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The Effects Of Video Self-Modeling On Children With Autism Spectrum Disorder

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THE EFFECTS OF VIDEO SELF-MODELING ON CHILDREN WITH AUTISM SPECTRUM DISORDER

being

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by

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The research described in this thesis utilized human subjects. The thesis prospectus was therefore examined by the Human Subjects Research Committee of the Psychology Department, Fort Hays State University, and found to comply with Title 45, Subtitle A – Department of Health, Education and Welfare, General Administrations; Part 46 – Protection Subjects.

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Date

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Ethics Committee Chairman

ABSTRACT

Video self-modeling (VSM) is a type of intervention that has been developed to assist students in viewing themselves successfully in a wide variety of domains. Previous research regarding VSM states that it is beneficial to children with autism spectrum disorder and has helped them improve functioning in many settings. Specifically, VSM is useful to children with autism spectrum disorder because it minimizes attentional and hearing requirements, and allows the child to see themselves as they could be rather than as they currently are. Video modeling avoids reliance on social interactions or the presence of a therapist to promote learning. This reduction in the importance of social interactions may be particularly significant for children who struggle in social settings. Finally, motivation for watching television in general might increase interest in watching the video. The present study was designed to analyze the effects of VSM on children with autism spectrum disorder in an academic setting. The present study added to the literature by allowing classroom teachers to choose the area of academic behavior, thereby increasing social relevance.

The present study examined the effects of VSM on children with autism spectrum disorder within a functional interrelated classroom. Specifically, the present study examined the effects of the implementation of VSM within the functional interrelated classroom and the potential it has to enable significant positive changes in on-task behavior and appropriate transitions. The study also examined the maintenance of on-task behavior and appropriate transitions within implementation of the VSM research. Also explored were the teachers' perceptions of on-task behavior and appropriate

transitions through surveys that were administered before implementation of VSM and upon completion of VSM.

The sample of the current study was comprised of two participants who were enrolled within the functional interrelated classroom and diagnosed with autism spectrum disorder. The implementation of VSM within an academic setting proved to be successful and showed significant results in increasing on-task behavior with Student 1. Maintenance was also shown with this student. No significance was found with the Student 2 and increasing appropriate transitions; however an anomaly was discovered within one of the days VSM was implemented. With the removal of this anomaly, significance was found with the second student and increasing appropriate transitions. Despite the increase in appropriate transitions, maintenance was not established with the second student. The teachers' perceptions from the administered survey revealed a significant increase in on-task behavior and appropriate transitions with the implementation of the VSM research.

When investigating approaches appropriate for students with ASD, it is important to remember that some progress is significant. Implementation of VSM revealed progress with both students with ASD, at varying levels. It is also important to stress that small change for students with ASD may not occur without some difficulty, due to general resistance to changes in their schedules. Over the course of the seven weeks of implementation, small change was observed and can be considered a success in their academic setting.

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INTRODUCTION

Autism is a type of disorder included in the autism spectrum disorder (ASD) category. Other disorders in the category include Asperger's syndrome and pervasive developmental disorder-not otherwise specified. Individuals with autism have a triad of impairments. These impairments include verbal and non-verbal communication, social interactions, resistance to environmental change (Delano, 2007) and restricted behaviors and interests (Braithwaite & Richdale, 2000; Delano, 2007). Examples of restricted behaviors and interests include unusual behaviors and habits or obsessions, such as repetitive ticks or motor routines. In addition, children with autism have deficits in attention behavior, eye contact, and processing of social stimuli. One of the most prominent deficits in children with autism is communication, as 30% of children with autism never develop a language to native-like proficiency.

Volkmar, Cohen, and Paul (1985) found that parents of 50 children diagnosed with autism reported a variety of stereotyped movement including rocking (65%); toe walking (57%); arm, hand, or finger flapping (52%); and whirling (50%). The pervasive influence of autism spectrum disorder on diverse domains can have an adverse impact on a child's educational performance (Delano, 2007) and can cause these children to lag behind peers. Consequently, educational programs for children with ASD must be multi-faceted and address communication and language development, social and affective development, life skills, and academics.

For many years parents, teachers, and therapists have actively and aggressively pursued a wide range of approaches to treating students with ASD (Buggey, 2005). There have been many attempts to intervene with children who have ASD, some with

reasonable success. This literature review will examine such attempts, focusing on a new technique known as video self-modeling and the practical significance its benefits has for children with autism.

The concept of modeling, or observational learning, as an intervention technique was first introduced 40 years ago by Albert Bandura, as part of his seminal work on social learning theory (Bellini & Akullian, 2007). Modeling or observational learning is defined as a result of observing the behavior of a model (Shipley-Benamou, Lutzker, & Taubman, 2002). This concept is known as "others as model." Among the countless responses acquired observationally, those behaviors that seem to be effective for others are favored over behaviors that are seen to have negative consequences and the evaluative reactions that people generate toward their own behavior also regulate which observationally learned responses will be performed (Bandura, 1977). Over the course of his career, Bandura (1977, 1997) demonstrated that modeling has a profound impact on the development of children. Bandura (1977) showed that children will imitate behaviors with or without the presence of reinforcement, and will perform the behavior in surroundings other than the settings where it was originally observed. Bandura also stated that children are most likely to attend to a model that they perceive as competent, and who is similar to themselves in some way.

Technological advances in the past two decades have allowed researchers to extend the concept of modeling to include the use of video to teach a wide variety of skills (Sherer, Pierce, Parades, Kisacky, Ingersoll, & Schreibman, 2001). Models presented in televised form are so effective in capturing attention that viewers learn much of what they see without requiring any special incentives to do so (Bandura,

1977). Only a few studies have investigated the effectiveness of video interventions for children with autism, the majority of which have focused on teaching social behaviors and increasing language skills (Shipley-Benamou et al., 2002). In a typical study, children with autism view a video of a target behavior prior to entering the setting in which the target behavior was measured (Delano, 2007). D'Ateno, Mangiapanello, and Taylor (2003) created videotapes for children with autism using adults as models for appropriate play. Children with autism viewed the videotapes, waited one hour, and were observed afterwards in a similar play scenario as the one depicted by the adult in the video. It was noted that the modeling intervention was related to positive gains in appropriate play in children with autism.

As illustrated from the research studies above, the use of video modeling to improve behaviors in a child with autism has been fairly successful. The success could, in part, be explained by four primary features. First, video modeling includes many of the features that Bandura found to be important, such as the use of a competent and similar model. Second, video modeling minimizes attention and language requirements. This is because the child only needs to view a small spatial area (i.e., television monitor) and to listen to a minimum amount of language. Video modeling avoids reliance on social interactions or the presence of a therapist to promote learning. This reduction in the importance of social interactions may be particularly significant for children who struggle in social settings. Finally, motivation for watching television in general might increase interest in watching the video (Sherer et al., 2001).

Among all the advantages of other as model, there are some disadvantages. One disadvantage is the child acting as the model may not remain anonymous during

the video recording process. This might reduce the number of parents who give permission for their child to serve as a model (Shipley-Benamou et al., 2002.). Filming the desired behavior requires time and follow-up sessions may be needed. Locating a child that is age and gender appropriate as well may serve as a disadvantage.

These disadvantages might be solved through another idea from Badura. Specifically Bandura (1997) noted that the advantage of seeing oneself perform successfully provides clear information on how best to perform skills and strengthens beliefs in one's capability. The phrase "self-as-model" is a method of having the child with autism spectrum disorder serve as their own model, typically using videotapes. Video Self-Modeling (VSM) has been evaluated as a second type of video modeling in which the children with autism serve as their own models (Delano, 2007). The process involves recording the target child maximizing a specific skill. The videos are edited, removing unwanted behaviors or errors and other distracting footage, and should be around three to five minutes in length all together. The result should be footage of the target child performing desired behaviors. Repeated viewing of the video occurs, showing only desirable behaviors. The potential of VSM is supported by the socio-cultural view of learning and language development. Research has been supported that VSM is beneficial to children with autism spectrum disorder, and has helped them improve functioning in many settings. Moderate to strong outcomes of the reviewed studies suggest that VSM can be used successfully to support students' communication, behavior, and academic performance in educational settings (Hitchcock, Dowrick, & Prater, 2003).

Buggey (2005) applied VSM to autism spectrum disorders to help with such behaviors as social interactions, tantrums, and language productions. In his study, Buggey collected baseline data, and then implemented VSM intervention. After noticeable improvement of such behaviors, VSM was withdrawn and conclusions were made. It appeared that all participants made substantial gains as a result of VSM. Shipley-Benamou et al., (2002) found that using VSM was effective in teaching daily living skills to children with autism. An increase in play-related statements in children with autism toward their siblings was found using VSM according to Taylor, Levin, and Jaspers (1999). VSM has proved efficient with help in academic areas such as math (Schunk & Hanson, 1989) and life skills (Miklich, Chida, & Danker-Brown, 1997). Shunk and Hanson (1989) concluded that children who struggled with arithmetic made noticeable improvements after viewing themselves perform correct fraction problems on videotape. Thus, VSM has been incorporated into the classroom as an effective tool to assist students academically. Evidence has been provided for an increase in rate of desired classroom behavior and performance of academic skills and decreases in inappropriate behavior in the classroom.

The success of the tool could be due to a variety of factors. First, VSM offers a way for individuals to confront their own behaviors (Buggey, 2005). VSM usually has immediate results, making it time and cost efficient (Hitchcock et al., 2003). Videos are also portable and can be used to maintain target behaviors during school breaks, such as winter or summer break. By minimizing attentional requirements, requiring the child only to look at a small spatial area (a television monitor), and to hear only the minimum necessary language, children are more able to direct their focus to relevant stimuli

(Shipely-Benamou et al., 2002). Children might enjoy watching themselves more than watching an age-matched model and, thus, may be more motivated to attend to the videotape, as well as the familiarity of the self-model might make visual processing, and thus learning, easier (Sherer et al., 2001). It also allows individuals to see themselves as they could be rather than as they currently are. In addition, television offers a relatively nonthreatening medium of teaching when compared to direct human interaction (Zihini & Zihini, 1998).

Further, watching predominately positive and/or successful behaviors of self, as opposed to negative and/or unsuccessful behaviors, is essential to effective modeling as it increases both attention and motivation to attend to the modeled behaviors (Bellini & Akullian, 2007). Research has supported the notion that skills learned via video modeling and VSM generalize across different settings and conditions and that the positive gains made during the video modeling intervention are maintained for months following the conclusion of the intervention (Bellini & Akullian, 2007). Schreibman, Whalen, and Stahmer (2000) used a video priming technique to reduce or eliminate disruptive behaviors associated with transition situations for children with autism, and in all instances the video priming intervention resulted in decreases in the disruptive behavior and generalized across new transition situations. These conclusions lead teachers and other education staff to use VSM within the classroom to increase academic learning with their students with autism spectrum disorder.

There has been limited research in general on VSM, the number only in the single digits. A meta-analysis conducted by Bellini and Akullian (2007), included 23 studies that were published between 1998 and 2005. Of those 23, 15 examined video

modeling interventions and only 7 examined VSM, with one study examining both video modeling and VSM. In addition, to date, most of the research on the use of video modeling with children with autism spectrum disorder has focused on improving social-communicative skills (Delano, 2007). There has been limited attention and research conducted regarding children with autism spectrum disorders who exhibit severe attention (Courchesne et al., 1994), social (Pierce & Schreibman, 1995), and motivational deficits (Shipley-Benamou et al., 2002). A majority of research has been conducted to increase social skills in the community, conversational skills, functional skills such as brushing teeth or washing face, and play behavior. Consequently, more research needs to be conducted on VSM procedures to improve academic functioning, increase on-task behavior in certain academic fields, or allow parents or teachers to pick the task to increase the social relevance. Hitchcock et al., (2003) noted that more research is needed on VSM and they encouraged teachers and researchers to implement VSM and investigate this type of intervention, since there is little research available to date.

The purpose of the present study was to implement VSM in the classroom to improve academic performance, such as on task behavior and appropriate transitions with two students with ASD. Specifically, this study utilized the image of future success (Dowrick, 1999) or video feedforward. Video feedforward is a category of VSM interventions. In feedforward interventions, individuals observe themselves successfully demonstrating skills that are slightly above their current capability (Bellini & Akullian, 2007) or that have not been previously attained (Hitchcock et al., 2003). In a study

conducted by Dowrick, Kim-Rupnow, and Power (2006), it was found that video feedforward had significantly increased students' rate of improvement in reading fluency.

Research indicates the utility of self-modeling is evident in that it has been used to address successfully a myriad of conditions, including daily living skills (Shipley-Benamou et al., 2002); language production (Buggy, 2005); preteaching reading skills (Beck, Burns, & Lau, 2009); responding behaviors (Buggy, Toombs, Garndener, & Cervettie, 1999); attention-deficit/hyperactivity disorder (Walker & Clement, 1992); transitions (McCoy, Mathur, & Czoka, 2010); and learning/behavior disabilities (Clare, Jenson, Kehle, & Bray, 2000). With regards to increasing children's on-task behavior, previous investigations employing self-modeling have revealed mixed results (Clare et al., 2000). Clare et al. (2000) reported a substantial increase in their participants' on-task behaviors. In contrast, however, Possell, Kehle, McLoughlin, and Bray (1999) found idiosyncratic and limited effects of self-modeling with similar students used in previous studies. Thus, the present research explored the implementation of VSM within a functional interrelated classroom to explore the effects it had on children with autism spectrum disorder and on-task behavior. Therefore, it was hypothesized that *the implementation of video self-modeling (VSM) would significantly increase the percentage of on-task behavior compared to control conditions*. With regards to Clare et al. (2000), students' on-task behaviors were maintained at six and eight weeks after termination of treatment. Lonnecker, Brady, McPherson, and Hawkins (1994) also observed maintenance during the fading phase of research conducted. Consequently, it was also hypothesized that *the implementation of video self-modeling (VSM) within the functional*

interrelated classroom would demonstrate maintenance, or the general increase in on-task behaviors over the seven weeks of implementation.

Making successful transitions from one activity to another is difficult for many children, especially children with autism spectrum disorder; increasing the length of the transition is directly relevant to the amount of time available for student engagement in an expected task (McGrath & Rust, 2002). Visual supports may improve learning for children who have limitations in processing or attending to transient information or who are challenged to recall information presented verbally (McCoy et al., 2010). It was hypothesized that *the implementation of video self-modeling (VSM) within the functional interrelated classroom would increase the percentage of appropriate transitions as compared to control conditions*. With regards to this hypothesis, it was also predicted that *the implementation of video self-modeling (VSM) within the functional interrelated classroom would demonstrate maintenance, or the general increase in appropriate transitions over the weeks of implementation.*

Finally, the present study investigated the functional interrelated classroom teachers' responses before the implementation of VSM and after the completion of VSM. It was hypothesized that *teacher's ratings of on-task behaviors and appropriate transitions would significantly increase after the introductions of VSM as compared to baseline ratings.* This hypothesis was intended to provide a clearer understanding of how the functional interrelated classroom teachers perceived the implementation of VSM and whether they found it effective with their chosen students and areas of improvement.

The present study has practical implications for many students with autism spectrum disorder within the realm education. The information presented may be

beneficial to students in the future for increasing academic success. This methodology was advantageous because it allowed children to achieve new skills that are pertinent to the academic world. This specific study added to the literature by allowing teachers to pick the academic behavior, thus increasing social relevance.

METHODOLOGY

Participants

Two middle school students were chosen to participate in this study. Both students attended one middle school in Western Kansas and participated in a special education functional interrelated classroom on a daily basis. They were selected for participation in this study because they were previously diagnosed with ASD, showed struggles or difficulties in specific academic areas, and were thought to benefit from VSM when teacher input was taken into consideration.

The first student was a 13-year-old Caucasian girl in the 8th grade. VSM was implemented to assist her in increasing her time on-task during reading class (30 minutes), suggested by the two functional interrelated classroom teachers. Beck et al. (2009) described time on-task as attending to the assigned reading material (e.g., appearing to silently read material, writing, raising hand to ask for assistance, and listening to a teacher explain directions). Clare et al. (2000) defined on-task behavior as having eye contact with the teacher, or the assigned task, and performing the requested assignment. In the current study, these definitions were used in addition to time on-task including the student being engaged in academic learning time. Academic learning time consisted of listening to a story, cut and paste activities, coloring or drawing, handwriting practice, or flashcards. Time on-task also included increasing her positive interaction with peers and classroom staff, which encompassed keeping her hands to herself (no pinching, hitting, pulling hair), and replacing automatic refusal to do academic activities with willingness to attempt activities. Off-task behaviors were as defined by previous research and included not having eyes orientated toward the assigned material. Examples

of off-task behavior included talking to a peer about something other than the assigned task, staring out the classroom window, being out of seat, and showing any physical aggression (Beck et al., 2009). These definitions of off-task behavior were utilized in the current study.

The second student was a 14-year-old Caucasian girl in the 8th grade. VSM was also implemented to assist her with transition difficulties. She had difficulties with transitions during individual classes or transitions that were not aligned with her routine. She had a visual schedule she followed for the daily routine. However, she struggled with transitions during specific class periods when she was asked to switch activities or when she was asked to leave for related services. According to the functional interrelated classroom teachers, her struggles included: very vocal responses and exaggerated questions as to what is going on, tears or crying, hand or finger flapping, and/or exaggerated sobbing. For the purpose of this study, the research focused on transitions during academic periods, which included switching activities in the same academic period. This study focused specifically on math class, because both teachers reported math as being the academic class period where a majority of her difficulties were observed. The focus was on this transition because she displays inappropriate transitions every day, she was not accomplishing as much academic school work as desired, and she disrupted her classmates to the point where it is potentially problematic for them to focus and continue on their academic school work.

Appropriate transitions for this student encompassed attending to the assigned task, which included eyes focusing on the assignment, remaining in her seat, and little to no loud vocalizations or interruptions. Appropriate transitions also included putting away

specific materials as directed and retrieving materials for the next activity in math class. Inappropriate transitions consisted of loud vocalizations by the student when asked to begin a new activity in the math class, such as exaggerated sobbing, crying, and dramatic questions. Inappropriate transitions also encompassed refusal to put away class materials or refusal to get out new class materials for the new activity

The school that each student attended served approximately 425 students in 6th grade through 8th grade. Specifically, each student was part of the functional interrelated classroom, where instruction is warranted in all the core classes, with special instruction referenced to important activities in the home, community, and future work settings. Data was collected within the functional interrelated classroom.

Experimental Design

This study utilized a single subject repeated measures design. Single subject designs are designs that can be applied when the sample size is one or when a number of individuals are considered one group; these designs are typically used to study the behavioral change an individual exhibits as a result of some treatment (Bonds-Raacke & Raacke, 2012; Wasson, 2010) and are frequently used in VSM research (Bellini & Akullian, 2007; Beck et al., 2009; Hines & Simonsen, 2008). For the current study, a pre-assessment evaluation completed by the teachers before implementation of VSM of each student's academic behavior occurred. Next, the independent variable was introduced and impacts measured. Finally, a posttest assessment, again completed by the teachers, evaluated the effectiveness of VSM on targeted skills.

An alternating-treatment design with comparison and withdrawal conditions was used to compare the effects of video self-modeling (VSM) on the performance of on-task

behaviors and transitions by the two respective students. An alternating-treatment design is one in which two or more treatment options are alternated in quick succession to evaluate differential effects. Each time a condition is introduced it is maintained only for a brief period before being alternated with a different condition. This design was selected for the current study because of its numerous benefits such as the elimination of baseline data. In addition, previous research utilizing the alternating-treatment design has found that conditions are quickly discriminated by the participants and the influence of conditions can be easily observed (White, 2010). However, there are also some limitations to this design when the population of interest is children with ASD. Specifically many children with autism spectrum disorders are preoccupied with "sameness" in their home environments and with school routines. It is not uncommon for changes in the routine to lead to a tantrum or other emotional disturbances (Filipek et al., 1999). Another limitation includes any carry-over or contrast effect from one condition to the next that will cloud results. A carry-over effect is one in which the lingering effect of one treatment is likely to produce a similar effect in the condition that follows it, which tends to reduce differences in the impact of two treatments. A contrast effect is one in which the differences between the two treatments are exaggerated by experiencing them in close temporal approximation (White, 2010).

The alternating-treatment design consisted of 20 days of implementation, occurring, three days a week for seven weeks (See table 1). Of the 20 days, 10 days utilized VSM treatment and 10 days served as a control. The order of the implementation was determined using a random procedure. Specifically, Microsoft Excel randomized

both the treatment and the control groups, using randomization within blocks of three days.

Materials and Procedure

Materials essential for this study included necessary proof that the target student had autism spectrum disorder. An Individual Education Plan (IEP) was sufficient proof that the target child had a diagnosis within autism spectrum disorder. This study also utilized a "Flip Video MinoHD" camcorder to record each student in their specified class; then the footage was edited by including only desired behavior to create a master video for each student to view before their class began. The Flip Video MinoHD camcorder was also used to record a behavior each day of implementation to measure for change. A Dell XPS laptop was also used to edit the video clips, and used for each student to view their VSM clip.

Within this study, several measures were included. Simple demographics were taken to provide characteristics of the population chosen. A specific coding system was implemented using eCOVE to measure the effectiveness of VSM. The coding system included defined target behaviors for each child. Behaviors of interest to this study comprised on-task behavior in reading class and appropriate transitions in math class. Each student had a different target behavior, therefore having a different specific coding system for each child was appropriate. The target behaviors were identified during a meeting with the two functional interrelated teachers. This meeting was warranted to determine if each student had prerequisite skills for VSM training, such as self-recognition and the ability to correct specific behaviors (Buggey, 2005). To aid in establishing social validity, teachers were allowed to identify specific behaviors each

child needed to increase or see changes in. Two surveys were also developed and distributed to the two teachers of the functional interrelated classroom. One survey was administered before implementation of VSM and can be found in Appendices G and H. The other surveys were implemented upon completion of and can be found in Appendices I and J.

This study lasted approximately three months in the fall semester of the 2011-2012 school year. After obtaining consent from the school district to conduct the study, permission was granted by both the functional interrelated classroom teachers. Consent was then obtained from each of the student's parents and, child assent was also obtained from each of the participants in the present study. Once consent was granted, the teachers completed the pre-assessment baseline surveys.

Next, video recording began on each individual child to record the specific target behaviors for VSM footage used in implementation of the research. Video recording took approximately one week to obtain enough footage to create a master video for the two students to view on their randomly assigned VSM days. Editing the videos occurred as well to ensure that only positive behaviors were viewed. Once the videos were edited, a voice over was provided with encouraging prompts for the first student to increase self-efficacy. Such auditory prompts included "Great work," "nice job working quietly," or "look how good you are working!" The master video for the second student made use of visual prompts she could read. These visual prompts included "Nice job working quietly," "good job," and "great work!" Videos were played to the child before the specified academic class on the randomly assigned VSM day. To document any change in behaviors, each student was recorded using the Flip video camera each day of the

research, which included VSM days and control days for comparison to measure change. The videos were stored on the researcher's personal lap top computer with password protected.

Dependent Variables

Classroom data was collected by employing momentary-time sampling, with 10-s intervals during 30 minute observation sessions with Student 1 and 10 minute observation sessions with Student 2. Behaviors of each student were rated every 10 seconds. The observations occurred during independent seat-work in reading and math class, as previously conducted by Clare et al., 2000. There were two dependent variables. The two dependent variables made use of momentary time sampling, which has been shown to effectively measure on-task behavior for typically developing students as well as students with BDs (Beck et al., 2009; Gunter, Venn, Patrick, Miller, & Kelly, 2003). These two dependent variables included on-task behavior for the Student 1 and appropriate transitions for the Student 2. The software "eCOVE" was used within momentary time sampling to measure on-task behavior and appropriate transitions. To gather the dependent variables the present study made use of three research assistants to assist with coding the data obtained.

Interobserver Reliability

To obtain both dependent variables, the students were video-taped, and then observation took place at a later date. There were a total of three observers who viewed the video tapes, two current school psychology graduate students and one undergraduate student with a minimum of one year of experience in a research setting. When observation is the method of collecting data, reliability must be established among the

judges' scores to maintain consistency (Gliner, Morgan, & Leech, 2009). This type of reliability is referred to as interrater reliability. The observers received a one hour training session. During the training session, the operational definitions for on-task and off-task behaviors and appropriate and inappropriate transitions were provided. In addition, example video clips were provided to illustrate on-task and off-task behaviors for the first student, as well as appropriate and inappropriate transitions for the second student. The examples provided did not contain actual footage to be analyzed during the experimental procedure. The observers watched the sample videos, and practiced classifying on-task and off-task behavior and appropriate and inappropriate transitions, and discussed the results. When a 90% consensus was reached, the experimental procedure was ready to begin. The observers were blind to the conditions of the study as recommended by Clare et al. (2000). Although this method is preferred, one of the problems with this method is that while all three observers may agree that a behavior was elicited a particular number of times, this does not mean that each time the behavior occurred that all observers agreed (Gliner et al., 2009).

RESULTS

A Pearson correlation coefficient was calculated to assess the relationship between each of the three observers' scores to find the highest correlations between each when looking at Student 1 data. There were strong positive correlations found with Researcher one when compared to Researchers two (r (20) = .873, $p < .05$) and Researcher three (r (20) = .854, $p < .05$). Researcher one was determined the primary observer regarding Student 1; due to having the highest correlations (J. M. Naylor, personal communication, April 11, 2012)). A Pearson correlation coefficient was also calculated to assess for the relationship between each of the three observer's scores to find the highest correlations between each when looking at Student 2 data. There were strong positive correlations found with Researcher one when compared to Researcher two (r (20) = .957, $p < .05$) and Researcher three (r (20) = .955, $p < .05$). Again, Researcher one was determined the primary observer regarding Student 2, due to having the highest correlations.

Hypothesis (a)

A paired-samples t test was calculated with Student 1 data to determine if on-task behavior varied between control days and video self-modeling (VSM) days. The average percent of on-task behavior on the control days was 93.6 (SD = 4.56), and the average percent of on-task behavior on the VSM days was 97.42 (SD = 5.16). Data showed significantly higher mean scores for on-task behavior on the VSM days than the control days, t (9) = 2.18, $p < .05$. A paired-sample t test was also calculated using Student 1 data to determine if off-task behavior varied between control days and VSM days. The average percent of off-task behavior on the control days was 6.12 (SD = 4.83), and the

average percent of off-task behavior on the VSM days was 2.58 (*SD* = 5.16). Thus, significantly higher mean scores were found for off-task behavior on the control days than on the VSM days, t (9) = 1.98, $p < .05$.

Hypothesis (b)

A Pearson correlation coefficient was calculated to assess the maintenance effects of VSM on Student 1 over the course of implementation. A moderate positive correlation was found ($r(20) = .402$, $p < .05$), indicating a significant linear relationship between the day of treatment and on-task behavior. Maintenance was achieved over the course of implementation of the research for Student 1 (See graph 1).

Hypothesis (c)

A paired-samples *t* test was calculated with Student 2 data to determine if appropriate transitions varied between control days and video self-modeling (VSM) days. The average percent of appropriate transitions on the control days was 76.84 (*SD* = 18.34), and the average percent of appropriate transitions on the VSM days was 84.67 (*SD* = 22.09). No significant difference from the control days to the VSM days was found (t (9) = -1.41, $p > .05$). A review of the days in which the video was applied to Student 2 revealed an anomaly. This anomaly may be due to the fact Student 2 had a different para-educator than she usually has on this specific day, resulting in a change in the student's schedule. The anomaly was the only day during the 20 days of implementation that showed a significant difference when compared to the 19 other days. Student 2 had a consistent para to work with during math class each day, but on this day the para was absent. Many students with ASD display resistance to environmental change, which may have led to the anomaly on this day. The paired-samples *t* test was re

re-run with the exclusion of the anomaly. The average percent of appropriate transitions on the control days was 80.93 (*SD* = 13.78), and the average percent of appropriate transitions on the VSM days was 91.45 (*SD* = 5.09). With the removal of the anomaly, there was a significant difference between the control days and the VSM days (t (8) = -1.94, $p < .05$). A paired-samples t test was calculated with Student 2 data to determine if inappropriate transitions varied between controls days and VSM days. The average percent of inappropriate transitions on the control days was 23.16 (*SD* = 18.34), and the average percent of inappropriate transitions on the VSM days was 15.33 (*SD* = 22.09). No significant difference from the control days to the VSM days was found (t (9) = 1.41, $p > .05$). Again the analysis was rerun excluding the anomaly. The average percent of inappropriate transitions on the control days was 19.07 (*SD* = 13.78), and the average percent of inappropriate transitions on the VSM days was 8.51 (*SD* = 5.09). With the removal of the anomaly, there was a significant difference between the control days and the VSM days (t (8) = 1.94, $p < .05$).

Hypothesis (d)

A Pearson correlation coefficient was calculated to assess the maintenance effects of VSM on Student 2 over the course of implementation. A weak positive correlation was found (r(20) = .103, $p > .05$), indicating a lack of a significant linear relationship between the day of implementation and appropriate transitions. Maintenance was not easily achieved over the course of implementation of the research for Student 2 (See graph 2).

Hypothesis (e)

A likert-scale was administered to the two classroom teachers in the functional interrelated classroom before implementation of VSM and upon completion of the VSM research. The likert-scale had each of the teacher rate on-task behavior as well as off-task behavior in terms of strength and each teacher also rated appropriate and inappropriate transitions in terms of strength. The before implementation and after implementation of VSM likert-scales from each teacher was compared and each question averaged for analysis.

A paired-samples *t* test was calculated to compare the teachers' perceptions of on-task behavior for student 1 before implementation of VSM, to the teachers' perceptions of behaviors after implementation of VSM. The average mean rating of the teachers' perceptions before VSM implementation was 2.79 (*SD* = .49), and the average mean rating of the teachers' perceptions after implementation of VSM was 4.12 (*SD* = .24). According to the two teachers' responses, there was a significant increase of on-task behavior in Student 1 upon completion of the VSM research (t (6) = -5.20, $p < .05$). A paired-samples *t* test was also calculated to determine the teachers' perceptions before and after VSM implementation of off-task behavior. The average mean rating of the teachers' perceptions before implementation was 2.90 (*SD* = 1.93), and the average mean rating of the teachers' perceptions after implementation was 4.40 (*SD* = .42). Again, according to the two teachers' responses, there was a significant decrease of off-task behavior in Student 1 upon completion of the VSM research (t (4) = -3.00, $p < .05$).

A paired-samples *t* test was calculated to compare the teachers' perceptions before implementation of VSM, to the teachers' perceptions after implementation of VSM of appropriate transitions for Student 2. The average mean rating of the teachers'

perceptions before VSM implementation was 2.80 (*SD* = .67), and the average mean rating of the teachers' perceptions after implementation of VSM was 4.20 (*SD* = .57). According to the two teachers' responses, there was a significant increase in appropriate transitions in Student 2 upon completion of the VSM research (t (4) = -14.00, $p < .05$). A paired-samples t test was calculated to compare the teachers' perceptions before implementation of VSM, to the teachers' perceptions after implementation of VSM of inappropriate transitions for Student 2. The average mean rating of the teachers' perceptions before VSM implementation was 3.20 (*SD* = 1.35), and the average mean rating of the teachers' perceptions after implementation of VSM was 4.40 (*SD* = .55). Thus, there was no significant difference found between before and after implementation of the VSM research with regards to inappropriate transitions (t (4) = -1.47, $p > .05$).

DISCUSSION

The purpose of the present study was to examine the effects of video self-modeling on children with autism spectrum disorder when implemented in an academic setting and the maintenance of desired behaviors over time. This study was developed in response to previous research (Buggey, 2005; Clare et al., 2000; Sherer et al., 2001; Shipley-Benamou, 2002; Schunk & Hanson, 1989) suggesting the positive gains made by video self-modeling on children in various settings; however this study was implemented in the classroom to improve academic performance, including on-task behavior and appropriate transitions with students with ASD. In addition, this study made use of video feedforward, or the image of future success. The present study that has been conducted has also added to the literature by allowing teachers to choose the specific students' with concerns, the academic behavior to target, and the class period to implement VSM, thus increasing social relevance.

In an effort examine the effects of video self-modeling on children with autism spectrum disorder; five hypotheses were developed in relation to the two participants and the administered likert-scales. The first hypothesis developed stated the implementation of VSM within the functional interrelated classroom would significantly increase the percentage of on-task behavior compared to control conditions. Consistent with prior research, the data suggests that video is a useful medium for accomplishing positive behavior change in this population (Charlop & Milstein, 1989; Lonnecker et al., 1994; Pierce, Clad, & Schreibman, 1997; Schreibman et al., 2000; Shipley-Benamou et al., 2002). The data analysis conducted for the effects of video self-modeling increasing on-task behavior supported the first hypothesis. Video self-modeling was effective and

efficient in increasing on-task behavior in an academic setting. There was a clear demonstration that for Student 1 on-task behavior greatly improved as a result of the VSM implementation in her reading class. Consistent with the second hypothesis developed, the implementation of VSM demonstrated maintenance over the seven weeks of implementation. In other words, at the completion of the study, on-task behavior for Student 1 had increased overtime regardless of the condition.

The third hypothesis developed stated that the implementation of VSM within the functional interrelated classroom would increase the percentage of appropriate transitions as compared to control conditions. Student 2 was approaching significance overall, but showed evidence of an anomaly within the 20 days of implementation. With the removal of this anomaly, Student 2 showed a significant difference in overall appropriate transition behavior. The anomaly consisted of Student 2 having a consistent para-educator for two weeks, and then was given an unfamiliar para-educator on day 11 due to her consistent para-educator being absent. As mentioned earlier, children with ASD show resistance to environmental change (Delano, 2007) which can lead to that child with ASD to struggle for the remainder of the day if their schedule or routine is changed abruptly. It was apparent that the removal of her consistent para-educator led her to struggle during her math class, even with the presence of her video. The fourth hypothesis developed stated that the implementation of VSM within the functional interrelated classroom would demonstrate maintenance. Maintenance for Student was difficult to establish, and it is thought with more time dedicated to the implementation of VSM, maintenance may prove to be clearer.

The fifth, and final, hypothesis developed stated the teacher's ratings of on-task behaviors and appropriate transitions would significantly increase after the introductions of VSM as compared to baseline ratings. Consistent with this hypothesis, both of the functional interrelated classroom teachers rated on-task behavior and appropriate transitions low on the administered likert-scale before implementation. Upon completion of the present study, another likert-scale was administered for the teachers to rate the strength of improvement in on-task behavior and appropriate transitions. Each teacher gave high ratings for improvement and an increase in on-task behavior and appropriate transitions. Both of the classroom teachers may have perceived change and rated so on the likert-scales because they expected to observe change.

Skills are not perfected through observation alone, nor are they developed solely by trial-and-error fumbling (Bandura, 1977). It is important to stress that some progress is significant when working with children with ASD. Their triad of impairments, consisting of verbal and non-verbal communication, restricted behaviors (Delano, 2007; Braithewaite & Richdale, 2000) and resistance to environmental change (Delano, 2007) can drastically affect their performance academically in the classroom. With VSM implementation, it was shown to have an increase in desired behaviors in the specific VSM days when compared to the control days. It is also important to stress that a small change does not occur without difficulty. Children with ASD do present a resistance to small changes in their schedule, and the progress that was observed and noted can be considered a success in their academic classes. In most everyday learning, people usually achieve a close approximation of the new behavior by modeling, and they refine it through self-corrective adjustments on the basis of informative feedback from

performance and from focused demonstrations of segments that have been only partially learned (Bandura, 1977).

The implementation of VSM was relatively nonintrusive, only taking a few minutes at the beginning of their chosen class period to view the edited video clip of positive and appropriate behaviors. Another aspect of VSM supported in the current study is that VSM tends to produce almost immediate results upon viewing the video clip, which initially can increase their academic success, being the objective for the current study. No researchers have found instances of delayed effect or even slow, gradual effects; thus if immediate results are not exhibited, it is unlikely that continued viewing will be effective unless it is adapted (Buggey, 2005).

The success of VSM may have been accomplished by minimizing the attentional demands, requiring the children to look only at a small spatial area and to hear only the minimum necessary language (Pierce et al., 1997; Shipley-Benamou et al., 2002). Motivation to attend and learn from the videos seems to have been enhanced by the low demand of video viewing and the apparently natural reinforcing properties of videos to children with autism (Shipley-Benamou et al., 2002). The implementation of VSM was conducted in the functional interrelated classroom setting, a setting where the students are most comfortable with.

Along with the likert-scales presented to each of the functional interrelated classroom teachers, there were numerous verbal reports from various staff members who include assistive technology professionals, speech-language pathologists, para-educators, and certified teachers. These verbal reports were extremely positive and suggested they could really see a difference in behavior from each student and could generally tell when

it was a schedule video day. Each student displayed appropriate classroom behavior and was able to focus better in each of their additional related services.

Limitations

Although the previously described methodology is the most appropriate methodology for the research questions, there are still limitations. For VSM to be effective, the viewer must attend to the video. The attention problems that children with autism often exhibit may be among the reasons why this method has rarely been attempted with children with autism (Buggey et al., 1999). A second limitation is it may be time consuming to record desired behaviors and to edit them to only show appropriate behaviors. Baseline data needs to be recorded, which may be time consuming as well. A third limitation is it may be difficult to capture the target behavior that is desired.

A constant threat to validity in single-subject design is the small sample size (Buggey, 2005). In this specific study, that threat was confounded by only having two participants with ASD. By having the classroom teachers chose two students of interest and also choosing the academic class period and the range of behaviors to increase, it was hoped to compensate for the lack of participants. The implementation of VSM was conducted in a natural environment or the functional interrelated classroom, where there were many extraneous variables that could not be controlled for such as fire drills and school wide activities.

Another possible threat to validity was the presence of the video-camera throughout the implementation of the research. Known as the Hawthorne Effect, students may have tended to increase their on-task and appropriate behavior having known there was a camera recording their behavior. Another limitation of the present study may also

include the lack of a follow-up phase. Maintenance as well as replication of skills across settings and contexts within the student's natural environment remains uncertain (Shipley-Benamou et al., 2002). This study was performed within 20 days of control and VSM implementation; the two participants may have benefited and maintained appropriate behaviors given more time. One limitation that is hard to plan for is the fact that many students with ASD take medication for various reasons, such as attention and anxiety. It is difficult to know and plan around when a student is unmedicated; which may lead to different results throughout the study.

Practical Implications and Future Research

Future research is needed to verify the current studies results and to continue exploring the effects of video self-modeling on children with autism spectrum disorder. The future research should also extend the amount of time between the intervention and the follow-up phase to determine maintenance of video self-modeling. Generalization across different settings and skills should also be explored. Allowing more time for implementation process may also lead to more significant results. The application of video self-modeling should also be extended to being used in other academic and behavior areas and throughout each day, as opposed to once a day a few times a week. Future research can also include training sessions to assist the teachers and staff in developing and implementing specific video clips for chosen students.

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TABLES

Table 1

Alternating-treatment Design

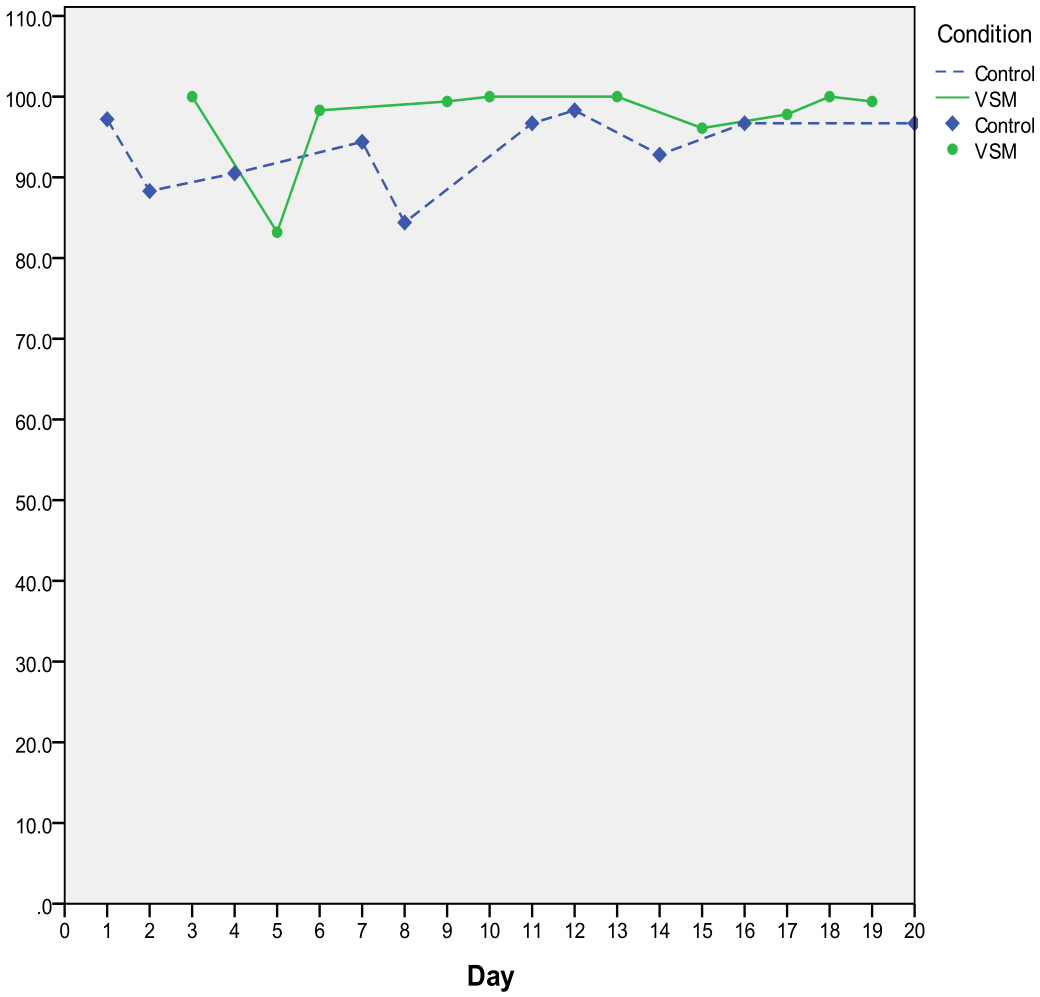
Week	Day	Student 1	Student 2
1	1	C	C
	2	C	C
	3	VSM	VSM
2	4	C	C
	5	VSM	VSM
	6	VSM	VSM
3	7	C	C
	8	C	C
	9	VSM	C
4	10	VSM	VSM
	11	C	VSM
	12	C	VSM
5	13	VSM	C
	14	C	C
	15	VSM	VSM
6	16	C	VSM
	17	VSM	C
	18	VSM	VSM
7	19	VSM	VSM
	20	C	C

C=Control

VSM=video self-model

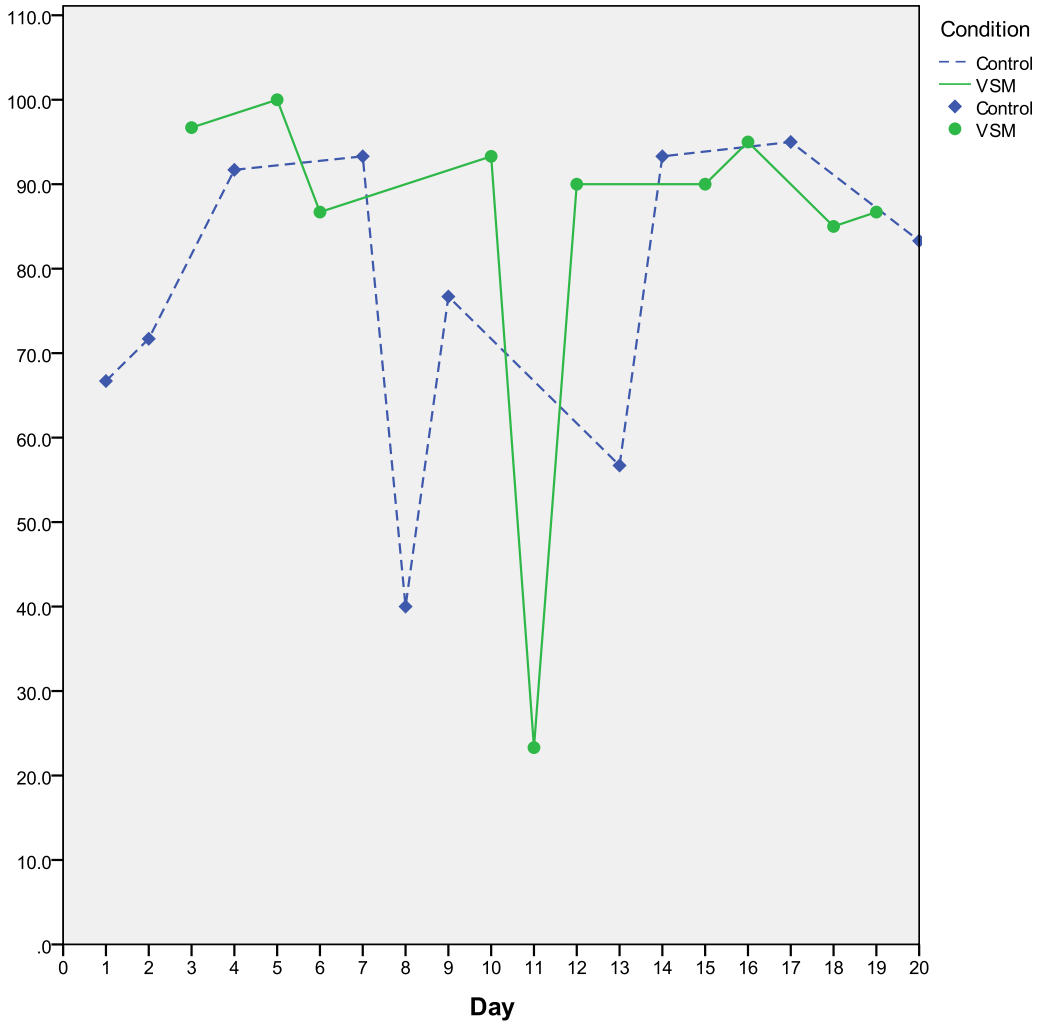
GRAPHS

Graph 1
Student I Maintenance



Graph 2

Student 2 Maintenance



APPENDIX A

Informed Consent Form

Researcher: Casey Schmidt
Graduate Student

Director: Dr. Jennifer Bonds-Raacke
Department of Psychology

The Effects of Video Self-Modeling (VSM) on Children with Autism Spectrum Disorder

I have been asked to allow my child to participate in a research project. This project will evaluate a specific visual support and the effectiveness of video modeling on increasing specific academic skills in the classroom. The visual support includes videos of my child maximizing on a specific positive behavior. My child will watch the video modeling on a Dell XPS laptop computer screen. This video shows my child maximizing a skill in a specified academic class period that is three to five minutes long. Following the viewing of the video, my child will be observed to see if the video was modeled. There will be a team of investigators consisting of the primary researcher and two research assistants watching the video of my child. This project has been reviewed and approved by the Department of Psychology Human Subjects Review Committee and the FHSU Institutional Review Board. By giving permission for my child to participate in this study, I agree to the procedures administered by the researcher.

I understand that:

A. There are minimal risks involved in this routine clinical procedure. The video-modeling procedure has been supported by previous research to have a positive outcome on children with autism spectrum disorder.

B. All data collection sheets will be destroyed at the end of the study and videos will be destroyed once at the conclusion of this study.

C. Results of this study may be published but all personal identifiable information will not be revealed and confidentiality will be maintained.

D. The results of this study will be shared with me at the conclusion of the study. In addition, I understand that I may observe any of the sessions on video to assure that a specified academic skill is being targeted.

E. The possible benefit of this study includes providing my child with a visual means to improve academic performance in the classroom.

F. The intervention will be incorporated weekly into my child's specified academic class. Recording will occur as much as needed, and implementation of the videos will be played at the beginning of each specified academic class period.

G. Any questions concerning this study will be answered by Casey Schmidt at 785-650-8194 or Dr. Jennifer Bonds-Raacke at (785) 628-4403.

H. I may withdraw my child from the study at any time without penalty.

I. Consent for my child's participation is given voluntarily without coercion or force.

J. My willingness to have my child participate in the study will be demonstrated by signing this consent form.

K. I have received a copy of this informed consent.

L. I give consent to the investigator to video-tape my child.

_____	_____
Name of Child (Please Print)	Date
_____	_____
Name of Parent or Guardian (Please Print)	Signature of Parent of Guardian

APPENDIX B

Debriefing Statement

Title: The Effects of Video Self-Modeling (VSM) on Children with Autism Spectrum Disorder (ASD)

Investigator: Casey Schmidt, graduate student School Psychology
Dr. Jennifer Bonds-Raacke, Thesis Chair

Thank you for yours and your child's participation in this study. The principle variable being studied is video self-modeling and its effects on children with autism spectrum disorder. The purpose of the study is to investigate if video self-modeling has a positive effect on children with autism spectrum disorder and their academic performance in the classroom. The hypothesis being studied is that video self-modeling will have a positive effect on children with autism spectrum disorder and increase their academic performance in school.

The procedure included deciding what specific behaviors will be modified according to the student's teachers. A survey was then administered before the study began and once the study was completed to assess whether teachers could identify a positive increase in academic behaviors. Once target behaviors were defined, implementation of video began. The study took approximately seven weeks to complete. Once target behaviors were recorded, videos were edited to delete any unwanted or negative behaviors. After videos were edited, they were played in front of your child before the specified academic class period. The investigator and the research assistants then observed and recorded data to decipher whether the process of video self-modeling was effective or not.

There was no deception used in this study. However, if you or your child feel discomfort or distress for any reason upon completion of this study, please contact the special education teachers (Name and phone number), school counselor (Name and phone number), or the school principle (Name and phone number). If you should have any questions concerning your child's participation, please feel free to contact Dr. Jennifer Bonds-Raacke at (785) 628-4403 or email at jmbondsraacke@fhsu.edu of the Psychology Department at Fort Hays State University or Casey Schmidt at (785) 650-8194 or by e-mail at cnschmidt@scatcat.fhsu.edu.

You and your child's participation in this study was important and greatly appreciated. Results of this study can be made available to you upon request and should be ready by (Date). If you would like a copy, please send an email to either Casey or Dr. Bonds-Raacke expressing your interest in the results and providing your phone number and e-mail address. Thank you again for your interest and participation.

APPENDIX C

Debriefing Statement for Teachers

Title: The Effects of Video Self-Modeling (VSM) on Children with Autism Spectrum Disorder (ASD)

Investigator: Casey Schmidt, graduate student School Psychology
Dr. Jennifer Bonds-Raacke, Thesis Chair

Thank you for yours and your student's participation in this study. The principle variable being studied is video self-modeling and its effects on children with autism spectrum disorder. The purpose of the study is to investigate if video self-modeling has a positive effect on children with autism spectrum disorder and their academic performance in the classroom. The hypothesis being studied is that video self-modeling will have a positive effect on children with autism spectrum disorder and increase their academic performance in school.

The procedure included deciding what specific behaviors will be modified according what academic behaviors you thought needed improvement. A survey was then administered before the study began and once the study was completed to assess whether you could identify a positive increase in academic behaviors. Once target behaviors were defined, implementation of video began. The study took approximately seven weeks to complete. Once target behaviors were recorded, videos were edited to delete any unwanted or negative behaviors. After videos were edited, they were played in front of your student before the specified academic class period. The investigator and the research assistants then observed and recorded data to decipher whether the process of video self-modeling was effective or not.

There was no deception used in this study. However, if you or your student feel discomfort or distress for any reason upon completion of this study, please contact the special education teachers (Name and phone number), school counselor (Name and phone number), or the school principle (Name and phone number). If you should have any questions concerning your or your student's participation, please feel free to contact Dr. Jennifer Bonds-Raacke at (785) 628-4403 or email at jmbondsraacke@fhsu.edu of the Psychology Department at Fort Hays State University or Casey Schmidt at (785) 650-8194 or by e-mail at cnschmidt@scatcat.fhsu.edu.

You and your student's participation in this study was important and greatly appreciated. Results of this study can be made available to you upon request and should be ready by (Date). If you would like a copy, please send an email to either Casey or Dr. Bonds-Raacke expressing your interest in the results and providing your phone number and e-mail address. Thank you again for your interest and participation.

APPENDIX D

Script for Recruitment

I am a graduate student under the direction of Dr. Jennifer Bonds-Raacke in the Department of Psychology at Fort Hays State University. I am conducting a research study to evaluate the effectiveness of video self-modeling on children with autism spectrum disorder.

I am recruiting children with autism spectrum disorder to participate in the study. These children will be observed and video recorded to assess the effectiveness of the process of video self-modeling. All aspects of the study will be kept confidential. The study should take approximately seven weeks to conduct. I would like to record your child during a specific academic class, edit the video to only depict the positive behaviors and play the video back to the child before the specified academic class period. Video feedforward will be incorporated, which is recording a behavior that has not previously been attained before.

The potential benefits of this study include several aspects. First, you and your child will have an opportunity to participate in research and possibly add to the literature. Secondly, your child may experience an increase in academic performance in the classroom due to video self-modeling that may generalize over different settings.

You and your child's participation in this study are voluntary. If you are interested in participating or have any questions concerning the research study, please call me at (785) 650-8194.

APPENDIX E

Child Assent Form

Hi, my name is Casey Schmidt. I am doing a project that uses a video camera to record people. I want to know if you want to help me with my project and your parents already said it was okay if you wanted to help me. I would get to record you working hard on your (Specific Homework or Class Period). Then later you will get to see yourself on the TV working hard before this class starts.

If you want to help me, please write your name on the line.

Name or Witness if unable to sign: _____

Date:_____

APPNDIX F

Permission to Conduct Study (Institution)

Date
Mr. X
Head of School or Center
Address

RE: Permission to Conduct Research Study

Dear Mr. X:

I am writing to request permission to conduct a research study at your school. I am currently enrolled in the School Psychology Program at Fort Hays State University and am in the process of writing my Thesis. The study is entitled The Effects of Video Self-Modeling (VSM) on Children with Autism Spectrum Disorder.

I hope that the school administration will allow me to observe and recruit two children with autism spectrum disorder in the functional interrelated classroom. Due to the nature of the study, I hope to also obtain consent from parents or guardians as well. If consent is given the children of interest will be asked for assent to participate as well. Parents who volunteer to participate will also be given consent forms to be signed and returned to the primary researcher.

If approval is granted, student participants will be observed and assessed on what academic behaviors need improvement. They will then be video recorded; the videos will be edited then played back in front of the children. The children are hoped to model their own behavior and improve academic performance in the classroom. The process should take approximately two months, with no impediment during academics. You, teachers, and parents will have access to information at all times. The results will be pooled for the thesis project and individual results of this study will remain absolutely confidential and anonymous. Should this study be published, only pooled results will be documented. No costs will be incurred by either your school/center or the individual participants.

Your approval to conduct this study will be greatly appreciated. I will follow up with a telephone call next week and would be happy to answer any questions or concerns that you may have at that time. You may contact me at my email address: cnschmidt@scatcat.fhsu.edu

If you agree, kindly sign below and return the signed form in the enclosed self-addressed envelope. Alternatively, kindly submit a signed letter of permission on your institution's letterhead acknowledging your consent and permission for me to conduct this survey/study at your institution.

Sincerely,

Casey Schmidt, Fort Hays State University

Approved by:

_____ _____ _____

Print your name and title here Signature Date

APPENDIX G

Likert-Scale Before Student 1

Likert Scale of On and Off Task Behavior Before
Participant 1

One a scale of 1 to 5, please rate the strength for the following on-task behaviors, 1 being minimal and 5 being significant for Participant 1.

On-task for approximately 25 minutes of the 45 minute class period	1	2	3	4	5
Having eye contact	1	2	3	4	5
Performing requested assignment	1	2	3	4	5
Engaged in academic learning time	1	2	3	4	5
Positive interaction with peers and classroom staff	1	2	3	4	5
Keepings hands to herself	1	2	3	4	5
Willingness to attempt activities	1	2	3	4	5

On a scale of 1 to 5, please rate the strength for the following off-task behaviors, 1 being minimal and 5 being significant for Participant 1.

Not having eyes oriented toward Assigned material	1	2	3	4	5
Talking to peers at inappropriate times	1	2	3	4	5
Staring out the classroom window	1	2	3	4	5
Out of seat	1	2	3	4	5
Physical aggression	1	2	3	4	5

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APPENDIX H

Likert-Scale After Student 1

Likert Scale of On and Off Task Behavior After Participant 1

On a scale of 1 to 5, please rate the strength of improvement for the following on-task behaviors, 1 being no improvement and 5 being significant improvement for Participant 1.

On-task for approximately 25 minutes of the 45 minute class period	1	2	3	4	5
Having eye contact	1	2	3	4	5
Performing requested assignment	1	2	3	4	5
Engaged in academic learning time	1	2	3	4	5
Positive interaction with peers and classroom staff	1	2	3	4	5
Keepings hands to herself	1	2	3	4	5
Willingness to attempt activities	1	2	3	4	5

On a scale of 1 to 5, please rate the strength of improvement for the following off-task behaviors, 1 being no change and 5 being significant change for Participant 1.

Not having eyes oriented toward Assigned material	1	2	3	4	5
Talking to peers at inappropriate times	1	2	3	4	5
Staring out the classroom window	1	2	3	4	5
Out of seat	1	2	3	4	5
Physical aggression	1	2	3	4	5

APPENDIX I

Likert-Scale Before Student 2

Likert Scale of Appropriate and Inappropriate Transitions Before Participant 2

On a scale of 1 to 5, please rate the strength for the following appropriate transitions, 1 being minimal and 5 being significant for Participant 2.

Attending to assigned task	1	2	3	4	5
Eyes focused on assignment	1	2	3	4	5
Remaining in seat	1	2	3	4	5
No loud vocalizations or interruptions	1	2	3	4	5
Putting away specific materials	1	2	3	4	5

On a scale of 1 to 5, please rate the strength for the following inappropriate transitions, 1 being minimal and 5 being significant for Participant 2.

Loud vocalizations	1	2	3	4	5
Refusal to put away materials	1	2	3	4	5
Refusal to begin new activity	1	2	3	4	5
Out of seat frequently	1	2	3	4	5
Not attending to assigned Work	1	2	3	4	5

APPENDIX J

Likert-Scale After Student 2

Likert Scale of Appropriate and Inappropriate Transitions After Participant 2

On a scale of 1 to 5, please rate the strength of improvement for the following appropriate transitions, 1 being no improvement and 5 being significant improvement for Participant 2.

Attending to assigned task	1	2	3	4	5
Eyes focused on assignment	1	2	3	4	5
Remaining in seat	1	2	3	4	5
No loud vocalizations or interruptions	1	2	3	4	5
Putting away specific materials	1	2	3	4	5

On a scale of 1 to 5, please rate the strength of improvement for the following inappropriate transitions, 1 being no improvement and 5 being significant improvement for Participant 2.

Loud vocalizations	1	2	3	4	5
Refusal to put away materials	1	2	3	4	5
Refusal to begin new activity	1	2	3	4	5
Out of seat frequently	1	2	3	4	5
Not attending to assigned Work	1	2	3	4	5