palisano and colleagues (2001) reviewed studies that suggest young children with DS achieve gross motor functions at an average age that is almost twice the mean age of children without DS, and these differences become more pronounced over time. The goal of early intervention in infants with DS is to achieve maximum gross motor potential in the future.

Studying and reviewing gross motor intervention methods for children with DS is essential in determining the best treatment regimens for this population. Lafferty (2005) examined the effects of a stair-walking intervention for children with DS. His findings showed that the intervention strategy employed induced changes in both the process and product of stair walking and the movements were corrected and not just altered (Lafferty, 2005). Interventions like these can be beneficial to gross motor development (GMD) of children with DS.

Research by Pereira et al. (2013) provided information on the percentages and ages for acquisition of gross motor skills (GMS) for infants with DS. Research such as this that compares directly to typically developing infants is very valuable, since it is known that this population presents deficits in GMD. Parents, professionals, teachers, and therapists can use this information as a resource to track progress and possibly predict expected milestones of infants with DS. Barr and Shields (2011) expressed how the

benefits of participation in physical activity (PA) for children with DS include improved health, prevention of chronic disease, increased self-esteem, and enhanced social interactions. A recent study the researchers reviewed, however, found that 58% of children with DS do not meet these recommendations (Barr & Shields, 2011). To achieve maximum GMD potential in individuals with DS, interventions must start early.

In order to effectively teach these skills, it must first be understood what delays and deficits are present and how they impact GMD. In addition to understanding these deficits and delays, it is important to understand the effects of interventions techniques.

The following review of literature is divided into two sections: the GMD and physical fitness of children with DS, and the effects of gross motor interventions on children with DS. Research regarding the GMD and physical fitness of children with DS specifically includes barriers and facilitators to PA, the creation of gross motor function growth curves, perceptual motor discrimination, leg and trunk activity in infants, community-based progressive resistance training, and the planning and execution of multiple target movements. Research dealing with gross motor intervention examines stair-walking, sensorimotor development, exergaming and jumping and balancing interventions. Finally, the last section presents practical teaching strategies that aid in the development, instruction, and evaluation of teaching young children with DS.

Related Research Literature

Gross Motor Development and Physical Fitness of Children with Down Syndrome

Barr and Shields (2011) conducted a study to explore the barriers and facilitators to PA for children with DS. An explorative qualitative approach consisted of in-depth interviews with parents of children with DS. They explored experiences of their child's

engagement in PA and the factors that made this easier or more difficult. The subjects of this study included parents of children with DS, aged 17 and under, and took place at a location convenient for the parent, including phone interviews. Interviews lasted 20-50 minutes and were recorded via an MP3 voice recorder (Barr & Shields, 2011).

The authors identified four main themes related to the facilitation of PA. Themes included positive role of the family, opportunity for social interaction with peers, structured accessible programs that make adaptations for children with DS, and children who were determined to succeed and physically skilled. Similarly, four main themes emerged in regards to barriers to PA. These themes included characteristics commonly associated with DS, competing family responsibilities, reduced physical or behavioral skills, and a lack of accessible programs (Barr & Shields, 2011). Understanding the facilitators and most prominent barriers to PA can help teachers and parents create the most successful environment and provide the most effective instruction to foster maximum gross motor development. A study very similar to this one was also conducted with adults with DS.

Mahy and colleagues (2010) examined the barriers and facilitators to PA from the perspectives of adults with DS and their support people. Similar to the previous study, in-depth interviews with 18 participants took place. Participants included 6 adults with DS, aged 21-44, and 12 support people including mothers and staff that worked with adults (Mahy et al., 2010). Interviews were conducted by an investigator with experience in supporting adults with intellectual disability, but who was not known by any of the participants. The investigator received training on interview techniques and ways to

interact during the interviews. All interviews were recorded using an MP3 recording device (Mahy et al., 2010).

Results revealed three main themes in regards to the facilitators of PA and three additional themes in the barriers of PA for adults with DS. Facilitation themes included support from others, activity was fun or had an interesting purpose, and routine and familiarity. Themes in relation to the barriers of PA included lack of support from others, not wanting to be physically active, and medical and physiological factors (Mahy et al., 2010).

Additional evidence from this study indicated that adults with DS were more likely to be engaged in PA if they felt they will be successful (Mahy et al., 2010). It is necessary to maximize GMS learning in children with DS at a young age in order to allow them to experience success in PA and confidence to participate. A study by Palisano and colleagues (2001) more specifically examined the GMD in children with DS and developed a tool to estimate and predict their motor development milestones.

Palisano and colleagues (2001) created gross motor function growth curves for children with DS to estimate the probability that motor functions are achieved by different ages. The underlying purpose of this study was to examine the motor function of a large sample of children with DS prospectively by means of a standardized criterion-referenced measure (Palisano et al., 2001). The motor development of 133 children with DS was assessed by means of the Gross Motor Function Measure (GMFM), a criterion-referenced test constructed specifically to evaluate change in gross motor function in children with motor disabilities. The GMFM consisted of 88 items grouped into 5

dimensions. Participants were 1 month to 6 years of age and were, or had been, clients of early intervention (Palisano et al., 2001).

From the data collected, growth curves for mild motor impairment and moderate to severe motor impairment were created that represented the average scores predicted by the model. During the first 6 years of life, the motor curves illustrated scores that improved the fastest at younger ages, then leveled off as the predicted upper limit of gross motor function was approached. Data showed that motor impairment had a discernable effect on rate of improvement, but only a slight effect on ultimate achievement of gross motor function during early childhood (Palisano et al., 2001).

This research suggested that children with DS require more time to learn movements as complexity increased (Palisano et al., 2001). Since learning takes longer, determining the most effective strategies and understanding the developmental sequence of object control skills in children with DS can provide significant insight. This information can influence the manner in which we teach important gross motor skills beginning in the early, influential stages of life. While Palisano and colleagues (2001) created growth motor curves that represented gross motor function in children with DS, Pereira et al. (2013) similarly studied infants with DS and examined the percentage and age for the acquisition of GMS.

The purpose of the study by Pereira and colleagues (2013) was to identify the difference in age, in relation to typically developing infants, at which motor skills were acquired and the percentage of infants with DS that acquire them in the first year of life. The researchers proposed that when compared to typical infants, those with DS take longer to acquire the skills in prone and supine positions (Pereira et al., 2013).

The longitudinal study utilized a nonprobabilistic convenience sample and included 20 infants with DS and 25 infants without who served as a control group. The infants were evaluated using the Alberta Infant Motor Scale (AIMS) which assesses the infants from birth to achieving independent gait and identifies risks of developmental delay. The infants were assessed monthly between 3-12 months of age. Typically developing infants were assessed each month for a total of 10 times, while the infants with DS varied from 3-10 assessments (Pereira et al., 2013).

Data from this study were used to create charts that compared infants with and without DS. Four charts illustrated the difference in age and percentage of infants who acquired motor skills in the prone position, supine position, sitting position, and in the standing position. Pereira and colleagues (2013) concluded that typically developing infants and those with DS acquire GMS at different ages (Pereira et al., 2013).

Another vital aspect of gross motor development, walking onset in infants, was examined by Lloyd and colleagues (2010). The purpose of this study was to establish whether a relationship existed between leg and trunk activity at an average age of 10, 12, and 14 months and independent walking onset. Additionally, the authors wanted to establish whether other growth and developmental factors influenced the onset of walking in infants with DS using a multivariate analysis. The researchers observed PA levels in the leg and trunk, independent of a implemented treadmill training intervention (Lloyd et al., 2010).

Participants in this study included 30 infants with DS whose average age was 10.7 months. Infants were randomly assigned to receive one of two partial-weight-supported treadmill interventions designed to promote the achievement walking. Treatments

included a high-individualized intensity (HI) treadmill training group and a low-generalized intensity (LG) treadmill training group. PA was measured by placing one activity monitor on the right ankle and a second just above the right iliac crest. Data were collected for 24 consecutive hours beginning at entry into the study and every other month until the onset of independent walking (Lloyd et al., 2010).

Results showed that there were no statistical differences in the age of walking between the HI and LG groups for the age of walking onset. However, the results indicated that total product of leg activity was related to the onset of independent walking in infants with DS (Lloyd et al., 2010).

Results indicating that high leg activity in the early months of life was the main factor significantly related to the onset of walking in infants with DS. This created a strong argument for the inclusion of treadmill training in developmentally delayed pediatric populations, such as those with DS. This made it ultimately plausible that decreased levels of early motor movements had long-term consequences on the motor development of children with DS (Lloyd et al., 2010). Since walking is a significant milestone in motor development, any intervention that aids in the acquisition of that skill can be potentially beneficial to the development of many gross motor skills.

A study by Ulrich and colleagues (2001) also examined treadmill training in infants with DS. The purpose of this study was to determine if stepping on a motorized treadmill could help reduce delay in walking onset normally experienced by infants with DS. The participants in this study included 30 families of infants with DS who were randomly assigned to either an intervention or control group. All infants received traditional physical therapy at least every other week, and the intervention infants

additionally received practice stepping on a small, motorized treadmill, 5 days a week, for 8 minutes a day, in their own homes (Ulrich, Ulrich, Angulo-Kinzler, & Yun, 2001).

The researchers found that the experimental group learned to walk independently significantly faster than the control group. The groups however, were not statistically different for rate of learning to raise self to stand, but there was a moderate effect size statistic, suggesting that the groups were meaningfully different in favor of the experimental group. Practicing movement patterns was believed to lead to the improvement and integration of functional motor responses, ultimately fostering maximum motor development potential (Ulrich et al., 2001). As previously mentioned, any intervention to improve GMD in this regard should be acknowledged and considered when working with children with DS. Without GMD experiences in the early years of life, individuals with DS may refrain from PA to improve physical fitness later in life because of feeling incapable or lacking in the appropriate motor skill competencies.

A study by Shields, Taylor, and Dodd (2008) examined components of physical fitness in young individuals with DS. They investigated whether a community-based progressive resistance training (PRT) program, designed to increase muscle strength, improved work task performance in adolescents and young adults with DS. Two additional goals of the study were to examine whether the program led to increased muscle strength and an increase in the amount of PA (Shields et al., 2008).

Participants of this study included 68 adolescents and young adults with DS, aged 14-22 years who were randomly assigned to either an intervention or control group. The intervention group completed a student-led PRT program at their local community gym 2 times a week for 10 weeks. The PRT program was led by student mentors who received

training prior to their participation. The control group completed a social program with a student mentor once a week for 10 weeks. Total time spent with student mentors was approximately equal in both groups (Shields et al., 2008).

Results illustrated a 21% increase in upper limb and a 30% increase lower limb baseline strength in the intervention group at week 11 compared to the control group. No significant difference was seen in PA level between the groups at week 11, but there was a significant difference between groups at week 24 in favor of the intervention group. Evidence suggested that increases in muscle strength were associated with positive changes in work task performance. The study highlighted that those who participated in PRT maintained their PA level at 6 months compared to a corresponding decrease in the control group, however PRT may not have had an effect on the performance of work tasks (Shields et al., 2008).

In reference to this study, PRT is a safe and effective way to increase muscle strength in young adults with DS. Additionally, PRT led to benefits in PA levels after the program ended (Shields et al., 2008). In regards to GMD and physical fitness of individuals with DS, it is vital to develop and examine interventions and techniques that may help close the gap in physical ability levels compared to those without DS. Lawrence (2013) examined the sequential aiming movements and the one-target advantage in individuals with DS.

Lawrence (2013) investigated how individuals with DS planned and executed the more complex responses involved in multiple target movements. The researchers expressed how the one-target advantage (OTA) suggested that individual elements in a response were not programmed or executed independently. Their investigation sought to

examine the root cause of these motor deficits in individuals with DS through an experimental design (Lawrence, 2013).

Participants of this study included 24 adult volunteers, 8 with DS, 8 undifferentiated intellectual disability without DS, and 8 typically developing individuals. The participants performed 3 aiming tasks. The first task was moving their right index finger from the start point to a target. The second task was moving the same index finger from the start point, to a target, and then to a second target. The third task utilized both limbs and had the participant moving their right index finger from the start position, to a target, and then move their left index finger from its position to a target, and then to a second target. Three blocks of trials were completed, one for each aiming task, and consisted of 5 practice trials and 25 test trials.

The results of this study showed that increasing the number of response segments in a manual aiming movement produced an increase in the time taken to execute the first segment in a sequence, regardless of the presence of an intellectual disability. The existence of the OTA for individuals with DS indicated that movements within a sequence are not prepared and executed independently. These results additionally suggested that any central deficits associated with DS do not prevent the adoption of movement strategies designed to increase the integration of elements within responses. (Lawrence, 2013). This study had examined to an extent the sequence of which specific movement was processed and performed by individuals with DS. In relation to the GMD in individuals with DS, this signifies that movement execution is processed and performed slower than in individuals without DS. This means that the time necessary for

processing and execution when teaching individuals with DS is going to be greater and is necessary to take into account when teaching.

The Effects of Gross Motor Interventions on Children with Down Syndrome

Lafferty (2005) conducted a study that examined the effects of a stair-walking intervention for children with DS. This population consistently exhibits gait patterns that are delayed in comparison to non DS persons. The purpose of the study was to devise and examine the effects of an active therapy intervention program on the stair-walking ability of children with DS (Lafferty, 2005).

Participants in this study were 10 children with DS for the preintervention trials. Seven of those children, who were regular attendees at a special needs gymnastics club, were continued on to become part of the group that received the intervention. Intervention lasted for 12 weeks and consisted of bi-weekly sessions during the participant's gymnastics class and lasted for 3 hours. Lafferty (2005) devised an intervention based on the whole-part-whole method of learning. Participants practiced the whole movement, which was then broken down into subroutines. Specific exercises were developed to correct each subroutine fault. New movement patterns were then combined to produce ascent and descent phases. Gait analysis techniques were used to evaluate the kinematic action and movement patterns during both phases (Lafferty, 2005).

Results showed that the intervention strategy induced changes in both the process and product of stair walking in children with DS (Lafferty, 2005). Data showed that there were fewer significant differences in the ascent phase than within the decent phase post intervention. This suggested that the movement pattern was in fact corrected and not

altered (Lafferty, 2005). This information provides insight into how children with DS develop alternative sequences of GMS to compensate for specific deficits.

A similar study by Fiss et al. (2009) examined the effects of sensorimotor groups on gross motor acquisition for young children with DS. Early group intervention sessions have proven to elicited earlier attainment of developmental milestones in children with DS. The purpose of this study was to investigate if young children with DS who participate in weekly sensorimotor group sessions, in addition to individual intervention, displayed greater improvements in GMD and goal attainment than young children with DS who participated solely in individual intervention (Fiss et al., 2009).

Participants included 10 children with DS between 1 and 3 years of age. The intervention and control groups each included 5 children. Children in both groups continued their regular schedule of physical and occupational therapy based on their current plan of care. Children in the intervention group participated in a short-term sensorimotor group intervention 1 time per week, for 1 hour, for 10 consecutive weeks. The intervention sessions emphasized task specific, functional motor skill practice, sensorimotor experiences, and socialization. Assessment tools used in this study included the GMFM and GAS and were completed at the children's homes by an experienced physical therapist (Fiss et al., 2009).

The results of this study revealed no significant differences between the 2 groups at pretest on the GMFM and the intervention group demonstrated between a 1.4% and a 14.8% greater average improvement in the various domains of the GMFM at follow-up, when compared with the control group. This suggested that the progress in GMS acquisition made by the children continued to outpace the improvements in the control

group after the intervention phase ended. Additionally, a significant difference was found in GAS scores in favor of the intervention group from pretest to posttest. Therefore, children in the intervention group made progress on multiple areas of GMS more rapidly than children in the control group. Ultimately, these results suggested that increasing intensity off intervention by participation in a short-term weekly group intervention session led to improved GMS acquisition compared with individual intervention alone (Fiss et al., 2009). Any intervention that can aid in the development of GMS for children with DS is important, since they often display deficits and acquire skills at a slower rate compared to children without DS. Any intervention that can minimize that gap can help these children reach their full potential. A study by Wuang, Chiang, Su, and Wang, (2011) similarly examined the sensorimotor functions of children with DS.

Wuang and colleagues (2011) studied the effectiveness of exergaming using Wii gaming technology with children with DS. The purpose of this study was to examine the effects of sensorimotor stimulation by use of video games in the treatment regimen for children with DS. The researchers hypothesized that exergaming using Wii gaming technology is potentially efficacious in enhancing sensorimotor functions compared to standard sensorimotor training among children with DS (Wuang et al., 2011).

Participants of this study were 155 children with DS between the ages of 7 and 12 years. Of the 155 children, 50 had initially agreed to participate but could not attend, and were assigned to the control group. From the remaining 105 children, 2 equal sized intervention groups that used exergaming using Wii gaming technology (VRWii) and standard occupational therapy (SOT) were randomly created. Each intervention group received a 1 hour session, 2 days a week, for 24 weeks. Measurement instruments used

included the Bruininks-Oseretsky Test of Motor Proficiency – Second Edition (BOT-2), The Developmental Test of Visual Motor Integration (VMI), The Test of Sensory Integration Function (TSIF), VRWii, and SOT (Wuang et al., 2011).

The results of this study indicated that VRWii improved motor proficiency, visual-integration abilities, and sensory integrative functions for children with DS. Together, SOT and VRWii groups substantially outperformed the control group on most sensorimotor measures at post intervention. Overall, children who received VRWii therapy demonstrated the largest increase in post intervention scores on the BOT-2 gross motor subtests and outperformed in all the TSIF subtest scores in comparison to the SOT group that included sensory integration therapy. These results offer direct evidence that children with DS are able to benefit from VRWii therapy to optimize the integrated processing of sensory cues and motor responses (Wuang et al., 2011). Implications of this study can potentially improve the acquisition of many GMS that children with DS present deficits in, including object control skills, and offer persuasive arguments for the inclusion of exergaming technologies in their gross motor intervention regimens.

A study by Wang and Ju (2002) examined how to promote balance and jumping skills in children with DS. They studied the effects of a jumping and balancing intervention on children with DS. The purpose of the study was to investigate changes in balance skills and qualitative and quantitative jumping performances among the children with DS after 6 weeks of jumping lessons (Wang & Ju, 2002).

The participants of this study included 20 children with DS, ages 3-6 years, who were recruited from an early intervention center. A comparison group of 30 typically developing children was also recruited from a general kindergarten class. The researchers

conducted a pretest that consisted of an assessment on balance and jumping skills, where balance skills were assessed using items of the Bruininks-Oseretsky Test of Motor Proficiency (BOTMP) and jumping skills were assessed quantitatively using a distance measure and qualitatively based on the Motor Skill Inventory. Intervention for the group of children with DS consisted of 3 sessions, 30 minutes of warm-up exercises, and individual or group jumping practices, per week for 6 weeks. The posttest was given to all children after 6 weeks of jumping lessons (Wang & Ju, 2002).

Results indicated that the pre and posttest differences on subtests for floor walk, beam walk, horizontal, and vertical jumping for subjects with DS were significantly greater than those for typically developing children. Children in the intervention group were able to perform more efficient jumping after 6 weeks of jumping lessons. Additionally, their balance skills of floor walks and beam walk were significantly improved. The results of this study suggest that the improvements in balance and jumping skills of participants with DS were related to the training they received and not their developmental growth (Wang & Ju, 2002). The inclusion of specific intervention strategies in children with DS can significantly influence the attainment of earlier gross motor milestones. This suggests that the earlier the intervention begins, the more likely the appropriate developmental sequence of the skill will be developed.

Teaching Literature Related to Gross Motor Development in Individuals with Down Syndrome

While research literature provides beneficial statistical and methodological information regarding the motor development and intervention studies for individuals with DS, teaching literature provides specific strategies for effective instruction with this

population. Teaching literature offers practical techniques for the development, implementation, evaluation, and assessment of instruction for young children with DS, and it is vital to take these resources into account in educational settings, such as adapted physical education.

Jobling (1994) illustrated five elements to use when providing quality instruction during physical education (PE), as well as programming guidelines. Jobling expressed concern about whether individuals with DS are truly being prepared to become physically educated individuals, rather, are they being instructed within modified, selective, and adapted type programs which do not allow for such learning. She argued that quality PE programming for individuals with DS can provide learning experiences in all aspects of development that lead to an active and healthy lifestyle (Jobling, 1994).

Jobling addressed five elements of quality instruction that are essential to keep in mind when teaching individuals with DS. First, programs must provide opportunities to learn skills that will enable the performance of physical activities. Therefore, PE programs must specifically address delays and deficits in the motor development of children with DS, but also focus on the development of comprehensive movement abilities which can be developed and practiced (Jobling, 1994).

The second element is providing opportunities for the students to become physically fit. Jobling explained that general fitness levels in individuals with DS are low and believed to have both a motivational and physiological basis. This means activities in PE must be carefully taught and chosen for their fitness benefit (Jobling, 1994).

Third, programs must provide opportunities for the students to participate in regular PA. Jobling asserts that children with DS often do not have the ability or

spontaneity to be able to do this. Therefore, activities need to be realistically related to the lifestyle of the student's family initially, and then become specific to the individual's independent way of life (Jobling, 1994).

The fourth element Jobling stressed for quality PE for individuals with DS is providing opportunities for them to know and understand physical activities and education. It is important for persons with DS to develop an understanding of the 'feeling' of the movement in order to eventually repeat it. PE programming should include opportunities for students to both kinesthetically and cognitively understand movements with skills and within games or activities (Jobling, 1994).

The final element stressed the importance of providing opportunities to learn the value of PA as a part of the student's life. Jobling explained that individuals with DS need to not only develop the skills to play, but also the ability to relate PA to other aspects of life. When this happens, they will maintain motivation to continue participating in PA. While Jobling touched on the idea that individuals with DS present delays and deficits in motor development in her second element, Sacks and Buckley (2003) addressed it in greater depth.

Sacks and Buckley examined what is known about motor development in typically developing children and the factors that influence progress or levels of skills achievement, what is known about the same factors in individuals with DS, the effects of therapeutic interventions, and important principles for effective intervention and activity programs for individuals with DS.

They initially explored motor development in typically developing children for a basis to compare to when looking at children with DS. They looked at coordination of

motor control, the central nervous system, muscles, peripheral nerves, feedback systems, and numerous others. Some findings when analyzing the development in children with DS compared to those without include significantly delayed motor development, greater variability, continued deficits in regards to balance throughout teenage years, slower movement and reaction times, a greater reliance on visual feedback, and the amount of practice required in order to learn a skill is almost two fold (Sacks & Buckley, 2003).

When reviewing research on interventions for basic skills in individuals with DS, Sacks and Buckley determined there was relatively no evidence that interventions other than encouraging and increasing opportunities for active movement influenced motor development progress. Based on this finding, the authors recommended implications for effective intervention for basic motor skills, starting from infancy. These include encouraging active movement, encouraging practice, choosing activities to help balance and strength, teach by modeling, encouraging fine motor skills, starting early, joining clubs, following individual interests, participating in recreation, and remembering that it is never too late to progress (Sacks & Buckley, 2003).

This teaching resource provided information about how typical children develop and why it is important, and related it to the delays and deficits seen in individuals with DS. It then provided realistic and effective suggestions to improve and increase motor development in individuals with DS so they ultimately continue their involvement in PA.

Winders (2014) similarly examined development in individual with DS, more specifically the GMD in infants. Within the National Down Syndrome Society resource section, challenges that infants with DS face regarding gross motor development are addressed, as well as how their temperament impacts their physical therapy sessions and

development. Winders argued that there are typically "motor-driven" infants and "observers." Whichever the infant is will influence the manner in which they explore and develop GMS (Winders, 2014).

Winders additionally highlighted three general tips that parents should keep in mind when working with children on GMS. These tips include determining what motivates the child, setting the child up to succeed, and treating activities and practice as if it were a game (Winders, 2014). These tips can be easily transferred to the PE/APE setting and be effective when teaching students with DS skills like throwing, catching, rolling, and dribbling. Winders additionally published a book entitled, *Gross Motor Skills for Children with Down Syndrome*, which provides a comprehensive overview on learning in the area of GMS for children with DS.

Within the introduction of Winder's book is a section about the learning of GMS in individuals with DS. This section includes multiple strategies for effectively developing GMS. The basis for all skills acquisition come from a four step process: introducing the skills slowly and carefully, allowing the skill to become familiar with practice, encouraging the child to collaborate and participate with executing the skills, and building mastery of the skill and independence (Winders, 2014).

In addition to utilizing the four step process for developing GMS, Winders offered a variety of recommendations for supporting a child with DS along the way. For example, it is important to allow adequate time for response when teaching children with DS due to their delayed or slow reaction times. Additionally, be intentional and strategic when setting up the child's body and the equipment being used so that they are

successful. Finally, practice only as long as the child is performing at their best. The quality of time practiced will be more important than the quantity (Winders, 2014).

In part two of Winder's book, chapter 10 focuses on the skill of kicking a soccer ball. Included in the chapter are recommendations for setup, specific guidelines, and suggested activities to use, as well some of the tendencies children with DS have when learning how to kick a ball. Many of the guidelines Winder's mentions when working on kicking a ball can be transferred to teaching other object control skills. These include choosing a ball of the appropriate size and weight, practicing when the child is motivated, letting the child kick with the leg they choose, providing verbal, visual, and tactile cues, choosing the appropriate surface and space to practice in, and using the appropriate footwear when practicing. Almost all of these guidelines can be slightly altered to be relevant when teaching other object control skills as well.

While Winder's book was specific to DS, a book written by Winnick in 2011 covered a much broader range of intellectual and physical disabilities in relation to adapted PE and sport. Within the book, Fegan, one of many authors, briefly reviewed the causes and characteristics of DS, as well as implications for PE programming, assessment, and organizational methods.

According to Fegan (2011), there are over 80 clinical characteristics that are associated with DS. Many characteristics listed have a direct influence on GMD and the acquisition of object control skills including poor muscle tone, mild to moderate obesity, poor balance, perceptual difficulties, and poor vision and hearing loss. In regards to PE programming, Fegan suggests that exercises and activities that strengthen muscles around

the joints should be encouraged. Additionally, adapted equipment and teaching strategies aimed toward sensory impairments should be utilized.

Fegan also asserted the importance of assessment and stressed the use of alternative assessments that incorporate teacher-developed rubrics, analytic rating scales, and checklists for evaluating the progress of children with DS. The Brockport Physical Fitness Test (BPFT), the Ohio State University Scale of Intra-Gross Motor Assessment (OSU-SIGMA), and the Special Olympics coaching guides were included in her recommendations for appropriate assessments (Fegan, 2011).

Further content included specific organizational methods that have proven successful in aiding the learning of students with intellectual disabilities, including those with DS. Learning stations were just one example of a method Fegan recommended. Dividing the gymnasium or play area into smaller units allows students to learn or practice specific skills or tasks in their own space. Stations can be tailored to fit the needs of an individual student if necessary, making learning stations a valuable method to utilize when teaching individuals with DS (Fegan, 2011).

Weeks, Chua, and Elliott (2000), published a book which extensively covered the perceptual-motor behavior in DS. Content included the characteristics of perceptual-motor behavior associated with DS, motor development, learning, and adaptive change, and current research on perceptual-motor behavior in DS. The book offers insight into many dimensions of the development of an individual with DS. The content covering motor development, learning, and adaptive change is particularly relevant for teaching OCS with young children with DS.

Within the second part of the book in chapter 7, written by Almeida, Marconi, Tortoza, Ferriera, Gottlieb, and Corcos, a comparison of sensorimotor deficits and typical sensorimotor development in individuals with and without DS is included. Chapter 8, written by Dulaney and Tomporowski, covers attention and cognitive-skill execution. This chapter offers suggestions and practice tasks for improving attention and cognitive functioning in individuals with DS in regards to skill execution. Chapter 9, written by Latash, reviews motor coordination in DS and the roles of adaptive changes. This chapter covers the major coordination issues, movement patterns, practice effects, and possible routes to optimize special physical education programs for individuals with DS. Finally, chapter 10, written by Jobling and Mon-Williams, summarizes motor development in DS from a longitudinal perspective. Content covers intervention programs, effects of certain environments, and developmental progress into the school-age years.

All four chapters included significant information about the development and sensorimotor functioning of children with DS. The content focuses on understanding how children with DS are similar and different to children without DS in regards to sensorimotor behavior, the major coordination issues with this population, and the effects of various intervention programs.

Skallerup (2008) authored a guide for new parents of babies with DS. The guide covered everything from what DS is and the medical concerns in babies with DS, to legal rights and hurdles. Included in the guide was an entire chapter on the development of babies with DS. This chapter included information on individual differences in motor development within babies with DS, sports and active play, communication, speech, and language, cognition and play, memory, early intervention, and even learning activities for

at home (Skallerup, 2008). All of these components play a role in the development and acquisition of object control skills. Skallerup's parent guide offers an overview about what can be expected regarding the motor development of an infant with DS.

Summary and Conclusions

The development of object control skills in all children is just one component of GMD. Successfully developing object control skills in young children with DS does however involve understanding GMD and physical fitness levels, the effects of certain interventions, and the use effective teaching strategies. While research literature provides statistical evidence based on empirical data and effective intervention strategies, teaching literature offers practical recommendations and strategies to effectively teach young children with DS. Together, research and teaching literature can be utilized to maximize the learning of individuals with DS.

As a result of utilizing the most effective teaching strategies, young children with DS can develop adequate object control skills that will allow them to explore and broaden their participation in PA. Object control skills are important building blocks for future PA and should be developed early in childhood. For individuals with and without DS, participation in PA will lead to improvements in health, social interaction, and overall quality of life.

CHAPTER III

CRITICAL ANALYSIS

Introduction

Gross motor skills (GMS) are the building blocks for physical activity (PA) for children and assist with development of a healthy and active lifestyle. Gross motor skills provide children with opportunities to participate in PA for a lifetime and lead to benefits in physical and mental health, social interaction, and quality of life (Fiss et al., 2009). While obesity and secondary health concerns are common among individuals with Down syndrome (DS), the opportunity to prevent or take control of these issues is presented in the early stages of childhood. Increasing PA levels and preparing individuals with DS to participate in daily PA begins first and foremost with the development of GMS, specifically OCS. With adequate gross motor development in the early stages of childhood, individuals with DS can increase their PA levels and remain active throughout life (Stodden et al., 2008). Additionally, opportunities for participation in adapted sports leagues, recreational PA, social interaction, family PA, weight management programs, and physical enjoyment are made possible.

This chapter presents instructional strategies for teaching OCS to young children with DS, as well as strategies to limit and appropriately respond to challenging behaviors that can decrease PA time. Information presented will clarify each of these strategies as well as provide realistic examples and implications for teaching OCS to young children with DS. Additionally, this chapter describes a video resource which presents each of the teaching and behavior management strategies along with demonstrations and explanations related to young children with DS.

Instructional Strategies for Teaching Object Control Skills to Young Children with Down Syndrome

The following instructional strategies have been compiled based on related research on gross motor development and physical fitness of individuals with DS, as well as teaching literature on this topic. These strategies are recommended to maximize engagement and motivation, and for the acquisition and retention of OCS such as throwing, catching, rolling, and dribbling for young children with DS.

1. Allow extra time to complete tasks.

Since children with DS often have delayed or slow reaction times compared to children without DS, it is important to allow extra time for them to process and respond to verbal or visual prompts and instructions (Sacks & Buckley, 2003). Not waiting long enough, and interrupting learning, may cause the child to rely on the support of others instead of initiating the movement or task themselves. Without allowing extra time, the teacher may assume that the child is incapable or doesn't know how to perform the desired skill or task.

An example of allowing extra time to complete a task would be waiting a few additional seconds for a response from the student when checking for understanding, and not immediately telling the student the correct answer. Another example may be providing additional time after verbal and visual directions are given for a student to process and initiate a movement on their own, instead of responding negatively to their delay in answering or incorrect performance.

2. Provide adequate time for practice.

Providing adequate practice time is vital for skill acquisition to take place. Children with DS require many more repetitions of a skill before it becomes learned or mastered in comparison to typically developing children (Sacks & Buckley, 2003). This means that more time will have to be spent practicing skills to reach mastery. Communicating with the parents about their child's progress and providing suggestions for how to practice GMS at home will provide more repetitions and quicker learning for the student.

For example, within the general physical education setting, a class may be playing whiffle ball. The student you are teaching has been focusing on throwing with the proper form. An opportunity to provide them with more throwing repetitions may be when they are waiting in line to hit or when transitions are happening. Another opportunity for more repetitions may be when they are in the field playing defense at a position that may not be seeing too much action. Another example could be utilizing stations where a student can perform many repetitions at their own pace.

3. Utilize the task analysis approach when presenting and teaching motor skills.

The task analysis approach consists of breaking specific motor skills into fundamental components to pinpoint sources of performance difficulties or to facilitate specific instruction. Designing the appropriate movement experience so the child is successful is key. This method considers the movement and environmental factors that influence the performance of a task, such as the size of the ball, the length of the striking implement, or the predictability of the trajectory of the ball. Designing ways for the student to experience success during each specific component of the movement will

prepare them to combine all aspects to perform the full movement. The ultimate goal is for the student to perform the task under the most authentic circumstances. Modifying the task or goal, by structuring the environment to meet the needs and abilities of the learner is beneficial when teaching young children with DS (Block, 2007).

The following is an example of using the task analysis approach to present and teach the OCS of catching. Catching involves a preparation phase where the elbows are flexed and the hands are in front of the body, the arms extend in preparation for making contact with the ball, the ball is caught with the hands only, and the elbows bend to absorb force (Ulrich, 2000). Teaching a student to catch may initially begin by using a light scarf, dropped from above the head of the student, so that the child has a greater length of time to recognize the object, prepare their hands, extend the arms, and catch or grasp the scarf using only their hands. Successfully catching the scarf in this situation will help the child understand that catching involves their hands extending out toward an object and that they must bring their hands together to do so. The next step may be using a large beach ball or balloon that travels a little faster, but is large and slow enough for the child to continue to be successful. This task will require the child to see the ball approaching from the front and have their hands extend out towards the ball and bend the elbows back toward the body to successfully absorb the ball.

These two tasks illustrate the child practicing one catching component at a time. Ultimately, the task and the environment should be manipulated to require the child to focus on and perform specific components of a skill, eventually combining them and performing them as a whole.

4. Break down verbal and written instruction into as few steps as possible.

Verbal directions given to the child should be presented in a few simple steps. This will allow the child to more easily remember what they are being asked to do. Providing lengthy and wordy directions may confuse and make the child feel incapable of performing the movement (Winders, 2014). In addition, slang or words that have multiple meanings should be avoided since many children with DS are literal learners.

For example, when teaching a young child with DS (ages 4-5), verbal directions during a throwing activity should be kept simple and short. Instructional prompts may be, "get ball, stand on spot, point, step, throw at Spiderman, and get ball." These directions can be given one at a time, while the child performs each one, so they do not have to remember multiple steps. Another example could be, an elementary general physical education class is given directions on a whiteboard that read: 1. Find a partner, 2. Get 1 ball to use between the 2 of you, 3. Play catch using the overhand throw, and 4. When the whistle blows, put all equipment away and sit on the black line. For the student with DS, participating in the general physical education class, the directions should read something like: 1. Get partner, 2. Get ball, 3. Overhand throw, and 4. Clean up, sit on black line. The directions can be given one at a time to allow the child to focus on only one task at a time, along with pictures next to each direction to further promote understanding.

5. Modify the equipment and environment.

Modifying the equipment and environment may be one of the most important strategies for ensuring the success of learning OCS for students with DS. Equipment such as balls, bats and other striking implements, tees, goals/nets, and targets can be modified to increase the chances of success for the child. When the child is successful, they will be

more likely to sustain motivation and engagement, and ultimately learn the skill through practice (Harter, 1999). In addition to modifying equipment, the environment can be manipulated in many ways to help foster success and learning. If in a distracting or busy environment, you will want to instruct your student from a position so that they are facing the direction where there are the fewest distractions. If the child performs better outside, inside, on carpet, grass, or hard wood, or in certain lighting, these can all be manipulated to maximize their engagement. Based on the preferences or interests specific to the child, equipment of different textures, sizes, weights, and colors can be used to motivate and engage them.

Examples of these modifications are using a smaller and lighter basketball while dribbling, throwing with a ball that the child's hand can fit around, lowering a basketball hoop, using larger barrel and lighter baseball bats, using a striking implement that has a larger hitting surface and shorter handle, practicing catching with a large, light ball, and having the child throw at large targets from a short distance. Equipment can also be chosen based on the student's favorite colors, cartoon/TV characters, or preference for certain textures.

6. Utilize visual and tactile supports to aid in instruction.

While it is generally more difficult for children with DS to process verbal instructions, many are visual learners and utilizing visual and tactile supports to aid in instruction is paramount (Sacks & Buckley, 2003). Providing visual demonstrations of a skill can motivate the child to imitate what is seen. Additionally, if the student feels something, like speed or force (maybe by pressure on hand), they may be able to connect that to their performance as well. Tactile supports could include equipment of various

materials and sensory input. One example may be throwing a ball. If you want them to throw hard or soft you could press on their hand to communicate the degree of how hard or soft you want them to throw. A rubber ball with little bumps on it may also provide sensory stimulation that motivates the child to participate. Depending on the child's preference, visual demonstrations can be presented by the instructor in a picture, through a video of another person, or in a video of the actual student. Additional visual aids and supports such as videos, social stories, picture schedules, choice boards, and picture symbols can all be utilized to aid in instruction and participation.

Specific examples of visual supports include a picture schedule for a warm-up which has the student performing various locomotor skills illustrated by pictures of different animals, a video of the child playing catch with another student, picture symbols of the steps involved in throwing, and written directions with corresponding pictures next to each step.

7. Plan for success: Implement developmentally appropriate motor tasks.

Setting the child up for success is another important strategy to teaching OCS. Since children with DS, like all children, tend to stay motivated when having success in a task, and present avoidance behaviors when they are not, it is important to manipulate the equipment, the environment, and the task for success (Harter, 1999). If students are learning to throw a ball, they will not experience success if asked to throw a ball that is too big to be held in one hand, or from a distance that is much too far for their present level of ability. Instead, incorporating fun wall targets like Mickey Mouse or Spiderman at a close distance can increase motivation and performance. In addition, developmentally appropriate equipment and tasks should be utilized to maximize success.

This also means beginning with a task where they will succeed and progressively make the task more difficult as their confidence and skill increases. Appropriately making adjustments to the equipment or environment the child is performing in can make all the difference in maintaining engagement and keeping the child motivated.

For example, in an activity that requires to the child to throw a ball at a target on the wall as many times as they can in 30 seconds, it is important to set the environment up so that they can be successful. This means, having large motivating targets, using a small enough ball for them to fully grip, throwing from an appropriate distance, and providing the child with multiple balls to throw so they don't have to chase after a ball after each skill repitition. All factors should be set up for the child so that they experience success and have many opportunities to practice the skill. Once they succeed, the environment and task can be modified to make it more challenging for the child. Additional examples include using a ball that the child can fully grasp, utilizing striking implements that have large hitting surfaces and that are the appropriate weight, and choosing distances that are appropriate to each task.

8. Utilize peer interaction and mentors to foster maximum effort.

Similar to all children, those with DS are highly motivated when joined by a peer, sibling, or additional person to complete tasks or engage in PA (Barr & Shields, 2011). These individuals can provide skill feedback, model correct performance, and relay the importance of the skill to the child. When a child is participating in an activity with a nondisabled peer, they can see the importance of learning the skill more clearly. These individuals can serve as models to young children with DS. When the child sees that the peer they are with has learned a skill necessary to participate in an activity, it can

motivate them to learn that skill so that they can also participate. While the child may occasionally become frustrated or tired of hearing the same person try to correct or teach a skill, they may respond better to other individuals. Some ways to include nondisabled peers when teaching children with DS could be inviting a sibling to join, utilizing a peer mentor while in general PE, or simply having them choose a friend to work with in class.

9. Practice to a point where the child's performance begins to decline.

Practicing new OCS should end when the child's performance is no longer at their best. Once the child has hit the point where they are beginning to lose interest, or are not giving their full effort, it is time to move on to a new task or take a break (Winders, 2014). This is assuming the decline in skill performance is a result of fatigue or decrease in engagement, rather than the child's stubbornness or avoidance behaviors. Some signs that practice should end are when the child begins to appear tired, their performance and attention declines, they begin demonstrating avoidance behaviors, or start to fuss and complain. It is important for the child to associate the skill that is being learned with a happy and fulfilling feeling so that they continue to practice and improve. When they become frustrated, or lose interest in the skill they are learning, they will no longer have a desire to engage in practice to improve the skill and it may be more difficult to motivate them with the next task or next time you want to practice.

For example, your plan during a kicking activity may be to have the child perform a kick for ten repetitions. They begin to appear fatigued and their performance begins to decline after about 7 or 8 repetitions. At this point, it would be more beneficial to end the activity. Another example, during a throwing activity where the target is too far away, or the ball is too large for them to hold, they may become frustrated when not experiencing

success. Their negative experience in the throwing activity may transfer when they are asked to participate in a different throwing activity or when it comes time to practice throwing again. When the child hits this point, it may be time to either take a break, change the activity, or end the session.

10. Present the practice or instruction as a game.

Since motivation is an important factor in teaching children with DS, an effective strategy in maintaining motivation is treating the practice or instruction of that skill as a game. For young children (4-5 years old), motivate by challenging them to perform as "hard as they can," "as far as they can," or "for as long as they can." For children of this age, games should involve characters or scenarios that are engaging and fun, not competitive. Games could focus on cartoon/TV characters or timed situations. If an older child you are teaching has developed an understanding of points, winning, and goals, utilizing those can be a fun tactic to increase motivation. Introducing OCS in a way that allows the child to earn points, beat a score, or win something will motivate them to continue to participate and give their best effort.

For example, with an older child, create competition between the child and yourself by challenging them to complete more repetitions or perform for skill for a longer period of time. Maybe challenge the child to beat a score they received in the first round of an activity during a second round. Another way could be keeping personal records, stats or videos of the child and make it a game to improve how they have been performing including incentives for when they do improve.

In summary, when teaching OCS to young children with DS it is important to utilize effective teaching strategies to foster success and learning. Delays in gross motor

development, cognitive functioning, and the additional characteristics associated with DS affect when and how children develop OCS. Incorporating these ten teaching strategies can assist in maximizing learning and help children develop competency in these skills. Acquiring these skills at a young age is paramount for them to pursue future PA and maintain a healthy, active lifestyle (Stodden et al., 2008).

Behavior Management Strategies for the Physical Education Environment

This section presents behavior management strategies to assist with preventing and managing common behavior issues in young children with DS when teaching OCS. When teaching, it is beneficial to be proactive with behavior management, rather than reactive. Utilizing these strategies may help minimize the time spent addressing unwanted behavior, and maximize time for instruction and practice.

1. Provide structure and establish routines.

Children with DS commonly respond and perform better when in a structured and familiar environment. Having information about what will happen at the beginning, middle, and end of each session allows the child to feel comfortable and in control. A structured environment should similarly be used when teaching new OCS (Winders, 2014). This does not necessarily mean the activities are exactly the same each time, because that could be boring and the child will most likely lose interest. Creativity and variety should be a focus so the child is always engaged, but structure and routine can provide a format for the flow of the session. Having a set routine and introducing components of a skill in a strategic manner, can help promote appropriate behaviors.

An established routine should include a system for alerting the child when it is time to put equipment away and/or transition. A method for reminding the children when

clean-up will be will give them an opportunity to prepare to stop whatever they are doing. Letting them know when transitions or closures are approaching can help avoid undesired behaviors if they do not want to stop. A cue can also alert a child that a stopping point is near if they do not want to keep going or are losing interest.

2. Utilize picture schedules and visual reminders.

Many students with disabilities benefit from the use of visual aids and children with DS are no exception (Block, 2007). Whether it is picture schedules, cue cards, video demonstrations, or visual representations of time or scores, many children are able to better process what is being asked of them in an alternate way. Visual materials can present information to children in a way they more clearly understand. While it takes longer for children with DS to process verbal directions, it is beneficial to present new information in ways where the child can focus on performing the skill rather than the cognitive aspect of the directions.

One way to effectively utilize visual supports is to supplement verbal instructions with them. Incorporating pictures of the various components of a skill, or the cues associated with the skill helps to convey important information to the child in an alternative way that is stimulating and engaging.

Social stories are another example of a visual aid that may prevent unwanted behaviors. A social story depicts appropriate behaviors or a sequence of an activity in the form of a sequenced picture story. Once a child sees the social story, they can later relate it to the real scenario. An example of using a social story with a young child with DS is when they are first beginning formal physical education in early childhood education, preschool, or kindergarten. The social story can illustrate, using pictures and videos, what

the environment will look like, what equipment the child may use, who will be there, and what their responsibility will be in the class. The social story will not ensure that the child knows or remembers everything, however, it will introduce information so they are more familiar when entering that environment. These social stories can be repeated if needed.

Visual aids can additionally reinforce routines and structure by illustrating schedules in a way that is interactive and lets the child be ready for what's next, making transitions and expectations clear. When a child can comprehend or have more clear expectations about the activities they are participating in, they will be less likely to present undesired behaviors, allowing for maximum learning to take place.

3. Stay positive and reinforce for specific tasks – Encourage improvements and efforts more than exact or perfect performance and ability.

Motivation is one of the most important components in fostering learning and appropriate behaviors for children with DS, especially for those tasks requiring sustained physical participation. They thrive in environments that they are excited to be in, and participate to their fullest when encouraged and experience success. It is important to encourage improvements and efforts rather than performance and ability. If the child feels accomplished and motivated while learning a skill, competency and ability will improve with time (Harter, 1999). It is vital to provide the child with an experience they enjoy, otherwise their desire to continue participating in activities where the skill is a prerequisite will likely decrease (Harter, 1999). Motivation techniques can include cheering, high fives, clapping, rewards, stickers, teacher involvement/excitement, peer mentors, and things that makes the child happy and willing to participate. Finding out

from parents, teachers, and others what the child is interested in and enjoys can help make motivation that much easier.

For example, find out the child's favorite color and use bats and balls of that color, or find a cartoon character they really like, and incorporate wall targets of that character. Additional motivators can include sticker charts, structured free time, music, iPad use as a reward, and time spent doing an activity they enjoy as a result of being compliant. Simple motivational tools can be found by talking with the child and their parents. If the child you are teaching is happy and excited about the activity being practiced, learning will more likely take place.

4. Use consequences that strengthen the behavior they follow.

Similar to motivation, consequences that strengthen a desired behavior help to foster learning. These consequences are not necessarily "bad," and are known as reinforcers. Positive reinforcers can be used to provide the child with some type of validation that what they just did was good, or correct. Negative reinforcers can also be used to communicate to the child that what they just did was not good, or not correct. It is, however, more beneficial to reinforce positive behaviors rather than providing negative reinforcement for challenging or incorrect behaviors in children with DS (Winders, 2014). Providing positive reinforcers such as stickers, high fives, or other tangible objects for desired or correct performances and behaviors, will help encourage the child to perform correctly, or practice a newly learned skill while staying engaged.

For example, if the child is participating in a throwing activity where the goal is to consistently step with opposition, positive reinforcers they might receive after each

successful throw could include: a high five and verbal praise, a sticker added to a sticker chart, or a tally added on their checklist for the activity.

5. Use "if, then" statements.

"If… then…" statements encompass pairing a desired behavior with a not so desired activity. If the child you're working with has no desire to perform a certain task related to a skill, try pairing it with an activity they really enjoy. Providing the child with the opportunity to do something they enjoy upon the completion of a task you would like them to perform, can motivate them to do the desired task.

For example, "**If** you catch the ball 5 times in a row, using your alligator arms, **then** we can sing ring-around-the-rosy one time." Another example could be, "**If** you throw the ball overhand 5 times at Spongebob (wall target), **then** you can cross 1 picture of him out on our picture sheet." Or, "**If** you roll the ball underhand using your tick-tock arm motion 6 times in a row, **then** you can listen to the music on the iPad."

6. Limit distractions.

When teaching children with DS new OCS, or anything new, it is important to limit visual and auditory distractions within the environment. In order to maintain the child's attention, extra equipment and individuals in the learning space should be limited. This includes controlling noise levels and being aware of various noise distractions in the environment. This also means choosing an environment to practice in that has few individuals, is free of distracting noises, and is appropriate for the skill being practiced.

For example, in the general physical education setting there are often many students in class. If practicing catching while doing station work, position the child so he/she is facing the wall while the instructor, paraprofessional, or peer is facing the rest

of the classmates and equipment. Just being able to see the other students moving and practicing can be distracting enough to pull the child's attention away from the desired task. Another example may simply be closing the door in the room where you are teaching to cut down on excess noise. Adjusting lights to find a setting that is the most comfortable for the child could help as well. Positioning the student appropriately and controlling the environment as much as possible when practicing OCS will foster engagement and learning.

While some children with DS have tendencies to be stubborn, oppositional, or present behaviors that make it difficult to manage and structure the learning environment, it is possible to become proactive in addressing these concerns. When utilized, these behavior management strategies can assist in proactively minimizing unwanted behaviors as well as effectively reacting to them when they do occur.

Description of Project Video

The video resource that accompanies this manual illustrates effective strategies for teaching OCS to young children with DS. Each strategy is presented and demonstrated either with additional examples and explanations, or within an actual physical activity learning environment with a young child with DS. Suggestions for managing and addressing behavior issues that commonly arise when teaching children with DS are also in the video. The behavior strategies enable the teacher to be proactive, rather than reactive for behavior management.

Additionally, the video includes interviews with professionals in the field, including adapted physical education teachers and physical therapists. They address the

importance of the development of OCS in young children with DS, as well as how the characteristics associated with the condition affect these skills.

Resources on Object Control Skill Development for Children with Down Syndrome

Books

1. Winders, P. (2014). Gross motor skills for children with Down syndrome: A guide for parents and professionals (2nd ed.). Bethesda, MD: Woodbine House.

This resource includes information regarding gross motor development for children with DS beginning in infancy and progressing through each gross motor milestone. The book includes helpful strategies for teaching GMS, including OCS, as well as the implications of the different learning styles, characteristics, and medical concerns associated with DS.

2. Skallerup, S. (2008). Babies with Down syndrome: A new parents' guide (3rd ed.). Bethesda, MN: Woodbine House.

This book includes important information pertaining to medical care, daily care, family life, development, early intervention, learning, legal rights, and much more for new parents of children with DS. Specific chapters including medical concerns and babies with DS and the development of babies with DS, include meaningful information that can assist physical educators, paraprofessionals, parents, or any individuals working with a child with DS in the first five years of their life in regards to appropriate instruction of motor development.

3. Hanson, M. (1987). Teaching the infant with Down syndrome: A guide for parents and professionals (2nd ed.). Austin, TX: Pro-ed.

This book provides information on teaching activities for infants, resources for parents, and medical facts about DS. Content includes developmental milestones for children with DS as well as teaching activities specific to gross motor development,

cognitive functioning, communication, and social interaction. The book includes additional resources for parents and professionals on child development.

4. Lane, D., & Stratford, B. (1985). Current approaches to Down's syndrome. NY: Greenwood Press.

This textbook includes comprehensive chapters on motor development and PA programming for individuals with DS. The chapter on motor skill development includes helpful information regarding the neurodevelopmental foundations of motor ability, the acquisition of basic skills, early intervention, and the processes underlying motor control. Content in the PA programming chapter includes physical performance of youngsters with DS, assessment for physical activity, programming, and individual instruction.

5. Weeks, D., Chua, R., & Elliott, D. (2000). Perceptual-motor behavior in Down syndrome. Champaign, IL: Human Kinetics.

This book includes content on the characteristics of perceptual-motor behavior associated with DS, motor development, learning, adaptive change, and current research strategies in the investigation of perceptual-motor behavior in DS. The book offers insight into many dimensions of the development of an individual with DS. The content covering motor development, learning, and adaptive change is particularly relevant for parents and professionals seeking to better understand motor development.

6. Baker, J. (2008). No more meltdowns: Positive strategies for managing and preventing out-of-control behavior. Arlington, TX: Future Horizons.

This book includes information for understanding, preventing, and managing behavior, and meltdowns specifically, when rewards and punishment are not enough for children. The book additionally offers suggestions and strategies for understanding why behavior problems occur, creating prevention plans, and de-escalating behavior when

children have meltdowns. This book can be beneficial for preventing and managing undesired behavior within the physical education setting.

Journal Articles

1. Jobling, A. (1994). Physical education for the person with Down syndrome: More than playing games? *Down Syndrome Research and Practice, 2(1)*, 31-35.

This article addresses five key elements that are believed to reflect quality physical education for individuals with DS. Jobling explains how children with DS are at risk for a wide range of physical problems and difficulties that may interfere with their attainment of gross motor milestones. She stresses the importance of providing quality physical education that prepares individuals with DS with the correct movement patterns and skills to continue their participation in PA through these five key elements.

2. Sacks, B., & Buckley, S. (2003). What do we know about the movement abilities of children with Down syndrome? *Down Syndrome News and Update*, 2(4), 131-141.

This article presents information on the development of motor skills in typically developing children, and follows with information on the development of motor skills in children with DS. The article presents information on the affects of interventions as well as implications for effective intervention. In summary, the article highlights that children with DS are substantially delayed rather than different, and provide suggestions for minimizing that gap.

3. Harter, S. (1999). *The construction of the self: A developmental perspective.* New York: Guilford Press.

The author has published extensive research and literature on the development of self-concept, self-esteem, and motivation in children. In this resource, she expands on how this development influences the likelihood of children, adolescents, and adults remaining physically active. She explains that when children have higher perceived and

actual motor skill competence, they will be more likely to continue to participate in PA. The resource provides a strong rationale for why young children should be working towards developing competency in motor skills so as their self-esteem and self-concept are strengthened and they remain physically active.

Organization Websites

1. National Down Syndrome Society - www.ndss.org

The National Down Syndrome Society website is a comprehensive resource for parents, professionals, advocates, donors, and individuals with DS. The site includes an overview of DS, ways to donate, volunteer, sponsor, and hold events, stories of individuals with DS, as well as a way to create your own story, information about advocacy, and resources that span from publications to helpful information for caring for your family.

2. National Association for Down Syndrome – www.nads.org

The National Association for Down Syndrome is the earliest organization in the country serving individuals with DS and their families. The services they offer include parent support, resource referrals, public awareness, self-advocacy programs, retreats, conferences and seminars, and public speakers for schools, medical professionals, and community organization. The website includes information on these services as well as additional information, broken down by age, on individuals with DS.

3. Down Syndrome Education International – www.dseinternational.org

Down Syndrome Education International is an international charity working to raise the levels of educational achievement for children with DS. Their site includes extensive resources for teachers, research that explores how children with DS develop

and learn as well as effective teaching approaches and therapies, and information on international news and events surrounding DS.

Videos

1. Kids with Down Syndrome: Staying Healthy and Making Friends http://blueberryshoes.com/

This video resource is a comprehensive guide to health and social challenges for children with DS through the adolescent years. Components of health covered include potty training, nutrition, hearing, sleep, exercise, and therapy. In the second major section of the video, there are suggestions for how to take the first steps to independence, building conversational skills, friendship, behavior, and an overall successful life for individuals with DS.

2. Down Syndrome: The First 18 Months http://blueberryshoes.com/

This video resource was created to assist new parents of children with DS through the first 18 months of their child's life. The video shines a positive light on what parents can expect from their new infant with DS. Content includes advice from knowledgeable experts on healthcare for newborns, breastfeeding, working with professionals, considerations before surgery, nutrition, therapies, signing and language, physical therapy, motor development within the first 18 months, and much more.

Recommendations for Future Research

Future research is needed regarding the following topics in order to develop a more comprehensive understanding of OCS development and effective interventions for children with DS.

1. What do parents believe are the most beneficial OCS for their children to learn?

2. How important do parents feel the development of OCS are for their child with DS?

3. What strategies do general physical education teachers use when including children with DS in their instruction of OCS?

4. What strategies do adapted physical education teachers feel are most beneficial to use when teaching OCS young children with DS?

5. Is there a correlation between weight and skill level in performing OCS in adults with DS?

6. What percentage of adults with DS are involved in regular PA that involves the use of OCS?

7. What level of competency in OCS is necessary for individuals with DS to remain involved in PA that requires those skills?

8. What are the most effective strategies for teaching OCS to young children with DS?

9. Do young children with DS develop OCS in the same sequence as their nondisabled peers?

Recommendations for Future Critical Analysis Projects

Additional critical analysis projects in the following areas would assist in better understanding, planning for, and teaching individuals with DS to remain involved in PA for a lifetime.

1. A manual highlighting methods that will help eliminate barriers to PAfor children and adults with DS.

2. The creation of a manual for developing OCS in children with DS that outlines the sequence, activities, and teaching strategies.

3. A critical analysis project of the most effective interventions and teaching strategies for teaching aquatic skills to young children with DS.

4. A manual for paraprofessionals that includes strategies for working with children with DS in the general and adapted physical education settings.

5. A video resource for parents and teachers on effective teaching strategies that can be used to teach aquatic skills to children with DS.

6. A critical analysis project of how children with DS develop OCS and in what sequence, including resources and recommendations for teaching.

7. A critical analysis project about which lifelong activities individuals with DS tend to stay involved in, and which GMS are necessary for their participation in that activity.

8. A critical analysis project of how family and friends impact the PA levels of an individual with DS.

9. A manual that outlines the most effective behavior management strategies to use when working with young children with DS.

10. A critical analysis project of what community activity programs individuals with DS tend to stay involved in, and a compilation of recommended resources and programs for adults with disabilities.

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APPENDIX

Project Video Script

INSTRUCTIONAL STRATEGIES FOR TEACHING OBJECT CONTROL SKILLS TO YOUNG CHILDREN WITH DOWN SYNDROME

Time	Content and Script	Video
0:00-0:15 (15 sec) 0:15-0:25 (10 sec) 0:25-0:35 (10 sec) 0:35-0:50 (15 sec)		Video begins by showing scenes of young children with DS performing object control skills in their actual environment.
0:50-2:25 (1 min 35 sec)	Hi, my name is Alex Levine. I'm a graduate student at the University of Wisconsin-La Crosse in the adapted physical education teacher preparation program. The purpose of this video is to demonstrate effective techniques for teaching object control skills, like throwing or catching, to young children with Down syndrome. The video will also cover behavior management techniques to help become proactive rather than reactive when dealing with behavior issues that are fairly common in this population. The target audiences for this video includes general and adapted physical education teachers, parents, paraprofessionals, physical therapists, occupational therapists, and any person seeking to better understand how to teach object control skills to children with Down syndrome.	Video of me on screen in a professional/quiet setting

	Gross motor development, including object control skills like kicking, striking with an implement, catching, throwing, dribbling, and rolling, are vital for children to acquire during the early years of life. Developing competency in these skills provides children with the confidence and ability to apply them when playing games with friends, outside at recess, and on youth sports teams. As participation in physical activity increases, socialization with other children fosters the development of basic interaction skills that are necessary throughout life. Gross motor skills are the building blocks for additional physical activity and lead to the maintenance of a healthy and active lifestyle. They provide children with skills that open doors to opportunities to participate in physical activity for a lifetime and lead to benefits in physical and mental health, social interaction, and quality of life.	Video of me on screen in a professional/quiet setting
2:25-3:40 (1 min 15 sec)	While gross motor development is vital for all children, research along with trends in this population have shown that it may be even more paramount for individuals with Down syndrome. Barr and Shields explained that 58% of children with Down syndrome do not meet the recommended 60 minutes of moderate-vigorous physical activity every day. Dodd and his colleagues stated that, many Adults with Down syndrome do not participate in the recommended levels of physical activity per week and are typically sedentary. While obesity and secondary health concerns are common among this population, the opportunity to take control of these issues is presented in the early stages of life. Increasing physical activity levels and preparing individuals with Down syndrome to meet these recommendations begins first and foremost with the	Video goes to a blank screen with key words showing up as I narrate. *58% **do not** meet physical activity recommendations* ***Sedentary...** do not participate in recommended*

	development of gross motor skills, specifically object control skills. With adequate gross motor development in the early stages of life, individuals with Down syndrome can hopefully increase their physical activity level and be active throughout life. Additionally, opportunities for participation in adapted sports leagues, recreational physical activity, social interaction, family quality time, weight management, and physical enjoyment can be made possible.	*amounts physical activity.* *Development of gross motor skills* *Throwing* *Catching* *Kicking* *Dribbling* *Rolling* (Entrance and exit of the key points will be times appropriately)
3:40-5:10 (1 min 30 sec)	Now that we more clearly understand the importance of gross motor development in children with Down syndrome, specifically object control skills, let us get a better idea of Down syndrome. Down syndrome is a genetic condition that occurs in 1 of every 691 births, making it the most frequently occurring chromosomal abnormality. The most common form of Down syndrome is Trisomy 21, which occurs when there are three instead of two number 21 chromosomes in every cell of the body. That extra genetic material alters the course of development and causes the characteristics associated with DS. The common characteristics in individuals with Down syndrome like, joint laxity, hypotonia, delayed speech, vision and hearing issues, and poor reflexes have both health and cognitive implications that play a role in the acquisition of gross motor skills., Payne and his colleagues suggested that children with Down syndrome have the ability to achieve the same motor levels as typically	Video of me on screen in a professional/quiet setting Video will go to screen, me talking on one half, the other half with key facts about DS scrolling up. *-Genetic condition* *-1 of every 691 births* *-Trisomy 21* *-3 instead of 2 number 21 -chromosomes* *(video picture of an illustration of this with scroll through)*

	developing children when the appropriate intervention is provided. Keeping in mind the implications of certain characteristics often accompanied by this condition and utilizing strategies for effective instruction, children with Down syndrome can develop functional gross motor skills that result in meaningful participation in physical activity. This will ultimately equip them with a set of fundamental gross motor skills for physical activity, recreation, leisure, and enjoyment later in life.	Video of me on screen in a professional/quiet setting
5:10-5:25 (15 sec)	Listen to what some professionals in the field, including adapted physical education teachers and physical therapists, had to say about what they find to be the most prevalent difficulties and challenges when teaching object control skills to children with DS and the importance of these skills to physical activity and health.	Video still of me, however the transition will be moving to be in different room, one where the interviews took place.
5:25-5:35 (10 sec)	*How do hypotonia, and ligamentous laxity affect the manner in which children with Down syndrome develop object control skills? (Barb Johnson)* Hypotonia causes decreased resistance or stiffness of the muscles. The degree of hypotonia can be mild, moderate, or severe, which causes the effect on the child's gross motor development to vary. If hypotonia is more severe in the child's legs, then it will be more difficult for them to generate power perform gross motor skills that utilize the legs. The same is true for the arms or abdomen. Hypotonia	Each question will be answered by Matt Meyers, Jana Yashinsky, and a PT (Either from Hamilton, or Barb Johnson) Video of dark screen and question written

5:35-6:25 (50 sec)	will have influence in gross motor development as the child begins to perform skill that require coordination. Ligamentous laxity causes increased flexibility in the joints. Similar to hypotonia, the degree of that flexibility will vary as well as which joints are most affected. Decreased stability in the joints can make it difficult to perform certain object control skills. In addition, cognitive impairments associated with Down syndrome impact the ability of children to process, understand, and also learn object control skills. While the degree of cognitive impairment is different for each individual, it is usually going to impact the ability to learn. Strategies that increase practice time, allow for success, and convey information appropriately are going to be essential when teaching object control skills. Both hypotonia and ligamentous laxity can affect the way the child will learn gross motor skills, and cognitive impairments will affect the way they learn motor skills; however with repetition and proper instruction, their muscles can be strengthened, and their laxity can be maintained.	in white lettering as I narrate it.
6:25-6:35 (10 sec)	*What are the most common object control skills that are delayed in development among children Down syndrome? How do these delays pose challenges when teaching them the skills?*	Video of dark screen and question written in white lettering as I narrate it.
6:35-7:05 (30 sec)	"Some of the most common delays that I see in children with Down syndrome stem from the lack or delay of coordination, balance, and timing. These delays tend to cause the most issues when a child is learning object control skills like kicking, dribbling, striking, and catching. Kicking first and foremost requires enough balance to stand on only one foot and control the other enough to make	

	contact with a ball. Dribbling, striking, and catching all require enough coordination to manipulate an object in addition to their body and the timing to allow for the correct execution of the skill.	
7:05-7:15 (10 sec)	*What are the most common behavioral challenges you face when teaching object control skills to children with Down syndrome? What are some common techniques you use to keep them on task?*	Video of dark screen and question written in white lettering as I narrate it.
7:15-7:50 (35 sec)	Common behavioral challenges I've seen when working with children with Down syndrome arise from their frustration of not being able to perform a task/skill or from a lack of motivation to perform the task. When they feel they are not being successful in an activity, they engage in various avoidance behaviors to try and get out of, or end that activity. Avoidance behaviors I commonly run into are stubbornness, refusal to pay attention, underperformance, crying or fussing, and attempts to divert my attention to something else by maybe smiling or dancing. Some strategies I use to help manage these behaviors include keeping a structured environment and routine, providing visual aids that the child can interact with, and small rewards, either tangible or some activity the child really enjoys doing, as a form of motivation.	
	What are the long-term impacts of these motor development delays on physical activity participation including sport?	Video of dark screen and question written in white lettering as I narrate it.
	The long term impacts on physical activity participation as a result of motor development delays are significant as individuals with Down syndrome get older. If the delays in	

	motor development and the foundation of sport skills are not addressed during childhood, individuals will likely never will develop the skills they need to participate in recreation and leisure physical activity as an adult. This can result in feelings of incapability and low self confidence for performing correctly and can lead to them not wanting to be involved in physical activity. Physical inactivity, may increase their chances of becoming obese, having a sedentary lifestyle, developing secondary health issues, and experiencing emotional stress. All which lead to a decreased quality of life. *What suggestions do you have for teaching object control skills to young children with DS?* When teaching object control skills to young children with DS, I think it's important to make it an activity that they enjoy doing, while still working on the components of the skill you want them to improve with. I think another key is repetition. Children with DS require more repetitions of a skills for it to become learned, and second nature. You have to create those opportunities for them to practice the specific skill.	Video of dark screen and question written in white lettering as I narrate it.
7:50-8:15 (25 sec)	*In your opinion, what are the most important benefits to developing object control skills for young children with DS?* It allows equips them with the confidence and ability to participate in physical activity with their peers. When they can participate with their peers, they are more likely to enjoy physical activity and continue to be involved in it throughout their life. When they have the skill require to participate in an activity, they feel more confident and	Video of dark screen and question written in white lettering as I narrate it.
8:15-9:00 (45 sec)		

	willing to take part. That is one of the barriers for many individuals with DS I think.	
	What are the long-term impacts of these motor development delays on physical activity participation including sport? The long term impacts on physical activity participation as a result of motor development delays are significant as individuals with Down syndrome get older. If the delays in motor development are not addressed and an individual does not acquire the skills that serve as the foundation for other specialized skills in physical activity, they likely never will. This can result in them lacking correct motor patterns necessary to participate in many activities. In addition, feeling incapable of performing correctly can lead to them not wanting to be involved in physical activity because they are not confident in doing so. From a lack of physical activity, they may increase their chances of becoming obese, maintain a mostly sedentary lifestyle, develop secondary health issues, experience emotional stress, and overall a lead a poor quality of life.	Video of dark screen and question written in white lettering as I narrate it.
9:00-9:15 (15 sec)	Now that we have heard what some of the professionals in the field have to say about the implications of certain health issues, motor delays, and behavioral issues in children with Down syndrome, let's take a look at how we can effectively address them when teaching object control skills. Research and teaching literature on the development of gross motor skills in children with Down syndrome, suggests certain instructional strategies can help foster learning by carefully planning and differentiating instruction for children with Down syndrome.	Back to video of me talking in a professional/quiet setting

	1. Allow extra time to complete tasks 2. Provide adequate time for practice. 3. Utilize the ecological task analysis method of teaching 4. Break down instruction into as few steps as possible 5. Modify the equipment and environment 6. Utilize visual and tactile supports to aid in the instruction of the skill. 7. Set the child up for success by implementing developmentally appropriate motor tasks. 8. Utilize peer interaction and mentors to foster maximum effort. 9. Practice to a point where the child's performance begins to decline or lose interest/keeping instruction varied. 10. Treat the practice or instruction as a game.	Each strategy will appear on a blank screen one by one as I narrate them.
	"The following are examples of how these instructional strategies might be implemented in general or adapted physical education working one-on-one or in a group setting with a child with Down syndrome, and how to ensure effectiveness when using them.	Blank screen as I narrate to lead into each specific strategy
9:15-9:35 (20 sec) *9:35-10:25* *(~50 sec?)*	1. Since children with Down syndrome often have delayed or slow reaction times, it is important to allow extra time for the child to respond to verbal or visual prompts and instructions. Not waiting long enough, and stepping in, may cause the child to learn to rely on your support instead of initiating a movement or task themselves. **Video**	<u>Blank screen, 1st strategy appears</u> Video of me talking in the gymnasium. **Video** (Eliza maybe?)- Myself presenting a visual sequence (separate cut out pieces) of how to throw a ball will be shown to a child and they are to put it in

10:25- 10:35 (10 sec)	Without allowing extra time, the person teaching may jump to the conclusion that the child is incapable or doesn't know how to perform the desired skill or target.	order of how they think it should be done. Allowing substantial time for them to complete it. Back to video of me talking in the gymnasium
10:35- 10:50 (15 sec) *10:50-* *11:50* *(~1 min?)* 11:50- 12:05 (15 sec)	2. Providing adequate practice time is vital for skill acquisition to actually take place. Children with Down syndrome require many more repetitions of a skill before it becomes learned in comparison to typically developing children. **Video** This may mean that more time will have to be spent on a skill before moving on to the next one. Setting the student up so that they can practice at home is another very helpful strategy. Sharing with the parents their child's progress and giving them suggestions on how to practice the skill at home will allow for more repetitions and quicker learning.	<u>Blank screen, 2nd strategy appear</u> Video of me talking in the gymnasium <u>Blank screen, 3rd strategy appears</u>
12:05- 12:15 (10 sec)	3. The task analysis approach consists of breaking specific activities into fundamental components to pinpoint sources of performance difficulties or to facilitate specific instruction. Allowing the child to choose their own movement solution based on the requirements of the task to perform the skill will allow them to find out what works best; this is the ecological task analysis approach. It is important to structure the task so that the most effective movement solution is the one that you want the child to	Video of me talking in the gymnasium **Video** This clip demonstrates

	learn, or improve on. Giving the child choices in the environment they perform in, like equipment, and movement they choose to use, increases intrinsic motivation, and ultimately engagement in the activity. Modifying the task, or goal, by structuring the physical and social environment to meet the needs of the learner and providing choices is beneficial when teaching young children with Down syndrome.	providing a task that allows the student to make choices on what movements they will perform to complete the task. Telling Eliza to "hit the target with bells on it as hard as she can so it makes a
12:15-13:00 (~45 sec?)	**Video** Allowing the child to make a decision as to which ball they want to throw, what target they want to throw it at, and from how far they want to throw it, allows them to makes	really loud noise," motivates her to throw really hard, and ultimately step when she throws, which is my over-arching objective for the task.
13:00-13:15 (15 sec)	choices as to how to complete the task they're given. Determining what your ultimate goal is for the child, then providing choices for ways in which they can complete a task, and allowing them to feel successful and correct performances on their own terms is helpful in teaching object control skills.	Video of me talking/summarizing again in the gymnasium <u>Blank screen, 4th strategy appears</u>
13:15-14:00 (45 sec)	4. Directions given to the child should be presented in a few, simple steps. This will allow the child to more easily remember what they are being asked to do.	Video of myself next to a baseball tee in the gymnasium
14:00-15:00 (~1 min?)	**Video** Providing lengthy and wordy directions will only confuse and make the child feel incapable of performing the	**Video** (Gretchen?) – Myself telling the child to step, swing, follow through, and get new ball, 3 times
15:00-15:10	movement. In addition, slang, or words that have multiple	in a row. Then video

(10 sec)	meanings should be avoided, since many children with Down syndrome are very literal learners.	of them doing all 3 trials. Back to video of me talking/summarizing by the tee Blank screen, 5th strategy appears
15:10-15:40 (30 sec)	5. Modifying the equipment and environment may be one of the most important strategies for ensuring the success of learning object control skills. Equipment such as balls, bats, tees, goals/nets, and targets can be modified to increase the chances of success the child experiences. When the child is successful, they will be more likely to sustain engagement and ultimately learn the skill. In addition to modifying equipment, the environment can be manipulated in many ways to help foster learning. If in a distracting or busy environment, you will want to instruct your student from a position so that they are facing the direction where there is the least going on. If the child performs better outside, inside, on carpet, grass, or hard wood, in certain lighting, these can all be manipulated to maximize their engagement.	Video of myself talking in the APE equipment room **Video** – In the gymnasium with a table behind me showing some of the different equipment that can be used. Different size and textured balls, different bats, etc.
15:40-16:25 (~45 sec?)	**Video** Based on the preferences or interests specific to the child,	
16:25-16:35 (10 sec)	equipment of different textures, sizes, weights, and colors can be used to motivate and accommodate them.	Back to video of myself talking in the equipment room Blank screen, 6th strategy appears

16:35- 17:20 (45 sec)	6. While it is generally more difficult for children with Down syndrome to process verbal instructions, many are visual learners and utilizing visual and tactile supports to aid in instruction is paramount. Providing visual demonstration of a skill can motivate the child to imitate what they have just seen. Additionally, if the student feels something, they will likely imitate it as well. An example of this may be throwing a ball. If you want them to throw hard or soft so you press on maybe their hand to communicate the degree of how hard or soft you want them to throw.	Video of me talking in a gymnasium with visual aids hung up in the background. **Video** (Mara?)– Present instructions for dribbling to the child using pictures of a person's hand point to the pads of their fingers, and a picture of a person dribbling at waist high. Then take the child's hand and push our finger pads together (like a jellyfish) to have them feel what it should be like. Then give a visual demonstration of myself dribbling and then saying "okay, your turn." Back to video of me talking in front of the visual aids <u>Blank screen, 7th strategy appears</u>
17:20- *18:20* *(~1 min?)*	**Video**	
18:20- 18:30 (10 sec)	Depending on the child's preference, visual demonstrations can be presented by the instructor, in a picture, in a video of another person, or in a video of the student themselves.	
18:30- 18:50 (20 sec)	7. Setting up the child for success is another important strategy to teaching object control skills. Since children with Down syndrome tend to stay motivated when excelling at a task, and present avoidance behaviors when they are not, it is important to manipulate the equipment, the environment, and the task so that they can be	Video of me talking in the gymnasium

	successful. If a student is learning to throw a ball, they will not experience success if asked to throw a ball that is too big to be held in one hand, or a distance that is much too far. Instead, incorporating fun wall targets like Mickey Mouse or Spiderman can increase motivation and performance. In addition, developmentally appropriate equipment and tasks should be utilized to maximize success. This also means beginning with a task where they will succeed and progressively making the task more difficult as their confidence and skill increases.	**Video** – The child will be asked to throw as many times as they can at a target of their choice in 30 seconds to a large square-taped target on the wall. At first, have them start too far back and with a ball that is too big, and once they miss, move them forward and give them a different ball so they are successful. Each time they hit it, they get 1 block. At the end of the minute, could up how many blocks they have.
18:50-20:30 (~30 sec?)	**Video**	
20:30-20:50 (20 sec)	Appropriately making adjustments to the equipment or environment the child is performing in can make all the difference in maintaining engagement and keeping the child motivated.	Back to video of me talking in the gymnasium with the equipment I changed. <u>Blank screen, 8th strategy appears</u>
20:50-20:30 (40 sec)	8. Similar to most individuals, children with Down syndrome are highly motivated when joined by a peer, sibling, or additional person to complete tasks or engage in physical activity. These individuals can correct skill execution, model correct performance, and relay the importance of the skill to the child.	Video of me talking in in gymnasium **Video** (Mara) - Video of Mara working with her little sister and myself playing a

20:30- 20:45 (15 sec)	**Video** When a child is participating in an activity with a nondisabled peer, they can see the importance of learning the skill more clearly. They see that others have learned a skill that allows them to participate in a certain activity, and can motivate them to learn that skills so they can participate also . While the child may occasionally become frustrated or tired of hearing the same person try to correct or teach a skill, they may respond better to other individuals. --- 9. Practicing new object control skills should end when the child's performance is no longer at their best. Once the child has hit the point where they are beginning to lose interest, or are not giving their full effort, it is time to move on to a new task or take a break. Some signs that practice should end are when they appear tired, start performing worse, demonstrate avoidance behaviors, or start to fuss and complain. It is important for the child to associate the skill that is being learned with a happy and fulfilling feeling so that they continue to practice and improve. When they become frustrated, or lose interest in the skill they are learning, they will no longer have a desire to engage in practice to improve the skill. --- 10. Since motivation is such an important factor in teaching children with Down syndrome, an effective strategy in maintaining motivation is treating the practice or instruction of that skill as a game. If the child you're working with has developed an understanding of points,	modified whiffle ball type game. Back to video of me talking in the gymnasium Blank screen, 9th strategy appears Video of me talking in the gymnasium Blank screen, 10th strategy appears Video of me talking in the gymnasium **Video** – Video of presenting a throwing activity to the child as a game where they

	winning, and goals, utilizing them can be a fun tactic, to increase motivation.	can earn points towards free time at the end. The game will be throwing different colored beanbags to corresponding colored taped-targets on the wall using step, point, and throw. Every time the child does hit the correct color, they will get a point. The game will last 1 minute and every 10 points will equal 1 minute of free time at the end. A second round will be introduced where the child can attempt to beat their score the first time and double their minutes.
20:45-21:35 (~50 sec?)	**Video**	
21:35-21:45 (10 sec)	Introducing object control skills in a way that allows the child to earn points, beat a score, or win something, will motivate them to continue to participate and give their best effort.	
21:45-21:55 (10 sec)	Let's take a look again at the 10 teaching strategies that can help effectively teach object control skill to children with DS.	Video of me talking in the gymnasium again
21:55-22:40 (45 sec)	1. Allow extra time to complete tasks 2. Provide adequate time for practice. 3. Utilize the ecological task analysis method of teaching 4. Break down instruction into as few steps as possible 5. Modify the equipment and environment 6. Utilize visual and tactile supports to aid in the instruction of the skill. 7. Set the child up for success by implementing developmentally appropriate motor tasks. 8. Utilize peer interaction and mentors to foster maximum effort. 9. Practice to a point where the child's performance begins to decline or lose interest/keeping instruction varied. 10. Treat the practice or instruction as a game."	Quick video of me back in the professional/quiet setting, and then back to the screen where each strategy appears as I narrate.

22:40-22:50 (10 sec)	These strategies are beneficial when teaching gross motor skills and learning object control skills. They should be incorporated when appropriate and whenever possible.	Appearing on screen one by one as I narrate
22:50-24:00 (1 min 10 sec)	In addition to the health concerns that effect gross motor development, behavior management is a key factor when teaching children with Down syndrome. As _____ mentioned earlier, some children with Down syndrome have tendencies to be stubborn, oppositional, or present behaviors that make it difficult to manage and structure the learning environment. Many children with Down syndrome have grown accustomed to being the center of attention and getting their way. Since they require adult supervision, they are used to the attention. Once it's not there to the extent they want, they may protest. Often a child with Down syndrome is excited and engaged with a task when they are feeling successful. As soon as feel unsuccessful, they become frustrated and unhappy. It is vital to recognize these two extremes to create an environment where the child can be successful, to minimize frustration, and to manage challenging behaviors when they do arise. The next part of this video will focus on the need to be proactive, rather than reactive when teaching children with Down syndrome in order to prevent unwanted behaviors. Additionally, we will introduce you to techniques that will help motivate, instruct, and reward the child you're working with.	Back to video of me in professional/quiet setting Video of me talking in the professional/quiet setting
	The following strategies can be used when planning, teaching, responding to, rewarding, and handling the	

24:00- 24:10 (10 sec)	behaviors of children with Down syndrome while teaching them object control skills. 1. Provide structure and establish routines 2. Utilize picture schedules and visual reminders 3. Be positive and reinforce for specific tasks – encourage improvements and efforts more than performance and ability. 4. Use consequences that strengthen the behavior they follow (Hanson, pg. 38). 5. Use "if, then" statements. 6. Limit distractions.	Transition video of me back in the gymnasium Each strategy appears as they did for the teaching strategies one at a time as I narrate. Blank screen with me narrating the transition sentence. <u>Blank screen, 1st strategy appears</u>
24:35- 24:45 (10 sec)	Let's take a look at how these behavioral strategies can be put to use in the actual physical education setting while working one-on-one or in a group setting with a student with Down syndrome.	Video of me in the gymnasium in front of the poster board
24:45- 25:00 (15 sec)	1. Children with Down syndrome commonly respond and perform better when in a structured familiar environment. Having information about what will happen at the beginning, middle, and end of each session allows the child to feel comfortable and in control. **Video**	**Video** – Video explaining a schedule poster that outlines the session that a hypothetical child might follow. (What to do when they come in, where to sit, expectations, rules,
25:00- 25:50 (~50 sec?)	A structured environment should similarly be kept in mind when teaching new object control skills. This does not necessarily mean the activities are the exact same each time, because that would be boring and the child will most likely lose interest. Creativity and variety should be a focus	

25:50- 26:20 (30 sec)	so that the child is always engaged, but structure and routine can provide a format for the flow of the session. Having a set routine and introducing components of a skill in a strategic manner, can help promote the appropriate behaviors. An established routine should include a system for alerting the child when it is time to clean up and/or transition. A method for reminding the children when clean-up will be will give them an opportunity to prepare to stop whatever it is they are doing.	etc.) The poster will be interactive so they can put a check mark next to each thing as they do it. **Video** of me explaining what types of aids you can use to effectively give time warnings
26:20- 26:40 (20 sec)	**Video**	
26:40- 27:25 (~45 sec?)	Letting them know when transitions or closures are approaching can help avoid undesired behaviors if they do not want to stop. A cue can also alert a child that a stopping point is in the near future if they do not want to keep going.	Video of me summarizing/closing back in front of the board. <u>Blank screen, 2nd strategy appears</u>
27:25- 27:35 (10 sec)		
27:35- 28:00 (25 sec)	2. Many students with and without disabilities benefit from the use of visual aids and children with Down syndrome are no exception. Whether it be picture schedules, cue cards, video demonstrations, or visual representations of time or scores, children are able to process what is being asked of them in an alternative way. Visual materials can present information to children in a way they more clearly understand. **Clip 1**	Video of me talking with various visual aids in the background **Video** **Clip 1** – Video of me presenting directions to a child using pictures of the sequence they will do

		it in. This will be a
28:00-28:30 (~30 sec?)	While it takes longer for children with Down syndrome to process verbal directions, it is beneficial to present new information in ways where the child can focus on performing the skill rather than the cognitive aspect of the directions.	asking them to (picture 1,) put their hands out in front, (picture 2,) move their hands to the ball, and (picture 3,) catch
28:30-28:45 (15 sec)	Social stories are another example of a visual aid. A social story depicts appropriate behaviors or a sequence of an activity in the form of a story. Once a child sees the social story, they can later relate it to the real scenario. Visual aids can also reinforce routines and structure by illustrating schedules in a way that is interactive and lets the child be ready for what's next, making transitions and expectations clear.	a ball with just their hands, to practice catching. Back to video of me talking
28:45-29:05 (25 sec)	**Clip 2**	**Clip 2** – Video and narration of a social story for when a child is about to take their turn at bat in a baseball game.
29:05-29:50 (~45 sec?)	When a child can comprehend and have expectations about the activities they are participating in, they will be less likely to present undesired behaviors, allowing for maximum learning to take place.	Back to video of me talking
29:50-30:00 (10 sec)	--- 3. Motivation is one of the most important components in fostering learning for children with Down syndrome, especially for those tasks requiring sustained physical participation. They thrive in environments that they are excited to be in, and participate to their fullest when encouraged and rewarded. It is important to encourage improvements and efforts rather than performance and ability. If the child feels accomplished and motivated while	<u>Blank screen, 3rd strategy appears</u> Video of me talking **Video** **Clip 1** – Video of child in motor development being excited to
30:00-30:20 (20 sec)		

	learning a skill, the competency and ability will improve with time. **Clip 1**	complete the object control skill task that they are doing.
30:20-30:40 (~20 sec?)	It is vital to provide the child with an experience they enjoy, otherwise their desire to learn the new skill will vanish. Motivation techniques can include cheering, high fives, clapping, rewards, stickers, teacher involvement/excitement, peer mentors, and things that makes the child happy and willing to participate.	Back to video of me talking **Clip 2** – Video of me encouraging a child, and giving them a high five as they pass during motor development.
30:40-31:00 (20 sec)	**Clip 2**	Back to video of me talking
31:00-31:20 (~20 sec?)	Finding out what the child is interested in and enjoys can help make motivation that much easier as well. For example, finding out the child's favorite color and using bats and balls of that color, or finding a character they really like, and using wall targets of that character.	**Clip 3** – Video of me talking to a student in the gym about what their favorite color is, and then saying "well, I have a bat, a ball, and a tee of that same color, why don't we use those!" For a striking activity.
33:20-33:35 (15 sec)	**Clip 3**	
31:35-32:00 (~25 sec?)	Simple motivational tools can be found by talking with the child. If the child you are working with is happy and excited about the activity they are involved in, learning will be more likely to take place.	
32:00-32:15 (15 sec)		Back to video of me talking
	4. Similar to motivation, consequences that strengthen a desired behavior help to foster learning. These consequences are not "bad," and are known as reinforcers. Reinforcers are used to provide the child with some type of	Blank screen, 4th strategy appears

32:15- 32:40 (25 sec)	validation that what they just did was good, or correct. It is more beneficial to reinforce positive behaviors rather than provide negative reinforcement for challenging or incorrect behaviors in children with Down syndrome.	Video of me talking while at motor development with the large gym in the background as they do activities
32:40- *33:00* *(~20 sec?)*	**Video** Providing reinforcers like stickers, high fives, or other tangible objects, will help encourage the child to perform correctly, or practice a newly learned skill while staying engaged.	**Video** – Video of myself and a child playing catch and I provide reinforcement to the child when they step before they throw.
33:00- 33:15 (15 sec)		Back to video of me talking at motor development with the large gym in the background as they do their activities
		<u>Blank screen, 5th strategy appears</u>
33:15- 33:25 (10 sec) *33:25-* *33:40* *(~15 sec?)*	5. "If... Then..." statements encompass pairing a desire activity with a not so desired activity. If the child you're working with has no desire to perform a certain task related to a skill, try pairing it with an activity they really do enjoy. **Video** Providing the child with the opportunity to do something they enjoy, can motivate them to do the desired task.	Video of me talking in the gymnasium **Video** (Levi?) – "Levi, if you step every time you throw, 5 times in a row, then we can take one lap around the gym on the scooter!"

33:40- 33:50 (10 sec)		Back to video of me talking in the gymnasium
		Blank screen, 6th strategy appears
	6. When teaching children with Down syndrome new object control skills, it is important to limit distractions within the environment.	Video of me talking at motor development
33:50- 34:00 (10 sec) *34:00-* *34:20* *(~20 sec?)*	**Video** In order to maintain the child's attention, extra equipment and individuals should be limited. This also includes controlling noise levels and being aware of various noise distractions in the environment.	**Video** – Video during motor development of working with a child facing the wall while the people and distractions are in the back where they cannot see them.
34:20- 34:30 (10 sec)	While there are multiple techniques shown to be successful when teaching children with Down syndrome, learning is not likely to take place in an environment that is not structured, where the child is disengaged, or learning is not rewarded. This is why it is vital to be proactive rather than reactive in regards to the behavior management of children with Down syndrome. Let's take a look at the 6 effective behavior management strategies one more time.	Back to video of me talking at motor development Video of me talking in professional setting
34:30- 34:55 (25 sec)	1. Provide structure and establish routines 2. Utilize picture schedules and visual reminders 3. Be positive and reinforce for specific tasks – encourage improvements and efforts more than performance and ability. 4. Use consequences that strengthen the behavior they follow (Hanson, pg. 38). 5. Use "if, then" statements.	Each strategy will appear on a blank

34:55-35:20 (25 sec)	6. Limit distractions. The development of gross motor skills at an early age is paramount to the maintenance of a healthy and active lifestyle later in life. Once these skills are acquired, children can begin using them in physical activity outside of school and in their everyday life. Development of object control skills offers individuals a set of basic gross motor skills to allow them to explore and participate in an array of physical activities and sports. Participation in recreational leisure and sport activities can improve quality of life, foster social interaction, help maintain a healthy weight, and provide enjoyment through being active. It is important to find resources to assist individuals with Down syndrome to contribute and participate with their families and in their communities. This includes maintaining a healthy and active lifestyle and successfully interacting with those around them. Ensuring that each individual receives a physical education that provides them with the necessary gross motor development early in life is one component in achieving this goal.	screen one by one as I narrate them. Back to video of me talking in a professional/quiet setting
35:20-36:40 (1 min 20 sec)	Individuals with Down syndrome can participate at meaningful levels in team sports, individual sports, and physical activity in general. In addition, teaching fundamental motor skills can lead to acquiring and refining more of the complex skills needed to play golf, tennis, volleyball, basketball, and many other sport activities.	

36:40- 36:55 (15 sec) 36:55- 37:10 (15 sec) 37:10- 37:25 (15 sec) 37:25- 37:40 (15 sec)		Video clips of young adults performing more complex motor skills that are possible because of a foundation of object control skills Sarah V – Playing basketball in the rec with a few other peers (maybe some grad students or other students in the mentoring program) Student 2 – Playing golf (driving.) Student 3 – Playing floor hockey at a game for the ASL Student 4 – Playing tennis, rallying back and forth a couple times