THE EFFECTS OF VIDEO SELF-MODELING ON WALKING SKILLS OF PRESCHOOLERS USING WALKERS

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ABSTRACT

The purpose of this study was to expand the existing knowledge on video self-modeling and its use with increasing walking skills of preschool children using walkers. A multiple baseline, single-subject design was used with three preschool age children that measured the number of steps taken. After establishing baseline with each child, they each were shown a short three minute movie of themselves walking every day for at least five days. During this time, measurements of the number of independent steps taken by the children were recorded by the researchers on a self-made chart. This data collection continued for five more days after the last child stopped watching their video. The data from the chart was then used to create a graph. The results showed that vide self-modeling was ineffective in increasing the number of independent steps for one child, inconclusive for another child, and unknown for the last child.

DEDICATION

This thesis is dedicated to my family, friends, professors, and the school staff that helped to make this all possible. I would not have finished this study without their encouragement and support. Thank you all.

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I would like to thank Dr. Tom Buggey for his help and guidance with completing this study. I would also like to thank my committee members for their input on the study as well. I would like to thank Lisa Spurlock for her assistance with the children and Siskin Early Learning Center for allowing me to complete this study in their facilities. I would also like to thank my friends and family for their encouragement and support while completing my graduate studies. I could not have completed this study without these important people in my life.

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LIST OF ABBREVIATIONS

VSM, Video Self-Modeling

OT, Occupational Therapist

CHAPTER 1

INTRODUCTION

Statement of the Problem

Video self-modeling (VSM), a technique that uses edited videos of an individual performing a skill that is currently not mastered or depicting more appropriate behavior, has been used successfully to improve the skills of young children with varying disabilities. However, the research base focusing on improving physical abilities using this type of intervention is very small and the last study on improving the physical abilities of children with physical disabilities was done over thirty years ago.

Objectives of the Study

The objective of this study was to use video self-modeling to increase the independent walking of three preschool children who used walkers, and thus, expand the knowledge base of video self-modeling and its use with preschool children with physical disabilities.

Scope and Limitations of the Study

One of the limitations of this study was the small size of the sample. Another limitation was that the study was completed in a short time frame. The children being absent also affected the study along with the short time frame. Another limiting factor of the study was the weather. The school in which the participants attended was closed for four days because of snow, which

limited the researchers' ability to collect data. The participants themselves may have also put limitations on the study. One of the participants in particular was very reluctant to try to walk on his own, even with the assistance of the teachers. The presence of the researchers may have been the cause of this behavior.

Significance of the Study

The significance of this study is that no study like this has been done before, and thus, its results will expand the research base on video self-modeling and its use with improving physical capabilities of children with physical disabilities.

CHAPTER 2

LITERATURE REVIEW

Introduction

The use of modeling is an important part of the everyday curriculum in education. Children and adults alike gain knowledge through intently watching and listening to others. This is why it is still being used in education as a teaching technique today. A relatively new type of modeling called self-modeling first appeared in the 1970's (Creer & Miklich, 1970). This type of modeling, which came about with the advances with video recording, allows the viewer to act as their own model so that they learn from seeing themselves engaged in their own positive behaviors. This type of modeling has been used effectively across a range of ages and behaviors. Although its use with young children has been mostly used with those diagnosed with autism, there is little literature that addresses its use with young children with physical disabilities.

Review of the Literature

Modeling

The use of modeling as an intervention technique has been thoroughly researched by Albert Bandura as part of his work on social learning theory. Bandura (1977) found that children were able to acquire a varying degree of skills by observing other people performing the skills first, rather than just from their own experiences. He also found that observers would perform the skill with or without a reinforcement, and that the skill could be generalized to another

environment. Attention and motivation were the only requirements for this observational learning. Bandura (1997, 2001) found that children were more likely to watch models that they see as competent and similar to them in some way. Models that are similar to the individual in gender, age, and ability were found to be the most effective in motivating, gaining, and maintaining the attention of the individual. This discovery led to research experimenting with video self-modeling (Wert & Neisworth, 2003).

Video Modeling

Video modeling is a technique that involves an individual watching a video demonstration of desired behaviors with the hopes that the individual will then begin imitating the behaviors being shown (Charlop & Milstein, 1989; Dowrick, 1999). Modeling in the video can be done by peers, adults, or the individual. Video modeling has been used successfully across multiple disciplines and populations to teach a variety of skills (Creer & Miklich, 1970; Dowrick, 1999; Dowrick & Raeburn, 1995; Hitchcock, Dowrick, & Prater, 2003; Hosford, 1981; Kehle, Clark, Jenson, & Wampold, 1986; Starek & McCullagh, 1999).

Types of video modeling

The main video modeling types are peer (Charlop-Christy, Le, & Freeman, 2000), point-of-view (Hine & Wolery, 2006; Tetreault & Lerman, 2010), and self-modeling (Bellini & Akullian, 2007; Buggey, 2005). Peer modeling is the most researched of the three models and involves the individual's peers modeling the desired behavior. Point-of-view modeling is the newest modeling procedure and requires the camera to be held at the child's eye level while the

adult performs the desired behavior. The result is that the video looks as if it is being completed by the individual; from their own eyes (Buggey & Ogle, 2013).

Video self-modeling

Watching raw footage of a personal performance is called self-observation. This is commonly used by coaches and players when viewing game films. Observers see success, as well as failure. While there is evidence supporting the use of self-observation (Foster, Laverty-Finch, & Gizzo, 1999) there is a risk for people with low self-esteem or poor skills. In particular, watching themselves fail may have a negative effect on them and cause more problems. A method of viewing one's performance that eliminates this risk is video self-modeling. Video self-modeling allows viewers to watch themselves succeeding at a task. All negative aspects of the performance are eliminated. The individual sees him or herself successfully performing a behavior that they then may try to imitate (Bellini, Akullian, & Hopf, 2007).

There are several steps to successfully implement video self-modeling. The first step is to record the target behavior (or approximations of the behavior). The second step is editing the video to show the target behavior being performed successfully by the individual. The final step involves the individual watching him or herself performing the desired behaviors on the video. The person can be depicted performing the desired behavior in two ways. The quickest and easiest way is to have the individual role play or imitate the desired behavior. The longer way is to record the individual over time, capturing rare behaviors, and then editing the video so the rare behaviors seem to be occurring frequently (Buggey, 2005). Teacher prompting (unless it is central to the behavior, e.g., responding to questions) is also typically removed. Dowrick (1999) coined the term "feedforward" to describe this process. The feedforward format allows the

individual to see him or herself in the future performing at a more advanced level or in a more positive manner (Litras, Moore, & Anderson, 2010).

Several benefits result when using video self-modeling. Self-awareness and what Bandura (1997) refers to as a positive self-efficacy (the personal belief in the ability to complete goals successfully) are usually increased after viewing the desired modeled behavior (Wert & Neisworth, 2003). Newly learned behaviors also have been shown to generalize across settings and conditions, while positive gains from the intervention have been maintained for long periods even after viewing of the video has ceased (Bellini & Akullian, 2007; Buggey, 2005). Video self-modeling addresses Bandura's (1977) belief that children are most likely to attend to a model as similar to themselves as possible. When children watch themselves perform positive or successful behaviors instead of negative or unsuccessful behaviors, their attention and motivation increases (Bellini & Akullian, 2007; Buggey, 2005; Buggey & Ogle, 2013). This is important for effective modeling because it means the children attend to the modeled behaviors better, thus, facilitating the development of self-efficacy and confidence (Bellini & Akullian, 2007; Buggey & Ogle, 2013; Litras et al., 2010). Buggey (2005) has gone so far as stating that children need to be able to attend to the video in order for video self-modeling to be successful.

Other researchers have their own reasoning for why video self-modeling has been used successfully to teach new skills. One speculation was that watching certain activities being performed on video serves as an establishing operation (something that changes the value of a reinforcer) which then increases the reinforcing properties of the activities being performed on the video (Nikopoulos & Keenan, 2004). Another group of researchers thought that watching oneself perform tasks successfully on video may replace the individual's past memories with new, more positive ones (Kehle, Bray, Margiano, Theodore, & Zhou, 2002). They found that

individuals whose behavior had changed after watching VSM videos had difficult times remembering the previous behavior.

Research on VSM

Video self-modeling has been shown to be an effective treatment across an extensive range of behaviors, ages, and abilities. Positive results have been obtained for treating emotional issues (Kahn, Kehle, Jenson, & Clark, 1990; Madaus & Ruberto, 2012), stuttering (Bray & Kehle, 1998), elective mutism (Pigott & Gonzales, 1987), attention disorders (Dowrick & Raeburn, 1995; Woltersdorf, 1992), behavior disorders (Lasater & Brady, 1995), and aggressive behaviors (Buggey, 2005; Creer & Miklich, 1970). Likewise, VSM has proved effective as a tool for teaching new skills such as math computation (Burton, Anderson, Prater, & Dyches, 2013; Schunk & Hanson, 1989), life skills (Miklich, Chida, & Danker-Brown, 1977), social behaviors (Bellini et al., 2007; Buggey, Hoomes, Sherberger, & Williams, 2011; Lonnecker, Brady, McPherson, & Hawkins, 1994), reading fluency (Decker & Buggey, 2014), and language (Buggey, 1995, 2005; Haarmann & Greelis, 1982; Sherer et al., 2001; Wert & Neisworth, 2003; Whitlow & Buggey, 2003). In a review of literature (Hitchcock et al., 2003), it was found that over 200 subjects had participated in published research in which VSM was the independent variable. In the more recent review conducted by Buggey and Ogle (2013), the number of studies had increased greatly, and the number of participants had more than doubled. Furthermore, they found thirteen studies dealing with people on the autism spectrum. Interestingly enough, nine of these studies were carried out with all or some of the participants being preschool children. In their meta-analyses of self-modeling studies, Bellini and Akullian (2007) compared their results

to the Council for Exceptional Children's Guidelines for Evidence-Based Practices, which resulted in VSM to now be considered a research-based method.

VSM focus on preschoolers

Almost all research on video self-modeling with preschoolers has dealt with those with disabilities, and a majority of these have focused on children with autism(Buggey & Ogle, 2013). In one study (Wert & Neisworth, 2003), video self-modeling was used successfully with four preschool children in spontaneous requesting. The participants ranged in age from three to six and all four were diagnosed with autism. The participants had a variety of language abilities, but used little or no spontaneous requesting. Spontaneous requesting was defined in this study as asking for a desired object or action without assistance. Each of the participant's self-modeling videos was created to show engagement in the desired behavior of spontaneous requesting. The participants watched their own videos once per day for five days. The VSM videos were immediately effective with each participant, resulting in substantial gains in their number of spontaneous requesting behaviors. One participant showed a delay in acquiring the requesting behaviors, but made steady gains afterwards. Maintenance data for the first three participants also showed that the frequency of the spontaneous requesting lasted for two to six weeks after the intervention was withdrawn, and, therefore, demonstrating the video self-modeling intervention was effective in increasing the target behavior.

Yet video self-modeling has been shown to be ineffective with preschool children in at least two different studies (Buggey & Ogle, 2013; Clark et al., 1993). In one of these studies (Buggey & Ogle, 2013), the use of video self-modeling was not successful in promoting social interactions between typically developing preschool children and preschool children with autism.

Four typically developing children, one male and three females, and two male children diagnosed with autism participated in the study. The participants were between the ages of two and three. The target social behaviors for the study were initiations, parallel play, and engaged play. The typically developing children were filmed interacting with the children with autism, and this footage was used to create short two to three minute videos for each child. The typically developing children then viewed their own videos once per day over five days. The frequency of social interactions between the typically developing children and children with autism did not change once the intervention was implemented or discontinued. The video self-modeling videos were ineffective in increasing the desired behaviors. Buggey suggested that this may have been due to the children being too young or that the behavior was not developmentally appropriate.

In another study (Clark et al., 1993), video self-modeling had no positive effects in reducing aggression and non-compliance in six male preschool children. The children's ages ranged between three and five, and all were diagnosed with oppositional defiant disorder. The children's videos were about four to five minutes long and created from footage taken from within a one-way mirror booth during their free play time. The videos showed the targeted prosocial behaviors between peers and adults. The video self-modeling intervention was compared with peer modeling with a control over a ten week period. The peer-modeling videos came from the other children's self-modeling videos, and a five minute Sesame Street video about numbers served as the control. Lower rates of aggression occurred during viewing of the self-modeling tapes than the other two tapes, however there was no consistent pattern. For two participants, aggression increased when self-modeling videos were viewed after peer-modeling videos. Although there was a slight tendency for decreased aggressive behaviors over time for all, there was no evidence that this was related to any of the treatments because five of the

children's noncompliance behaviors started decreasing during the baseline phase. One child's noncompliance behaviors greatly decreased during the self-modeling interventions. There was no increase in prosocial behavior for four of the participants after viewing their self-modeling videos. The authors of the study think the effectiveness of video self-modeling may have been affected by the age of the participants. The results of these studies raise a question about the use of video-self modeling with very young children and whether there are age limitations for VSM use. There is also the consideration of what adaptations may need to be made for VSM to be implemented successfully.

VSM and physical behaviors

The current study is very important to expanding the research on video-self modeling in the area of improving physical capabilities for young children with disabilities. The last video self-modeling study focusing on physical disabilities was conducted thirty-three years ago (Dowrick & Dove, 1980), and there have been no video self-modeling studies done that focus on improving walking capabilities, nor, have any been carried out with preschoolers. This last study focused on increasing the swimming skills of three children with spina bifida using VSM. Two of the participants were five years old; one was male and one female. The other participant was a ten year old boy. All of the children had severe spina bifida lesions. They were not hesitant to swim in the water with their floaties on, but two of the children were afraid of getting their faces wet and one of the children became upset when asked to remove his arm bands. The main skills identified to improve the children's swimming ability included the children entering the water, gaining confidence with the arm bands, submerging their head and face in the water, and gaining confidence without the arm bands. Self-modeling videos around two minutes long were created

for each child, as well as a fourth video that showed all of the children swimming at their current ability with no self-modeling characteristics in it. All of the children were shown the regular video of them all swimming three times a week for several weeks. Then the self-modeling video was switched in and watched by each child individually, three times a week, while the other two continued to watch the first video. After watching the videos the children were then observed swimming with the focus on the target skills. The participants made moderate gains in the swimming skills after viewing their self-modeling videos, with the older child demonstrating higher skill achievement compared to the younger children. This study was the only study in the current literature that focused on using video self-modeling to improve the physical capabilities of young children.

Summary

Video self-modeling has been shown to be an effective treatment for individuals on the autism spectrum, although, the number of studies remains small. While the majority of studies have been carried out with young preschool children, most of the individuals have been four or five years of age. Reported findings have been successful, except, for children under this age range. It is unclear whether age, the chosen behavior, or a combination of both are deciding factors in the success of video self-modeling.

Thus, the purpose of the current study is to expand on the existing knowledge about video self-modeling and determine its effectiveness in improving the capabilities of children with physical disabilities. In particular, this study focuses on improving the walking ability of preschool children who use walkers.

CHAPTER 3

METHODOLOGY

Introduction

The study used a multiple-baseline, single-subject design across children. Two to three walking trials were completed each day on each child during baseline, intervention, and maintenance phases of the study. The dependent variable, the number of independent steps completed by each participant, was counted by two researchers. These numbers were then recorded for each participant and plotted on a graph. Video recording cameras were used to take footage during the baseline walking trials. The footage was edited and condensed into short videos approximately three minutes long each using Apple's iMovie®. Each child viewed their individual video for five days, then the video was subsequently withdrawn.

Participants

Three preschool students referred for the study by an occupational therapist (OT) participated. Each of the children were being served under a contract with the local school system and all had been diagnosed with delays in physical development. All of the participants received services from the OT and all of them used walkers. Before the start of the study, all of the children were reported to be able to stand without assistance, but none of them could take

more than two steps without falling. There were two females and one male. The male, who will be referred to as participant A, was 3 years and 8 months old at the beginning of the study. One of the females, who will be referred to as participant B, was 3 years and 11 months old. The other female, who will be referred to as participant C, was 4 years and 2 months old. Informed consent was received for each participant before beginning the study, with each participant's guardian aware of the option of dropping out of the study at any time with no consequences. The study was also approved by the University of Tennessee at Chattanooga's and Siskin Children's Institute's Intuitional Review Board.

Participant A was diagnosed with trisomy 12p, a rare chromosomal disorder that typically results in developmental delays, with language usually being more affected than motor skills (Segel et al., 2006). He also has a history of ear infections and shunts. Toward the end of the present study, he developed pneumonia and missed the final week. He was assessed when he turned three on the Bayley Scale of Infant and Toddler Development III (BSITDIII) (Bayley, 2005) and transitioned to public school services. His General Adaptive Composite score was < 1st percentile based on parent and teacher input. Participant A scored at the 1st percentile in the fine and gross motor subtests of the Learning Accomplishment Profile (LAP-3). His score on the cognitive subtest was indicative of severe developmental delays. His last formal assessment was carried out 11 months prior to the study. Participant A attended school for six hours per day. Each week he received 30 minutes of physical, occupational, and speech/language therapies within the classroom setting.

Participant A often used a wagon or bike to travel into the hallway where data collection took place. He would also move forward while holding a wand held by the occupational therapist. Later in the study he would "walk" when holding one hand of the OT. Participant A

was shown his image in the viewfinder of the video camcorder and he responded positively with a smile and laughter giving the impression that he could self-recognize. He was reluctant to walk on his own and would arch backwards so that his teacher would hold onto him. The vehicles participant A used to travel in were used as motivators to get him to walk. Once he was removed from them the teacher or occupational therapist, they would move the vehicle forward and then encourage him to go to it. Participant A was very reluctant to do this and would arch back and cry. As soon as he was let go he would take one step, arch his back, and fall back requiring one of the adults to catch him. Later in the study he began to control his fall and land on his bottom. A few times he took the few steps required to reach his desired item.

The first time participant A viewed his movie he cried. However, he soon started to laugh and point at the screen. He even requested to watch it again. However, towards the middle of the intervention, participant A started to refuse to watch his video and would even close the laptop to keep his teacher from opening the video. On the last day of viewing, he agreed to watch his video and even requested to see it again. While watching the video he would laugh and point to himself.

Participant B was three years and 11 months at the beginning of the study. She was diagnosed with seizure disorder, right hemiplegia, and was being observed for possible Cerebral Palsy. Her early history included hydrocephaly with shunts. She scored on the first percentile in the BSITDIII for Cognitive and Adaptive Behavior. This testing had been done one year prior to this study. She attended preschool five days per week and received four 30-minute therapy sessions per month in speech/language and physical therapy. She received occupational therapy twice per month. All sessions were 30 minutes in length. It was also stated that she participated

in private outside therapy on Tuesday and Wednesday evenings. The OT mentioned that participant B seemed tired on Wednesdays.

Participant B was very compliant in participating in the study. She reacted positively when shown her image in the video camcorder. Participant B responded positively to the researchers, especially the author, and would reach out to her during the walking trials. Although she had been reported taking no more than two steps, Participant B actively walked toward the camera being held by the author taking nine steps. She would walk with her arms up and out and sometimes not completely balanced and would fall on her bottom. Two more trials on the first day of baseline had her making 12 and then 26 steps.

Participant C was four years and one month at the outset of the study. She had a complicated medical history that included a lung transplant, decreased bone density, and hypotonicity. She was small for her age and traveled in a wheelchair that she could hand propel adeptly. She received daily tube feedings administered by the school nurse. Participant C attended school for six hours per day and received 60 minutes per month of physical, occupational, and speech/language therapies that were carried out in the classroom setting.

Participant C had a neutral reaction when viewing herself in the video camcorder. She did not react positively or negatively, but did attend well. She was also reluctant to walk on her own when she was stood up, often just dropping to her bottom and scooting. Participant C was frequently absent, so it was difficult to collect the necessary data on her.

Setting

The study took place at an inclusive preschool that served children with a variety of disabilities. Data on the children were gathered during the morning in the hallways, cafeteria, or

playground of the school. The author and her supervisor would wait until circle time ended before entering the classrooms so as not to cause disruptions. The hallways were wide with few obstructions. Classes and people passed through them occasionally. The cafeteria was much larger than the hallways and was an open area with almost no traffic passing through it. There were, however, three tables spaced out on one side of the room with activities for children to engage in set up on each table. There was also bubble wrap taped onto the floor on one side of the room. The floors of these two areas were tiled and both areas were well lit. The playground was very large and included swings, a sand area, and three large jungle gyms. A sidewalk wound around the playground and in between the structures. Several mobile devices were scattered along the sidewalks for the children to ride. There was an area around the swings that had soft, flat, and textured rubber padding. This area was used for participant A occasionally to see if he would walk to the swings which he greatly enjoyed.

Procedures

The participants, when available, were pulled out of their rooms separately for data collection. Monday through Wednesday the occupational therapist accompanied the researchers and assisted with the children. Participant A was also accompanied by his classroom teacher. Participant C, who was found to be lower functioning physically, was worked with in her classroom with the assistance of the OT and/or a teaching assistant. Footage of the children was obtained with the use of prompted walking in collaboration with the occupational therapist and teacher. All data collection was done in the classroom, hallways, cafeteria, or playground. The teacher or occupational therapist would hold on to the student by their arms or shirt, and then would try to slowly release them once they seemed stabilized in their stance. The occupational

therapist or teacher would stay close to the participant so that they could catch them if they started to fall. This procedure was carried out two to three times a day with each child.

During baseline, the researchers used two camcorders to record the children walking with assistance from the occupational therapist, teacher, or researchers. The footage was then uploaded from the camcorders to one of the researcher's MacBook Pro® and edited into a movie using iMovie®. The raw footage included shots of only of the child's legs, their upper body or face, and their whole body while standing or holding on to something or someone. Footage of them walking with assistance was taken from in front, behind, and the sides. When recording the children, the researchers tried to keep the adults out of the frame as much as possible. Actual footage of walking was captured and used with participant B. iMovie® was used to create short videos in which each child appeared to walk without assistance. The raw footage was edited to show only the children as if they were walking independently and looking happy doing it.

Each of the videos was approximately three minutes in length. A still frame representing a very flattering view of the child stepping was placed at the beginning of the movie. Overtop of this a verbal introduction stating whose movie it was and stating the behavior ("This is _____'s movie. Let's watch _____ do some good walking!"). The sound was taken out and background music was added to the movie to eliminate noise, adult discussion, and prompting. The music seemed to be soothing and the volume subdued. At the end of the video another flattering still frame was added along with verbal praise, naming the behavior, and children cheering ("Good job, _____. Nice walking!" – [Cheering children]). The movies were then burned onto DVD's, using two different video formats, and were given to the teachers just before the children were to begin viewing them. The teachers were instructed to let the children view their videos without comment about the content or the movie in general. They

were allowed to praise the children for good attending. Because the researchers did not watch the viewings, treatment fidelity could not be guaranteed. Thus, the researchers asked the teachers daily how the viewing went and what reactions the children had to their video.

The participants viewed their videos first thing in the morning on their teacher's computer, in their teacher's office, so as to not disrupt the rest of the class and to limit distractions. Each child viewed his or her individual video once per day for five days. If the child requested, he or she could watch the video one additional time right after the first viewing. Participant A started to refuse to watch his video first thing in the morning, even when prompted by the teacher and a classmate, and instead watched it in the afternoon. Once the first participant's five viewings of their video ended, then the next child started viewing their video for five days while the first child went into the maintenance phase and the third child continued in the baseline phase. Then once the second child finished watching their video for five days, the third child started watching their video while the first two children continued in the maintenance phase. This way each child watched their video one at a time and no two child watched their videos at the same time. Thus, baseline was extensive for participant C and maintenance data were collected long after participant A finished viewing his video.

Control

The participants served as their own control in this study. Instead of comparing the average results of individuals in groups between different control groups, the results of the study were compared among the individuals at different points in time. Because of this control factor, this type of study was a single subject design across multiple baselines.

Data Analysis

Baseline data were collected, and the intervention of showing the VSM videos was implemented and subsequently withdrawn. Data were collected by the researchers during baseline, intervention, and maintenance phases of the study. Observations on independent walking were done by the researchers in the hallways, cafeteria, or playground of the school. The target behavior was the number of unassisted steps taken by the children, which was counted by the two researchers for inter-rater reliability. Two or three trials of each child walking were taken each day, and the number of steps taken written down on a computer made chart. These data were then uploaded into an Excel spreadsheet that was used to create a graph to analyze and compare the data quickly.

Inter-rater reliability was calculated by comparing the total number of steps for each child counted by each researcher. Both researchers counted steps except when one was shooting video. The author would sometimes miss a Thursday or Friday session; however, slightly more than 65% of the walking sessions were scored by both researchers. A percentage agreement score was to be used, but visual comparisons turned out to be sufficient. All step counts were either identical or off by one step. The very slight difference was attributed to viewing from different angles and having differing opinions on when the teacher or OT let go and independent walking began. Participant B did the most walking and, of 1636 steps counted by both, there was agreement on 1633. Overall the inter-rater reliability was over 99% on total number of steps and over 95% for exact agreement on the total number of steps in each walking session. This was well above the 85% agreement that is typically accepted as sufficient for inter-rate reliability agreement.

Summary

The study was completed with three preschool children with physical disabilities who used walkers. Each child was reported to take two or less steps when walking independently before the start of the study. The children attended an inclusive preschool that serves children with a variety of disabilities. Most of the study was completed in the school either in the hallways, classroom, or cafeteria. Baseline data were taken on each child by counting the number of steps they could take independently. These data points were continuously collected as the intervention was implemented individually with each child, and also after the intervention was withdrawn. This information was then plotted out on a graph. The results are discussed below.

CHAPTER 4

RESULTS

Findings

Results indicate that the VSM intervention was unsuccessful for participant A and inconclusive for participant B. There was insufficient time to introduce the intervention to participant C. The results are depicted in Figure 1. Participant A had a mean score of 7.73 steps during baseline walking trials and 7.4 steps during intervention walking trials. This dropped to 0.4 during maintenance walking trials, mainly due to his refusal to walk. The OT had to get him into a position where his upper torso was leaning forward. When she let go, the child had an arranged forward momentum and did take steps toward an object such as a chair, table, or swing. As the study progressed, he became more defensive and exhibited more stress at being asked to walk. Once the intervention stage was complete, less effort was placed in putting him into position and he refused most requests to stand and walk.

Participant B had a mean score of 37.18 during baseline walking trails and 88.1 during intervention walking trials. This remained fairly consistent through the maintenance period where her mean was 74.18 steps. While this may seem as if there were a significant improvement between baseline and intervention, her rapid gains began three trials before the intervention was introduced. Participant B made enormous strides in her walking during the study. However, the gains were seen during baseline while filming for her VSM video. The child did get to see her image in the viewfinder, as one of the researchers moved backward while she walked toward her,

which may have caused this immediate increase in walking ability. The trials of 120 steps or more were usually associated with a complete trip between classroom and library, or classroom and gym, and represented a maximum score in that environment. The score of 200 included a 180 degree turn where she headed back the way she came.

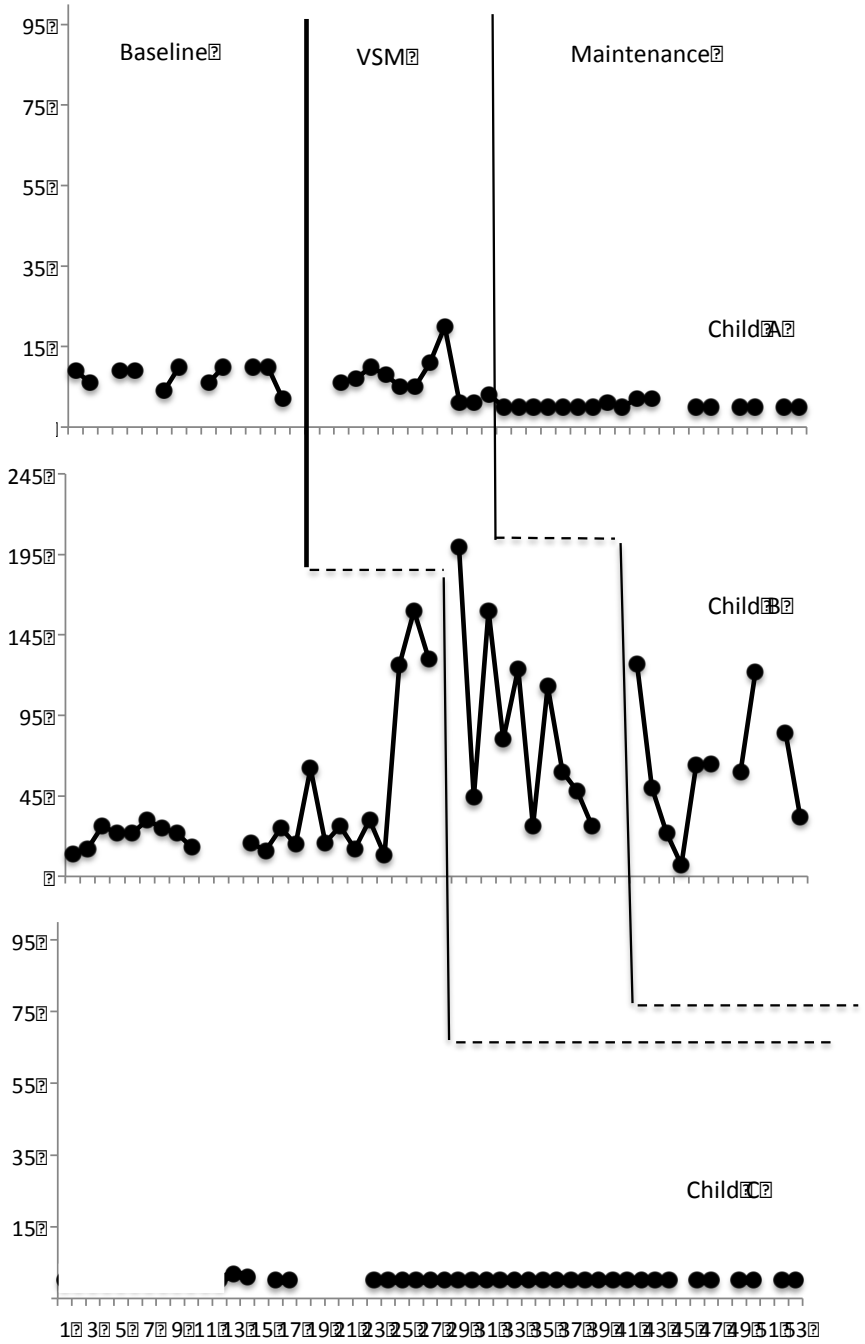

Figure 1. Graph showing results of VSM intervention and maintenance.

CHAPTER 5

DISCUSION AND CONCLUSION

Objectives of the Study

The objective of this study was to increase the number of independent steps of three preschool children who used walkers. Ultimately, the goal was to have the children gain more confidence in their walking abilities and try to walk more independently, not only in the classroom, but to have the skill generalized to settings and environments outside of the classroom.

Summary of the Findings

The results of the study showed that the implementation of video self-modeling was unsuccessful with increasing the number of independent steps with participant A and inconclusive with participant B. Participant A's number of steps stayed consistent throughout the study, except for one day during intervention were it increased slightly. But then, participant A's number of steps started to greatly decrease, mostly due to his refusal to walk. Walking became an undesirable task for participant A, and he soon started to associate this undesirable task with the presence of the researchers. Participant B started making great gains in her number of steps not after the intervention of VSM, but during the baseline phase. The introduction to the video camera and seeing herself in the view finder may have caused this increase in mobility. The number of steps participant B took stayed relatively consistent during and after removing the

intervention of video self-modeling. Unfortunately, there was insufficient time to implement the intervention with participant C.

Conclusions

The therapists and teachers commented on participants A's tendency to resist requests to do a variety of tasks that required effort or were outside his routine. It is quite possible that the sight of one or both of the researchers cued him to what was coming and he went into a defensive mode. On a couple of sessions he indicated "no" upon seeing us, even before being pulled out of class. The OT and teacher expressed great hope that this method would work where direct pressure to walk had not. He enjoyed watching himself and liked viewing videos. However, discussions with the OT, teacher, and a physical therapist revealed changes in behaviors. They related that he began walking with support of only one finger (previously he needed two hand support, a wand or a vehicle that allowed him to grasp with two hands) and he was standing on his own and for longer periods. These behaviors were new. In reviewing the video, it was seen how these behaviors were represented in the video. It is possible that the target of independent walking was too optimistic for this participant.

Participant B's progress proved astounding to her teachers, therapists, and parents. Going from a two-step maximum to walking the entire distance between classrooms in three days of work with the researchers was completely unexpected. Additionally, her main way of navigating in her classroom during that short period changed from scooting on her bottom to walking. It is possible that the filming alone, the idea that she was starring in her own movie, provided the encouragement for her walking. It may have been that seeing herself walk in the viewfinder

while filming was taking place was the change agent. However, it was fairly evident that it was not the VSM movie that produced these changes.

Recommendations for Further Study

The results for participant B may indicate the potential that the film medium has for promoting motor behaviors in young children. At the same time, participant A is a good indication of how a child's attitude or temperament can affect outcomes. It would be beneficial to discover the elements necessary for VSM to be successful. Working with a broader range of children in terms of ability and ages would provide additional knowledge of who was most amenable to VSM intervention. Other forms of video modeling should also be analyzed. Physical and occupational therapists often use ideation as their first step in therapy (May-Benson & Cermak, 2007). Ideation involves visualizing tasks to better understand the steps needed for completion. It would seem that video modeling, and in particular self-modeling, would be good matches for facilitating ideation, although there are presently no studies in the area. Given that this was the first study in decades that examined VSM's impact on children's physical abilities, the areas for further research are vast.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

MEMORANDUM

TO: Kelley Smith **IRB # 14-036**
Dr. Tom Buggey

FROM: Lindsay Pardue, Director of Research Integrity
Dr. Bart Weathington, IRB Committee Chair

DATE: 02/20/2014

SUBJECT: IRB #14-036: The Effects of Video Self-Modeling on Walking Skills of Preschoolers Using Walkers

The IRB Committee Chair has reviewed and approved your application and assigned you the IRB number listed above. You must include the following approval statement on research materials seen by participants and used in research reports:

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project* # 14-036*.

Please remember that you must complete a Certification for Changes, Annual Review, or Project Termination/Completion Form when the project is completed or provide an annual report if the project takes over one year to complete. The IRB Committee will make every effort to remind you prior to your anniversary date; however, it is your responsibility to ensure that this additional step is satisfied.

Please remember to contact the IRB Committee immediately and submit a new project proposal for review if significant changes occur in your research design or in any instruments used in conducting the study. You should also contact the IRB Committee immediately if you encounter any adverse effects during your project that pose a risk to your subjects.

For any additional information, please consult our web page http://www.utc.edu/irb or email instrb@utc.edu

Best wishes for a successful research project.

APPENDIX B

INFORMED CONSENT FORM

University of Tennessee-Chattanooga/Siskin Children's Institute Informed Consent Form

This is to certify that I, _____, hereby give permission to have my child,_____, participate in the study entitled, *The Effects of Video Self-Modeling on Walking Skills of Preschoolers Using Walkers*, conducted by University of Tennessee at Chattanooga Professor and Siskin Children's Institute's Chair of excellence, Dr. Tom Buggey and graduate student Kelley Smith.

For children with disabilities maintaining self-confidence can be a challenge. This may be especially true for children with physical challenges as they see typically developing peers engaging in behaviors that they cannot match. Dr. Buggey has done research since 1993 on a method called video self-modeling that works to improve children' belief that they can succeed. We will allow the children to see themselves succeeding in walking. To do this, we will take video footage over several days. We will film the child walking with assistance from the occupational therapist, Lisa Spurlock and her teachers, but will remove these adults from the final video. We will also shoot footage of actual standing and steps and combine them to illustrate longer walking sequences than presently demonstrated. The video will show the children performing more ably than they do at present. We will work very closely with the occupational therapist so that our goals and video are not too advanced – beyond the child's ability. The video will then be shown to the children over several days; this is the intervention stage. The child will be observed daily, probably on a tile surface in the hallways, to document any changes in number of steps taken or distance covered without assistance. The intervention stage will be introduced over a period of no more than one week or five days. Research on video self-modeling has rarely been done with children this young, so our expectations are limited. However, we hope the visual imagery of them walking will increase self-confidence and, thus, their walking ability. If you need more information or would like to talk face to face with Dr. Buggey, he can be reached at 648-1755 mornings and at UTC (425-4539) in the afternoon or at email tom.buggey@siskin.org.

At the conclusion of the study, I understand that I will be provided a summary of the results. I also understand that I will have the options of receiving any videos made during the study, having them destroyed, or allowing limited use of them for educational purposes (classroom and conference uses).

I understand that the University of Tennessee at Chattanooga does not have any funds budgeted for compensation for injury, damages or other expenses. I understand that in the event of physical injury resulting from this investigation neither financial compensation nor, free medical treatment is provided for such physical injury.

I understand that any data or answers to questions will remain confidential with regard to my child's identity. Confidentiality requirements included in the Individuals with Disabilities Education Act (IDEA) will be strictly adhered to. I also understand that information collected in this study will be kept confidential within the limits allowed by law. I understand that before this study can be undertaken my informed consent will be necessary. I have received a copy of this consent form. The University of Tennessee at Chattanooga Institutional Review Board (IRB) has reviewed and approved this research. If you have questions about the review process, you can contact the IRB offices. Email: instrb@utc.edu. If you have any questions about the rights as a subject/participant in this research, of if you feel you or your child have been placed at risk, you can contact Dr. Bart Weathington, Chair of the Institutional Review Board, at (423) 425-4289. Additional contact information is available at www.utc.edu/irb.

I certify that to the best of my knowledge and belief, my child has no physical or mental illness or weakness that would increase the risk to him or her of participation in this investigation.

I further understand that I am free to withdraw my consent and terminate my child's participation at any time.

I hereby consent to the participation of _____, a minor as a participant in this scientific investigation described.

Date Signature of minor participant's parent or guardian

I the undersigned, have defined and fully explained the investigation to the above parent or guardian.

Date Investigator's signature

VITA

Kelley Smith was born in Goodlettsville, Tennessee. She earned a Bachelor of Science in Elementary Education with a focus on PreK-3 from the University of Tennessee at Chattanooga in May 2012. After graduation she attended the University of Tennessee at Chattanooga to complete a master's degree in Special Education with a focus on Early Childhood. Kelley will earn her Master of Education in Special Education in May 2014 and looks forward to pursuing a career in early childhood special education for the upcoming school year.