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Using Video Self-Modeling to Increase Compliance to Classroom Requests in Students with Autism Spectrum Disorder

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Video self-modeling (VSM) is a resource efficient intervention that has been used to address some of the social and behavioral challenges experienced by children with autism spectrum disorder (ASD). In the current study, a multiple baseline design across three students was implemented to examine whether VSM can be used to increase compliance to classroom requests in students with ASD. The results indicated that the VSM intervention resulted in modest increases in compliance across all three participants. In addition, teachers and paraprofessionals reported that the VSM intervention was feasible and appropriate to implement in schools. Replication studies are needed to increase the internal and external validity of the current study.

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Using Video Self-Modeling to Increase Compliance to Classroom Requests in Students with Autism Spectrum Disorder

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Chapter I: Introduction

Statement of the Problem

Federal law requires that public schools provide students with disabilities a free and appropriate education (Individuals with Disabilities Education Improvement Act [IDEA] of 2004). Despite this legislation, limited resources can make it difficult for educators in public schools to provide students with disabilities the academic and behavioral supports they need in order to be successful. It can be particularly challenging for educators to address the needs of students with autism spectrum disorder (ASD) given their behavioral challenges including noncompliance.

Typically a variety of antecedent and consequent strategies are used to increase compliance in children with ASD. Although many of these strategies have been successful, they can be time consuming and often require that the intervention agent receive substantial training (Ducharme & Drain, 2004; Ducharme & Ng, 2012). Video self-modeling (VSM) serves as an effective, more resource efficient alternative to the traditional approaches used to address noncompliance in the classroom. Once the intervention video has been created, VSM only requires the intervention agent to the show the student an edited video of him/herself exhibiting the desired behavior (Collier-Meek, Fallon, Johnson, Sanetti, & del Campo, 2012). In addition, the gains achieved during the VSM intervention are often maintained after the intervention has been discontinued (Bellini & Akullian, 2007). VSM has been an effective intervention for treating many of the deficits exhibited by children with ASD including communication, social skills, and behavior problems (Bellini & Akullian, 2001; Collier-Meek eta al., 2012). Despite the success of VSM with children with ASD, only one unpublished study (Figueira, 2007) with several limitations has examined the use of VSM to increase compliance in this population.

Purpose of the Study

The purpose of the current study was to examine whether a VSM intervention could be used to increase compliance to classroom requests in students with ASD. Given the literature base supporting the use of VSM as an intervention to modify behavior in students with ASD, it was hypothesized that VSM could be used with students with ASD to increase their compliance to classroom requests.

Research Question

When used with children with ASD, will VSM increase compliance to targeted classroom requests?

Chapter II: Literature Review

Overview of Autism Spectrum Disorder

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), ASD is defined by two key characteristics: (1) "persistent deficits in social communication and social interaction" and (2) "repetitive patterns of behavior, interests or activities" (American Psychiatric Association [APA], 2013, p. 50-51). In recent years, there has been much discussion about a perceived increase in the prevalence of ASD. Epidemiological studies suggest that approximately one in every 88 to 150 children have been diagnosed with ASD (Baio, 2012; Fombonne, Quirke, & Hagen, 2009). While there is evidence to suggest that the prevalence of ASD has increased at a significant rate over the last 15 years (Fombonne, 2003), it is unclear whether this corresponds to an actual increase in incidence. It is hypothesized that the increase in diagnoses is in part due to changes in diagnostic criteria and policies for special education, as well as a heightened awareness of ASD (Fombonne, 2003; Fombonne, et al., 2009). Preliminary research suggests that prevalence estimates may decline in the coming years due to the adoption of the DSM-5 diagnostic criteria (Maenner et al., 2014).

In addition to displaying the two defining characteristics, children with ASD frequently exhibit challenging behavior including tantrums, aggression, noncompliance, and self-injury (Bellini & Akullian, 2007; Singh, Lancioni, & Winton, 2006). Historically, noncompliance was considered an important behavioral feature of ASD. The term "autistic negativism" appeared shortly after the publication of Leo Kanner's (1943) seminal article *Autistic Disturbances of Affective Contact*, which first described ASD as a distinct disorder. Autistic negativism was defined as, "deliberate noncompliance; i.e. the child is capable of performing a requested activity, realized that a request has been made, but chooses not to comply with it" (p. 173, Volkmar, 1986). A number of historical studies were conducted on "autistic negativism." For example, Volkmar and Cohen (1982) examined patterns of noncompliance in children with ASD. Based

on a hierarchical organization of response patterns, it was found that the children with ASD were least likely to comply with verbal requests for verbal responses and were most likely to comply with verbal requests for nonverbal responses. Another study on autistic negativism (Jose & Cohen, 1980) found that children with ASD exhibited more noncompliance in response to novel stimuli, such as tasks and teachers. Although there was an initial emphasis on noncompliance as a defining feature of ASD, a study conducted by Volkmar, Hoder, and Cohen (1985) suggested that not all children with ASD exhibit noncompliant behavior.

While today noncompliance is no longer considered a defining characteristic of ASD, research suggests that it is still an area of concern for educators and caregivers. Results of several investigations suggest that young children with ASD may be less complaint to parent prohibition than mental-age matched disabled and typically developing children (Arbelle, Sigman, & Kasari, 1994). Another study (Bryce & Jahromi, 2013) found that children with high functioning ASD were significantly less compliant to their parents' indirect commands than were typically developing children even after controlling for receptive language. In addition, several studies have recently been conducted to evaluate the effectiveness of school-based interventions to teach children with ASD to be more compliant to classroom requests (Ducharme & Ng, 2012). Given that much research is still being conducted on the topic, it seems that noncompliance continues to be a common problem behavior for many children with ASD.

Noncompliance is often the behavior that is first targeted for intervention in children with problem behavior because it is considered a "keystone behavior" (Barnett, Bauer, Ehrhardt, Lentz, & Stollar, 1996), a behavior targeted for change that is expected to result in changes in a broad range of untargeted behavioral responses. For example, in a study with children with intellectual disability, an increase in compliance was negatively associated with aggression, disruptive behavior, property destruction, and pica (Parrish, Cataldo, Kolko, Neef, & Egel, 1986).

Similarly, in a study with three children who were noncompliant to adult requests, an increase in compliance resulted in decreases in untreated corollary behaviors such as crying, self-injurious behavior, and aggression (Russo, Cataldo, & Cushing, 1981). A follow-up study (Cataldo, Ward, Russo, Riordan, & Bennet, 1986) confirmed that the changes in untargeted behaviors were not related to changes in reinforcement, lending further support that the changes were due to an increase in compliance. As an increase in compliance appears to produce widespread improvements in behavior, it is an important target for intervention.

Techniques Used to Increase Compliance

A variety of antecedent and consequent strategies have been used to increase compliance in children with ASD. While the effectiveness of these techniques has been validated by research, there are limitations to their use in school settings. Several antecedent and consequent interventions that have been used are described below. As positive behavior supports have been emphasized in recent years, interventions involving punishment (i.e. time-out) will not be included in the discussion of consequent strategies.

Antecedent strategies. Antecedent strategies decrease the likelihood that the problem behavior will occur by altering events that typically precede the problem behavior. Therefore, antecedent strategies to increase compliance will alter the context in which the request is typically given. One such strategy, called high probability requests, presents a series of tasks for which there is a high probability of compliance (high-*p*) prior to presenting a task for which there is low probability of compliance (low *p*; Banda, Neisworth, & Lee, 2003). A review article, which examined the use of high probability request sequencing to increase compliance to requests in children 8-years of age and younger, found that the use of high-*p* requests were effective at increasing compliance in 14 out of 16 studies that were reviewed. In addition, there is evidence to suggest that the use of high-*p* requests will increase compliance in children with

ASD. For example, a study found that immediately following the use of high-*p* requests there was an increase in appropriate responding of the two participants, one of whom had ASD (Davis, Brady, Williams, & Hamilton, 1992).

Although the use of high-*p* requests appears to be a relatively simple way to produce positive behavior change, there are certain limitations to using this technique. In particular, it is unclear whether the improvements in compliance will generalize across different individuals who are giving the commands and to untargeted low-*p* requests. For example, only 4 out of the 16 studies included in the Banda et al. (2003) review article reported generalization of compliant behaviors. Therefore, more research is needed to determine whether the improvements in compliance are generalizable.

Another antecedent strategy, called errorless compliance training (ECT), has also been effective at improving compliance to requests. This strategy is similar to high probability requests in that the intervention agent begins with high-*p* requests to allow the child to experience success and reinforcement. Low-*p* requests, however, are gradually introduced based on their level of difficulty. For example, according to Ducharme, Sanjuan, and Drain (2007), the intervention agent will create a hierarchy of requests by categorizing the requests into four compliance probability levels based on child compliance during observational assessments. The intervention agent will begin the intervention by only introducing level 1 requests and by rewarding the child for demonstrating compliant behavior. Requests from lower probability levels will be gradually introduced in a manner that minimizes occurrences of noncompliant and problem behaviors. Several research studies suggest that this technique is effective at increasing compliance, resulting in high compliance levels for academic and household requests (Ducharme & Drain, 2004; Ducharme et al., 2007). In addition, the use of ECT improved compliance to classroom requests and a concomitant improvement in on-task skills was also apparent

(Ducharme & Ng, 2012). These results suggested that the use of ECT with children with ASD can result in improvements in compliance across settings and behavioral domains.

Although the outcomes of this intervention are promising, it is important to keep in mind that ECT may be challenging for parents and educators to implement due to the substantial amount of training involved. Intervention agents had to attend three to four training sessions where they were introduced to ECT and were taught procedures regarding request delivery, reinforcing compliance, ignoring noncompliance, and avoiding requests from subsequent levels (Ducharme & Drain, 2004; Ducharme et al., 2007; Ducharme & Ng, 2012). In addition, the researchers helped the intervention agents to develop an appropriate request hierarchy (Ducharme & Drain, 2004; Ducharme et al., 2007; Ducharme & Ng, 2012). Therefore, although ECT may result in positive outcomes, it may be difficult to implement in certain settings, such as schools where there is limited time and resources for teacher to participate in multiple training sessions.

When attempting to increase compliance, it is also important to consider the manner in which requests are delivered. Effective instruction delivery (EID) is comprised of several component behaviors including: using eye contact (Roberts, Tingstrom, Olmi, & Bellipanni, 2008; Everett, Olmi, Edwards, & Tingstrom, 2005), presenting instructions as a statement rather than as a question (Ducharme & Poppynick, 1993; Neef, Shafer, Egel, Cataldo, & Parrish, 1983), standing 3-5 feet from the child when presenting a request (Houten, Nau, MacKenzie-Keating, Sameoto, & Colaveccha, 1982), and waiting 5-10 seconds for the child to respond (Neef et al., 1983). Ford, Olmi, Edwards, and Tingstrom (2001) found that the use of EID with elementary school children resulted in up to a 44% increase in compliant behavior. Although EID alone is associated with an increase in compliance, it is often used in conjunction with other antecedent and consequent strategies.

In particular, EID is often combined with time-in (TI), which is defined as the attention and praise that a child receives for exhibiting appropriate behavior (Ford et al., 2001). Since TI is tied to appropriate behavior in general rather than a specific appropriate behavior, it is considered an antecedent strategy. Benoit, Edwards, Olmi, Wilezynski, and Mandal (2001) operationally defined TI as the provision of verbal praise and physical contact for every two minutes that the child exhibited appropriate behavior. Research suggests that TI can be used to increase compliance. TI alone was shown to increase compliance in preschool children in a clinic setting (Mandal, Olmi, Edwards, Tingstrom, & Benoit, 2000). When EID strategies were already in place, up to an additional 18% increase in compliant behavior was seen when TI was added to intervention procedures (Ford et al., 2001). Although TI is effective when implemented appropriately, treatment integrity may be a concern with this intervention. When mothers were taught to use a combination of EID and TI, skill mastery of TI procedures at home was variable (Benoit et al., 2001), indicating that it may be difficult to implement. Another limitation is that although EID and TI strategies are generally considered best practice, studies have not examined their use with children with ASD. Therefore, it is unclear whether these strategies would effectively increase compliance in children with ASD.

Consequent strategies. Consequent strategies are implemented after a behavior occurs and serve to reduce occurrences of the problem behavior or increase occurrences of positive replacement behaviors. Positive reinforcement is a consequent strategy that increases compliance by reinforcing appropriate behavior with attention, praise, and/or access to a tangible. Positive reinforcement alone can increase compliance. For example, teacher attention contingent on following directions was shown to increase compliance with instruction in elementary school classrooms (Schutte & Hopkins, 1970). In addition, contingent access to preferred tangibles and activities was shown to increase compliance to classroom requests to complete a specific

academic task in preschool children (Baer, Rowbury, & Baer, 1973). Positive reinforcement strategies have also been effective in improving compliance in children with ASD in that contingent access to food was shown to increase compliance (Lomas, Fisher, & Kelley, 2010).

Although positive reinforcement strategies increase compliance when used alone, they are often used in conjunction with other behavior change strategies to maximize behavior change. The use of contingent praise can result in further increases in compliance when EID components are already being implemented (Everett et al., 2005; Roberts et al., 2008). In addition, contingent praise is often part of treatment packages used to increase compliance in children with ASD (Tetreault & Lerman, 2010). Since behavioral intervention plans often combine multiple behavior change strategies, they require that the intervention agent have sufficient time and resources to dedicate to planning and implementation.

Extinction is another consequent strategy that is commonly used in conjunction with other intervention components. This technique decreases occurrences of a challenging behavior by not reinforcing it. For example, when a child was sent to time-out for noncompliant behavior, escape extinction was implemented by reissuing the demand to which a child was originally noncompliant immediately after the child was released from time-out (Everett et al., 2007). By implementing escape extinction, time-out was no longer reinforcing because the child was unable to escape from an undesirable demand. Similarly, Cote, Thompson, and McKerchar, (2005) found that extinction increased compliance during activity transitions when it was used with two other antecedent strategies. Therefore, extinction is another strategy that may be used as a component of a behavioral intervention plan designed to increase compliance.

Although the antecedent and consequent techniques described above have generally been effective in increasing compliance, they require a significant amount of time and energy from the intervention agent. Multiple antecedent and consequent strategies are commonly used in

conjunction with one another to improve compliance. Unfortunately, a plan with multiple component parts may be difficult for overburdened teachers to implement. In addition, certain procedures, such as errorless compliance training, require time-consuming training sessions. Given that parents and schools are often operating with limited resources, it is worthwhile to explore whether other more resource efficient interventions, such as video self-modeling, could be used to increase compliance in children with ASD.

Video Modeling

Theoretical underpinnings. Video modeling is an intervention that involves an individual repeatedly viewing a video of the desired behavior. It first emerged in the 1970s when Albert Bandura introduced the concept of observational learning, or modeling (Bellini & Akullian, 2007; Hitchcock, Dorwick, & Prater, 2003). This concept is part of social learning theory (Bandura, 1977), which highlights the idea that one can learn new behaviors without experiencing them firsthand. Bandura (1977) described that one can acquire new patterns of behavior by: (a) observing physical demonstrations of the behavior, (b) receiving verbal instructions, such as reading a manual, or (c) viewing pictorial representations of the new behavior as provided in television or films. By highlighting that individuals are able to acquire new behaviors by watching filmed or televised models, Bandura's social learning theory served as the theoretical foundation for using video modeling interventions as a behavior change mechanism.

Other aspects of the social learning theory have been important in guiding the use of video-modeling interventions. Bandura (1977) denoted four conditions that are necessary for one to successfully learn new behaviors through observational learning: attention, retention, motor reproduction, and motivation. Attention refers not only to the ability to attend to the model, but it also refers to the ability to recognize the relevant features of the model's behavior.

After attending to the appropriate aspects of the model's behavior, the learner must be able to retain the observed behavior in memory in symbolic form. This will allow the learner to reproduce the observed behavior when the model is no longer present. In order to reproduce the behavior, however, the learner must possess the motor skills to be able to accurately reproduce the observed behavior. Finally, the learner must be motivated to display the modeled behavior. Although the learner must be motivated to produce the new behavior, reinforcement is not an essential component of social learning theory. Bandura (1977) described that as long as the learner is able to attend to modeled activities, the addition of reinforcement will not increase observational learning. These conditions must be considered when developing video-modeling interventions.

Self-efficacy, defined as the beliefs that people have about their ability to successfully execute behaviors to produce certain outcomes (Bandura, 1997), is another important theoretical underpinning of video modeling interventions. Self-efficacy is thought to determine how much effort people will expend and their persistence in the face of adversity (Bandura, 1997). When a video self-modeling intervention was used to remediate selective mutism in a six year-old student (Kehle, Owen, & Cressy, 1990), it was hypothesized that self-efficacy was the mechanism of behavior change. Prior to the intervention, the student may have lacked the self-efficacy to speak in the school setting. By watching a video of himself talking to others at school, his self-efficacious beliefs were likely modified to believe that he was capable of conversing with others in the school setting as was depicted in the VSM video (Kehle, Bray, Margiano, Theodore, 2002), suggesting that self-efficacy may mediate behavior change.

According to social learning theory, self-efficacy can be increased through vicarious learning experiences (Bandura, 1997). For example, seeing others successfully complete certain behaviors can generate expectations that they too will be successful. Similarity to the model

tends to increase the relevance of the observed success and can enhance the effectiveness of the modeling. For example, Schunk and Hanson (1985) found that when students who were struggling to learn subtraction with regrouping observed a same-gender peer model the skill, they exhibited higher achievement and self-efficacy for learning than did students who observed a teacher model. Video self-modeling may be an effective means of promoting self-efficacy since similarity to the model is heightened by using the self as a model.

Another important feature of social learning theory that underlies the use of video-modeling is the zone of proximal development. According to Lev Vygotsky (1978), the zone of proximal development refers to the range of behaviors that a child cannot complete independently, but can complete with guidance from adults or capable peers. Imitation is one technique that learners often employ to perform actions that exceed what they are capable of doing by themselves (Vygotsky, 1978). By imitating a more competent model, one is able to learn behaviors that are not currently in one's repertoire. Therefore, video models may serve as a guide to help learners acquire behaviors that are within their zone of proximal development.

Theories of change. In recent years, observational learning as the primary explanation for the efficacy of video self-modeling (VSM), a type of video modeling where one's self is the model, has come into question. Dowrick (2012a) explains that "a shortfall in procedural explanations of observational learning" (p. 30) and the theory's inability to fully account for ultra-rapid changes in behavior have prompted a reconsideration of the underlying theory of change. Dowrick (2012a) posits that VSM may mediate behavior change through mental time travel (MTT), which is defined as the human ability to mentally construct images of the future and of past events. During VSM interventions and other observational learning experiences, observers extract what Dowrick (2012b) calls the 'self model image,' or the cognitive images of a response hierarchy. When presented with situations in the future, the cognitive response is to

activate a mental image at the top of the hierarchy and the behavioral response is to enact that image. Therefore, according to Dowrick (2012b), the success of VSM interventions is dependent on where the extracted cognitive image of future behavior is placed on the cognitive response hierarchy, which is likely determined by factors such as self-efficacy and goals. Dowrick (2012b) also explains that individuals fail to learn from models when the observed behavior does not illustrate outcomes of relevance or value. In addition, modeling will not be successful if the model does not illustrate component behaviors that are in the repertoire of the observer.

While Dowrick (2012b) theorizes that the effects of video self-modeling are mediated through MTT, others suggest that they are mediated by "changing the individual's memory of the performance, or nonperformance, of the target behavior" (Kehle, Bray, Margiano, & Theodore, 2002, p. 204). Kehle et al. (2002) cited studies (Loftus, 1997; Schacter, 1995) that provided support for the alterable nature of memory and the ability to distort memories. In addition, research suggests that visual information is more powerful than verbal information in altering memories and that these alterations can lead to changes in behavior (Braun & Loftus, 1998). Therefore, Kehle et al. (2002) posited that individuals who view videotapes of themselves engaging in the desired behavior may actually change their behavior and self-beliefs to be aligned with the behavior depicted in the video. A study conducted by Margiano, Kehle, Bray, Nastasi, and DeWees (2009) provided evidence that video self-modeling interventions can produce changes in autobiographical memory. After watching a VSM video, all participants in the study exhibited changes in self-confidence and narrative recall data, which strongly suggested memory alterations. In the future, more empirical studies will need to be conducted to examine both MTT and memory alteration as mechanisms of change in VSM.

Types of video models. All video modeling interventions involve watching a video of a model completing the desired behavior or skill. Although the basic procedure is consistent

across all video-modeling interventions, different types of models can be portrayed in the videos. Video-modeling studies have used adult, peer, self, and mixed models, which combine multiple model types (McCoy & Hermansen, 2007). When the video-modeling intervention is used with children, peer and self-models are typically more effective than adult and mixed models (McCoy & Hermansen, 2007). Self-modeling is as effective as peer modeling. For example, when a combined multiple baseline and alternating treatment design was used to evaluate the differential effectiveness of "self" versus "peer" video models on teaching conversational skills to children with ASD, there was no overall difference in effectiveness between the two types of models (Sherer, Pierce, Pardes, Kisacky, Ingersoll, & Schreibmen, 2001). Other studies, however, have suggested that the use of self-models may actually be more effective than peer-models. Using a video modeling study that compared the use of self and peer-models to teach children with ASD to identify and label novel letters (Marcus & Wilder, 2009), all three participants in the self-modeling condition met the mastery criterion, whereas only one of the three participants in the peer-modeling did so. Similarly, a study (Decker & Buggey, 2012) that examined the use of video modeling to increase oral reading fluency in elementary students found that the use of self-models resulted in more immediate and substantial gains in reading fluency than did the use of peer-models. Therefore, while the use of both peer and self-models are efficacious, videos depicting self-models may allow for the most significant behavior change.

Advantages of video modeling. Compared to in-vivo modeling, video-modeling offers a number of advantages both in terms of efficacy and feasibility. Video-modeling promotes rapid acquisition of new behaviors (Buggey, 2007; Charlop-Christie, Le, & Freeman, 2000). In addition, many studies suggest that VSM leads to the maintenance of the learned behavior over time and promotes performance of the learned behavior in new settings (Bellini & Akullian, 2007). A study comparing the effectiveness of video modeling and in-vivo modeling to teach

developmental skills to children with ASD found that the video modeling intervention allowed for faster acquisition and better generalization of the new skills (Charlop-Christie et al., 2000). There are a number of reasons that video-modeling may result in better outcomes than in-vivo modeling. As the videos are standardized, it is more likely that the intervention will be delivered reliably (Ayers & Langone, 2005). In addition, when using video modeling, the child will have more opportunities for observational learning because the videos can be played repeatedly without requiring additional demands from the intervention agent (Marcus & Wilder, 2009). Finally, video modeling interventions are generally successful at gaining and maintaining attention (Dowrick, 1991); by editing out irrelevant stimuli, the child is able to focus on the salient aspects of the skill or behavior (Bellini & Akullian, 2007).

Other advantages of video modeling are related to the ease of implementation of the intervention. The use of video-modeling interventions place very few demands on the intervention agent (Ayers & Langone, 2005). Once the video has been created, the only demand placed on the intervention agent is showing the video to the child. As long as the child is being supervised, the intervention agent can be engaged in other tasks while the child is viewing the video (Ayers & Langone, 2005). Given the simplicity of intervention implementation, video-modeling requires less time for training and is more cost efficient than in-vivo modeling (Charlop-Christie et al., 2000; Marcus & Wilder, 2009). In addition, as the intervention agent does not need a specific skill set to implement the intervention with fidelity, any school staff member would be capable of implementing the intervention. Therefore, video-modeling interventions may be an appealing option for many schools that are challenged to provide evidence-based treatments within limited resources.

Of the different types of video-modeling interventions, VSM may offer the most advantages. While a model needs to be recruited in other video-modeling interventions, in VSM

the child acts as his/her own model. Therefore, the process of finding a consenting model can be avoided. In addition, using a self-model will maximize similarity between the subject and model, which could be important in increasing the child's self-efficacy (Buggey, 2007). By viewing one's own success in the video, the child may have more confidence about his/her ability to perform the desired behavior. Buggey (2007) describes that VSM is typically highly motivating for children because they "take the center stage on television. They become stars" (p. 156). Given the engaging nature of VSM interventions, it is likely that the children will be attentive during the intervention.

A Closer Look at Video Self-Modeling

Video self-modeling (VSM) is commonly defined as "the observation of images of oneself engaged in adaptive behavior" (p. 37, Dorwick, 1999). During the VSM intervention, the individual targeted for behavior change watches a 2-4 minute long video clip that depicts him/herself performing the desired behavior (Dorwick, 2000). The video clip is then viewed repeatedly to allow the individual to learn the new skill (Dorwick, 2000). There is little consensus, however, on how frequently the videos should be viewed. One recommendation is that the video should be viewed daily when the goal is to teach a new skill and that video viewing should be spaced to once or twice a week when trying to enhance the performance of existing skills (Bellini & McConnell, 2010). The spacing effect, which refers to the notion that spaced presentations result in better learning than massed presentations, has been described in the literature since the 1980s (Dempster, 1988). Research suggests that spaced presentations of an intervention can be twice as potent than a single massed presentation (Dempster, 1988). This finding provides support for spacing VSM video viewings to once or twice a week when trying to enhance an existing skill as recommended by Bellini and McConnell (2010).

Two types of VSM interventions are described in the literature: positive self-review (PSR) and feedforward. PSR is used to improve a behavior that is already in an individual's behavioral repertoire (Dowrick, 1991). It is used to increase the frequency of rarely occurring adaptive behaviors and to increase adaptive behavior that is interspersed with undesirable behavior (Dowrick, 1991). In contrast, feedforward is used to teach new behaviors and to introduce behaviors to a setting where they have not yet been displayed (Dowrick, 1991). In feedforward interventions, the component skills are already in the individual's repertoire, but they are reorganized into a new pattern or are demonstrated in a new setting (Dowrick, 2000). To summarize the differences these two types of VSM, Dowrick (2000) describes PSR as reconstructive while feedforward is constructive. In other words, PSR simply reconstructs a behavior that is already in the person's repertoire, while feedforward uses component skills to construct a behavior that has not yet been performed or to perform it in a new setting.

When creating the videos, one of two techniques is typically employed. For feedforward, the individual is typically prompted to demonstrate the desired behavior during imitation and role-playing exercises (Collier-Meek, et al., 2012; Buggey, 2007). Children who exhibit inappropriate behavior can usually role-play correct behavioral responses (Buggey, 2007). Buggey (2007) has found that, in particular, children with high functioning ASD and ADHD tend to participate in the role-playing activities with enthusiasm. After the initial filming, the prompts are edited out of the video footage so it appears as though the child is performing the desired behavior independently. For PSR, the behavior is already in the student's behavioral repertoire, so it is possible to videotape the student over a period of time and edit the footage to include only the best examples of the desired behavior (Collier-Meek et al., 2012). This technique is useful when role-playing is not possible, such as when working with a child with severe ASD (Buggey, 2007). A major limitation of this technique, however, is that it can be a

very time consuming because one must film for long enough to capture behaviors that occur infrequently (Buggey, 2007). If the researcher suspects that it may take a significant amount of time to collect sufficient video footage, it may make more sense to use the role-playing strategy as long as the individual is capable of doing so.

VSM has a wide range of applicability. It can be used to improve a variety of academic and behavioral problems. In terms of academics, VSM has been used to improve oral reading fluency, (Bray, Kehle, Spackman, & Hintze, 1998; Decker & Buggey, 2012; Dowrick, Kim-Rupnow, & Power, 2006; Hitchcock, Prater, & Dowrick, 2004), reading comprehension (Hitchcock, Prater, & Dowrick, 2004), the number of words and functional essay elements written in an essay (Delano, 2007), and functional math skills (Burton, Anderson, Prater, & Dyches, 2013). It has also been used to promote behavior change, including increasing on-task behavior (Clare, Jenson, Kehle, & Bray, 2000) and reducing disruptive classroom behavior (Possell, Kehle, McLoughlin, & Bray, 1999; Kehle, Clark, Jenson, & Wampold, 1986; McCurdy & Shapiro, 1988) and tantrums (Buggey, 2005). In addition, VSM has been effective with a variety of disability classifications, such as ASD (Bellini & Akullian, 2007; Gelbar, Anderson, & McCarthy, 2012; Delano, 2007), Tourette's (Clarke, Bray, Kehle, & Truscott, 2001), selective mutism (Kehle, Bray, Byer-Alcorace, Theodore, & Kovac, 2012; Kehle, Madaus, Baratta, & Bray, 1998), attention deficit hyperactivity disorder (Woltersdorf, 1992), and stuttering (Bray & Kehle, 1996; Cream, O'Brian, Onslow, Packman, & Menzies, 2009). It has also been effective for a wide age range, from preschoolers (Wert & Neisworth, 2003) to adults (Meharg & Lipsker, 1992).

Of particular relevance is a recently published study (Axelrod, Bellini, & Markoff, 2014) suggesting that VSM may be a promising strategy for increasing compliance in children with Oppositional Defiant Disorder (ODD). In this study, three elementary aged children who were

patients in an acute care psychiatric hospital were shown brief video clips of themselves complying with classroom instructions that they were historically noncompliant with 50% of the time or less. All three participants showed an increased mean percentage of compliance during the VSM condition when compared with baseline levels. In addition, higher levels of compliance were maintained in the follow-up condition for two of the three participants. All participants also engaged in fewer aggressive episodes following adult instruction in the VSM condition and the follow-up condition than in the baseline condition. A measure of social acceptability indicated that the hospital staff implementing the intervention found it to improve compliance, productivity, and overall behavior. It also revealed that staff felt that the VSM intervention was easy to implement and that they would be likely to use it with other children. Although the results of the study seem promising, the findings must be interpreted with caution due to methodological limitations. A multiple baseline intervention across settings was used, but only two demonstrations of effect were observed for each of the three participants. Future research studies with three or more demonstrations of effect should be conducted to confirm that a functional relationship exists between the VSM intervention and increases in compliant behavior.

Video Self-Modeling and Autism Spectrum Disorder

Given that VSM has been successfully applied to a variety of target behaviors and populations, it is not surprising that it has been effective at improving a number of the deficits commonly exhibited in children with ASD. Corbett and Abdullah (2005) suggest that VSM creates the ideal conditions for observational learning in children with ASD by increasing their attention to and retention of the behaviors displayed in the video. Specifically, VSM interventions increase attention by providing a restricted field of focus, which is useful for children with ASD who have impaired selective attention (Bellini & Akullian, 2007; Corbett & Abdullah, 2005). In addition, given that children with ASD tend to enjoy watching videos, it is

likely that they will be motivated to attend to the video (Bellini & Akullian, 2007; Corbett & Abdullah, 2005). In terms of retention, Corbett and Abdullah (2005) described that in VSM the encoding of the target behavior in memory is facilitated through repeated viewings of video depicting the desired behavior. Other researchers hypothesize that VSM may be especially effective for children with ASD because it minimizes human interaction, which may be distressing and anxiety provoking for some children with ASD (Bellini & Akullian, 2007). Therefore, a number of characteristics of VSM may contribute to the efficacy of the intervention across a variety of target behaviors in children with ASD. Research on the effectiveness of VSM is summarized below.

Communication. Recent research has focused on the use of VSM to improve a variety of social communication skills in children with ASD. In terms of conversation skills, VSM has been shown to increase the frequency with which children with ASD appropriately respond to questions (Buggey, 2005; Buggey, Toombs, Garderner, & Cervetti, 1999; Sherer et al., 2001). When examining the maintenance and generalization of the responding skills learned during the VSM intervention, Sherer et al. (2001) demonstrated that appropriate responding to questions was generalized to use with a peer, and Buggey (2005) found that that the gains were maintained after withdrawal of the VSM intervention. Other research studies have found that VSM can increase unprompted social communication in children with ASD (Buggey, 2005; Buggey, Hoomes, Sherberger, & Williams, 2011; Thiemann & Goldstein, 2001; Wert & Neisworth, 2003). Specifically, several studies suggested that VSM can be used to increase the number of unprompted social initiations made by children with ASD during lunch, recess, and/or playtime and that the effects will be maintained after intervention has been terminated (Buggey, 2005; Buggey et al., 2011). In addition, Wert and Neisworth (2003) demonstrated that VSM can be used to increase the frequency with which children with ASD request for an object or action

during play time. Thiemann and Goldstein (2001) found that VSM can be used in combination with other intervention components, such as written text and pictorial cueing, to increase a variety of communication skills including initiating comments and requests. In addition to resulting in improvements in social communication, a recent study (Smith, Hand, & Dowrick, 2014) found that VSM can be used to teach nonverbal students with ASD a picture based communication system.

Social skills. Several studies suggest that VSM can be used to increase social skills in children with ASD. Bellini, Akulliian, and Hopf (2007) found that VSM resulted in an increase in unprompted social engagement in children with ASD. Therefore, following the intervention, children with ASD were more likely to actively participate in play with peers by sharing toys, objects, and play items. Another study (Bernad-Ripol, 2007) found that an intervention combining the use of social stories and VSM increased the ability an 11-year old with Asperger syndrome to accurately label emotions and explain what should be done in emotional situations. The study also found that the child was better able to label emotions in the home setting, suggesting that the skills generalized across settings.

Academic skills. In terms of academic skills, VSM has been shown to increase both language arts and math skills. For example, Marcus and Wilder (2009) found that children with ASD were better able to identify or label letters. The intervention was effective for all three children included in the study. Another study (Morlock, Reynolds, Risher, & Comer, 2014) found that a VSM intervention increased word recognition and pronunciation in three high school students with ASD. In addition, Burton et al. (2013) found that VSM was effective at teaching functional math skills to three children with ASD. Specifically, VSM increased their ability to accurately estimate the amount of money needed to pay for an item and the amount of

money to receive back in change. Finally, Hart and Whalon (2012) found that VSM increased academic responding of a child with ASD during science instruction.

Activities of daily living. VSM has also been used to teach children with ASD activities of daily living. For example, Lasater (1995) found that VSM improved the ability of a child with ASD to hang clothing on a hanger, shave with an electric razor, and make the bed. Another study suggested that VSM can be used to teach children with ASD some of the steps involved in toilet training such as sitting on the toilet, flushing, and dressing (Lee, Anderson, & Moore, 2013). Although some studies used VSM procedures to teach activities of daily living, it seems that other video modeling techniques, such as point-of-view video modeling, are more commonly employed when teaching these behaviors (Norman, Collins, & Schuster, 2001; Shipley-Benamou, Lutzker & Taubman, 2002).

Behavior. Several studies have also examined whether VSM can be used to modify behavior in children with ASD. In particular, VSM has been used to decrease off-task behavior in children with ASD. For example, Coyle and Cole (2004) used VSM as part of a self-monitoring intervention to increase on-task behaviors, such as remaining seated, looking at the assigned work, and engaging only with work related materials. During the self-monitoring intervention, the participants were shown a video of themselves exhibiting on-task behavior and were trained to use a self-monitoring procedure, where they recorded whether they were on-task during a timed 30-second intervals. The intervention resulted in decreases in off-task behavior for all three participants. Similarly, Hagiwara, and Myles (1999) used VSM as part of a social story intervention to increase on-task behavior for children with ASD. The participants viewed computerized social stories, which had a book-like format that contained the text of social stories, depicted the student exhibiting the desired behavior, and audio capability that read the text aloud. The intervention resulted in a modest increase in on-task behavior for a participant with ASD. In

addition to increasing on-task behavior, VSM has also been shown to decrease task-avoidance in children with ASD (Ohtake, Kawai, Takeuchi, & Kimiko, 2013). Another study found that VSM can be used to decrease disruptive behavior, such as tantrums and pushing behavior (Buggey 2005). Finally, Lang et al. (2009) found that VSM can be used to teach children with Asperger's classroom rules. While the study examined the ability of children with ASD to recite classroom rules, it did not measure whether the children with Asperger's exhibited improved compliance to classroom rules during the school day.

Despite the extensive research that has been conducted on VSM interventions for children with ASD, only one unpublished study has examined whether it can be used to increase compliance to classroom requests in children with ASD. Figueira (2007) found that VSM increased compliance to classroom requests for two high school students with ASD in a self-contained classroom. In addition, maintenance of the compliant behavior was exhibited in one of the two participants following termination of the VSM intervention. No maintenance data were collected on the other child. Although the study suggests that VSM may be effective at increasing compliance in children with ASD, it had a number of limitations. In particular, Figueira (2007) noted that the reliability of data collection procedures may have been compromised. Specifically, researchers had difficulty coding for compliance based on video-recordings of the observation when teachers or students wandered off-screen or spoke to quietly to be understood. Therefore, even though IOA was 80% for compliant behavior, it is possible that both observers missed opportunities to record compliance if participants were off-screen or if classroom requests were not audible. Another limitation is that the intervention phase only included three to four data points for each participant when a minimum of five data points is recommended for the intervention phase (Kratochwill et al., 2010). Given the limitations of this

study, additional research is needed to confirm that VSM can be used to increase compliance in children with ASD.

Chapter III: Method

Participants and Setting

Three students with ASD were recruited from two special education classrooms of consenting teachers in a public elementary school in a suburban town in the Northeast. The school was recruited through the researchers' contacts and a letter of permission from the school was obtained. The school enrolls students in pre-kindergarten through fifth grade. According to data collected at the end of the 2013 – 2014 school year, total enrollment was 504 students. Of the students enrolled, 59 (11.7%) received special education services and 117 (23.2%) were racially diverse.

Student participants were selected based on the following criteria: (1) diagnosis of ASD according to the diagnostic criteria outlined in the DSM-5, (2) perceived need for improvement in compliance according to the classroom teacher, (3) ability to attend to a video of oneself for at least 3-minutes, and (4) self-recognition. Three children with ASD (two kindergarteners and one 4th grader) participated in the study.

For each student participant, his or her school year special education teacher and summer program teacher were enrolled along with his or her paraprofessional for the school year and summer program. In total, one school year special education teacher, two summer program teachers, three school year paraprofessionals, and three summer school paraprofessionals were enrolled. One of the paraprofessionals was enrolled during both the school year and the summer program. Participating teachers had at least a bachelor's degree in education and paraprofessionals had at least a high school diploma. English was the primary language spoken by both the teachers and the paraprofessionals. Also, a school psychologist and a social worker participated in the study. They held master's degrees in their field and English was their primary language.

Student 1 was a 6 year-old, male kindergartener with a medical diagnosis of ASD. For special education, the student received a combination of daily academic support in the resource

room as well as social skills and self-help instruction in the general education classroom. He was also given speech/language and occupational therapy support each week. Standardized tests conducted eight months prior to baseline indicated the following test results in regards to the student's expressive and receptive language. The student obtained standard scores of 50 for the auditory comprehension, expressive communication, and total language scores, on the Preschool Language Scale-5, which reflects significant difficulties with both receptive and expressive language. Similarly, the student obtained a standard score of 55 on the Receptive One Word Picture Vocabulary Test (ROWPVT). The examiner, a speech and language pathologist, noted that poor attention likely contributed on the student's low score on this task. On the Assessment of Basic Language and Learning Skills (ABLLS), the examiner, a special education teacher, noted that receptive language was a relative strength and that he was able to follow instructions for preferred activities. Standardized testing had not been conducted to obtain a measure of the student's intelligence quotient.

When interviewed regarding Student 1's noncompliance, his school year special education teacher estimated that he is noncompliant between 10 and 20 times a day during transitions and unstructured time. Strategies used to address the student's problem behavior during the school year included reinforcement of appropriate behavior with small edibles and tokens for his token board. During summer school when the research study was implemented, however, the only behavioral strategies used were praise for appropriate behavior, redirection when the student exhibited problem behavior, and sensory breaks in the occupational therapy room.

Student 2 was a 9 year-old, male fourth grader who was diagnosed with autism at 35 months of age by a developmental psychologist. According to his individualized education plan (IEP), he received special education services in the resource room for language arts, math,

academic support, and behavioral support. He was also given weekly speech and language services. Testing that was completed a year prior to the research study provides information regarding his intellectual ability and both his receptive and expressive language abilities. His performance on the Wechsler Intelligence Scale for Children, 4th Edition (WISC-IV) indicated low average verbal comprehension (SS = 87) and perceptual reasoning (SS = 86), borderline working memory (SS =77), and extremely low processing speed (SS = 68). His score on the Test of Nonverbal Intelligence, 3rd Edition (TONI-3) fell in the average range (SS = 91). His performance on the Clinical Evaluation of Language Fundamentals 4 (CELF-4) indicates low average expressive language skills (SS = 80) and severe impairments in receptive language (SS = 51).

According to his special education teacher, Student 2 has a history of significant behavior issues including physical aggression towards others. His teacher estimated that the student is noncompliant approximately 20 times a day with one to two episodes of physically aggressive behavior per month. The noncompliance is most likely to occur during transitions or when work demands are placed on him. To increase the student's compliance during the school year, the special education teacher has a behavioral strategy called differential reinforcement of other behaviors (DRO) where the student earned an extra minute of free time for every interval of time that he did not exhibit any of the targeted problem behaviors. During summer school, a formalized behavior support plan was not implemented. On the eighth day of baseline data, three data points before the VSM intervention was implemented with this student, however, a response-cost strategy was introduced to decrease the student's problem behavior. Specifically, the student began the day with a predetermined amount of free time. He lost or earned free time based on meeting three behavioral expectations (compliance with teacher directives, staying in

control, and not scripting). Antecedent strategies that were used throughout summer school were sensory breaks in the occupational therapy room and the use of a visual schedule.

Student 3 was a 5 year-old male, kindergartener who was diagnosed as meeting criteria for an educational classification of ASD. A file review completed by the researcher indicated that he also meets diagnostic criteria for ASD according to the DSM-5. Testing conducted by the school psychologist a month prior to the research study provided information about this student's intellectual ability. According to his performance on the Differential Ability Scales, Second Edition (DAS-II), the student's general conceptual ability fell in the below average range (SS = 81). Additional testing completed by the speech and language pathologist revealed that his auditory comprehension and expressive communication fell significantly below the average range (SS = 78, SS = 75 respectively) on the Preschool Language Scale, Fifth Edition (PLS-5). In contrast, his performance on the ROWPVT fell in the average range (SS = 98) and his performance on the EOWVT fell in the slightly below average range (SS = 84). Student 3 received a variety of special education services including academic support in the resource room and social skills instruction in the resource room and in the regular classroom. He also received weekly occupational therapy and speech and language services.

During an interview with the student researcher, his special education teacher estimated that he is noncompliant approximately 10 times a day when denied access to a preferred object/activity or when academic demands are placed on him. Strategies that the teacher used to increase compliance in the classroom included reinforcement of the appropriate behavior with small edibles and the use of a token board. Although these strategies were used during the school year, the only behavioral strategies used during summer school were praise for appropriate behavior and redirection when the student exhibited problem behavior.

Description of Dependent Variable

The dependent variable, compliance to classroom requests, was defined as the initiation of the requested behavior within a predetermined amount of time (between 10- and 20-seconds depending on the student), which was selected based on the special education teacher's perception of the amount of time that it takes the student to process classroom requests. If the child was initially noncompliant and the request was reissued a second time, the child's response was not recorded, as this was the same episode of noncompliance. If request was reissued (1) after the student complied with the request or (2) in a different context (i.e. "sit down" issued to request the child sit at the table and later to request that the child sit at circle time), the child's response was recorded, as this was a separate opportunity for compliance. Percent compliance to classroom requests was recorded during 45-minute observation sessions for each participant during which the paraprofessional issued four to five targeted requests. The observer recorded whether the student complied with each of the four to five targeted requests within the predetermined amount of time (10-20 seconds depending on the participant). Percent compliance to classroom requests was calculated by dividing the frequency of compliance to the targeted requests by the total number of targeted requests that were issued.

Data were also collected on requesting behavior (use of a direct statement, eye contact, proximity control, waiting 10-20-seconds for a response) to ensure that the requests were issued in a standardized format. These data helped ensure that changes in compliance were due to the independent variable rather than the manner in which the requests were issued.

Description of Independent Variable

The independent variable consisted of a VSM intervention. During the intervention phase, the participants watched one 1.5-minute video recording of themselves. The video was comprised of four to five vignettes that were approximately 30-seconds in length. Each vignette depicted the student complying with one of the targeted classroom requests. Each day, the child

watched the video immediately prior to the period of the day during which the child was most likely to exhibit noncompliant behavior according to the teacher. The child watched the video on an iPad in the area of the classroom that was out of view from other children or in the school psychologist's office if a private space in the classroom was not available. After the video, the paraprofessional provided the student with a reward for watching the video. Observation of compliance to the targeted classroom requests took place during normal classroom activities immediately after the child watched the video. Behavioral strategies implemented in the classroom during the observation period consisted of praise for appropriate behavior and redirection for inappropriate behavior. In addition, a response-cost intervention was implemented for Participant 2.

Material and Measures

Participant qualification criteria checklist. After parental permission was obtained, the researcher recorded whether the participant met criteria to participate in the study (see Appendix A). It was recorded whether the student (1) met diagnostic criteria for ASD according to the DSM-5, (2) exhibited noncompliant behavior according to teacher report, (3) could attend to a video of oneself for at least 3-minutes, and (4) had self-recognition.

Participant intake questionnaire. Once parental permission was obtained, the parents of student participants completed a questionnaire (see Appendix B) that was used to compile demographic information about the participants (i.e. age, gender, primary language spoken at home, medical conditions, psychological diagnoses). The form also included questions regarding any private intervention services (i.e. speech services, occupational therapy, physical therapy, behavioral intervention services, counseling) that their child had received in the past or was receiving at the time of the study.

Educational history form. Upon completion of the consent forms, a researcher conducted a record review for each student participant. Educational diagnoses, special education services, and scientific research based intervention (SRBI) services that had been provided were recorded (see Appendix C).

Teacher interview form. After parental permission and teacher consent were obtained, the researcher used this form (see Appendix D) to guide an interview with the teacher. The researcher asked questions about when noncompliance is most likely to occur, previous strategies that had been implemented to increase compliance, and the outcome of these interventions. In addition, the researcher asked the teacher about reinforcers that have served to increase desirable behavior in the past.

Classroom compliance probability checklist- revised. Prior to data collection, the paraprofessional completed this checklist (see Appendix E) under the guidance of the classroom teacher for each participant. The checklist, which was a modified version of the Compliance Probability Checklist created by Ducharme and DiAdamo (2005), contained over 75 commonly used classroom requests. The Duchareme and DiAdamo (2005) form was modified to include requests that were more relevant to the setting where the study took place and included a section that required the teacher to rate the frequency with which the request was issued. The paraprofessional rated each request according to an estimate of the likelihood of child compliance. When completing the checklist, the paraprofessional chose between 4 levels of compliance for a particular request: Level 1 - “almost always complies” (75 – 100% of the time), Level 2 - “usually complies” (51 – 75%), Level 3 - “occasionally complies (26 – 50%), and Level 4 - “rarely complies” (0 – 25%). In addition, for each request, the paraprofessional rated how often he/she makes the request: 5 = multiple times a day, 4 = once a day, 3 = several times a week, 2 = once a week, 1 = rarely/never. The paraprofessional also noted whether the child had

learned the skill required of the request and whether they thought that the child understood the request. This survey was used to determine which requests would be used during the baseline and intervention phases of the study.

Systematic direct observation (SDO) form. This form was completed by the researcher during each direct observation (see Appendix F). Prior to baseline data collection, during observation periods of approximately 1 hour in length, the paraprofessional issued between 9 and 12 Level 3 and Level 4 requests from the Compliance Probability Checklist- Revised that were rated as happening at least once a day. During baseline and intervention observation periods of approximately 45-minutes in length, the paraprofessional issued each targeted request at least once during the observation period.

For each request, the researcher recorded whether the student complied with the request the first time that it was issued. The observer also recorded whether the paraprofessional used a direct statement, eye contact, proximity control, and waited 10-20 seconds for a response when issuing the request.

The data were used to calculate percent compliance to the request within 10-20 seconds of the first time it was issued. It was calculated by dividing the frequency of compliance to targeted requests by the total number of targeted requests issued during the observation period. The data were also used to calculate the percentage of requests that were delivered using a direct statement, eye contact, proximity control, and waiting 10-20 seconds for a response.

Classroom request assessment- paraprofessional checklist. The paraprofessional used this checklist (see Appendix G) during the Classroom Request Assessment to ensure that all requests were issued and that appropriate requesting behaviors (direct statement, eye contact, proximity control, and waiting 10-20 seconds for a response) were employed.

Classroom request checklist- baseline. The paraprofessional used this checklist (see Appendix H) during the Classroom Request Assessment to ensure that all 5 targeted requests were issued and that appropriate requesting behaviors (i.e. direct statement, eye contact, proximity control, and waiting 10-seconds for a response) were employed during baseline.

Treatment integrity checklist. This checklist (see Appendix I) was completed by the paraprofessional during the intervention phase. It contained a checklist of the procedures that had to be followed and a script for issuing the targeted requests. The paraprofessional was also required to note whether he/she made eye contact and stood 3-5 feet from the child when making the request. Finally, the paraprofessional described whether any environmental circumstances (i.e. changes in services/routines, major life events) could have impacted the child's behavior in order to consider history threats.

Attentiveness observation form. This form (see Appendix J) was completed by the student researcher while the student participant was watching the video of him/herself. At the end of each 10-second interval during the video viewing session, the student researcher recorded whether the student participant was looking at the video by placing a check in the box. This served as a measure of attentiveness.

Usage rating profile - Intervention revised (URP-IR). After the intervention phase of the study, the teachers and paraprofessionals completed this rating scale (see Appendix K) developed by Chafouleas, Briesch, Neugebauer, and Riley-Tillman (2011). The scale consisted five of 29 items yielding 6 subscales: Acceptability, Understanding, Feasibility, Family-School Collaboration, System Climate, and System Support. The scale provided information regarding potential facilitators and barriers to intervention implementation. Reliability estimates and inter-item correlations for the six subscales demonstrated acceptable levels of internal consistency reliability (range = .72 to .95; Briesch, Chafouleas, Neugebauer, & Riley-Tillman, 2013). In

addition, construct validity is supported by the results of both the exploratory and confirmatory factor analyses, which support a six-factor model of usage (Briesch et al., 2013).

Videos. Prior to baseline data collection, one approximately 1.5-minute long video recording was created for each participant. The video was comprised of four to five vignettes that were approximately 30-seconds in length. Each vignette depicted the student complying with the one of the targeted classroom requests.

Design

A multiple-baseline study across three students was used to demonstrate the effectiveness of a VSM intervention in improving compliance to classroom requests in children with ASD.

Procedures

Recruitment. Once written approval from a suburban elementary school in central Connecticut was in place, the student investigator obtained approval from the principal of the school where the study took place by meeting with the principal and describing research study procedures, risks, and benefits. At the end of the meeting the student participant provided the principal with a permission form. The student researcher asked the principal to contact her through email if the principal decided to participate. When the principal responded, the student researcher collected the form from the principal.

Once the principal consented, the student researcher used direct recruitment in person at the school to recruit the teachers to participate in the study. The student researcher contacted teachers that the principal and/or school psychologist suggested based on the presence of a child with ASD in the classroom and arranged a time to meet. The student researcher met with the teachers to describe the research study including its risks and benefits. At the end of the meeting, the student researcher provided the teacher with a consent form, which explained the study in more detail. If the teacher was interested in participating, he/she completed the consent form,

placed it in a sealed envelope, and emailed the student researcher who collected the form within two days.

The consenting teachers nominated children with ASD who exhibited noncompliant behavior to participate in the study. The teachers phoned the parents of the nominated students to describe the study. The student researcher's contact information was provided to the parents if they had more questions. The teacher sent home Parental Permission Forms to parents who were interested in having their child participate in the study and collected those that were returned to them.

Once parental permission was obtained, the paraprofessionals that worked with that child during the school year and over the summer were recruited for participation in the study. Specifically, the researcher met with the paraprofessionals and described study procedures, as well as risks and benefits. If the paraprofessionals were interested in participating, the researcher provided them with a consent form. The same procedures that were used for collecting the consent forms of the teachers were used to collect the consent forms of the paraprofessionals.

Next, the student researcher used direct recruitment in person at the school to recruit the school psychologist and/or social worker to participate in the study. The student researcher met with the school psychologist and/or social worker separately to describe their participation in the research study including risks and benefits. At the end of the meeting, the student researcher provided him/her with a consent form. If interested in participating, he/she was to complete the consent form, place it in a sealed envelope, and give it to the principal who stored the consent forms in a locked drawer. The student researcher collected the consent forms from the principal twice a week.

Prior to screening, the child participant with ASD was invited to participate in the study using the script for obtaining the target child's oral assent.

Pre-baseline. Once appropriate consent and assent was obtained, the researcher completed the Participant Qualification Criteria Checklist to ensure that the nominated students met criteria for participation in the study. This required the researcher to review educational records to ensure that the students met DSM-5 criteria for ASD. To ensure that the child could watch a 3-minute long video of oneself, the researcher videotaped the child engaging in typical classroom activities. The researcher then showed the video to the child at a time agreed upon by the teacher and paraprofessional to minimize missed instruction and recorded whether the child was able to attend to this video for at least 3-minutes. Given the possibility that the student would have a negative reaction to seeing a video of him/herself, either the school psychologist or social worker was present for the video viewing. If the child were to become upset during the video viewing, the video would be stopped immediately and the school psychologist or social worker would reassure and comfort the child. The video did not have to be stopped for any of the participants. To determine whether the child could recognize him/herself, the researcher used procedures described by Buggey (2012). Specifically, the researcher turned the view screen on the iPad camera so that the student was able to see him/herself on the screen. The child's reaction to seeing him/herself determined whether he/she was able to self-recognize. If the child reacted in any way that affected what was depicted (i.e. sticking out tongue, big smiles, moving in and out of the screen), he/she could self-recognize. If he/she showed no interest or did not try to manipulate what they were seeing, he/she could not self-recognize.

For each of the participants, the researcher completed an Educational History Form, and the parents completed the Participant Intake Questionnaire. To obtain more information about when noncompliance was most likely to occur and other interventions that had been used to address the problem behavior, the researcher interviewed the special education teacher and completed the Teacher Interview Form. The interview was also used to determine rewards that

could be given to the child after attending to the 1.5 minute long videos. In addition, the paraprofessional completed the Classroom Compliance Probability Checklist- Revised. The classroom teacher reviewed the paraprofessional's ratings to ensure that he/she agreed. Based on the ratings, the researcher identified all of the requests to which the student "rarely complies" or "occasionally complies" at least once a day; 9-10 of these requests were included in the Classroom Request Assessment.

The Classroom Request Assessment was conducted for each student and was used to assess the students' probability of compliance to the specific requests identified on the Classroom Compliance Probability Checklist-Revised. During the each assessment session, the paraprofessional issued each identified request during regular classroom activities. The paraprofessional was instructed to issue the request in a non-question format while making eye contact and standing within 3-5 feet from the child. For example, the paraprofessional would say, "[Student's name], [request]" while making eye contact and standing 3-5 feet from the child. He/she would then wait 10-20 seconds for the student to initiate the requested behavior. During an observation period that will be approximately 1 hour in length, the researcher used the Systematic Direct Observation (SDO) Form to record student compliance and whether the paraprofessional used a direct statement, eye contact, proximity control, and waited 10-20 seconds for a response when issuing the request.

Three to four Classroom Request Assessment sessions were conducted for each student. After all assessment sessions had been completed, the researcher calculated the probability of student compliance to each of the requests by dividing the number of requests to which the student complied by the total number of targeted requests issued by the paraprofessional. If the paraprofessional did not follow appropriate requesting procedures (eye contact, direct statement, proximity control, waiting 10-seconds), the request was not included in the probability

calculation since the manner in which the request was delivered could have impacted student performance. Based on the probability calculations, four or five requests were selected to be targeted in the study. Requests to which the student did not comply on any of the observation sessions were excluded because it could not be verified that the child understood the request. Of the remaining requests, the four to five requests to which the student exhibited the lowest probability of compliance will be included in the study. In order to be included in the study as a targeted classroom request, the probability of compliance had to be lower than 80%.

In addition, the researcher conducted IOA training sessions for graduate students in school psychology who would be collecting IOA data. The researcher defined each behavior being coded for during the observation period and gave them an opportunity to practice in vivo during the Classroom Request Assessment sessions. Secondary observers achieved 80% agreement or higher for three consecutive sessions prior to beginning baseline data collection.

Baseline. Baseline data collection occurred during 45-minute observation periods during the time that noncompliant behavior was most likely to occur according to the teacher. Normal classroom activities took place during the observation sessions. Behavioral strategies implemented in the classroom during the observation period consisted of praise for appropriate behavior and redirection for inappropriate behavior. In addition, a response-cost intervention was implemented for Participant 2. During the observation period, the paraprofessional delivered the 4-5 targeted requests at least once. When issuing the request, the paraprofessional followed the same procedure as during the Classroom Request Assessment sessions. He/she issued the request in a non-question format while making eye contact and standing within 3-5 feet from the child. After the request had been issued, he/she waited 10-20 seconds for the student to initiate the requested behavior. The paraprofessional responded to the child's compliant or noncompliant behavior according to normal classroom procedures.

During the baseline observation periods, the researcher completed the SDO form to record data on student compliance to classroom requests and data on the manner in which the paraprofessional issued the request (direct statement, eye contact, proximity control, and waiting 10-seconds for a response). Data were collected for five baseline observation periods before the intervention was implemented with the first student. Intervention implementation of the other participants was staggered with at least three baseline data points between when they began intervention and when the last participant began the intervention. IOA data on compliance and the manner in which the paraprofessionals issued the request (i.e. using a direct statement, eye contact, proximity control, and waiting 10-seconds for a response) were collected between 20 and 41% of all sessions.

Also, during baseline, the researcher created the intervention videotapes. To maintain privacy, filming took place in an empty classroom. Filming took no longer than 30-minutes for each student. To create each vignette, the paraprofessional was videotaped while issuing one of the 4-5 requests selected for the target student. When making the request, the paraprofessional issued the requests as a direct statement, maintained eye contact with the student, and stood between three and five feet away from the student. Verbal and gestural prompts were used to cue the child to comply with the classroom request. The prompts were edited out of the video to make it appear as though the child immediately complied with the classroom request. The final video consisted of 4-5 vignettes so that the student was able to watch an example of compliance to each of the targeted classroom requests.

Intervention. During the intervention phase, the participants participated in a VSM intervention. To maintain privacy and minimize distractions, the participant viewed the video on an iPad in an area of the classroom that was out of view from the other students. When such a space was not available, the students viewed the video in the school psychologist's office. Video

viewing occurred immediately prior to the period of the day that the participant was most likely to exhibit noncompliant behavior according to the teacher. At this time, the paraprofessional played the video for the child. During the video viewing session, the paraprofessional monitored the student. If the student was not attending to the video, the paraprofessional used verbal and gestural prompts to regain his/her attention. The student researcher used the Attentiveness Observation Form to record whether the child was attending to the video. After the video, the paraprofessional provided the student with a reward for watching the video. All three students received the reward after every video viewing session.

The student then returned to participating in normal classroom activities. At this time, the researcher began collecting data during a 45-minute observation period. As during baseline data collection, the paraprofessional delivered the 5 targeted requests using the requesting technique that was described in the baseline procedures (direct statement, eye contact, proximity control, waiting 10-seconds for a response). To ensure that the paraprofessional remembered to issue the 5 selected requests and used appropriate requesting behaviors, the paraprofessional completed the Treatment Integrity Checklist during each video viewing session and subsequent observation period.

To record data on student compliance to classroom requests and data on the manner in which the paraprofessional issued the request (direct statement, eye contact, proximity control, waiting 10-seconds for a response), the researcher used the same SDO form that was used during baseline data collection. During the intervention phase, data was collected for at least 5 observation periods for each participant in the study. IOA data on compliance and the manner in which the paraprofessionals issued the request (using a direct statement, eye contact, proximity control, and waiting 10-seconds for a response) were collected between 28 and 31% of all sessions.

Post-intervention. At the end of the study, the teacher and paraprofessionals working with the targeted students completed the Usage Rating Profile- Intervention Revised, which evaluated their opinion of the intervention's feasibility and usefulness for improving compliance in the classroom. The information gained from this questionnaire can be used to determine whether changes in participant compliance were socially significant and to decide what changes can be made to the intervention procedures to make it more feasible for future use.

Data Analyses

Visual analysis was used to analyze the data collected on compliance to classroom requests. Specifically, data were analyzed according to What Works Clearinghouse (WWC) Standards (Kratochwill et al., 2010). The compliance data were graphed and was evaluated visually for change over time. Specifically, the level, trend, and variability within each phase were assessed. The split middle technique supplemented visual analysis and allowed the experimenter to examine the trend during baseline and intervention phases. This information was supplemented by comparing the overlap of data points between phases, the immediacy of effect, and the consistency of patterns in similar phases. Finally, a calculation of the percentage of non-overlapping data points (PND) was calculated to examine how reliably the intervention increased compliance, and TauU was calculated as a measure of effect size. TauU was chosen as the measure of effect size because unlike other non-overlap parametrics, it equally emphasizes all data points by deriving the effect size from pairwise data comparisons across phases (Parker, Vannest, Davis, 2011). Therefore, it is easily not skewed by outliers.

The data collected on the manner in which the paraprofessional issued the request were summarized in terms of the mean percentage of requests for which the paraprofessional used each of the requesting behaviors (direct statement, eye contact, proximity control, waiting 10-seconds for a response) during baseline and intervention. It served as a quality indicator.

Similarly, the data from the Treatment Integrity Checklist were summarized in terms of the mean percentage of steps that the paraprofessional followed during both baseline and intervention phases.

To analyze IOA data, trial-by-trial IOA were calculated for compliance and paraprofessional requesting behavior. IOA data for compliance was calculated by determining whether inter-observer agreement was achieved for each of the targeted requests that both observers coded for. The researcher divided the total number of trials for which there was agreement by the total number of trials and multiplied this number by 100. Trial-by-Trial IOA was also used to calculate IOA for paraprofessional behavior. For each of the targeted requests that both observers coded for, the researcher determined whether the observers agreed upon whether the paraprofessional used all four requesting behaviors (direct statement, eye contact, proximity control, and waiting 10-20 seconds for a response) when issuing the request. For each of the requesting behaviors, the researcher divided the number of trials for which there was agreement by the total number of trials and multiplied this number by 100. Given the small sample size, results from the Usage Rating Profile- Intervention Revised were analyzed using descriptive statistics to examine the teacher and paraprofessionals' impressions of the feasibility and appropriateness of the intervention.

Chapter IV: Results

Data collected during systematic direct observations were used to evaluate whether the VSM intervention resulted in improvements in student compliance to classroom requests. In addition, data collected on the paraprofessionals' requesting behavior (i.e. direct statement, eye contact, proximity control, wait time) served as a quality indicator to ensure that the requests were issued in a standardized manner. Teacher and paraprofessionals' ratings on the Usage Rating Profile- Intervention Revised (URP-IR) provided information about the feasibility and acceptability of the intervention.

SDO Data

Descriptive statistics and visual analysis of SDO data on compliance were used to examine whether the VSM intervention resulted in improvements in student compliance to classroom requests. Table 1 indicates the mean, standard deviation (SD), and range of percent compliance during baseline and intervention for the three participants, and Table 3 describes the heuristics for comparing SDO data from baseline to intervention. Table 2 examines mean percent compliance for each request to examine whether compliance increased differentially across requests. Figure 1 graphically depicts the overall percentage of compliance to classroom requests during the baseline and intervention phases.

Student 1. During baseline, Student 1 was compliant during a mean of 19.67% of opportunities observed (SD = 14.55, range 0.0 - 40.0%). Despite substantial variability and a moderate decreasing trend during baseline, the data stabilized for two points prior to intervention implementation. Upon intervention implementation an immediate change in level and a slight increasing trend throughout the intervention phase was observed. Despite greater variability in

the intervention phase, the intervention data reflect a higher mean level of compliance than do baseline data. During the intervention phase, Student 1 was compliant a mean of 44% of observed opportunities (SD = 20.39, range 16.67 - 83.33%). There is much overlap between baseline and intervention as is reflected by the PND score of 33.33%, which suggests that the intervention did not reliably increase compliance in Participant 1. An effect size of 0.68 suggests that there was a measurable difference in levels of compliance between baseline and intervention.

When examining each request individually, mean percent compliance increased from baseline to intervention for four out of five requests. It did not increase for the request "Come here." For this request, it was often difficult to obtain the student's attention because proximity control was not possible.

Student 2. Student 2 was compliant during a mean of 58.58% of opportunities observed (SD = 18.81, range 25.0 - 80.0%) during baseline. There was a significant amount of variability during this phase, especially at the beginning of the phase. A slight increasing trend was calculated during baseline. Upon implementation of the intervention, there was an immediate change in level and the first three data points in the intervention phase reflect an increasing trend towards higher percent compliance. During intervention, Student 2 was compliant during a mean of 72.07% of opportunities observed (SD = 12.07, range = 58.33 - 90.91%) indicating a higher level of mean compliance during intervention than during baseline. In addition, by comparing the range and standard deviation between baseline and intervention, it is clear that intervention data exhibited less variability than baseline data. As is indicated by a PND score of 11.76%, however, there is a great deal of overlap between baseline and intervention data. Although the intervention did not result in consistently higher compliance for this student, it seems that it did decrease the extreme variability that was exhibited during baseline and resulted in a higher level of compliance. An effect size of 0.40 was calculated for Student 2 when using

TauU. It is important to note, however, that on the eighth day of data collection, which was three data points before the VSM intervention was implemented with this student, a response-cost strategy was introduced to decrease the student's problem behavior.

When examining each request individually, mean percent compliance increased from baseline to intervention for two out of four requests. Although it did not increase for the request "Look at your paper/work," it would have been difficult to do so because mean percent compliance during baseline was 96.0%. In addition, mean percent compliance did not increase for the request "Stop scripting."

Student 3. During baseline, Student 3 was compliant a mean of 67.65% of opportunities observed (SD = 10.27, range = 50.0 - 83.33%). There was a moderate amount of variability and a slight increasing trend during baseline. Immediately prior to intervention implementation, the data stabilized for approximately four data points. During intervention, Student 3 was compliant a mean of 82.74% of opportunities observed (SD = 22.1, range = 50.0 -100.0%) indicating a higher level mean compliance than during baseline. Implementation of the intervention, however, resulted in an immediate decrease in level and trend; a decreasing trend that began at the end of baseline continued for the first two data points collected during the intervention phase. Overall, however, a strong increasing trend was present when examining the intervention phase as a whole. For the last four data points in the intervention phase, Student 3 was compliant during 100% of opportunities observed. Despite consistently higher compliance for the last four data points in the intervention phase, there is great variability and a significant amount of overlap between baseline and intervention data as is indicated by a PND score of 21.05%. When using TauU, an effect size of 0.36 was calculated for Student 3.

When examining each request individually, mean percent compliance increased for two requests. It did not increase for the request "Sit down." The fourth request, "Turn off the water,"

was not issued consistently because during the summer, the student used a sink that turned off and on automatically.

Paraprofessional Requesting Behavior

Data on paraprofessional requesting behavior was collected to ensure that the paraprofessional issued the targeted requests in a standardized manner. Descriptive statistics were calculated on the mean percentage of requests for which the paraprofessional used each of the requesting behaviors. See Tables 4 and 5 for a summary of results. Across participants and phases, on average the paraprofessionals used each of the requesting behaviors on 80% or more of the requests issued. The only exception was that Student 3's paraprofessional only used proximity control for a mean of 72.02% of the requests that were issued during the intervention phase. Since the requests were consistently issued using standardized requesting behavior, it is unlikely that changes in compliance were due to the manner in which the requests were issued.

Interobserver Agreement

Mean interobserver agreement (IOA) was calculated for compliance and each of the requesting behaviors for each student during baseline and intervention. See Table 6 and Table 7 for a summary of results. IOA was 80% or higher for compliance and for each of the requesting behaviors across the three students indicating that the observers reliably coded for each behavior during the observation periods.

Attentiveness Observation

Descriptive statistics on the mean percent of intervals during which the participant was attending to the intervention video were calculated for each participant. See Table 8 for a summary of results. The students exhibited differing degrees of attentiveness when watching the intervention video. On average, Student 1 was attentive 84.63% of the time when watching the

video while Student 2 was observed to be attending to the video during 69.25% of intervals. On average, Student 3 attended to the intervention video during 77.52% of the intervals.

Treatment Integrity

The extent to which the treatment was implemented with fidelity was evaluated by calculating the mean percentage of steps completed on the treatment integrity checklist. For Student 2 and Student 3, the 100% of the steps were implemented each time that the intervention was given. The mean percent of steps completed for Student 1 was slightly lower (M = 98.44) because on one occasion, the paraprofessional did not provide the student with a reward for attending the video. See Table 9 for a summary of results.

Usability

Upon completion of the intervention, the adult participants completed the *Usage Rating Profile-Intervention Revised* (URP-IR; Chafouleas, Briesch, Neugebauer, & Riley, 2011; See Appendix K) to evaluate the usability of the intervention. Of the 5 adult participants, 4 completed the URP-IR; one of the teachers did not complete the form. Table 10 displays the mean scores (1 = strongly disagree, six = strongly agree) across the six domains assessed by the URP-IR.

The paraprofessionals (n=3) rated the intervention positively across all six domains except System Support. They agreed with items pertaining to the *acceptability* of the intervention (M = 5.19, SD = 0.79) indicating that the paraprofessionals believed that the VSM intervention was a good way to handle the problem behavior and that the intervention procedures fit in easily with their current practices. They also agreed with items pertaining to their *understanding* of the intervention (M = 5.33, SD = 0.87), to the *feasibility* of the intervention (M = 5.17, SD = 0.86) and to the *system climate* (M = 5.27, SD = 0.80). Therefore, the paraprofessionals felt knowledgeable about the intervention procedures and believed that they had the time and

resources to implement the intervention. Although the intervention does not directly involve the parents, the paraprofessionals rated items pertaining to *home-school collaboration* highly (M = 5.11, SD = 1.36) indicating that they felt that a positive home-school relationship was needed to implement the intervention. Perhaps their responses to items on this domain reflect their underlying attitudes about the importance of parent involvement rather than the necessity of home-school collaboration to implement this intervention. The paraprofessionals tended to slightly disagree with items pertaining to the *system support* domain (M = 3.11, SD = 1.62). A low score for *system support* reflects a greater ability to implement the intervention independently. There was also great variability in their responding. Some paraprofessionals felt that they would need additional professional development or consultative support to implement the intervention while others did not.

Overall, the teacher (n=1) exhibited slightly lower ratings than the paraprofessionals across the domains, which could reflect her less direct involvement in intervention implementation. Her ratings indicate that she generally agreed that the VSM intervention was *feasible* (M = 4.67, SD = 0.52) and *acceptable* (M = 4.56, SD = 0.73) to implement in her classroom. She also agreed with items suggesting that the *system climate* would be supportive of the intervention (M = 5.0, SD = 0.0). For example, she agreed that administration would be supportive of the intervention and that her work environment was conducive to implementing a VSM intervention. The teacher's ratings reflect a lesser *understanding* of intervention implementation procedures (M = 3.33, SD = 0.58) than did the paraprofessionals' ratings, which is likely because the teacher was not responsible for implementing the VSM intervention. The teacher slightly disagreed with items pertaining to *home-school collaboration* (M = 3.67, SD = 0.58), which reflects that parental involvement was not necessary to implement the intervention with fidelity. Finally, the teacher slightly agreed with item pertaining to the *system support*

domain (M = 4.33, SD = 0.58), indicating that she felt that she would benefit from additional training and support to implement the intervention in the future. Since the teacher was not directly implementing the intervention, she did not receive the same level of training as paraprofessionals and therefore would likely benefit from more explicit instruction on how to implement the intervention.

Chapter V: Discussion

Given the research support for the use of video self-modeling to modify behavior in children with ASD, it was hypothesized that a VSM intervention could be used with students with ASD to increase their compliance to classroom requests. While VSM has been shown to increase on-task behavior (Coyle & Coyle, 2004; Hagiwara & Myles, 1999) and decrease task-

avoidance (Ohtake et al., 2013 and disruptive behavior (Buggey, 2005), only one unpublished dissertation study with a number of limitations (Figueira, 2007) has explored whether VSM can serve to increase compliance in children with ASD. The purpose of the current study was to reexamine whether VSM can be used to increase compliance in students with ASD. The social acceptability of the VSM intervention was also examined.

Summary of Results

Student outcomes. Results of this investigation reflect modest improvements in compliance for the three students with ASD who participated in the VSM intervention. The intervention improved the mean percentage of compliance for all three students. Student 1 experienced a 24% gain in mean compliance. Student 2's mean compliance rose by 13.49% and Student 3's rose by 15.09%. Although a mean increase in percent compliance was exhibited for all three students, visual analysis and effect size calculations provide inconsistent evidence for a positive, functional relationship between the VSM intervention and an increase in compliance to classroom requests. The effectiveness of the intervention varied between the three students with ASD who participated in the intervention.

Both visual analysis and effect size data for Student 1 demonstrated an improvement in compliance to classroom requests upon implementation of the VSM intervention. Visual analysis indicated that this participant responded immediately to the VSM intervention and that an increasing trend was present throughout the intervention phase (Figure 1). Of the three participants, Student 1 was the most responsive to the VSM intervention. Student 1 also exhibited the highest percentage of mean attentiveness to the intervention video (M = 84.63%).

Student 2 showed modest improvements in compliance during the intervention phase. Visual analysis and the percentage of nonoverlapping data (PND) calculation indicated that there

was a substantial amount of overlap between baseline and intervention data points. Although the intervention did not seem to reliably increase compliance in Student 2, visual analysis suggests that it decreased the extreme variability in compliance that was exhibited during baseline. The introduction of the response-cost intervention, however, confounds the results as it is unclear whether the VSM intervention or the response-cost intervention served to reduce the variability of the intervention data. The effect size calculated for Student 2 was 0.40. In contrast to the high level of attention to the intervention video that was seen in Student 1, on average, Student 2 only attended the video 69.25% of the time.

While the effect size calculation for Student 3 suggests only small changes in compliance as a result of the VSM intervention, visual analysis reflects a more complicated pattern of findings. Immediately upon intervention implementation, Student 3 exhibited lower levels of compliance than was exhibited during the last three baseline data points. At the end of the intervention phase, however, he was consistently complying with 100% of the classroom requests issued. While this finding is promising, it is difficult to conclude that the increase in compliance is functionally related to intervention implementation because the intervention effect was not immediate. Student 3 exhibited a modest level of attentiveness to the video. On average, he attended to the video 77.52% of the time.

Despite the research support suggesting that VSM is an appropriate strategy to address social-communication, functional skills, and behavioral functioning in students with ASD (Bellini & Akullian, 2007), the results of the current study provide only modest support that VSM can be used to increase compliance in students with ASD. There are several possible explanations as to why the VSM intervention did not reliably increase compliance across the three students with ASD. First, a requirement for VSM to be effective is that the viewer must be

able to attend to the video (Buggey, 2005). In the current study, the students that displayed variable attention to the intervention video (Student 2 and Student 3) exhibited the weakest response to the intervention. It is plausible that their inconsistent attention to the video attenuated the intervention effect. It is also possible that students who exhibit poor attention to the video may take longer to respond to the intervention. For example, while Student 3 did not seem to benefit from the intervention initially, after three video viewings, he was compliant with 100% of the requests issued during the subsequent four observation sessions. To provide further support for the notion that attentiveness to the intervention video may impact the effectiveness of VSM, Student 1, who exhibited the highest mean attentiveness to the video, also experienced the greatest intervention effect.

Another possible explanation for the inconsistency of the intervention effect is that the students may not have been motivated to exhibit compliant behavior. Dowrick (2012) explains that video self-modeling interventions are only effective if the observed behavior illustrates goals or outcomes of particular relevance or value to the viewer. According to his theory, if an observer watches a model perform a behavior that is not relevant or valuable, the behavioral response will be encoded towards the bottom of the viewer's cognitive response hierarchy. When presented with situations in the future, the observer's response will be to activate and enact a mental image that is at the top of his/her response hierarchy. Given that the VSM videos in this intervention depicted the students complying with classroom requests that they were historically noncompliant with and as a result engaging in a nonpreferred activity (i.e. completing school work), it seems unlikely that compliant behavior would have been placed at the top of their response hierarchy. Instead, noncompliant behavior would still likely be more valuable or motivating to them because they would be able to avoid nonpreferred task; if the

student was not easily redirected, they were often able to escape from the task that the paraprofessional requested that they engage in. Perhaps, it would have been useful to depict the student being reinforced (i.e. verbal praise or receiving a small edible) for exhibiting compliant behavior in the video, as this would likely make compliance a more meaningful outcome for the students. Ohtake et al. (2013) found that adding verbal praise to the VSM video further decreased task-avoidant behavior for a student whose problem behavior was partly maintained by teacher attention.

Intervention usability. Despite the modest outcomes regarding the effectiveness of the VSM intervention to increase compliance in students with ASD, the teacher and paraprofessionals' ratings on the Usage Rating Profile- Intervention Revised (URP-IR) suggest that the intervention was feasible and appropriate to implement in schools. See Table 9 for a summary of the mean scores across the six domains evaluated by the URP-IR. The paraprofessionals' ratings indicated that they felt knowledgeable about the procedures necessary to implement the VSM intervention and that they had the time and resources to implement the intervention. There was some inconsistency in their responding about their perceived ability to implement the intervention independently; some paraprofessionals felt that they would need additional training or support to do so, while others did not. The teacher also rated the intervention positively across the domains assessed by the URP-IR. She agreed that the intervention would be feasible and acceptable to implement in her classroom, but felt less knowledgeable about the procedures than the paraprofessionals. This discrepancy is likely because the paraprofessionals were responsible for implementing the VSM intervention with the students. Overall, positive ratings on the URP-IR indicate that the VSM intervention was widely

accepted by the teacher and paraprofessional as a feasible and fair way to address noncompliance in the classroom.

Implications for Practice

Although the nature of single-subject research prevents the study findings from being generalized to larger populations, some implications for practice can be gathered from the current study. First, the study findings suggest that VSM has the potential to result in modest improvements in compliance to classroom requests when used with children with ASD. Although some improvements in compliance were exhibited, the students with ASD did not consistently exhibit higher levels of compliance during the baseline phase than during the intervention phase. It is possible that the students' attentiveness to the intervention video mediated the intervention effect. The student that benefited most from the intervention according to visual analysis and effect size data was the student that exhibited the highest degree of attentiveness to the video. Prior to implementing the intervention in the future, educators may want to consider screening students to ensure that they can attend to the video at least 80% of the time. In addition, alternating between two intervention videos may help to increase the novelty of the videos and sustain the students' attention.

Given that the intervention only modestly increased compliance for the three students with ASD, it is not recommended that educators use this intervention as their only means for addressing noncompliance in the classroom. A major benefit of VSM, however, is the ease of implementation that was reported by the paraprofessionals and the teacher through their ratings on the URP-IR. Since the intervention is feasible to implement in the classroom and is considered a socially acceptable way to address the problem behavior, educators may consider

using VSM as part of a more comprehensive behavior support plan to address noncompliance in the classroom.

Limitations

Several limitations to the current research study should be considered when interpreting the study findings. Although researchers attempted to address the threats to internal validity that exist when using multiple baseline single subject designs, it was not always possible to do so. For example, Kratochwill et al. (2010) recommends that participants be randomly assigned to the order with which they enter the intervention phase to prevent selection threats. Given that data could only be collected for 6-weeks, however, the researcher did not create a random schedule of intervention implementation. Instead, the researcher began intervention implementation with the student that exhibited the most stable baseline data. Although multiple replications across participants and staggered intervention implementation helped mitigate some of the threats to internal validity, a lack of immediacy of effect, which was seen in Student 3, makes it difficult to conclude that a functional relationship exists between the intervention and this student's improvement in compliance. Furthermore, given the limited timeframe of the study, a pattern of stable baseline data was not always achieved prior to implementing the intervention. In addition, a longer period of intervention data collection may have allowed for the data to stabilize, which would have allowed more conclusions to be drawn about the functional relationship between the VSM intervention and compliance in the students with ASD. Finally, the introduction of a response-cost intervention during baseline data collection for Student 2 also limits the conclusions that can be made in regards whether a functional relationship exists between the VSM intervention and compliance. In addition to the threats to internal validity, the use of a

multiple baseline single subject design precludes the generalization of study findings to larger populations.

Another limitation is that the study did not examine maintenance or generalization data. It would have been useful to explore whether the students continued to exhibit higher mean percentages of compliance after the VSM intervention was terminated. Similarly, it would have been beneficial for the researchers to collect generalization data to examine whether the intervention increased student compliance to requests that were not targeted in the video and whether students would be compliant to requests issued by paraprofessionals or teachers that were not featured in the video.

When interpreting the data collected on the usability of the VSM intervention, it is important to consider that social desirability bias may have influenced teacher and paraprofessional ratings on the URP-IR. It is possible that they rated items regarding the feasibility and acceptability of the intervention highly because they wanted their responses to be viewed favorability by the researcher. For example, even though parental involvement was not a necessary component of the VSM intervention, paraprofessional still rated items pertaining to the Home-School Collaboration highly, indicating that that they felt that a positive home-school relationship was needed to implement the intervention. Perhaps the paraprofessionals' ratings of items on the Home-School Collaboration domain reflect their desire to select responses that would be viewed favorably by the researcher rather than their actual beliefs on whether a positive home-school relationship was an essential component to intervention implementation.

While a number of study limitations reduce the internal and external validity of the study, replication studies that address the aforementioned shortfalls could serve to provide further evidence for a functional relationship between the VSM intervention and increases in compliance

to classroom requests. Systematic replication of the current study would also increase the external validity of the study findings.

Future Research

Although the current research study contributes to the literature base on the use of VSM interventions for students with ASD, future research could be conducted to address several questions that still exist. As previously mentioned, it would be useful to conduct replication studies that account for some of the limitations present in the current study. Specifically, a longer timeframe should be allotted for data collection to allow the data to stabilize in each phase, and intervention implementation should be randomized to minimize selection threats. In addition to taking steps to increase internal validity, it may also be useful to collect maintenance and generalization data. It would be important for stakeholders to know whether the intervention effects are maintained after the intervention is terminated and whether students exhibit higher levels of compliance to classroom requests that were not targeted in the intervention.

Finally, future research could also examine whether greater gains in compliance would be obtained if the intervention video depicted the student being reinforced (i.e. specific praise, small edible) for complying with classroom requests. Although Bandura (1977) theorizes that reinforcement does not increase observational learning as long as the learner is able to attend to the modeled activities, Dowrick (2012) suggests that individuals fail to learn from models when the observed behavior does not illustrate outcomes of relevance or value. According to Dowrick (2012) then, if including reinforcement in the video increases the value of the compliant behavior, the student would exhibit higher levels of compliance when watching an intervention video where reinforcement of the compliant behavior is present.

Conclusion

The current study sought to add to the literature base on VSM as an intervention for students with ASD. Specifically, the study examined whether VSM could be used to increase compliance to classroom requests in students with ASD. Although modest increases in compliance were observed across all three participants, a number of limitations make it difficult to conclude that a functional relationship exists between the VSM intervention and increases in compliance. Future research that addresses some of the study limitations are needed to increase the internal and external validity of the current study.

References

American Psychiatric Association. (2013*). Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Arbelle, S., Sigman, M. D., & Kasari, C. (1994). Compliance with parental prohibition in autistic children. *Journal of Autism and Developmental Disorders*, *24*(6), 693-702.

Ayres, K. M., & Langone, J. (2005). Intervention and instruction with video for students with autism: A review of the literature. *Education and Training in Developmental Disabilities*, *40*(2), 183-196.

Axelrod, M. I., Bellini, S., & Markoff, K. (2014). Video Self-Modeling A Promising Strategy for Noncompliant Children. *Behavior Modification*, *38*(4) 567–586.

Baer, A. M., Rowbury, T., & Baer, D. M. (1973). The development of instructional control over classroom activities of deviant preschool children. *Journal of Applied Behavior Analysis*, *6*(2), 289-298.

Baio, J. (2012). Prevalence of autism spectrum disorders–autism and developmental disabilities monitoring network, 14 sites, United States, 2008. *Centers for Disease Control and Prevention Surveillance Summaries, 61*(3), 1–19. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6103a1.htm?s_cid=ss6103a1_w&quot >

Banda, D. R., Neisworth, J. T., & Lee, D. L. (2003). High-probability request sequences and young children: Enhancing compliance. *Child & family behavior therapy*, *25*(2), 17-29.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Barnett, D. W., Bauer, A. M., Ehrhardt, K. E., Lentz, F. E., & Stollar, S. A. (1996). Keystone targets for change: Planning for widespread positive consequences. *School Psychology Quarterly*, *11*(2), 95.

Bellini, S., & Akullian, J. (2007). A meta-analysis of video modeling and video self-modeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children*, *73*(3), 264-287.

Bellini, S., Akullian, J., & Hopf, A. (2007). Increasing social engagement in young children with autism spectrum disorders using video self-modeling. *School Psychology Review*, *36*(1), 80-90.

Bellini, S., & McConnell, L. L. (2010). Strength-based educational programming for students with autism spectrum disorders: A case for video self-modeling. *Preventing School Failure: Alternative Education for Children and Youth*, *54*(4), 220-227.

Benoit, D. A., Edwards, R. P., Olmi, D. J., Wilczynski, S. M., & Mandal, R. L. (2001). Generalization of a positive treatment package for child noncompliance. *Child & family behavior therapy*, *23*(2), 19-32.

Bernad-Ripoll, S. (2007). Using a self-as-model video combined with Social Stories™ to help a child with Asperger syndrome understand emotions. *Focus on Autism and Other Developmental Disabilities*, *22*(2), 100-106.

Bray, M. A., & Kehle, T. J. (1996). Self-modeling as an intervention for stuttering. *School Psychology Review*, *25*, 358-369.

Bryce, C. I., & Jahromi, L. B. (2013). Brief report: Compliance and noncompliance to parental control strategies in children with high-functioning autism and their typical peers. *Journal of Autism and Developmental Disorders*, *43*(1), 236-243.

Buggey, T. (2005). Video self-modeling applications with students with autism spectrum disorder in a small private school setting. *Focus on Autism and Other Developmental Disabilities*, *20*(1), 52-63.

Buggey, T. (2007). A picture is worth: video self-modeling applications at school and home. *Journal of Positive Behavior Interventions*, *9*(3), 151-158.

Buggey, T. (2012). Effectiveness of video self-modeling to promote social initiations by 3-year olds with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, *27*(2), 102-110.

Buggey, T., Hoomes, G., Sherberger, M. E., & Williams, S. (2011). Facilitating social initiations of preschoolers with autism spectrum disorders using video self-modeling. *Focus on Autism and Other Developmental Disabilities*, *26*(1), 25-36.

Buggey, T., Toombs, K., Gardener, P., & Cervetti, M. (1999). Training responding behaviors in students with autism using videotaped self-modeling. *Journal of Positive Behavior Interventions*, *1*(4), 205-214.

Burton, C. E., Anderson, D. H., Prater, M. A., & Dyches, T. T. (2013). Video self-modeling on an iPad to teach functional math skills to adolescents with autism and intellectual disability. *Focus on Autism and Other Developmental Disabilities*, *28*(2), 67-77.

Bray, M. A., & Kehle, T. J. (1996). Self-modeling as an intervention for stuttering. *School Psychology Review*, *25,* 358-369.

Bray, M. A., Kehle, T. J., Spackman, V. S., & Hintze, J. M. (1998). An intervention program to increase reading fluency. *Special Services in the Schools*, *14*(1-2), 105-125.

Braun, K.A., & Loftus, E.F. (1998). Advertising's misinformation effect. *Applied Cognitive Psychology, 12*, 569–591.

Briesch, A. M., Chafouleas, S. M., Neugebauer, S. R., & Riley-Tillman, T. C. (2013). Assessing influences on intervention use: Revision of the Usage Rating Profile-Intervention. *Journal of School Psychology, 51,* 81–96.

Cataldo, M. F., Ward, E. M., Russo, D. C., Riordan, M., & Bennett, D. (1986). Compliance and correlated problem behavior in children: Effects of contingent and noncontingent reinforcement. *Analysis and Intervention in Developmental Disabilities*, *6*(4), 265-282.

Chafouleas, S.M., Briesch, A.M., Neugebauer, S. R., & Riley-Tillman, T. C. (2011). *Usage Rating Profile – Intervention (Revised).* Storrs, CT: University of Connecticut.

Charlop-Christy, M. H., Le, L., & Freeman, K. A. (2000). A comparison of video modeling with in vivo modeling for teaching children with autism. *Journal of Autism and Developmental Disorders*, *30*(6), 537-552.

Clare, S. K., Jenson, W. R., Kehle, T. J., & Bray, M. A. (2000). Self□modeling as a treatment for increasing on□task behavior. *Psychology in the Schools*, *37*(6), 517-522.

Clarke, M. A., Bray, M. A., Kehle, T. J., & Truscott, S. D. (2001). A school-based intervention designed to reduce the frequency of tics in children with Tourette's syndrome. *School Psychology Review*, *30*(1), 11-22.

Collier-Meek, M. A., Fallon, L. M., Johnson, A. H., Sanetti, L. M., & del Campo, M. A. (2012). Constructing self-modeling videos: Procedures and technology. *Psychology in the Schools*, *49*(1), 3-14.

Corbett, B. A., & Abdullah, M. (2005). Video modeling: Why does it work for children with autism. *Journal of Early and Intensive Behavior Intervention*, *2*(1), 2-8.

Cote, C. A., Thompson, R. H., & McKerchar, P. M. (2005). The effects of antecedent interventions and extinction on toddler's compliance during transitions. *Journal of Applied Behavior Analysis*, *38*(2), 235-238.

Coyle, C., & Cole, P. (2004). A videotaped self-modelling and self-monitoring treatment program to decrease off-task behaviour in children with autism. *Journal of Intellectual and Developmental Disability*, *29*(1), 3-16.

Cream, A., O'Brian, S., Onslow, M., Packman, A., & Menzies, R. (2009). Self-modelling as a relapse intervention following speech-restructuring treatment for stuttering. *International Journal of Language & Communication Disorders*, *44*(5), 587-599.

Davis, C. A., Brady, M. P., Williams, R. E., & Hamilton, R. (1992). Effects of high-probability requests on the acquisition and generalization of responses to requests in young children with behavior disorders. *Journal of Applied Behavior Analysis*, *25*(4), 905-916.

Decker, M. M., & Buggey, T. (2012). Using video self-and peer modeling to facilitate reading fluency in children with learning disabilities. *Journal of Learning Disabilities*. Advance online publication. doi: 10.1177/0022219412450618

Delano, M. E. (2007). Improving written language performance of adolescents with Asperger syndrome. *Journal of Applied Behavior Analysis*, *40*(2), 345-351.

Dempster, F. N. (1988). The spacing effect: A case study in the failure to apply the results of psychological research. *American Psychologist*, *43*(8), 627.

Dowrick, P. W. (1991). *Practical guide to using video in the behavioral sciences.* New York, NY: Wiley Interscience.

Dowrick, P. W. (1999). A review of self-modeling and related interventions. *Applied and Preventative Psychology, 8,* 23-39.

Dowrick, P. W. (2000). A review of self modeling and related interventions. *Applied and Preventive Psychology*, *8*(1), 23-39.

Dowrick, P. W. (2012a). Self modeling: Expanding the theories of learning. *Psychology in the Schools*, *49*(1), 30-41.

Dowrick, P. W. (2012b). Self model theory: Learning from the future. *Wiley Interdisciplinary Reviews: Cognitive Science*, *3*(2), 215-230.

Dowrick, P. W., Kim-Rupnow, W. S., & Power, T. J. (2006). Video feedforward for reading. *The Journal of Special Education*, *39*(4), 194-207.

Ducharme, J. M., & DiAdamo, C. (2005). An errorless approach to management of child noncompliance in a special education setting. *School Psychology Review, 34*(1), 107-115.

Ducharme, J. M., & Drain, T. L. (2004). Errorless academic compliance training: Improving generalized cooperation with parental requests in children with autism. *Journal of the American Academy of Child & Adolescent Psychiatry*, *43*(2), 163-171.

Ducharme, J. M., & Ng, O. (2012). Errorless academic compliance training: A school-based application for young students with autism. *Behavior Modification*, *36*(5), 650-669.

Ducharme, J. M., & Popynick, M. (1993). Errorless compliance to parental requests: Treatment effects and generalization. *Behavior Therapy*, *24*(2), 209-226.

Ducharme, J. M., Sanjuan, E., & Drain, T. (2007). Errorless compliance training success focused behavioral treatment of children with asperger syndrome. *Behavior Modification*, *31*(3), 329-344.

Everett, G. E., Olmi, D. J., Edwards, R. P., & Tingstrom, D. H. (2005). The contributions of eye contact and contingent praise to effective instruction delivery in compliance training. *Education and Treatment of Children*, *28*(1), 48-62.

Everett, G. E., Olmi, D. J., Edwards, R. P., Tingstrom, D. H., Sterling-Turner, H. E., & Christ, T. J. (2007). An empirical investigation of time-out with and without escape extinction to treat escape-maintained noncompliance. *Behavior Modification*, *31*(4), 412-434.

Figueira, J. A. A. (2007). The effects of video self-modeling on the compliance rates of high school students with developmental disabilities. Unpublished master's thesis, Brigham Young University, Provo, Utah.

Fombonne, E. (2003). Epidemiological surveys of autism and other pervasive developmental disorders: an update. *Journal of Autism and Developmental Disorders*, *33*(4), 365-382.

Fombonne, E., Quirke, S., & Hagen, A. (2009). Prevalence and interpretation of recent trends in rates of pervasive developmental disorders. *McGill Journal of Medicine: MJM*, *12*(2). Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2997266/

Ford, A. D., Olmi, D. J., Edwards, R. P., & Tingstrom, D. H. (2001). The sequential introduction of compliance training components with elementary-aged children in general education classroom settings. *School Psychology Quarterly*, *16*(2), 142.

Gelbar, N. W., Anderson, C., McCarthy, S., & Buggey, T. (2012). Video self□modeling as an intervention strategy for individuals with autism spectrum disorders. *Psychology in the Schools*, *49*(1), 15-22.

Hagiwara, T., & Myles, B. S. (1999). A multimedia social story intervention teaching skills to children with autism. *Focus on Autism and Other Developmental Disabilities*, *14*(2), 82-95.

Hart, J. E., & Whalon, K. J. (2012). Using video self-modeling via iPads to increase academic responding of an adolescent with autism spectrum disorder and intellectual disability. *Education and Training in Autism and Developmental Disabilities*, *47*(4), 438.

Hitchcock, C. H., Dowrick, P. W., & Prater, M. A. (2003). Video self-modeling intervention in school-based settings a review. *Remedial and Special Education*, *24*(1), 36-45.

Hitchcock, C. H., Prater, M. A., & Dowrick, P. W. (2004). Reading comprehension and fluency: Examining the effects of tutoring and video self-modeling on first-grade students with reading difficulties. *Learning Disability Quarterly*, 89-103.

Houten, R. V., Nau, P. A., MacKenzie□Keating, S. E., Sameoto, D., & Colavecchia, B. (1982). An analysis of some variables influencing the effectiveness of reprimands. *Journal of Applied Behavior Analysis*, *15*(1), 65-83.

Jose, P. E., & Cohen, D. J. (1981). The effect of unfamiliar tasks and teachers on autistic children's negativism. *Journal of the American Academy of Child Psychiatry*, *19*(1), 78-89.

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous child*, *2*(3), 217-250.

Kehle, T. J., Bray, M. A., Byer-alcorace, G. F., Theodore, L. A., & Kovac, L. M. (2012). Augmented self-modeling as an intervention for selective mutism. *Psychology in the Schools*, *49*(1), 93-103.

Kehle, T. J., Bray, M. A., Margiano, S. G., Theodore, L. A., & Zhou, Z. (2002). Self-modeling as an effective intervention for students with serious emotional disturbance: Are we modifying children's memories?. *Psychology in the Schools*, *39*(2), 203-207.

Kehle, T. J., Clark, E., Jenson, W. R., & Wampold, B. E. (1986). Effectiveness of self observation with behavior disordered elementary school children. *School Psychology Review*, *15*, 289-295.

Kehle, T. J., Madaus, M. R., Baratta, V. S., & Bray, M. A. (1998). Augmented self-modeling as a treatment for children with selective mutism. *Journal of School Psychology*, *36*(3), 247-260.

Kehle, T. J., Owen, S. V., & Cressy, E. T. (1990). The use of self-modeling as an intervention in school psychology: A case study of an elective mute. *School Psychology Review*.

Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). Single-case designs technical documentation. *What Works Clearinghouse*.

Lang, R., Shogren, K. A., Machalicek, W., Rispoli, M., O'Reilly, M., Baker, S., & Regester, A. (2009). Video self-modeling to teach classroom rules to two students with Asperger's. *Research in Autism Spectrum Disorders*, *3*(2), 483-488.

Lasater, M. P. (1995). Effects of video self-modeling and feedback on task fluency: A home based intervention. *Education & Treatment Of Children (ETC)*, *18*(4), 389.

Lee, C. Y. Q., Anderson, A., & Moore, D. W. (2013). Using video modeling to toilet train a child with autism. *Journal of Developmental and Physical Disabilities*, 1-12.

Loftus, E. F. (1997). Memory for a past that never was. *Current Directions in Psychological Science*, *6*, 60-65.

Lomas, J. E., Fisher, W. W., & Kelley, M. E. (2010). The effects of variable-time delivery of food items and praise on problem behavior reinforced by escape. *Journal of Applied Behavior Analysis*, *43*(3), 425-435.

Maenner, M. J., Rice, C. E., Arneson, C. L., Cunniff, C., Schieve, L. A., Carpenter, L. A., ... & Durkin, M. S. (2014). Potential impact of DSM-5 criteria on autism spectrum disorder prevalence estimates. *JAMA Psychiatry*, *71*(3), 292-300.

Mandal, R. L., Olmi, D. J., Edwards, R. P., Tingstrom, D. H., & Benoit, D. A. (2000). Effective instruction delivery and time-in: Positive procedures for achieving child compliance. *Child & Family Behavior Therapy*, *22*(4), 1-12.

Marcus, A., & Wilder, D. A. (2009). A comparison of peer video modeling and self video modeling to teach textual responses in children with autism. *Journal of Applied Behavior Analysis*, *42*(2), 335-341.

Margiano, S. G., Kehle, T. J., Bray, M. A., Nastasi, B. K., & DeWees, K. (2009). Examination of the effects of self-modeling on autobiographical memory.*Canadian Journal of School Psychology*, *24*(3), 203-221.

McCoy, K., & Hermansen, E. (2007). Video modeling for individuals with autism: A review of model types and effects. *Education and Treatment of Children*, *30*(4), 183-213.

McCurdy, B. L., & Shapiro, E. S. (1989). Self-observation and the reduction of inappropriate classroom behavior. *Journal of School Psychology*, *26*(4), 371-378.

Meharg, S. S., & Lipsker, L. E. (1992). Parent training using videotape self-modeling. *Child & Family Behavior Therapy*, *13*(4), 1-27.

Morlock, L., Reynolds, J. L., Fisher, S., & Comer, R. J. (2014). Video modeling and word identification in adolescents with Autism Spectrum Disorder. *Child Language Teaching and Therapy*.

Neef, N. A., Shafer, M. S., Egel, A. L., Cataldo, M. F., & Parrish, J. M. (1983). The class specific effects of compliance training with “do” and “don't” requests: Analogue analysis and classroom application. *Journal of Applied Behavior Analysis*, *16*(1), 81-99.

Norman, J. M., Collins, B. C., & Schuster, J. W. (2001). Using an instructional package including video technology to teach self-help skills to elementary students with mental disabilities. *Journal of Special Education Technology*, *16*(3), 5-18.

Ohtake, Y., Kawai, M., Takeuchi, A., & Utsumi, K. (2013). Effects of video self-modelling interventions on reducing task avoidance behaviours of students with autism spectrum disorders. *International Journal of Disability, Development and Education*, *60*(3), 225-241.

Parker, R. I., Vannest, K. J., & Davis, J. L. (2011). Effect size in single-case research: A review of nine nonoverlap techniques. *Behavior Modification*, *35*(4), 303-322.

Parrish, J. M., Cataldo, M. F., Kolko, D. J., Neef, N. A., & Egel, A. L. (1986). Experimental analysis of response covariation among compliant and inappropriate behaviors. *Journal of Applied Behavior Analysis*, *19*(3), 241-254.

Possell, L. E., Kehle, T. J., Mcloughlin, C. S., & Bray, M. A. (1999). Self-modeling as an intervention to reduce disruptive classroom behavior. *Cognitive and Behavioral Practice*, *6*(2), 99-105.

Roberts, D. S., Tingstrom, D. H., Olmi, D. J., & Bellipanni, K. D. (2008). Positive antecedent and consequent components in child compliance training. *Behavior Modification*, *32*(1), 21-38.

Russo, D. C., Cataldo, M. F., & Cushing, P. J. (1981). Compliance training and behavioral covariation in the treatment of multiple behavior problems. *Journal of Applied Behavior Analysis*, *14*(3), 209-222.

Schacter, D. L. (1995). Memory Distortion: How Minds. *Brains, and Societies Reconstruct the Past (Cambridge, Mass., 1995)*, 1-20.

Schunk, D. H., & Hanson, A. R. (1985). Peer models: Influence on children's self-efficacy and achievement. *Journal of Educational Psychology*, *77*(3), 313.

Schutte, R. C., & Hopkins, B. L. (1970). The effects of teacher attention on following instructions in a kindergarten class. *Journal of Applied Behavior Analysis*, *3*(2), 117-122.

Sherer, M., Pierce, K. L., Paredes, S., Kisacky, K. L., Ingersoll, B., & Schreibman, L. (2001). Enhancing conversation skills in children with autism via video technology: Which is better,“self” or “other” as a model?. *Behavior Modification*, *25*(1), 140-158.

Shipley-Benamou, R., Lutzker, J. R., & Taubman, M. (2002). Teaching daily living skills to children with autism through instructional video modeling. *Journal of Positive Behavior Interventions*, *4*(3), 166-177.

Singh, N. N., Lancioni, G. E., Winton, A. S., Fisher, B. C., Wahler, R. G., Mcaleavey, K., Singh, J. & Sabaawi, M. (2006). Mindful parenting decreases aggression, noncompliance, and self-injury in children with autism. *Journal of Emotional and Behavioral Disorders*, *14*(3), 169-177.

Smith, J., Hand, L., & Dowrick, P. W. (2014). Video feedforward for rapid learning of a picture-based communication system. *Journal of Autism and Developmental Disorders*, *44*(4), 926-936.

Tetreault, A. S., & Lerman, D. C. (2010). Teaching social skills to children with autism using point-of-view video modeling. *Education and Treatment of Children*, *33*(3), 395-419.

Thiemann, K. S., & Goldstein, H. (2001). Social stories, written text cues, and video feedback: Effects on social communication of children with autism. *Journal of Applied Behavior Analysis*, *34*(4), 425-446.

Volkmar, F. R. (1986). Compliance, noncompliance, and negativism. *Social Behavior in Autism*, 171-188.

Volkmar, F. R., & Cohen, D. J. (1982). A hierarchical analysis of patterns of non-compliance in autistic and behavior-disturbed children. *Journal of Autism and Developmental Disorders*, *12*(1), 35-42.

Volkmar, F. R., Hoder, E. L., & Cohen, D. J. (1985). Compliance, 'negativism', and the effects of treatment structure in autism: a naturalistic, behavioral study. *Journal of Child Psychology and Psychiatry*, *26*(6), 865-877.

Vygotsky, L. (1978). Interaction between learning and development. *Readings on the Development of Children*, 34-41.

Wert, B. Y., & Neisworth, J. T. (2003). Effects of video self-modeling on spontaneous requesting in children with autism. *Journal of Positive Behavior Interventions*, *5*(1), 30-34.

Woltersdorf, M. A. (1992). Videotape self-modeling in the treatment of attention-deficit hyperactivity disorder. *Child & Family Behavior Therapy*, *14*(2), 53-73.

Table 1

Systematic Direct Observation (SDO) Data Collected by Researchers

	Baseline % Compliance			Intervention % Compliance			Effect Size	PND
	M	(SD)	Range	M	(SD)	Range		
Student 1	19.67	14.55	0.0-40.0	44.38	20.39	16.67 - 83.33	0.68	33.33
Student 2	58.58	18.81	25.0-80.0	72.07	12.07	58.33 - 90.91	0.40	11.76
Student 3	67.65	10.27	50.0-83.33	82.74	22.10	50.0 - 100.0	0.3571	21.05

Table 2

Percent Compliance by Request

	Baseline		Intervention	
Requests	# of Directives Issued	% Compliance	# of Directives Issued	% Compliance
Student 1				
Go jump.	6	0.0%	17	17.65%
Come here.	6	16.67%	18	5.56%
All done. Socks and shoes time.	5	0.0%	16	43.75%
Sit down.	7	57.14%	16	87.5%
Color the picture.	6	16.67%	16	87.5%
Student 2				
Take a seat.	29	31.03%	20	60.0%
Look at your work/the paper.	25	96.0%	38	84.21%
Read.	20	70%	20	80.0%
Stop scripting.	18	55.56%	26	53.85%
Student 3				
Come here.	21	57.14%	19	84.21%
Sit down.	28	67.85%	12	58.33%
Hold my hand.	19	73.68%	9	100.0%
Turn off the water.*	2	100.0%	n/a	n/a

**Request was not issued on a regular basis because the students were in a classroom where the sink automatically turned off and on.*

Table 3

Heuristics for Comparing SDO Data from Baseline to Intervention

	Level[a]	Immediacy[b]	Consistency[c]	Overlap[d]	Trend[e]
Student 1	Increase	Increase	Declined	Unreliable	Moderate decr. trend to slight incr. trend
Student 2	Increase	Increase	Improved	Unreliable	Slight incr. trend to slight decr. trend
Student 3	Increase	Decrease	Declined	Unreliable	Slight incr. trend to strong incr. trend

[a]*Level:* Increase, Decrease, or No Change in Mean
[b]*Immediacy*: Increase, Decrease, or No Change between final 3 baseline data points & first 3 intervention data points
[c]*Consistency:* Improved, Declined, or No Change (using standard deviation as crierion)
[d]*Overlap:* Using PND criteria -- PND < 50% Unreliable Treatment; PND 50-70% Questionable Effectiveness; PND 70-90% Fairly Effective; PND > 90% Highly Effective
[e]*Trend*: Comparison of baseline phase trend to intervention phase trend using split half technique.

Table 4

Mean Percent of Requests Using Requesting Behavior- Baseline

	Direct Statement			Eye Contact			Proximity Control			Wait		
	M	(SD)	Range	M	(SD)	Range	M	(SD)	Range	M	(SD)	Range
Student 1	100.00	0	100.0 -100.0	97.78	4.97	88.89 - 100.0	100.00	0	100.0 - 100.0	82.67	16.73	66.67 – 100.0
Student 2	96.97	5.08	87.50 - 100.0	95.50	7.53	80.0 - 100.0	83.40	23.35	28.57 - 100.0	90.90	11.36	77.78 - 100.0
Student 3	94.58	13.05	87.50 - 100	96.25	8.82	75.0 - 100.0	87.20	13.87	66.67- 100.0	97.77	5.23	85.71 – 100.0

Table 5

Mean Percent of Requests Using Requesting Behavior- Intervention

	Direct Statement			Eye Contact			Proximity Control			Wait		
	M	(SD)	Range	M	(SD)	Range	M	(SD)	Range	M	(SD)	Range
Student 1	95.00	15.49	40.0 - 100.0	100.00	0.00	100.0 - 100.0	97.50	6.83	80.0 - 100.0	96.67	7.20	80.0 - 100.0
Student 2	98.98	2.92	92.86 - 100.0	100.00	0.00	100.0 - 100.0	90.55	4.94	52.94 - 100.0	95.22	6.70	83.33 - 100.0
Student 3	100.00	0.00	100.0 - 100.0	88.21	8.34	75.0 - 100.0	72.02	19.91	40.0 - 87.5	98.21	4.72	87.5 - 100.0

Table 6

Interobserver Agreement During Baseline

	Compliance			Direct Statement			Eye Contact			Proximity Control			Wait		
	Mean	(SD)	Range	Mean	(SD)	Range	Mean	(SD)	Range	Mean	(SD)	Range	Mean	(SD)	Range
Student 1	100.0	0.0	100.0-100.0	100.0	0.0	100.0-100.0	100.0	0.0	100.0-100.0	100.0	0.0	100.0-100.0	80.0	0.0	80.0-80.0
Student 2	85.93	12.24	77.78-100.0	96.29	6.41	88.89-100.0	89.58	18.04	68.75 – 100.0	89.58	18.04	68.75 – 100.0	97.92	3.61	93.75-100.0
Student 3	94.44	9.62	83.33 – 100.0	86.11	12.72	83.33 – 100.0	86.11	12.72	83.33 – 100.0	94.44	9.62	83.33 – 100.0	94.44	9.62	83.33 – 100.0

Table 7

Interobserver Agreement During Intervention

	Compliance			Direct Statement			Eye Contact			Proximity Control			Wait		
	Mean	(SD)	Range	Mean	(SD)	Range	Mean	(SD)	Range	Mean	(SD)	Range	Mean	(SD)	Range
Student 1	96.67	7.45	83.33-100.0	100.0	0.0	100.0-100.0	100.0	0.0	100.0-100.0	100.0	0.0	100.0-100.0	96.67	7.45	83.33-100.0
Student 2	80.87	14.20	70.83-90.90	97.22	3.93	94.44-100.0	100.0	0.0	100.0-100.0	97.22	3.93	94.44-100.0	94.44	7.86	88.89-100.0
Student 3	87.50	17.68	75.0-100.0	100.0	0.0	100.0-100.0	92.86	10.10	85.71-100.0	92.86	10.10	85.71-100.0	92.86		85.71 – 100.0

Table 8

Attentiveness During VSM Video

	% Attentiveness During Intervention Video		
	M	(SD)	Range
Student 1	84.63	11.00	62.5 – 100.0
Student 2	69.25	14.77	50.0 – 87.5
Student 3	77.52	17.00	55.55 – 88.89

Table 9

Mean Percentage of Intervention Implementation Based on Data Collected Using the Treatment Integrity Checklist

Treatment Integrity Checklist	Student 1	Student 2	Student 3
1. Video is shown immediately prior to the observation session.	100.0	100.0	100.0
2. Participant views the video on an iPad.	100.0	100.0	100.0
3. Video is shown in an area of the classroom that is out of view from other students OR in a private office/conference room.	100.0	100.0	100.0
4. Child is reinforced for watching the video.	93.75	100.0	100.0
Overall Mean Percent of Implementation:	**98.44**	**100.0**	**100.0**

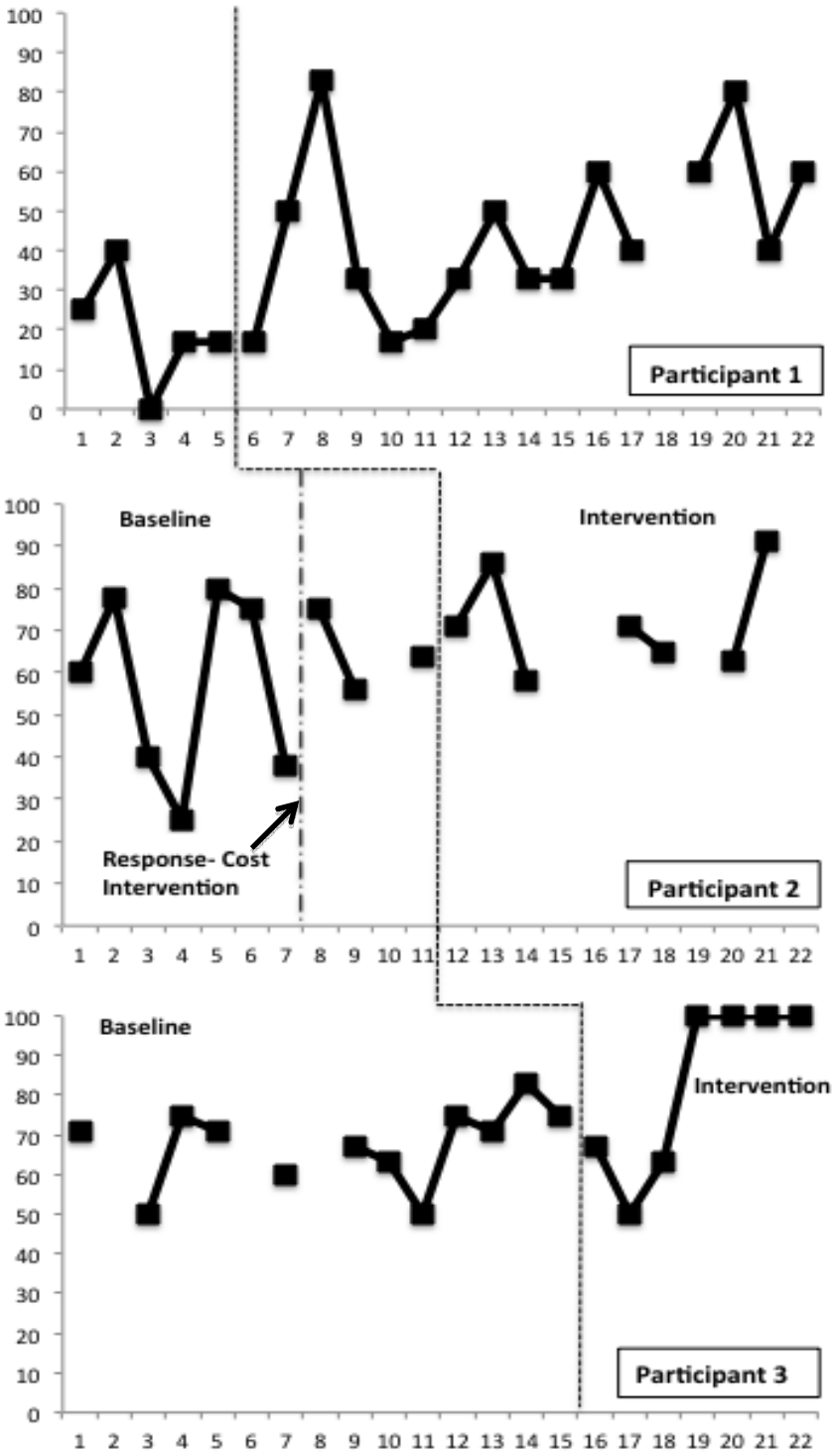
Table 10

Means and Standard Deviations for Post-Intervention Usage Rating Profile-Intervention Revised (UPR-IR) Ratings

Factors		Paraprofessionals (n=3)	Teacher (n = 1)
Acceptability	M	5.19	4.56
	(SD)	(0.79)	(0.73)
Understanding	M	5.33	3.33
	(SD)	(0.87)	(0.58)
Home-School Collaboration	M	5.11	3.67
	(SD)	(1.36)	(0.58)
Feasibility	M	5.17	4.67
	(SD)	(0.86)	(0.52)
System Climate	M	5.27	5.0
	(SD)	(0.80)	(0.0)
System Support	M	3.11	4.33
	(SD)	(1.62)	(0.58)

Figure 1.

Students' Percentages of Compliance to Classroom Requests



Participant Qualification Criteria Checklist

CRITERIA	
☐	Meets diagnostic criteria for autism according to the DSM-5:
	☐ Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive, see text): 1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions. 2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication. 3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative paly or in making friends; to absence of interest in peers.
	☐ Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text): 1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases). 2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat food every day). 3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g, strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interest). 4. Hyper- or hypo-reactivity to sensory input or unusual interests in

	sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).
	☐ Symptoms present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies until later in life.
	☐ Symptoms cause clinically significant impairment in social, occupational, or other important areas of functioning.
	☐ These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be low that expected for general developmental level.
☐	Able to attend to a video of oneself for at least 3-minutes
☐	Teacher perceives a need for improvement in compliance
☐	Recognizes self on a video

Participant Intake Questionnaire

This questionnaire will be used to obtain: (1) demographic information about your child and (2) information about intervention services that your child has received. Please complete the following information as accurately as possible.

Completed by (Circle one): Mother Father Legal Guardian

DEMOGRAPIC INFORMATION	
Date of Birth:	Age:
Sex:	Primary Language Spoken at Home:
Medical Conditions 1. _____ Age at time of diagnosis: _____ 2. _____ Age at time of diagnosis: _____ 3. _____ Age at time of diagnosis: _____	
Psychological Diagnoses: 1. _____ Age at time of diagnosis: _____ 2. _____ Age at time of diagnosis: _____ 3. _____ Age at time of diagnosis: _____	

INTERVENTION SERVICES RECEIVED OUTSIDE OF SCHOOL	
SPEECH AND LANGUAGE	
Service Provider:	Hours per Week:
Start Date:	End Date:
Outcome of Services (i.e. improvement, no change):	

INTERVENTION SERVICES RECEIVED OUTSIDE OF SCHOOL (CONT'D.)	
OCCUPATIONAL THERAPY	
Service Provider:	Hours per Week:
Start Date:	End Date:
Outcome of Services (i.e. improvement, no change):	
PHYSICAL THERAPY	
Service Provider:	Hours per Week:
Start Date:	End Date:
Outcome of Services (i.e. improvement, no change):	
BEHAVIORAL INTERVENTION SERVICES	
Service Provider:	Service Provider:
Start Date:	Start Date:
Outcome of Services (i.e. improvement, no change):	
OTHER (I.E. COUNSELING, THERAPY)	
Service Provider:	Service Provider:
Start Date:	Start Date:
Outcome of Services (i.e. improvement, no change):	

Educational History Form

IEP (2013-2014 SCHOOL YEAR)				
Date of Birth:			Age:	
Grade:			Gender:	
Race/Ethnicity:			Home Dominant Language:	
Primary Disability:				
SPECIAL EDUCATION SERVICES				
Frequency:	Responsible Staff:	Service Implementer:	Start Date:	End Date:
RELATED SERVICES				
Frequency:	Responsible Staff:	Service Implementer:	Start Date:	End Date:

PSYCHOLOGICAL EVALUATION (MOST RECENT)	
Date Evaluation:	Age:
Grade:	Assessment Used:
Intelligence Quotient (IQ):	
Other Information:	

SRBI SERVICES (2013-2014 SCHOOL YEAR)				
ACADEMIC				
Intervention (i.e. Tier II Reading-Lexia):	Frequency:	Service Implementer:	Start Date:	End Date:
BEHAVIORAL				
Intervention (i.e. Tier III- Individualized BSP):	Frequency:	Service Implementer:	Start Date:	End Date:

Teacher Interview Form

BACKGROUND INFORMATION
What does the noncompliance look like (i.e. ignore, aggression)? Ask for specific examples.
How often is the student noncompliant?
How long does the noncompliance last when it does occur?
What is the intensity/level of danger of this behavior?

A-B-C
When is noncompliance most likely to occur (i.e. times, activities)?
What happens right before the problem behavior?
What happens after the problem behavior has occurred?
What is the intensity/level of danger of this behavior?

INTERVENTION STRATEGIES
Describe the interventions that are currently being used to increase compliance, including the resources necessary to implement these interventions.
Describe previous strategies used to increase compliance, including the resources necessary to implement these interventions.
Which strategies were successful at improving compliance?
What strategies were not successful at improving compliance?
What reinforcers have effectively served to increase desirable behavior in the past?

CLASSROOM COMPLIANCE PROBABILITY QUESTIONNAIRE- REVISED

Listed below are a series of requests you may present to a child in a given day. What is the Likelihood that the child will comply to this request if the request is stated only once? Please check the appropriate box beside each command. Then rate the frequency with which you make each of the requests.

	Rate the likelihood with which the child will comply to the request if the request is only stated once:					Rate the frequency with which you make the requests:				
	Almost Always (76-100%)	Usually (51-75%)	Occasionally (26 – 50%)	Rarely (0-26%)	Child doesn't understand this request OR skill not yet learned	Multiple times per day	Once per day	Several times per week	Once per week	Never
GENERAL										
Follow me										
Look at me										
Come here										
Hold this										
Stand up										
Sit down										
Close the door										
Stand in line										
Line up for recess										
Go to the particular place										
Turn off the music										
Push your chair in										
Bring me (non-play item)										
Tell me your address										
Tell me your telephone number										
Come inside										

	Rate the likelihood with which the child will comply to the request if the request is only stated once:					Rate the frequency with which you make the requests:				
	Almost Always (76-100%)	Usually (51-75%)	Occasionally (26 – 50%)	Rarely (0-26%)	Child doesn't understand this request OR skill not yet learned	Multiple times per day	Once per day	Several times per week	Once per week	Never
Bring me your chair										
Do this (particular thing)										
Get your _____										
Speak quietly										
SOCIAL										
Give me a hug										
Give me five										
Shake my hand										
Clap your hands										
Hold my hand										
Sit beside me										
Smile										
Say (student)'s name										
Tap (student) to get his attention										
Invite (student) to play										
Let's (social activity)										
CLEAN-UP										
Put away your toys										
Pick up your _____										

	Rate the likelihood with which the child will comply to the request if the request is only stated once:					**Rate the frequency with which you make the requests:**				
	Almost Always (76-100%)	**Usually (51-75%)**	**Occasionally (26 – 50%)**	**Rarely (0-26%)**	**Child doesn't understand this request OR skill not yet learned**	**Multiple times per day**	**Once per day**	**Several times per week**	**Once per week**	**Never**
Put your dish in the sink										
Get out of the car/bus										
ACADEMIC										
Trace the (particular objects)										
Draw a (particular object)										
Draw a line										
Cut out the picture										
Point to the _____										
Find me a picture of a _____										
Print your name										
Tell me your name										
Show me the _____										
Give me the _____										
Tell me where your___is										
Count for me										
Count the _____										
n the book										
Take the book out of your desk										
Put the book away										

	Rate the likelihood with which the child will comply to the request if the request is only stated once:					**Rate the frequency with which you make the requests:**				
	Almost Always (76-100%)	**Usually (51-75%)**	**Occasionally (26 – 50%)**	**Rarely (0-26%)**	**Child doesn't understand this request OR skill not yet learned**	**Multiple times per day**	**Once per day**	**Several times per week**	**Once per week**	**Never**
Get your pencil out										
Put your pencil away										
Read this to me										
Turn the page										
Touch your _____										
Place the sticker on the sheet										
PLAY										
Go get your (play item)										
Play with your toys (games)										
Do the puzzle										
Put this piece in the puzzle										
Throw me the ball										
Catch the ball										
Play some music (instruments)										
Sing to the music										
Dance to the music										
Jump up and down										
Ride your (individual item)										
Draw me a picture										

	Rate the likelihood with which the child will comply to the request if the request is only stated once:					**Rate the frequency with which you make the requests:**				
	Almost Always (76-100%)	**Usually (51-75%)**	**Occasionally (26 – 50%)**	**Rarely (0-26%)**	**Child doesn't understand this request OR skill not yet learned**	**Multiple times per day**	**Once per day**	**Several times per week**	**Once per week**	**Never**
Color the picture										
Turn on the music										
Turn up/down the volume										
Put your hands up in the air										
Stamp your feet										
Play patty cakes with me										
Stack the blocks										
Do a somersault										
Sing the song										
Push the toy car										
Hug the doll/stuffed toy										
Pick a toy/activity										
Blow bubbles										
OTHERS										

SDO OBSERVATION FORM

Instructions: For each request issued, data on child behavior and classroom requesting behavior will be recorded. Under the column labeled "Child Behavior," record a "□" if the student was compliant (initiated the requested behavior within ____ sec) and an "X" if he/she was not. Under the column labeled "Requesting Behavior," use the same recording system to code for classroom requesting behavior (DS = Direct Statement; EC = Eye Contact, PC = Proximity control- standing 3-5 feet from the student, W = waiting ____-seconds for the student to respond to the request).

CLASSROOM REQUESTS	STUDENT BEHAVIOR	REQUESTING BEHAVIOR			
(Insert Classroom Request 1)		DS	EC	PC	W
(Insert Classroom Request 2)		DS	EC	PC	W
(Insert Classroom Request 3)		DS	EC	PC	W
(Insert Classroom Request 4)		DS	EC	PC	W
(Insert Classroom Request 5)		DS	EC	PC	W
(Insert Classroom Request 6)		DS	EC	PC	W
(Insert Classroom Request 7)		DS	EC	PC	W
(Insert Classroom Request 8)		DS	EC	PC	W
(Insert Classroom Request 9)		DS	EC	PC	W
(Insert Classroom Request 10)		DS	EC	PC	W
(Insert Classroom Request 11)		DS	EC	PC	W
(Insert Classroom Request 12)		DS	EC	PC	W
(Insert Classroom Request 13)		DS	EC	PC	W
(Insert Classroom Request 14)		DS	EC	PC	W
(Insert Classroom Request 15)		DS	EC	PC	W

Classroom Request Assessment- Paraprofessional Checklist

Instructions: During each Classroom Request Assessment session, issue ALL requests in the order that is most convenient for you. Be sure to use the script provided when issuing the requests. In addition, record whether you made eye contact, stood 3-5 feet away from the student when issuing the request, and waited _____-seconds after issuing the request to give the student an opportunity to respond. If the child is compliant, do not praise the child or provide him/her with reinforcement.

Requests:	Requesting Behavior
□ " [Student's Name], [request 1].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 2].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 3].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 4].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 5].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 6].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 7].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 8].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 9].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior

□ “ [Student’s Name], [request 10].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ “ [Student’s Name], [request 11].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ “ [Student’s Name], [request 12].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ “ [Student’s Name], [request 13].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ “ [Student’s Name], [request 14].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ “ [Student’s Name], [request 15].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior

Classroom Request Checklist- Baseline

Instructions: During each observation session, issue ALL requests in the order that is most convenient for you. Be sure to use the script provided when issuing the requests. In addition, record whether you made eye contact, stood 3-5 feet away from the student when issuing the request, and waited 10-seconds after issuing the request to give the student an opportunity to respond. If the child exhibits compliant behavior, do not praise the student or provide him/her with reinforcement.

Requests:	Requesting behavior
□ " [Student's Name], [request 1].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 2].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 3].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 4].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 5].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior

Treatment Integrity Checklist

Instructions: During the video viewing session, check off each step that is completed. Note any modifications that were made to the procedures. Next, rate the child's attentiveness during the video viewing session. Finally, when issuing the 5 targeted requests, be sure to use the script provided when issuing the requests. In addition, record whether you made eye contact, stood 3-5 feet away from the student when issuing the request, and waited 10-seconds after issuing the request to give the student an opportunity to respond. Also record that you did not praise/reinforce the student for exhibiting compliant behavior. If the child exhibits compliant behavior, do not praise the student or provide him/her with reinforcement.

VIDEO VIEWING SESSION		
	Procedures	**Describe any modifications**
☐	Video is shown immediately prior to the observation session.	
☐	Participant views the video on an iPad.	
☐	The video is shown in an area of the classroom that is out of view from the other students OR in a private office/conference room.	
☐	Child is reinforced after watching the video.	

REQUEST DELIVERY	
Requests:	**Requesting Behavior**
□ " [Student's Name], [request 1].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 2].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 3].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 4].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior
□ " [Student's Name], [request 5].	□ Make eye contact □ Stand 3-5 feet away □ Wait 10-seconds □ No reinforcement/praise provided for compliant behavior

Describe any environmental circumstances (i.e. changes in services/routines, major life events) could be impacting the child's behavior:

Attentiveness Observation

Directions: At the end of each 10-second interval, the student research will record whether the student participant is looking at the video by placing a check in the box. This will serve as a measure of attentiveness.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	14	16	17	18

Usage Rating Profile-Intervention Revised (URP-IR)

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1.	This intervention is an effective choice for addressing a variety of problems.	1	2	3	4	5	6
2.	I would need additional resources to carry out this intervention.	1	2	3	4	5	6
3.	I would be able to allocate my time to implement this intervention.	1	2	3	4	5	6
4.	I understand how to use this intervention.	1	2	3	4	5	6
5.	A positive home-school relationship is needed to implement this intervention.	1	2	3	4	5	6
6.	I am knowledgeable about the intervention procedures.	1	2	3	4	5	6
7.	The intervention is a fair way to handle the child's behavior problem.	1	2	3	4	5	6
8.	The total time required to implement the intervention procedures would be manageable.	1	2	3	4	5	6
9.	I would not be interested in implementing this intervention.	1	2	3	4	5	6
10.	My administrator would be supportive of my use of this intervention.	1	2	3	4	5	6
11.	I would have positive attitudes about implementing this intervention.	1	2	3	4	5	6
12.	This intervention is a good way to handle the child's behavior problem.	1	2	3	4	5	6
13.	Preparation of materials needed for this intervention would be minimal.	1	2	3	4	5	6
14.	Use of this intervention would be consistent with the mission of my school.	1	2	3	4	5	6
15.	Parental collaboration is required in order to use this intervention.	1	2	3	4	5	6

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
16.	Implementation of this intervention is well matched to what is expected in my job.	1	2	3	4	5	6
17.	Material resources needed for this intervention are reasonable.	1	2	3	4	5	6
18.	I would implement this intervention with a good deal of enthusiasm.	1	2	3	4	5	6
19.	This intervention is too complex to carry out accurately.	1	2	3	4	5	6
20.	These intervention procedures are consistent with the way things are done in my system.	1	2	3	4	5	6
21.	This intervention would not be disruptive to other students.	1	2	3	4	5	6
22.	I would be committed to carrying out this intervention.	1	2	3	4	5	6
23.	The intervention procedures easily fit in with my current practices.	1	2	3	4	5	6
24.	I would need consultative support to implement this intervention.	1	2	3	4	5	6
25.	I understand the procedures of this intervention.	1	2	3	4	5	6
26.	My work environment is conducive to implementation of an intervention like this one.	1	2	3	4	5	6
27.	The amount of time required for record keeping would be reasonable.	1	2	3	4	5	6
28.	Regular home-school communication is needed to implement intervention procedures.	1	2	3	4	5	6
29.	I would require additional professional development in order to implement this intervention.	1	2	3	4	5	6