A VIDEO SELF-MODELING INTERVENTION TO MODIFY AGGRESSIVE

BEHAVIORS IN STUDENTS WITH AUTISM SPECTRUM DISORDER AND

INTELLECTUAL DISABILITIES

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APPROVAL PAGE

The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

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presented by Kate Marie Sadler,

a candidate for the degree of doctor of philosophy in Special Education and hereby
certify that, in their opinion, it is worthy of acceptance.

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DEDICATION

  This dissertation is dedicated to my daughter for her title suggestion,

"Everybody's Brain Works Different." To my husband for his endless love and patience.

To my mother for her courage. To my father for always finding a solution. To Kate

Becker who believes that I can, when I think I can't. To my advisor who rises to any

challenge and suggests that, "we'll get there."

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ABSTRACT

This study evaluated the efficacy of a video self-modeling and functional behavior assessment intervention on a traditionally under-represented population. Students diagnosed with Autism Spectrum Disorder (ASD) and Intellectual Disabilities (ID) are prone to higher rates of aggressive behavior that can be resistant to treatment. Under the frameworks of Behaviorism and Social Cognitive Theory an intervention was developed to decrease aggressive behaviors and increase self-regulated behavior. A multiple baseline design across stimulus conditions with inter-subject replication was conducted to explore the effects of the intervention. Data was collected on both the rate of aggressive behaviors and the use of a replacement behavior which fostered socially appropriate self-regulation. The data indicate that both participants demonstrated a decrease in aggressive behavior immediately following intervention across all stimulus conditions. Data collected on the replacement behavior indicated a change from baseline to intervention but results differed across participants.

**CHAPTER ONE**
**INTRODUCTION**

Autism Spectrum Disorders (ASD) comprise a heterogeneous set of neuro-developmental disabilities characterized by marked deficits in social communication and restricted patterns of behavior (American Psychiatric Association [APA], 2013).  Social communication deficits can occur in the areas of language, symbolic communication, understanding other people's perspectives, attitudes, and behaviors (Baron-Cohen, 1985, 1988).  Restricted patterns of behavior can result in impaired mental flexibility, attention, and behavior regulation (Carlson & Moses, 2001; Mazefsky, et al., 2013).  Taken together, these neuro-developmental deficits often lead to emotions such as anger, frustration, loneliness, and anxiety that can result in behavioral responses that are difficult to manage (Corbett & Abdullah, 2005; Gotham, Brunwasser, & Lord, 2015; Lovass, Koegel, & Schreibman, 1979; Matson & Jang, 2014; Matson & Shoemaker, 2009).

Emotions emanate from an individual's overall evaluation of a stimulus (Beck, 2011; Mazefsky, et al., 2013; Pouw, Reiffe, Oosterveld, Huskens, & Stockm, 2013).  A complex processing system capable of reasoning, rationalizing, and labeling is responsible for mediating these emotional responses (Beck, 2011; Hariri, et al., 2000; Westen, Blagov, Harenski, Klits, & Hamann, 2006). When an individual's ability to evaluate stimulus is compromised, as it can be in individuals with ASD (e.g., mental inflexibility, impaired communication), maladaptive emotional responses are likely to result in (Goldin, Matson, & Cervantes, 2014; Matson & Adams, 2014; Patel, Day, Jones, & Mazefsky, 2016; Pine, Guyer, Goldwin, Towbin & Leibenlufte, 2008).  Maladaptive responses such as aggression, vary in frequency and intensity and may persist over the

lifetime (Gelbar, Anderson, McCarthy, & Buggey, 2012; Matson & Adams, 2014; Matson & Shoemaker, 2009; Storch et al., 2012).

     **ASD and Intellectual Disabilities (ID)**.  The highest rates of challenging behaviors have been observed in those who have both ASD and an intellectual disability (ID) (Carroll, et al., 2014; Goldin, Matson, Cervantes, 2014; Gotham, Brunwasser, & Lord, 2015; Jang, Dixon, Tarbox, & Granpeesheh, 2011; Matson & Shoemaker, 2009; Rojahn, et al, 2010; Storch, et al., 2012).  In fact, according to a 2012 report from the Center for Disease Control (CDC) among those identified with ASD, approximately one-third also had an intellectual disability.  An ID refers to deficits in two areas: intellectual and adaptive functioning (APA, 2013; CDC, 2012).  Intellectual functioning includes deficits in reasoning, problem-solving, abstract thinking, academic learning, and learning from experience; whereas adaptive functioning refers to the ability to meet developmental and social standards for personal independence and social responsibility (APA, 2013).

     A comorbid diagnosis of ASD and ID is considered if there are delays in one or more of the core ASD symptoms are more severe than would be expected for the developmental level (CDC, 2012).  The process of making a comorbid diagnosis is outlined in Figure 1.  When ASD and ID coexist, symptoms of ASD appear to be exacerbated (e.g., severe deficits in social communication, severe deficits in adaptive behavior, and severely restricted patterns of behavior, interests, and activities (Goldin, Matson, & Cervantes, 2014; Gotham, Brunwasser, & Lord, 2015; Matson & Shoemaker, 2009).  Often, for individuals with ASD and ID, maladaptive behaviors are highly entrenched, occur at high rates, and are difficult to manage (Matson & Adams, 2014;

Pedersen, et al., 2017; Reese, Richman, Belmont, & Morse, 2005).  In fact, for

individuals with ID and ASD there is a poorer prognosis for those on intensive behavior

plans (Kanne & Mazurek, 2011; Matson & Shoemaker, 2009; Rojahn, et al., 2010).
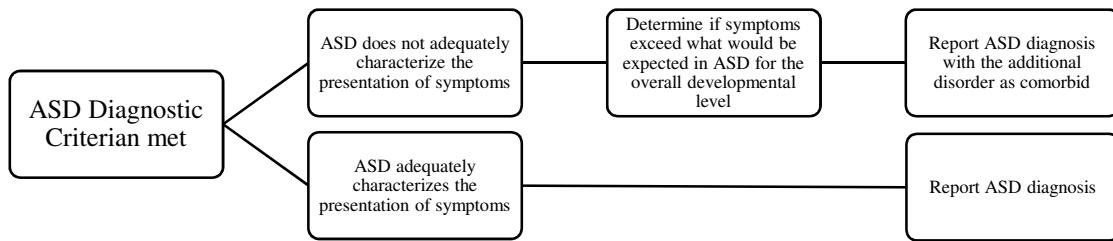


*Figure 1*.  Process for Making a Comorbid Diagnosis *(Adapted from CDC)* Note. ASD =
Autism Spectrum Disorder.

Given the poorer prognosis, antipsychotic medications are often used to treat

aggressive behavior.  The most commonly used drugs to treat aggression and self-injury

approved by the Federal Drug Administration (FDA) are risperidone and aripiprazole

(Carroll, et al., 2014; Siegel, 2012). While pharmacological treatments are an option, they

remain controversial due to potential long-term side effects and questionable

effectiveness.  Furthermore, pharmacology treats symptoms by inhibiting receptors in the

brain but fail to address the person's evaluation of external stimuli that contribute to

maladaptive responses.  Consequently, pharmacological treatments should occur

alongside behavior interventions designed to address the purpose for aggressive behavior

(Brosnan & Healy, 2011; Matson & Adams, 2014; Matson & Jang, 2014; Roth, Gillis, &

DiGennaro-Reed, 2013; Siegel, 2012). Many of these behavior interventions are delivered under the guidance of a therapist (e.g., psychiatrist) or within the school setting.

**School Based Treatments for Aggression**

Most school-based interventions to treat aggressive behaviors draw from principles of behaviorism (Carroll, et al., 2014; Matson, 2009; Scheuermann & Hall, 2016).  In behaviorism, learning is the process of forming associations between stimuli and responses (Carroll, et al., 2014; Fischer, Groff, & Roane, 2011; Scheuermann & Hall, 2016; Schunk, 2012; Skinner, 1953).  This theory suggests that features of the physical environment (e.g., stimuli, situations, events) serve as cues for responses or behaviors (Fischer, Groff, & Roane, 2011; Schunk, 2012; Skinner, 1953, 1973).  Features of the physical environment, are considered reinforcing or punishing to the observer, therefore patterns of behavior, in a stimulus-response situation, are either strengthened or weakened (Skinner, 1953, 1973).  In particular, when the outcome is reinforcing, the connection is strengthened; whereas, when a connection between a stimulus and a response is punishing the connection is weakened (Schunk, 2012; Skinner, 1953, 1973; Watson, 1928).  For example, if a student earns praise for good behavior (a reinforcing stimulus) they will likely continue to engage in good behavior (response).  If a student loses points for bad behavior (punishing stimulus) he will likely change his behavior (response).

According to behaviorism, operant conditioning is the mode in which behavior can be intentionally modified (Baer, Wolf, and Risley, 1968; Skinner, 1953, 1973; Schunk 2012).  The basic operant conditioning model involves the relationship between a descriptive stimulus (antecedent), a response (behavior) and the reinforcing stimulus

(consequence).  Using this model, situations are contrived to where the descriptive stimulus (antecedent) is altered in order to influence the response (behavior) while the, consequence is observed.  The process of observing behavioral relationships in an operant conditioning model is called a functional analysis.  The most common application of functional analysis procedures is Applied Behavior Analysis (ABA).

**Applied Behavior Analysis (ABA) Procedures**.  Applied Behavior Analysis (ABA) includes a wide range of strategies focused on observable interactions between the individual and the physical environment (Baer, Wolf, and Risley, 1968; Fisher, Groff, & Roane, 2011).  Those who have used ABA have developed successful strategies and measurement techniques based upon operant conditioning to modify many types of behavior, including the reduction of aggressive behavior in individuals with and without ASD (Baer, Wolf, and Risley, 1968; Fisher, Groff, & Roane, 2011; Hanley, Iwata, & McCord, 2003; National Research Council [NRC], 2001; National Institute of Mental Health [NIMH], 2008; Rosenwasser & Axelrod, 2001; Roth, Gillis, DiGennaro-Reed, 2014; Westling, 2015).  All ABA interventions are highly systematized, many of which require a professional trained in the technique to guide implementation (e.g. Board Certified Behavior Analysist [BCBA]).  When using ABA to modify any behavior, including aggression, the first step involves an analysis of the target behavior to identify the purpose of the behavior. The most commonly used approach used to do this is through a functional behavior assessment.

*Functional Behavior Assessment.*  A functional behavior assessment is used to identify antecedents and consequences surrounding a behavior and allow for the development of a function-based intervention (Baer, Wolf, & Risley, 1968; Fisher, Groff,

& Roane, 2011; Hanley, Iwata, & McCord, 2003; Iwata, Kahng, Wallace, & Lindberg, 2000; Westling, 2015). There are two data collection methods used in a FBA data; direct (e.g., observations) and indirect methods (e.g., teacher/caregiver interviews). Direct observations use Antecedent-Behavior-Consequence (ABC) data collection to analyze target behaviors under naturalistic conditions. First described by Bijour, Peterson and Ault (1968), ABC data collection involves collecting information on the events that precede (antecedent) and follow (consequence) a target behavior (Bijour, Peterson, & Ault, 1968; Iwata, et al., 2000). ABC data collection has become a common method used to capture behavioral sequences for the purposes of developing a hypothesis about target behaviors particularly in context (Iwata, et al., 2000).

Bijour and colleagues' seminal work (1968) suggest that ABC data, is prone to low fidelity due to its open-ended nature and should therefore be used in conjunction with other functional assessment methods. For this reason, indirect methods such as teacher or caregiver interviews, are often used in conjunction with ABC data collection to develop a hypothesis about behavior function (Iwata, et al., 2000). Indirect methods involve soliciting anecdotal information from individuals who have witnessed the target behavior. These interviews are typically structured, using checklists, rating scales, or questionnaires (Iwata, et al., 2000).

*ABA Intervention.* Once the function of the behavior has been identified via a FBA, a treatment (or intervention) is introduced. The treatment is designed to teach a socially appropriate reinforcing condition, referred to as a replacement behavior. During treatment either the antecedent stimulus or consequence is altered in order to influence the student's response or behavior (Scheuermann & Hall, 2016). The mechanism of

change in ABA treatments involves a number of teaching strategies including: positive reinforcement, negative reinforcement, punishment, extinction, stimulus control, modeling, and shaping (Bijour, Peterson, & Ault, 1968; Iwata, et al., 2000; Scheuermann & Hall, 2016). These strategies vary in frequency and duration, based on individual needs but all require modifications to the physical environment in order to produce change.

**Rationale for Current Study**

Within the k-12 school setting, aggressive behavior has been identified as the cause for the greatest loss of instructional time, reduced opportunities for independent functioning and interpersonal relationships, and restrictive placements (Brosnan & Healy, 2011; Farmer & Aman, 2011; Farmer, et al., 2015; Jang et al., 2011; Kanne & Mazurek, 2011; Matson & Adams, 2014). According to numerous research studies, ABA interventions have been demonstrated to be effective in reducing aggressive behavior, even in individuals with ASD and ID (Brosnan & Healy, 2011; Braithwaite & Richdale, 2000; Charlop-Christy & Haymes, 1996; Durand, 1999; Dooley, Wilczenski, & Torem, 2001; Falcomata, Roane, Muething, Stephenson, & Ing, 2012; Foxx & Garito, 2007; Foxx & Meindi, 2007; Frea, Arnold, & Vittimberga, 2001; Heckaman, Alber, Hooper, & Heward, 1998; Kern, Carberry, & Haidara, 1997; Mueller, Wilcynski, Moore, Fusilier, & Trahant 2001; Schindler & Horner, 2005). However, despite the positive outcomes of ABA interventions, high rates (over 50%) of aggressive behavior have been reported across large samples of individuals with ASD (Bronsard, Botbol, & Tordjman, 2010; Farmer and Aman, 2011; Farmer, et al., 2015; Kanne & Mazurek, 2011; Mazurek, Kanne, & Wodka, 2013; McTiernan, Leader, Healy & Mannion, 2011; Medeiros,

Kozlowski, Beighley, Rojhan, & Matson, 2012; Murphy, Healy, & Mannion, 2009).

Detrimental effects and high rates of aggressive behavior demonstrate that more work in

the area is clearly needed. (Brosnan & Healy, 2011; Jang, et al., 2010; Matson & Jang,

2014; Matson & Adams, 2014).

  According to behaviorism, an individual decides which behaviors to regulate

based upon consequential reinforcing or punishing stimuli.  This learning theory suggests

that internal processes (e.g., thoughts, beliefs, feelings) are not necessary to explain

learned behavior.  It's possible that both environmental contributors to behavior (e.g.,

stimulus-response) and internal contributors to behavior (e.g., thoughts, feelings, and

beliefs) could be combined to create a new intervention and address the contradiction in

the literature.  As Albert Bandura (1978) states,

> In their transactions with the environment, people are not simply reactors to
>
> external stimulation.  Cognitive factors partly determine which external events
>
> will be observed, how they will be perceived, whether they have any lasting
>
> effects, what valence and efficacy they have, and how the information they
>
> convey will be organized for future use (p. 345).

**Purpose of the Study**

  The purpose of this study is to test the effectiveness of an intervention that not

only focuses on behavioral responses to the physical environment but also incorporates

psychological implications on behavior.  Combining behavior-based strategies,

specifically, functional behavior assessments (which control for external consequences)

with a second mechanism, namely video self-modeling (VSM), to modify internal

consequences could be more effective at reducing aggressive behavior compared to either

strategy in isolation.

**CHAPTER TWO**

**LITERATURE REVIEW**

Video modeling as a way to show a desired behavior has been in existence in the

research literature for over 40 years (Creer & Miklich, 1970; Dowrick, 1999, 2012;

Hitchcok, Dowrick, & Prater, 2003; Hosford, 1981; Wert & Neisworth, 2003).  In the

current literature, there are two main ways of categorizing video modeling: video

modeling (VM) and video self-modeling (VSM).  Video modeling (VM) consists of

showing a person a video of someone performing a targeted skill (Cihak & Schrader,

2008; Gelbar, et al., 2012) whereas in VSM, the performer is the intended viewer.

Interestingly, the very first use of the self as a model, "self-modeling," was

introduced in a study conducted by Creer and Miklich in 1970 (cited in Hitchcock,

Dowrick, & Prater, 2003). The participant was a 10-year-old "asthmatic boy" who

exhibited severe "temper tantrums."  Through the use of a reversal design, it was

demonstrated that the boy displayed socially appropriate behavior when shown a video of

himself exhibiting socially appropriate behavior and displayed tantrum behavior when

shown a video of himself exhibiting tantrum behavior.  The authors concluded that using

the self-as-model within video modeling can be a highly effective approach to modify

behavior.

Since that study, numerous studies involving some form of modeling via a video

format have been conducted.  Overall, the findings support the use of VM and VSM as a

means to change behavior (Bellini & Akullian, 2007; Delano, 2007; Rayner, Denholm, &

Sigafoos, 2009; Wang & Spillane, 2009).  Although both forms are evidence-based, the

focus of this study is on VSM.  Unlike VM, VSM incorporates a theoretical perspective

that goes beyond a predominantly behavioral model that, as suggested may not

necessarily have the desired effect of reducing unwanted behaviors, particularly

aggressive behavior (Ayres, Davis, & Mason, 2016; Belllini & Akullian, 2007; Buggey,

2005; Creer & Miklich, 1970, Dowrick, 1999, 2012: Gelbar, et al., 2012).  While to some

the model may seem a minor difference, VSM explicitly draws upon Bandura's work

(1977, 1989, 1997) which suggests people learn best from models that most closely

resemble themselves and having oneself as the model optimizes this factor (Bandura,

1969, 1977, 1982, 1997; Buggey, 2005, 2009; Dowrick, 1999; 2012; Gelbar, et al., 2012).

The remainder of this chapter will (a) demonstrate how VSM is connected to theory, (b)

discuss the strength of using VSM as an intervention for reducing aggressive behavior in

individuals with ASD and ID, and (c) outline the purpose and rationale for the current

study that combines the use of VSM and functional behavioral assessment.

**Social Cognitive Theory**

Albert Bandura's (1989, 1997, 2001) Social Cognitive Theory (SCT) suggests

that human behavior is dependent upon a triadic model of influence.  His theory was

radically different from competing theories at the time that suggested human behavior is

solely influenced by the reinforcing and punishing consequences within the environment

(Schunk, 2012).  In SCT, behavior (e.g., performance), personal factors (e.g.,

expectations, self-beliefs, and goals), and environmental influences (e.g., modeling,

instruction, and social persuasion) operate reciprocally as mediators of human thoughts,

affect, and action (Bandura, 1986, 1977, 1989) (see Figure 2 for an overview of the

model).  According to SCT once a personal belief system is established by way of the

triadic model of influence, human behavior becomes self-regulated (Bandura, 1991;

Schunk, 2012).
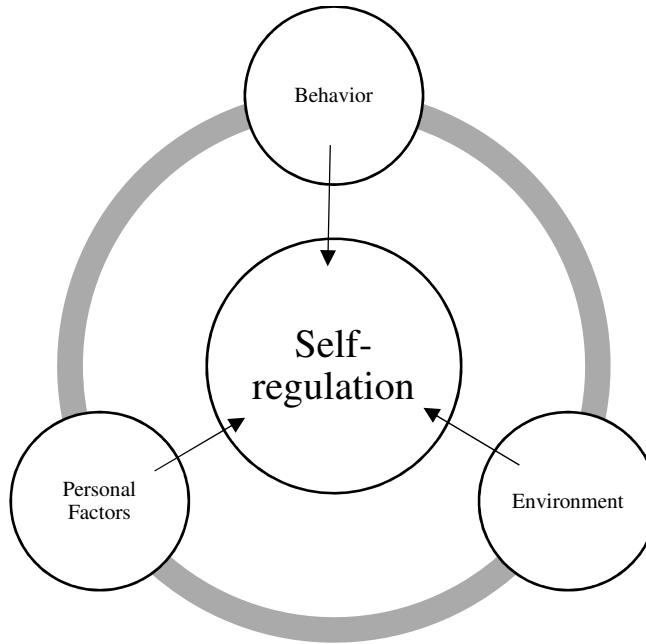


*Figure 2:* Diagrammatic Representation Between Behavioral Influences and

Resulting Self-Regulation (adapted from Bandura, 1986).

According to SCT, self-regulation is an internal process by which individuals

maintain their personal belief system by way of initiating and sustaining behaviors and

cognitions (Bandura, 1977, 1982, 1997, 2012).  SCT emphasizes that self-observation,

self-judgement, and self-reaction impact self-regulated behavior (Schunk, 2012).

Mechanisms to change self-regulated behavior include goal setting, self-efficacy, and

self-evaluations (Schunk, 2012).  This view of self-regulation differs from a behaviorist

approach which emphasizes that self-instruction and self-reinforcement impact self-

regulated behaviors.  Under a behaviorist paradigm an individual decides which new

behaviors to self-regulate based upon stimuli in the physical environment following a

performance (Schunk, 2012).

Self-regulation is important because "neither intention nor desire alone has much

effect if people lack the capability for exercising influence over their own motivation and

behavior" (Bandura, 1991, p. 249). As an illustration, if a student tears up her paper (e.g.,

behavior) every time she is under stress (e.g., personal factor), and the stressful condition

is removed every time she tears up her paper (e.g., environment), her reaction to stress

will become self-regulated (e.g., "if I tear up my paper, my stress will be alleviated").

When patterns of self-regulated behaviors are challenged, new behaviors can emerge

(Bandura, 1989, 1991). Bandura (1986) states that when "discrepancies between a

performance and the standard against which it is measured, activate evaluative self-

reactions, which serve to influence subsequent behaviors" (p. 20). Thus, when behavior

is modified, as it is in learning, an individual's personal belief system and patterns of

self-regulation have been altered. For instance, if a student believes that they are not

good at math (e.g., personal factors), they may expend little effort to achieve

mathematically (e.g., self-regulated behavior). However, if that same student is taught to

work on small tasks and monitor their success (e.g., environment), the self-monitored

progress (e.g., personal factors and behavior) may result in sustained effort for learning

(e.g., self-regulated behavior) (Bandura, 1989, 1991; Schunk, 2012).

Learning under this framework requires that the learner be involved in the process

by way of "enactive" and "vicarious" situations (Bandura, 1965, 1977, 1984; Schunk,

2012). Enactive learning is the act of learning by observing models, whereas vicarious

learning is the act of learning through experiencing (Bandura, 1965, 1977). Enactive

learning is dependent upon environmental cues whereas vicarious learning is dependent

upon self-evaluation (Bandura, 1984, 1989).  The strength of enactive and vicarious

learning is moderated by two important variables: self-efficacy and observational

learning.

**Self-efficacy.**  Bandura (1977) defines self-efficacy as the belief in one's personal

abilities to accomplish a goal.  Bandura suggests that a person's expectations of the

outcome directly impact both task initiation, and the ability to cope with the event or task

(Bandura, 1977, 1982).  Furthermore, self-efficacy impacts a person's willingness to

attempt a task.  As an illustration, people tend to avoid situations they may find

threatening or overwhelming, whereas they are more likely to engage in situations they

find safe or encouraging (Bandura, 1977, 1982, 1984, 1997).  Therefore, increases or

decreases in self-efficacy impact personal factors which in turn influence behavior,

according to the triadic model.

**Observational learning**.  The most common form of observational learning is

modeling (Bandura, 1965, 1975; Schunk, 2012).  In modeling, the viewer observes a

situation and is motivated to display new patterns of behavior (Schunk, 2012).

Observational learning through modeling is a complex process involving several

cognitive processes: (1) attention, (2) retention, (3) motivation, and (4) reproduction.

First, the viewer must attend to the model demonstrating the behavior.  Ideally, a model is

similar in age, sex, or status to the observer (Ayres, Davis, & Mason, 2016; Bandura,

1969, 1977, 1982, 1997; Dowrick, 1999; Schunk, 2012).  Second, the observation must

be within the viewer's capability to retain or remember the behavior of the model

(Bandura, 1997; Dowrick, 1999, 2012).  Third, the viewer must be motivated to copy the

behavior (Bandura, 1977; 1989). Fourth, the viewer must be able to reproduce the behavior (Bandura, 1977, 1989; Dowrick, 2012).

**In summary.** According to Bandura's theory, existing patterns of behavior can change through self-efficacy and modeling. Increases in self-efficacy and opportunities for self-evaluations have the ability to modify current patterns of self-regulated behavior which would allow for new behaviors and cognitions to be adopted. Video self-modeling is one method that supports these elements of change and has the potential to modify aggressive behaviors of students with ASD and ID through improved self-regulation skills.

**Overview of Video Self-Modeling (VSM)**

There are three main features of VSM. First, the model in the video is the intended observer (Buggey, 2006; Dowrick, 1999, 2012; Gelbar, et al., 2012). Second, the skill must be in the observer's behavior repertoire (Bandura, 1965; Bellini & Akullian, 2007; Buggey, 2006; Dowrick, 1999, 2012; Corbett & Abdullah, 2005; Dowrick & Biggs, 1983; Gelbar, et al., 2012; McCoy & Hermansen, 2007). Third, the viewer must perceive value in the goal (Bellini & Akullian, 2007; Dowrick, 1999, 2012, Prater et al., 2012).

In a VSM intervention the intended viewer demonstrates a target behavior (Bandura, 1986, 1989; Buggey, 2006; McCoy & Hermansen, 2007). The target behavior is typically something that is either inconsistently being demonstrated (e.g., a performance deficit) or one that is slightly outside of their current capabilities (e.g., a performance deficit) (Buggey, 2006; Dowrick 1983, 1999, 2012). For example, if a student inconsistently walks in a line with his class in the hallway, an appropriate VSM

would deficit the student walking in a line down the hallway and receive a desirable

consequence upon completion (e.g., verbal praise).

To create the videos, the student is prompted (verbal, visual, and/or physical)

through a series of replacement behaviors (e.g., walk in a line). During the editing

process, all errors, prompts, and extraneous footage is taken out leaving only depictions

of positive targeted behaviors (Bellini & Akullian, 2007; Dowrick 1999; Gelbar, et. al.,

2012; McCoy & Hermansen, 2007). In the final product, the viewer sees themselves

performing the target skill at mastery level (Buggey, 2006, 2009; Dowrick, 1997, 1999,

2012). The viewing of the VSM allows the individual opportunities to self-evaluate and

improved self-efficacy which have the power to modify self-regulated behavior.

**Connection to SCT.** VSM draws from SCT in that it provides the learner both

enactive and vicarious experiences specific to an academic, behavioral, adaptive,

communicative or social need (McCoy & Hermansen, 2007). Enactive learning occurs as

the observer witnesses the sequence of actions necessary to perform a skill; vicarious

learning is stimulated because the model is the intended viewer. The act of viewing a

VSM allows the individual an opportunity to believe in the possibility that he can

perform the sequence of actions portrayed, thus increasing self-efficacy (Buggey 2009;

Dowrick, 2012; Gelbar, et al., 2012). The increase in self-efficacy typically results in

expended effort and persistence to accomplish the depicted task (Bandura, 1997; Bellini

& Akullian, 2007; Corbett & Abdullah, 2005; Dowrick & Biggs, 1983; Gelbar, et al.,

2012; Howsford, 1981; Schunk, 1989).

There are four cognitive processes (attention, retention, motivation, and

reproduction) are accounted for in a VSM intervention. First, having the model be the

intended viewer optimizes the chances for attention and internalization (Ayres, Davis, &

Mason, 2016; Dowrick, 1999, 2012).  Second, the videos in VSM are typically short and

personally connected to a situation that the viewer is experiencing, therefore increasing

the likelihood that the information be retained (Buggey, 2006; Dowrick, 1983).

Motivation in a VSM can come in many forms such as the self being the model, seeing a

desired behavioral outcome (e.g., receiving a desirable object) and/or by adding

reinforcing elements to the video (e.g., visual and auditory sound effects) (Buggey,

2006).  Lastly, given that the model is the viewer, it demonstrates that the target behavior

is able to be reproduced (Dowrick, 1999, 2012).

**ASD and School Based Video Self-Modeling (VSM)**

VSM has been used as a school-based intervention for people with ASD to

address the following : adaptive behavior (Cihak & Schrader, 2008; Cihak, Fahrenkrog,

Ayres, & Smith, 2010), compliance training (Buggey, 2005; Coyle & Cole, 2004; Lang,

et al., 2009), academic skills (Burton, Anderson, Prater, & Dyches, 2013; Hart &

Whalon, 2012; Marcus & Wilder, 2009; Schatz, Peterson, & Bellini, 2016), social skills

(Bellini, Akullian, & Hopf, 2007; Boudrea & Harvey, 2013; Buggey, Toombs, Gardener,

& Cervetti, 1999; Buggey, Hoomes, Sherberger, & Williams, 2011; Hart & Whalon,

2012; Wert & Neisworth, 2003), and emotional recognition (Bernad-Ripoll, 2007).

Overall, research has demonstrated that VSM meets the criteria as an evidence-based

intervention for individuals with ASD, often producing substantial positive changes in

student behavior without the need for intensive services (e.g., one on one therapy in a

restrictive placement) (Bellini & Akullian, 2007; Bellini, Gardner, Hudock, & Kashima-

Ellingson, 2016; Dowrick, 2012).  Further, these studies report high levels of engagement

for students (e.g., reports that the student's enjoy seeing themselves in the video).

Despite VSM's success for students with ASD only four studies have focused on

the use of VSM for students with ASD and ID.  Before summarizing the literature, it is

important to note that classification for this population (ASD and ID) is vague.  For

example, in one situation, a VSM study reported an ASD description, but did not indicate

an IQ score (e.g., Buggey, Hoomes, Sherberger, & Williams, 2011).  While others

reported both ASD descriptors and IQ scores (e.g., Cihak & Schrader, 2008; Cihak, et al.,

2010; Coyle & Cole, 2004).  Changing diagnostic criteria could account for such variance

participant classification.  For instance, improved screening methods may have

provoked? Resulted in diagnostic substitution where individuals who were once

diagnosed as having ID and are now diagnosed as having severe ASD (Matson &

Shoemaker, 2009; Pedersen, et al., 2017).  Discrepant overlap between ASD and ID have

been found in several prevalence studies (Pedersen, et al., 2017).  For the purposes of the

following review participants that meet either of the following criteria were included for

discussion: (1) a score on a diagnostic measurement that places them in a "severe ASD"

category; (2) and/or a diagnosis of ASD with an "age equivalent IQ score" or IQ score

that indicates an ID.

**VSM for Students with Severe ASD and ID.**  Cihak and Schrader's (2008)

study compared VMs and VSMs for the effects of teaching chained vocational tasks to

students with ASD and ID.  Four high school students (age range 16 to 21 years) were

diagnosed with severe ASD according to diagnostic measurements (*Childhood Autism

Rating Scale™-2* [CARS-2], Schopler, & Van Bourgondien, 2010).  Two participants

had IQs of 45 and 50 suggesting moderate ID (*Developmental Profile™-2* [DP-2], Alpern, 2007). The other 2 participants had IQs of 30 and 35 suggesting severe ID. The purpose of each video was to show the participant depicting one of four vocational tasks (e.g., making a photocopy) ranging from 10 to 12 steps to complete the task. The VSMs ranged from 34 to 103 seconds and verbal praise was embedded in the video. An alternating treatments design was utilized where each participant had a VM condition and a VSM condition. Event recording was collected as each step of the chained task was marked "completed" or "not completed." According to the results, two students reached acquisition at a faster rate in the VSM condition and the other two participants showed no difference. Overall, the authors suggest that the videos positively influenced the participants' initiation to start a task and lessened the duration of task completion.

Cihak and colleagues (2010) examined the use of hand-held devices to deliver VSM instruction to improve transitioning within the school building. The participants were four elementary school students (age range 6-8 years) diagnosed as having severe ASD according to diagnostic measurements (CARS-2). Three students had an IQ range of 45-50, suggesting moderate intellectual disabilities (DP-2). One student had an IQ of 35 that indicated a severe intellectual disability (DP-2). All students had difficulty transitioning independently within the school building. Out of four participants, two exhibited aggression during transitions, one ran away from the teacher, and one would sit on the floor and refuse to move. Ten specific transitions were targeted and individualized per student needs. Transitions included the following: bus to classroom; classroom to music room; and bathroom to classroom. Each video clip lasted two to five minutes depending on the distance of the transition and verbal praise was embedded in the videos.

The participants' viewed the clips on an iPod prior to performing the transition.  A

reversal (ABAB) design was used where the VSM was either presented or not presented

prior to transitioning.  Event recording was collected and each transition was marked

"successful" or "not successful."  Results indicated that all students improved in

independent transitions overall.

Coyle and Cole's (2004) study aimed to decrease the off-task behavior of three

children with ASD (age range 9-11 years).  Two of the students were diagnosed as having

severe ASD and the third was moderately impacted according to diagnostic

measurements (not reported).  The student with moderate ASD was described as having a

comorbid moderate intellectual disability according to psychological measures (not

reported).  The two students with severe ASD had comorbid intellectual disabilities

according to age equivalents (2 years 10 months; 3 years one month).  The dependent

variable, "off-task behavior" was the same for all participants and was defined as,

looking around at other children, fiddling with a pencil or other objects, rolling items

from the desk, inspecting objects and other students at close proximity, touching other

students, staring blankly, or leaving their seats.  The videos depicted the students

engaging in "on-task behavior" (e.g., sitting at their desk, listening to the teacher,

refraining from touching objects not related to the activity.  The videos were three

minutes in length and included behavioral descriptions and praise.  After viewing the

videos once every morning, each student had a visual reminder to assist in remembering

the video and marked a checklist to monitor their behavior during the activity.  Single

case design was the methodology in this study however, two case studies utilized a

reversal (ABAB) design and the third followed a withdrawal (ABACA) design.  For all

three studies, off-task behavior was measured using time sampling recording (30 observation intervals followed by a five-minute break). The results indicate that the combination of VSM and a self-monitoring tasks were effective at reducing off-task behaviors.

Buggey, Hoomes, Sherberger, and Williams (2011) used VSM to teach social skills to pre-school participants. Four students (age range 3 to 4 years) participated in the study. Three were diagnosed as having severe ASD and one was labeled as having moderate ASD according to diagnostic measurements (CARS-2) but no IQ scores were reported. Pre-requisite skills for a VSM intervention were tested by showing each student a video or picture of themselves on a large screen and recording responses. The videos were 2.5 to 3.5 minutes in length and featured each participant social interacting with a peer. Reinforcing phrases (e.g., "great job"), music, and images were added to the videos. Additionally, verbiage to label the behavior (e.g., "Let's watch Lucy play with her friends!") was added to the videos. A multiple baseline across participants was used to determine the effect of the intervention. Frequency data on the dependent variable (social interactions) was collected during 15-minute observations. Participants made gains in social interactions.

Taken together, these four studies clearly demonstrate that VSM can be used with individuals with ASD and ID as a way to reduce some type of unwanted behavior. Further, all of the studies were able to modify behaviors in the majority of participants. Despite these positive findings, no study focused specifically on VSM's potential to reduce aggressive behavior in this population. Although Cihak and colleagues (2010) indicate that two students in their study displayed aggressive behavior, this was not the

primary variable targeted for change.  Instead, they focused on improving "successful"

transitions therefore no measurements on the rate of aggressive behavior were collected

and the conclusion regarding VSM's effectiveness to reduce aggressive behavior is

merely inferred.

In addition, these studies provide invaluable insight into how VSM can be used

with individuals who have comorbid ASD and ID in the following areas: (1) video

length, (2) engagement, and (3) response to prompting.  First, the VSM length of the four

studies ranged from 30 seconds to five minutes depending on the task.  Brevity or

attention to cognitive load may be an important factor when considering attention to the

VSM.  Second, all four studies used a method to optimize engagement in the videos (e.g.,

visual and/or auditory effects, verbiage to label the behavior).  Individuals with ASD and

ID have severely restricted attention and interests, therefore the additional images,

sounds, and verbiage may have improved retention and comprehension.  Finally, all of

the students were prompted through the target behavior in order to create the videos thus,

ensuring that the skill itself is within their capabilities and thus able to be reproduced.

**VSM to Treat Aggressive Behavior.**  Of the available research to-date, only one

study has focused specifically on reducing aggressive behavior.  Buggey (2005) used

video self-modeling (VSM) to reduce instances of pushing displayed by a pre-school

student who was moderately impacted by ASD.  The young boy had deficits in

expressive and receptive language and he often grabbed his peer's cheeks and then

pushed him or her away.  Buggey (2005) reported that after viewing the video one time,

the child's pushing behavior occurred only once and was not reported during the rest of

the intervention or maintenance condition.  The results of this study are astounding

considering the minimal invasiveness (e.g., delivered one time daily with minimal supervision from a professional) and immediate behavioral changes. Similar to other school-based interventions for aggressive behavior, the VSM intervention redirected an aggressive behavior with a socially appropriate behavior. Additionally, this intervention offered a chance for self-evaluation and improved self-efficacy as the child viewed himself appropriately interacting. Therefore increasing the likelihood of impacting self-regulated behavior.

Despite the promising results, limitations to this study need to be acknowledged. First, Buggey (2005) treated aggressive behaviors without the use of a functional behavior assessment. Therefore, the behavior function and appropriate replacement behavior were merely assumed. Without a confirmed hypothesis of behavior function, it is not possible to ascertain that the replacement behavior depicted in the video eradicated the aggression. For instance, it is possible that the novelty of the intervention decreased the behavior in the depicted situation, but the purpose or satisfying consequence of the aggression was still unmet. If the target behavior in a VSM is derived from a functional behavior assessment, one can ensure that it is consequentially satisfying for the learner. Second, as there was only one participant in one condition (i.e., lining up for recess) further replication is required to determine if this is a viable means to modify aggressive behavior in other settings/conditions. Third, Buggey (2005) reported that the student was moderately impacted by ASD. This study did not include individuals with comorbid ASD and ID or those severely impacted by ASD.

**Purpose of the Current Study**

Research indicates that individuals with ASD and ID are most likely to engage in aggressive behaviors that can be resistant to treatment (Matson et al., 2008; Matson & Shoemaker, 2009; O'Brien & Pearson, 2004; Storch et al., 2012). A need exists for the development of interventions that can overcome high rates of aggressive behavior in this population. One possible approach is a treatment that combines both VSM and functional behavior assessment to modify aggressive behavior. Functional behavior assessments (e.g., screening tools and direct observations) have been widely used as a way to analyze aggressive behaviors for individuals with ASD, whereas VSM interventions have been demonstrated to work among those with ASD and ID. However, no study has combined the use of functional behavior assessments and VSM for those with ASD and ID. It is possible that the strengths of these interventions can be combined to make a comprehensive whole that could possibly overcome high rates of aggression and add to the literature base for this population.

To illustrate, the strength of VSM is that it provides the viewer an opportunity for self-evaluation and increased self-efficacy as he/she sees themselves successfully performing a desired behavior. Whereas, the strength of functional assessment is to determine the specific environmental consequence for a behavior function, which allows for an equally reinforcing socially appropriate behavior to be taught as a replacement. When combined, the intervention has the potential to reduce unwanted aggressive behaviors by appealing to both internal (e.g., self-evaluation, self-efficacy) and external factors (e.g., environmental stimuli, exposure to modeling) responsible for self-regulated behavior.

Therefore, the purpose of the following study is to test an intervention that combines both VSM and functional assessment designed to decrease aggressive behavior and improve self-regulated behavior by using a replacement behavior. By doing so, this study extends literature in both the fields of analytic behavior and VSM research. This study also extends the literature for students with severe symptoms of ASD and ID, an often under-represented population.

**Research Questions**

The following central question and two sub-questions guide this study:

Central Question: To what degree does a VSM intervention developed from a functional behavior assessment impact classroom behavior in students with ASD and ID?

Sub Aim 1) What effect will the VSM have on aggressive behavior?

Sub Aim 2) What effect will the VSM have on the replacement behavior?

**CHAPTER THREE**

**METHODS**

The purpose of the following study is to test an intervention that combines both VSM and functional assessment as a strategy to promote socially appropriate self-regulation skills and decrease aggressive behavior.  The method and intervention procedures will be described below.

**Setting of Study**

Participants were recruited from a self-contained school in the Midwestern United States.  The school served approximately 172 individuals, ages five to fourteen years, with a variety of moderate and significant special needs as identified by educational diagnosis (Intellectual Disabilities, Emotional Behavior Disorder, Autism Spectrum Disorder, Multiple Needs, Other Health Impairments).  The primary form of instruction in the school utilized Applied Behavior Analysis (ABA) principles (e.g., behavior intervention plans, functional assessments, structured environmental supports, and functional communication systems) in addition to school-wide positive behavior supports (SWPBIS).

**Criteria for Participant Selection**

The following criteria were used for participation in this study:  (a) not currently receiving any form of behavior therapy outside of the school setting; (b) a score on a standardized diagnostic measurement that puts the student in the "severely impacted" range for ASD or classified as having "severe" ASD (e.g., a score equal to or greater than 37 on the *Childhood Autism Rating Scale™-2* (CARS-2), (Schopler, & Van Bourgondien, 2010); or a score greater than 75 on the *Social Responsiveness Scale™*

(SRS) (Constantino, 2005); (c) a score on a standardized diagnostic measurement that puts the student in the category for having an intellectual disability (e.g., a score less than or equal to 70 on the *Developmental Profile™-2* (DP-2) (Alpern, 2007); (d) an established reinforcement system (e.g., token economy); (e) able to visually attend to a video monitor for up to 1 minute; and (f) a classroom teacher report of levels of aggression that impede the student's ability to participate in the curriculum.

**Participants**

Based on teacher reports, two participants emerged as candidates for the intervention given high levels of aggressive behavior across stimulus conditions and inconsistent use of pre-taught replacement skills. The first participant, David (pseudonym), was seven years old at the beginning of the study.  According to school records David was not currently receiving any form of behavior therapy outside of the school setting and had a score of 42 on the CARS-2 which classified him as having a "severe" ASD.  He had a score of 42 on the DP-2 which classifies him as having an intellectual disability.  He had an IEP in place and an established reinforcement system (e.g., token economy).  David enjoyed spending time on the computer, thus was able to attend to a video monitor.  Despite educational supports (e.g., a behavior intervention plan) and high levels of reinforcement (e.g., verbal praise, use of preferred items) his teacher reported levels of aggression that impeded his ability to participate in various school-wide activities and the curriculum.  According to reports, when David became upset he threw objects, scratched, hit, pulled hair, and/or bit teachers, caregivers and/or other students.  His aggressive behavior resulted in the necessity for him to be restrained or placed in a secure observation room until he had calmed down.  David's current

behavior plan hypothesized that his behaviors were an attempt to escape a task, and his replacement behavior was a verbal cue to signify the need for a break.

Participant two, Nate (pseudonym), was twelve years old at the beginning of the study. According to school records he was not currently receiving any form of behavior therapy outside of the school setting and had a score of 76 on the SRS which classified him as having "severe" ASD. He had a score of <40 on the DP-2 which classified him as having an intellectual disability. Nate had an IEP in place and an established reinforcement system (e.g., token economy). Nate enjoyed watching videos on the classroom iPad® and was, therefore, able to attend to a video monitor. Despite educational supports (e.g., behavior intervention plan) and high levels of reinforcement (e.g., scheduled breaks from demands, verbal praise, use of preferred items), his teacher reported levels of aggression that impeded his ability to participate in various school-wide activities and the curriculum. It was reported that Nate mainly scratched and/or pulled hair. When Nate struck a teacher, he began to laugh and the likelihood for aggressive behavior elevated. Staff concluded that Nate enjoyed the struggle of restraint, therefore when he became aggressive he was given personal space (at least 1 to 2 feet). Nate's current behavior plan hypothesized that his behaviors were an attempt to escape a task, and his replacement behavior was to make a request (using picture icons) to signify the need for a break.

Each participant was in a different classroom, thus had different staff. David spent most of his day in an elementary classroom with a lead teacher and a one-on-one paraprofessional. For 30 minutes each day, David went to Music, Art, or Computers, each held in a different location within the school. Additionally, David went to lunch for

30 minutes in the cafeteria each day. Nate spent the majority of his day in a middle

school classroom with a lead teacher and a one-on-one paraprofessional. Nate went to

computer class two times per week for 30 minutes. He went to lunch in the cafeteria for

30 minutes each day. Nate received both Music and Art instruction in his classroom

setting. Both participants' daily routine consisted of direct instruction, individualized

work tasks, small group tasks, and a series of earned breaks from demands.

**Participant Preferences and Function of Aggressive Behavior**

Several measures were implemented to determine student preferences and

function of aggressive behavior in order to develop the VSM intervention. (See figure 3

for overview.)
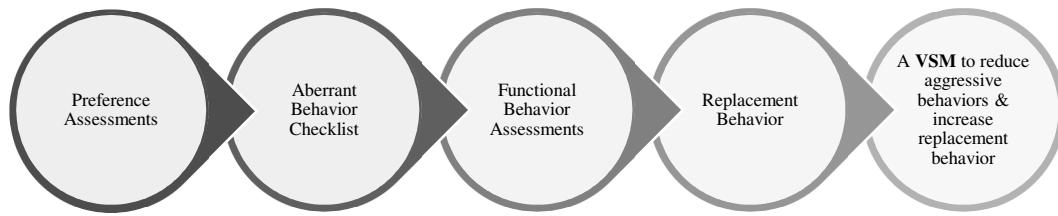


*Figure 3.* Summary of Measures used to Determine VSM Intervention

**Preference Assessments.** Each child's caregiver and classroom teacher

completed an interest inventory and a questionnaire to determine personal preferences

and challenges for the participants. Semi-structured interviews with the classroom

teacher (see Appendix A) and the child's caregiver (see Appendix B), were conducted by

the primary investigator to further assess the student's preferences, strengths, and areas of

concern.  From the data, it was determined that David enjoyed navigating *YouTube* on the

computer, watching characters from *Dinosaur Train*, and playing with toys that he

brought from home.  Nate enjoyed *Dora the Explorer*, listening to music, and swinging.

**Aberrant Behavior Checklist.**  Students were evaluated using the *Aberrant*

*Behavior Checklist* (ABC-2; Aman & Singh, 2017; α = .65 to .41) to determine the

severity of their aggressive behaviors and offer a hypothesis of behavior function.  The

ABC is a symptom checklist for assessing problem behaviors of children with

developmental disabilities.  Scores indicated that David exhibited high rates of

maladaptive behaviors as an attempt to seek attention and escape from task demands

during instruction.  This report aligned with teacher descriptions that David became

aggressive when a preferred adult was not speaking to him or when he was presented

with a non-preferred task.  Scores indicated that Nate exhibited high rates of maladaptive

behaviors as an escape from demands and often results in hyperactivity during

instruction.  This report reinforced the description his teachers gave regarding Nate using

aggression to escape task demands and exhibiting interfering self-stimulatory behaviors

after he successfully strikes another individual.

**Functional Behavior Assessment.**  A functional assessment of behavior was

conducted to ensure that the reinforcing consequence of the aggressive behavior was

precisely targeted. Selected participants underwent a functional assessment of behavior

by a qualified independent observer (i.e., Board Certified Behavior Analyst [BCBA]).

Challenging situations that typically resulted in aggressive behaviors were recorded and

analyzed using both direct and indirect methods.  For this study two data sources,

*Questions About Behavioral Function* (QABF; Matson & Vollmer, 1995; α = .88 to .79), Antecedent-Behavior-Consequence (ABC; Bijour, Peterson, & Ault, 1968) were utilized by the BCBA certified observer.

   *QABF*.  The QABF is a measure designed for the functional assessment of behavior problems in persons with developmental disabilities.  The instrument yields five categories reflecting the behavioral functions of Attention, Escape, Physical, Tangible, and Nonsocial.  The BCBA certified observer gathered data from two teachers per participant (e.g., David's teacher and para-professional and Nate's teacher and school behavior specialist).  Results from the QABF indicated that David's behaviors were equally split between a desire for attention and an effort to escape a task.  Results from the QABF indicate that Nate's aggressive behaviors were the result of a desire to escape a task demand.

   *ABC Observations*.  Antecedent, behavior, consequence (ABC) data was collected by the BCBA certified observer and the primary investigator during times that were reportedly "difficult" for each student.  David displayed aggression when asked to work at his desk, participate in lunchroom routines, and participate in structured activities outside the classroom (e.g., Music class).  David also displayed aggressive behaviors during non-structured activities when a preferred adult was playing with another student in the classroom.  These behaviors served to gain attention from a preferred adult.  David also displayed aggressive behavior when he was asked to transition from a preferred task to a non-preferred task.

   ABC data reflected that Nate was initially compliant when asked to join a structured activity (e.g., he would willingly walk to the designated location).  However,

once he was prompted to engage, he would not comply. Aggressive behaviors were observed across several conditions including center time instruction (e.g., task boxes located in the back of the room), instruction at his desk, and during small group instruction at a large table. When Nate's teachers prompted him to engage in the task, he displayed aggression, began to laugh, and engaged in interfering self-stimulatory behaviors (e.g., slapping his chest or head with an open palm, stomping his feet, or hitting a hard surface with a closed fist).

*Hypothesis Statement.* Based on the data collected from the functional assessment & QABF, it was hypothesized that David's aggressive behavior served two functions (attention seeking and escape or avoidance) based on different environmental stimuli. David's teacher reported that the escape-maintained behaviors caused greatest loss of instructional time in various settings, therefore it was determined that the intervention would focus on replacing aggression with a replacement behavior across three problematic stimulus conditions: (1) work at his desk, (2) in the lunch room, and (3) in the Music classroom. Nate's aggressive behavior served to escape or delay non-preferred tasks. The behaviors occurred most frequently in his classroom during three different stimulus conditions (1) small group activities, (2) center-time instruction, and (3) individual work at his desk.

**Research Design**

For this study a multiple baseline design across stimulus conditions with inter-subject replication was used (Gast & Ledford, 2014; Horner, et al., 2005). A stimulus condition was defined as an instructional arrangement (e.g., one-on-one instruction, group instruction, or a particular classroom setting; Gast & Ledford, 2014). Three unique

stimulus conditions were identified per participant based upon data obtained from preference and functional assessment measurements.  In a multiple baseline model, the participant serves as his own control and his/her performance prior to the intervention was compared to the performances during and after the intervention (Gast & Ledford, 2014).

An inter-subject replication refers to "repeating the same effect with different participants" (p. 109, Gast & Ledford, 2014).  To conduct an inter-subject replication the following criteria were adhered to per suggestion from Barlow and Hersen (1984): (1) the investigator, setting, materials, and instructional arrangements should be consistent across participants; (2) the dependent variable and measurements should be similar across participants; (3) participants should have similar abilities related to inclusion criteria; and (4) the independent variable should be the same.  The primary investigator was the main source of data collection for both participants.  The participants ranged in age from 7 to 12 years, and had similar target behaviors and instructional arrangements.  The dependent variables and measurements were consistent across both studies.

**Dependent Variables**

**Aggression.**  The first dependent variable was aggressive behavior and was the same across participants. For the purpose of this study, "aggressive behavior" was operationally defined as any instances of the following:  physical contact that results in harming oneself or another individual (e.g., biting, hitting, kicking, scratching, pulling hair, or using items as weapons).  Aggression was selected as a dependent variable because data reported high rates, thus the current study aimed to decrease aggressive behaviors via VSM.

**Replacement behavior**. The replacement behavior was operationally defined as any time the student requested a break from the demand and engaged in a "break task." When the participant requested a break, task demands were removed and the students' were presented with a break task designed to help them cope with stress related to the original non-preferred task demand. The break and break task strategies were selected as dependent variables because the data concluded that both participants experienced performance deficits, thus the current study aimed to increase the use of pre-taught replacement behaviors via VSM.

David's break task was a pre-taught "mindfulness" strategy (i.e., counting to 10, 10 deep breaths, 10 hand squeezes, 10 cheek squeezes). Once the break task was complete, the original task was presented again. This sequence of events (request a break and engage in a break task) mirrored his current behavior intervention plan that had been minimally effective. During baseline data collection, it was observed that David did not independently ask for a break when he was frustrated, but he would often respond when given a cue (e.g., a teacher holds up one finger and begins to count). On several occasions, after being prompted, David engaged in the break task but would resort to aggression when he was asked to complete the original task demand.

After a break from a demand was initiated by Nate (via pointing to an icon or handing a teacher an icon), he was presented with a break task. Nate's break task was a pre-taught strategy where he selected an item that provided sensory input (e.g., a ball to squeeze, exercise rubber bands to pull with his hands or feet, or items to chew). Once he began to engage with the item, the original task was presented again. This sequence of events (request a break and engage in a break task) mirrored his current behavior

intervention plan that had been minimally effective.  During baseline data, it was

observed that Nate occasionally engaged in the break task, but often disregarded it (e.g.,

dropped the tangible item on the floor) in place of using aggressive behavior.

**Independent Variable**

The independent variable for this study was the VSM.  The fundamental aspects

of the independent variable (the VSM) was consistent with previous VSM studies: (1)

self-as-model; and (2) features the individual independently performing the replacement

behavior under typically stressful conditions (e.g., when given a non-preferred task

demand).

**VSM Features.**  The VSMs were created in accordance to suggestions by

previous research: (1) no more than 3 minutes in length (Dowrick, 1983); (2) viewed at

least one time per day (Buggey, 2009; Dowrick, 1999, 2012); (3) all adult and peer

supports edited out (Buggey, 2009; Dowrick, 1999, 2012; Gelbar, et al., 2012); (4)

demonstrates a positive self-image (Bellini & Akullian, 2007; Buggey, 2009; Dowrick,

1999, 2012); and (5) clearly defined outcomes of the target behavior (Bandura, 1977,

1989; Bellini & McConnell, 2010; Buggey, 2009; Dowrick, 1999; 2012).  The videos

placed a strong emphasis on the student successfully demonstrating socially appropriate

behavior amidst conditions that were typical of triggering an aggressive episode.

**Video Development**.  Using the data collected via the functional assessment and

preference measures, a video was developed that depicted the learner demonstrating the

replacement behavior and receiving a desirable consequence.  As a means of engaging

the learner and maintaining interest in the video, a background song or sound effect

unique to each participant was played, on low volume, for varying lengths based upon

student needs. The inclusion of visual effects and/or images of preferred characters was

individualized across videos.

To create the videos the footage was captured (using an iPhone 6 plus) and edited

by the primary investigator to create a systematic, engaging, movie using Windows

Movie Maker© and Screencast-O-matic© software. Prior to filming, a storyboard was

created that depicts the sequence of events that the video aims to capture (see Appendix

C). Students were recorded during stimulus conditions that were typically challenging

for them (e.g., lunch room, instructional time), during instances that they prefer (e.g., free

play), and during staff attempts to redirect aggressive behavior (e.g., attempts at using a

socially appropriate replacement strategy). This video footage was used to create the

final product that the participant viewed during the intervention (see Appendix D).

**Intervention Procedures**

Experimental procedures used in this study are described below and include

information on data collection procedures, intervention phases, treatment fidelity,

observer training, inter-observer agreement, and social validity.

**Data Collection.** A partial interval recording system was used to collect data on

the two dependent variables (aggression and replacement behavior) for a total of 25 non-

sequential days. The partial intervals were 10 seconds in length. In partial interval

recording, the observer marks down whether a behavior occurs any time during the

designated period of time by placing a "+" for occurrence and a "0" for non-occurrence.

An observational period lasting 30 minutes occurred for each stimulus condition per

participant. This allowed for a total of 180 intervals per stimulus condition for a total of

540 intervals of data collection per participant each day (see Appendix E). Data was

collected by the primary researcher during every interval, and an independent observer

simultaneously recorded student behavior for 40% of the total number of intervals.

**Baseline**.  Baseline conditions consisted of typical classroom interventions.  The

baseline condition continued until a pattern in the data for the dependent variables was

apparent (e.g., 3 to 5 data points) (Horner, et al., 2005; WWC, 2014).  Once a baseline

pattern in the data was established, the intervention was presented in the first condition,

while baseline procedures continued in the second and third conditions.  When a

therapeutic pattern of data was established in the first condition, the intervention was then

presented in the second condition, while baseline procedures continued in the third

condition.  When a pattern in the second condition occurred, the third condition began the

intervention phase (Gast & Ledford, 2014).

**Stimulus Condition 1 (SC1).**  Following baseline, the VSM depicting the student

engaging in the replacement behavior during SC1 was shown one time at the beginning

of the school day.  For David, the VSM for this condition depicted him using his

replacement behavior at his desk in his classroom.  Nate's VSM for this condition

depicted him using his replacement behavior in a small group located at a large table in

his classroom.

**Stimulus Condition 2 (SC2).**  Once a therapeutic pattern in the data was

established in SC1 (e.g., three to five data points) the VSM that depicted the student

engaging in the replacement behavior during both SC1 and SC2 was then shown at the

beginning of the school day.  For David, SC2 added a depiction of him using his

replacement behavior in the lunchroom.  For Nate, SC2 added footage of him using his

replacement behavior during "center time" (located in a semi-private desk in the back of the classroom).

**Stimulus Condition 3 (SC3).** Once a therapeutic pattern was established in SC2, the VSM that depicted the student engaging in the replacement behavior during SC1, SC2, and SC3 was shown at the beginning of the school day. For David, SC3 added a depiction of him using his replacement behavior in the Music classroom. For Nate, SC3 added footage of him using his replacement behavior during instruction while he was seated at his own desk inside the classroom.

**Maintenance.** For David, maintenance data was collected on days 5, 9, 17, 20, and 24 post-intervention. For Nate, maintenance data was collected on days 3, 6, 10, 18, and 21 post-intervention. During the maintenance phase, the teacher and behavior analyst were instructed to cease playing the videos for the student each morning, but were asked to honor any request independently made by the student to view the VSM (e.g., if the student sought adult assistance to watch the VSM).

**Treatment Fidelity**

A treatment fidelity was conducted to ensure that classroom staff was implementing the expectations of each stimulus condition consistently. For example, in stimulus condition one for David, the observer reported if the following criteria was adhered to; (1) was the student required to remain seated in a chair; (2) was he expected to follow instructions; (3) were task demands given; and (4) was the VSM played for the participant one time each morning? The primary and second observer completed a checklist immediately following each stimulus condition (see Appendix F and G)

**Inter-Observer Training and Agreement**

Prior to collecting data, independent observers participated in a training session using videos that consisted of samples of both aggressive behavior and replacement behavior per participant. During training, inter-rater scores were calculated and the training(s) continued until 100% agreement was achieved (e.g., the data collectors came to an agreement that an aggressive or socially appropriate behavior did or did not occur). To practice interval synchronicity, observers were trained to listen to a private audio recording (using Smartphone technology) that indicated the beginning and end of each interval intended for observation.

Data was collected by the primary researcher 100% of intervals. IOA data was collected on 40% of the total number of intervals by a trained independent observer (e.g., doctoral students in the college of Special Education). This percentage is sufficient according to standards in the literature (Carroll et al., 2007; Horner, et al., 2005; Kratochwill, et al., 2010; WWC, 2014). The IOA was dispersed among baseline, intervention, and maintenance phases. The total number of agreements divided by the total number of agreements and disagreements yielded the percentage of inter-observer agreement. Inter-observer agreement for all collected data was at 99%. A Kappa statistic (Cohen, 1960) was established by dividing the total agreement by the chance agreement. Cohen's Kappa was calculated at 0.98 which indicates almost perfect agreement.

**Social Validity**

Social validity was measured via a researcher-developed questionnaire given to two classroom teachers and two paraprofessionals familiar with the participants. The interviews allowed the primary investigator to ensure that the VSM intervention is

minimally invasive to classroom instruction and helped determine the feasibility of

dissemination.  The social validity questionnaire consisted of the following questions:

(1)     Are you able to deliver the intervention with fidelity? Is the video being

viewed regularly? Is the replacement… being used?

(2)     Do you have the appropriate resources to deliver the intervention (e.g.,

electronic devices for viewing, tangible reinforcements, communication

systems, visual supports)?

(3)     Do you feel that the self-regulation strategy has social importance in the

school?

(4)      Do you believe the intervention is having an impact on the student?

(5)     Would you consider using the intervention after the study is complete?

(6)      Do you are any of your staff require additional instruction or support

regarding the intervention procedures?

**CHAPTER FOUR**

**RESULTS**

In the following chapter the results will be reported via three analysis procedures: (1) visual analysis of the dependent variables, (2) mean performance, and (3) the percentage of data points exceeding the median (PEM) across the three stimulus conditions for each student (David and Nate). The chapter will conclude with a summary of the teacher responses related to the social validity of the intervention.

**Visual Analysis of Dependent Variables**

A visual analysis of the data was performed to determine whether evidence of a functional relationship between an independent variable and an outcome variable exists and the strength or magnitude of that relation (Gast & Ledford, 2012; Kratochwill, et al., 2012; What Works Clearinghouse, 2002 [WWC]).

**David.**

*Baseline.* Figure 4 shows instances of baseline aggression (indicated in black with closed circles) for David. During stimulus condition 1 (SC1), baseline lasted four sessions. Stimulus condition 2 (SC2), baseline lasted nine sessions and baseline for stimulus condition 3 (SC3) lasted 13 sessions. In the SC3 baseline condition, data point 9 is missing. This is due to music class not being conducted that day per teacher decision. For all three stimulus conditions, David typically displayed high levels of aggression (range 1 to 45 instances). When lower rates of aggression were documented (data points 1, 6, and 11) intervening "environmental" factors were likely responsible. For example, during SC3 anecdotal notes from data points 6 and 11 indicate that David was given extra choice time (up to 11 minutes) beyond what he was typically given (2-3 mins) during

data collection.  For data point 1 in SC3, David was allowed to sit on a teacher's lap

during classroom instruction (something he preferred) and as a result he was not made to

complete tasks independently.

Figure 4 shows instances of baseline replacement behavior (indicated in gray with

open squares).  Overall, low rates of replacement behavior were apparent across all

stimulus conditions for David (range 0 to 18 instances).  Overlapping data points can be

explained by interfering environmental factors.  For example, in SC3 two of the

overlapping data points, data points 6 and 7, can be explained by shortened work

sessions, longer breaks from demands, and reduced task difficulty due to the teacher

being absent that day (e.g., a work session that typically lasts 30-minues but only lasted

8-minutes on day 6 and 7-minutes on day 7).  Another anomaly occurred on data point

13.  For part of the observation during this data point, David's aggressive behavior

became so intense that staff placed a "secure observation room" (e.g., a padded room

with the ability to close and lock the door; students are monitored through a window and

video monitoring).  On this day, it was observed that David was improperly using the

replacement behavior (e.g., going through the motions of the break task in an effort to

prompt the teacher to open the door).  This was supported by observations of David using

the opportunity of an open door to immediately resort back to aggression.  The high rate

of replacement behavior for this data point is due to the extra time the teachers had to

prompt him through the strategy and the instances that David executed the strategy, but

had not actually regained control of his anger.

*Intervention.*  As demonstrated by figure 4, SC1 intervention lasted 16 sessions,

(beginning on data point 5).  For SC2 intervention conditions lasted 11 sessions

(beginning on data point 10) and SC3 intervention lasted seven sessions (beginning on

data point 14). All three stimulus conditions demonstrate a decreasing pattern in the level

of aggression that remained stable after the intervention was introduced. Figure 4

illustrates that for SC1 and SC2 the change in the level of aggression occurred

immediately following the change in phase. For SC3, evidence of change is apparent on

the second day of intervention onward. The change in variability from baseline to

intervention conditions suggest that the intervention had the desired effect for reducing

aggressive behavior. Interestingly, the level of replacement behavior is either higher than

or equal to the rate of aggression across all stimulus conditions, with the exception of

data point 11 in SC2.

   *Maintenance*. For aggression, the maintenance data for SC1, SC2, and SC3

consisted of 5 data points up to 24 days post-intervention. The level of performance in

the maintenance condition is similar to the intervention condition across SC1, SC2, and

SC3, according to figure 4. All three stimulus conditions demonstrate a continuation of

low rates of aggression as evidenced during the intervention condition. Similar to the

intervention condition the rate of pro-social behavior was higher than or equal to the rate

of aggression in all data points.
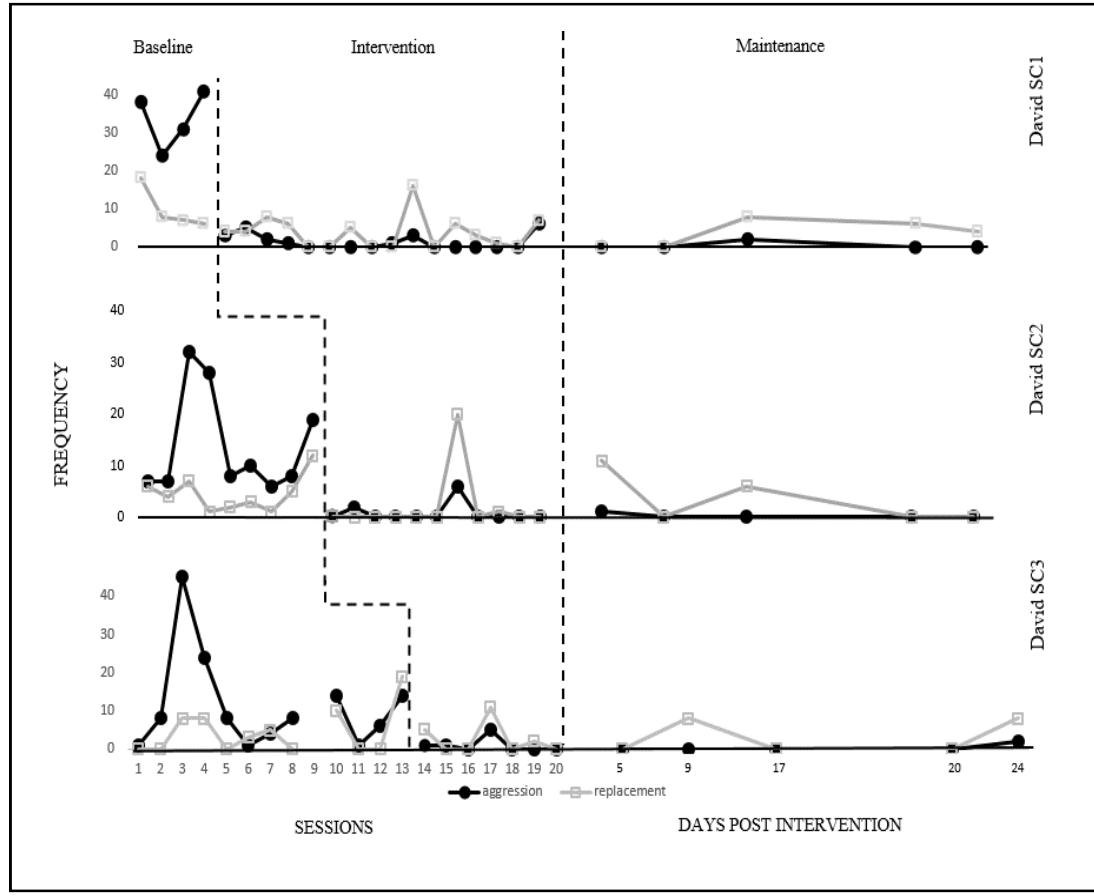
*Figure 4:* Instances of the Dependent Variables Across Stimulus Conditions for David

**Nate.**

*Baseline.*  Figure 5 shows instances of aggression during baseline conditions

(indicated in black with closed circles) for Nate.  For SC1, baseline lasted five sessions.

For SC2, baseline lasted 10 sessions and for SC3 baseline lasted 15 sessions.  For all 3

stimulus conditions, Nate displayed high levels of aggression (range 1 to 55 instances).

Some of the variability and the anomalies in the data can be accounted for by the

interfering environmental factors.  For instance, in figure 5, data point 10 was only

recorded one time (during SC1) because Nate left for a doctor's appointment and did not

return until the next day.  In SC3, data points 13 and 15 are missing because small group

instruction was not conducted that day due to teacher decision.

Figure 5 shows instances of baseline replacement behavior for Nate (indicated in

gray with open squares).  Overall, low rates of prosocial behavior were apparent across

stimulus conditions for Nate.  Some of the variability and the anomalies can be accounted

for by the environmental factors stated above.  For replacement behavior, a low level of

performance occurred during SC1 and is supported by a decreasing trend.  During SC2

and SC3 there are lower levels of replacement behavior compared to levels of aggression.

**Intervention.** Figure 5 also shows instances of aggression (indicated in black

with closed circles) during intervention conditions for Nate.  As demonstrated by figure

5, the SC1 intervention lasted 15 sessions (beginning on data point 6), SC2 intervention

lasted 10 sessions (beginning at data point 11), and SC3 intervention condition lasted five

sessions (beginning on data point 16).  All three stimulus conditions demonstrate a

pattern of decreased level of aggression after the intervention is introduced.  Figure 5

illustrates that the change in levels of aggression occurred immediately following the

change in phase for SC1 and SC2.  For SC3, evidence of change is apparent beginning on the second day of intervention.  The change in variability from baseline to intervention conditions suggest that the intervention may have resulted in reducing levels of aggressive behavior.

For replacement behavior data (indicated in gray with open squares) the length of each condition mirrored that in the aggression data stated above.  For replacement behavior, the outcome levels were higher during the intervention condition compared to baseline.  High variability is apparent across all stimulus conditions however, the rate of replacement behavior was higher than the rate of aggression in all but six points when they mirrored that rate of aggression at zero.

**Maintenance**.  For aggression, the maintenance data for SC1, SC2, and SC3 consisted of five data points lasting up to 21 days post intervention.  The level of performance in the maintenance condition is similar to the intervention condition across SC1, SC2, and SC3, according to figure 5.  Similar to the intervention condition, the rate of replacement behavior was higher than the rate of aggression in all but four data points when the rate of replacement behavior and aggression was at zero.
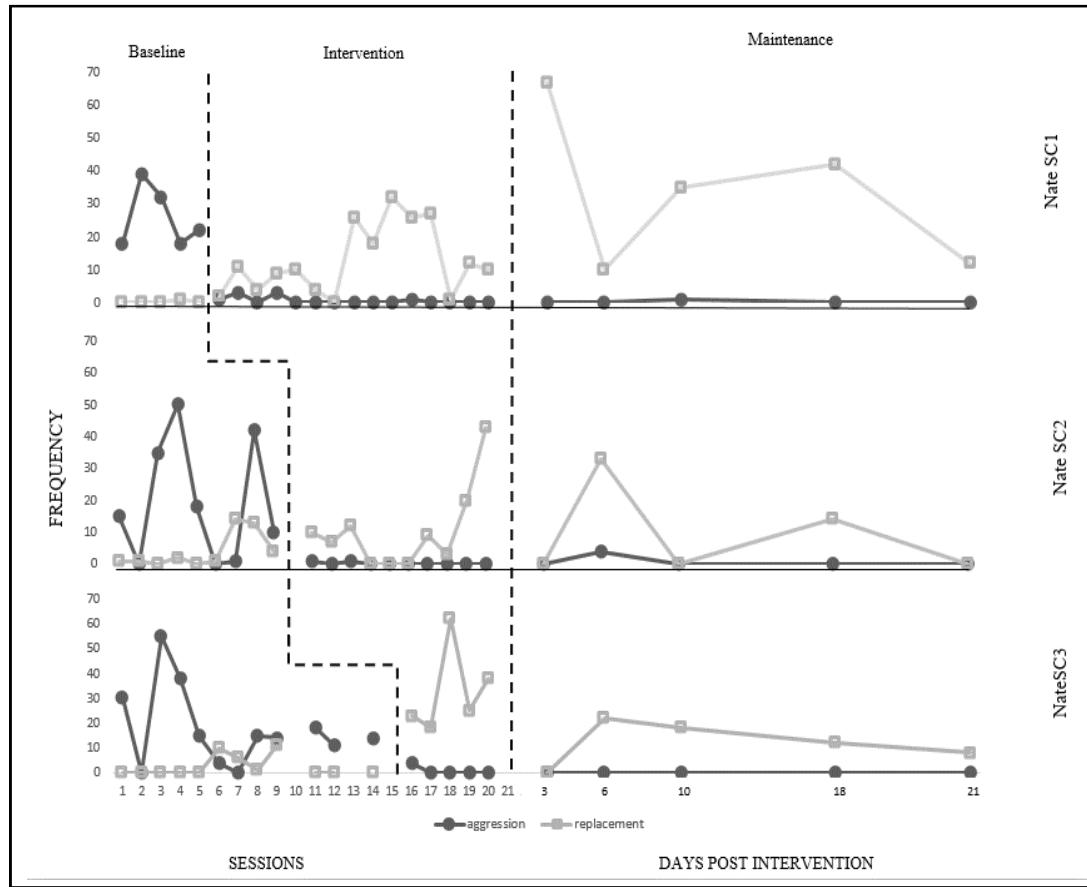
*Figure 5:* Instances of the Dependent Variables Across Stimulus Conditions for Nate

**Mean Performance for Dependent Variables across Stimulus Conditions**

     **David.** Table 2 displays the average occurrence of the dependent variables

(aggressive and replacement behavior) across stimulus conditions for David.  For SC1

aggressive incidents occurred at a rate of 33.5% of intervals during baseline, decreased to

1.31% during intervention and further decreased to 0.4% during maintenance.  For SC2,

aggressive incidents occurred at a rate of 13.88% during baseline, decreased to 0.72%

during intervention, and further decreased to 0.2% during maintenance.  For SC3,

aggressive incidents occurred at a rate of 11% during baseline, decreased to 1% during

intervention, and further decreased to 0.4% during maintenance.

     The mean performance of David's replacement behavior was also calculated.  For

SC1 the replacement behavior occurred at a rate of 9.75% of intervals during baseline,

decreased to 3.75% during intervention, and 3.6% during maintenance.  For SC2, the

replacement behavior occurred at a rate of 4.5% during baseline, decreased to 1.9 %

during intervention, and increased to 3.4% during maintenance.  During SC3's baseline,

the replacement behavior occurred at a rate of 4.46%, decreased to 2.16% during

intervention, and increased to 3.2% during maintenance.

Table 1

*David's Mean Occurrence of Dependent Variables Across Stimulus Conditions*

|  | Aggression | | | Replacement behavior | | |
|---|---|---|---|---|---|---|
|  | Baseline | Intervention | Maintenance | Baseline | Intervention | Maintenance |
| SC1 | 33.50% | 1.31% | 0.4% | 9.75% | 3.75% | 3.6% |
| SC2 | 13.88% | 0.72% | 0.2% | 4.50% | 1.90% | 3.4% |
| SC3 | 11.00% | 1.00% | 0.4% | 4.46% | 2.16% | 3.2% |

*Note.* SC1=Stimulus condition 1, SC2= Stimulus condition 2, SC3= Stimulus condition 3

**Nate.** Table 3 displays the average occurrence of dependent variables (aggressive and replacement behavior) across stimulus conditions for Nate. For SC1 aggressive behaviors occurred at a rate of 25.8% of intervals during baseline; decreased to 0.53% during intervention, and 0.2% during maintenance. For SC2, aggressive behaviors occurred at a rate of 19% during baseline; decreased to 0.2% during intervention, and 0.8% during maintenance. For SC3 aggressive behavior occurred at a rate of 17.83% during baseline, decreased to 0.8% during intervention, and 0% during maintenance.

The mean performance of Nate's replacement behavior was also calculated. For SC1 Nate's replacement behavior occurred at a rate of 0.2% of intervals during baseline, increased to 12.8% during intervention, and further increased to 33.2% during maintenance. For SC2, replacement behavior occurred at a rate of 4%, increased to 10.06% during intervention; and decreased to 9.4% maintenance. For SC3, the replacement behavior occurred at a rate of 2.3% during baseline, increased to 33.2% during intervention, and decreased to 12% during maintenance.

Table 2

*Nate's Mean Occurrence of Dependent Variables Across Stimulus Conditions*

| | Aggression | | | Replacement behavior | | |
|---|---|---|---|---|---|---|
| | Baseline | Intervention | Maintenance | Baseline | Intervention | Maintenance |
| SC1 | 25.80% | 0.53% | 0.2% | 0.2% | 12.80% | 33.2% |
| SC2 | 19.00% | 0.20% | 0.8% | 4.0% | 10.06% | 9.4% |
| SC3 | 17.83% | 0.80% | 0.0% | 2.3% | 33.20% | 12.0% |

*Note*. SC1=Stimulus condition 1, SC2= Stimulus condition 2, SC3= Stimulus condition 3

**Effect Size of the Intervention across Stimulus Conditions**

The percentage of data points exceeding the median (PEM) (Ma, 2006) was used to determine the effect size of the intervention.  PEM was selected because the aggressive behavior was highly variant for these participants and a single ceiling or floor level data point would not be indicative of actual behavioral performance (Ma, 2006; Vannest, et al., 2015).  In this type of analysis, the median of data points during the baseline phase are calculated to determine the effect size of the intervention.  The PEM involves calculating the number of data points showing improvement from the baseline median score divided by the total number of data points in the intervention conditions (Ma, 2006; Vannest, et al., 2015).  The number of data points above or below the median line in the intervention phase is then divided by the total number of data points.

In the present study, two dependent variables were calculated (aggression and replacement behavior).  The undesired behavior (aggression) was expected to decrease after the intervention was introduced, therefore the PEM calculations reflect the percentage of data points below the median level calculated in baseline.  The replacement

behavior was expected to increase after the intervention is introduced, therefore the PEM

calculations reflect the percentage of data points above the median level calculated in

baseline.  The following guidelines were used to explain the effects using PEM: 90-100%

is a highly effective treatment, 70-90% is a moderately effective treatment, 50-70% is a

minimally effective treatment, and less than 50% is not effective (Scruggs, Mastropieri,

Cook, & Escobar, 1986).

     **David.**  Table 4 displays the PEM calculations of the dependent variables

(aggressive and replacement behavior) across stimulus conditions for David.  During

David's SC1 baseline, the median number of aggression instances was calculated at 34.5.

During both the intervention and maintenance phases, 100% of the data points were

below the median rate of aggression, suggesting that the intervention was highly

effective.  David's SC2 baseline PEM for aggression was calculated at 8.  During both

the intervention and maintenance phases, 100% of the data points were below the median

rate of aggression, suggesting that the intervention was highly effective.  David's SC3

baseline PEM for aggression was calculated at 8. During both the intervention and

maintenance phases, 100% of the data points were below the median rate of aggression,

suggesting that the intervention was highly effective.

     The median rate of replacement behavior was calculated to be 7.5 at baseline.

During SC1 intervention in SC1, 18.75% exceeded the median; maintenance for this

condition was calculated to be 20%. Both of the PEM calculations suggest that the

intervention had no effect on replacement behavior during SC1.  David's SC2 baseline

PEM for replacement behavior was calculated at 4.  During SC2 intervention 18%

exceeded the median; maintenance for this condition was calculated at 40%.  Both of the

PEM calculations suggest that the intervention had no effect on replacement behavior during SC2.  David's SC3 baseline PEM for replacement behavior was calculated at 3. During both intervention and maintenance on SC3, 16 % exceeded the median.  Both of the PEM calculations suggest that the intervention had no effect on replacement behavior during SC3.

Table 3

*David's PEM Calculations*

|  | Aggression | | Replacement behavior | |
| --- | --- | --- | --- | --- |
|  | Intervention | Maintenance | Intervention | Maintenance |
| SC1 | 100% | 100% | 18.75% | 20% |
| SC2 | 100% | 100% | 11.00% | 40% |
| SC3 | 100% | 100% | 16.00% | 20% |

*Note.* SC1=Stimulus condition 1, SC2= Stimulus condition 2, SC3= Stimulus condition 3

**Nate.**  Table 5 displays the PEM calculations of the dependent variables (aggressive and replacement behavior) across stimulus conditions for Nate.  During Nate's SC1 baseline, the median number of aggression instances was calculated at 25.8. During both the intervention and maintenance phases, 100% of data points were below the median rate of aggression, suggesting that the intervention was highly effective. During Nate's SC2 baseline, the median number of aggression instances was calculated at 19.  During both the intervention and maintenance phases, 100% of data points were below the median rate of aggression, suggesting that the intervention was highly effective.  During Nate's SC3 baseline, the median number of aggression instances was

calculated at 14.  During both the intervention and maintenance phases, 100% of data

points were below the median rate of aggression, suggesting that the intervention was

highly effective.

During SC1, the median rate of replacement behavior was calculated to be zero at

baseline.  During the intervention, 93% of data points exceeded the median rate and

100% exceeded the median during maintenance, both suggesting a high effect.  During

SC2, the median rate of replacement behavior was calculated to be 7 at baseline.  During

the intervention, 60% of data points exceeded the median rate suggesting a mild

intervention effect whereas 40% exceeded the median during maintenance suggesting no

effect.  During SC3, the median rate of replacement behavior was calculated to be zero at

SC3 baseline.  During the intervention, 100% of data points exceeded the median rate

suggesting a highly effect.  During the maintenance condition of SC3, 80% of data points

exceeded the median rate also suggesting a high intervention effect.

Table 4

*Nate's PEM calculations*

|      | Aggression | | | Replacement behavior | |
|------|------------|-------------|--|----------------------|-------------|
|      | Intervention | Maintenance | | Intervention | Maintenance |
| SC1  | 100% | 100% | | 93% | 100% |
| SC2  | 100% | 100% | | 60% | 40% |
| SC3  | 100% | 100% | | 100% | 80% |

*Note*. SC1=Stimulus condition 1, SC2= Stimulus condition 2, SC3= Stimulus condition 3

**Social Validity and Treatment Fidelity**

For the first participant, (David) data was collected from the special education

teacher and the student's paraprofessional.  When asked about intervention fidelity and if

the classroom staff needed support implementing the intervention, both individuals

reported that the video was easily accessed from the classroom computer (where it was

saved to the desktop by the primary investigator) and the video itself explained how to

support David's replacement behavior.  For instance, the teacher said, "If anyone had

questions about what he [David] was doing I just told them to watch the video."  In

regard to social importance, both responders suggest that the replacement behavior was

highly valued by the school community.  The paraprofessional stated, "Other staff was

like whoa, what he is doing in the cafeteria?"  She continued by saying, "They kept

complimenting me on his behavior and I was like, it's not me it's the video!"   When

asked about the impact the video had on the student, the teacher reported that she had

noted a huge difference in his behaviors and that it is "exciting" to have David participate

in the curriculum.  The paraprofessional reported that David, "loves seeing himself on video."  She noted that he often laughed when he saw himself and often played the video in reverse in order to watch it repeatedly.  Both responders agreed that they would like to continue some form of VSM after the study was complete.

For the second participant, Nate, data was collected from the special education teacher.  When asked about intervention fidelity, she indicated that it was easy to implement because it was on an iPad® and the self-regulation skill was in his communication binder.  Similar to David's teacher, she also commented that if staff had any questions about the intervention she directed them to watch Nate's VSM.  When asked about the social importance, Nate's teacher stated that, "he needs to learn to participate in groups and we finally found something that works."  When asked if the VSM had an impact on the student, she stated that, "This is great!  He is able to meet his sensory needs and participate in activities.  We used to have to remove him from class."  To the same question she also stated that, "He selected a strategy and I didn't even realize he was using it during my lesson!"  When asked if she would consider using VSM after the study was completed, she said, "Yes!  I need one for all my students!"

Finally, when asked if they would consider using the intervention after the study is complete Nate's teacher said, "The technology seems hard to use and I don't think I could create a VSM on my own."  She then remarked, "Can you make videos for all my students?"  To the same question, David's teacher responded, "I would love to use the intervention if you could make me more videos!"  Further work should provide instructions to teachers on how to utilize technology in order to create VSM interventions for students with ASD.

# CHAPTER 5
## DISCUSSION

The current study used multiple baseline design across stimulus conditions with inter-subject replication to explore the following central question: To what degree does a VSM intervention developed from a functional behavior assessment impact classroom behavior in students with ASD and ID?  Two sub-questions also guided this research: (1) What effect will the VSM have on selected aggressive behavior and (2) What effect will the VSM have on selected replacement behavior?  To answer these questions, two students with ASD and ID who displayed high levels of aggressive behavior across various stimulus conditions and rarely utilized pre-taught replacement skills were identified to participate in the study.  Importantly, according to reports, traditional ABA strategies had been ineffective for both participants. The findings from this study are discussed in connection to the sub-questions guiding this research study.

**VSM Impact on Aggressive Behavior.**  The results of the study provide strong support for the effectiveness for the VSM intervention developed from a functional behavior assessment for reducing aggressive behavior of students with ASD and ID. Both visual analysis and effect data demonstrated a large decrease in aggressive behavior across all stimulus conditions for both participants.  For David, aggressive behaviors ranged from 11-33.5% during baseline and ranged from 0-1% during intervention.  For Nate, aggressive behaviors ranged from 17.83-25.8% during baseline and remained at 0% during intervention.  Visual analysis indicated that the behavior change occurred very rapidly after the onset of intervention and that this pattern was present for the duration of the intervention phase.  Both participants maintained lowered levels of aggression after the removal of the intervention.  These results begin to address the limited research of

identifying an evidence-based intervention specifically designed to treat aggressive

behaviors for students with ASD and ID (Matson et al., 2008, Matson & Shoemaker,

2009; O'Brien & Pearson, 2004; Storch et al., 2012).

Furthermore, this study demonstrates that a functional behavior assessment can be

embedded into VSM development to ensure that the correct environmental consequence

is being altered in the video.  The addition of the functional behavior assessment to the

VSM merged two important theoretical constructs for managing behavior which allows

for multiple perspectives of analysis that could improve teaching and learning practices.

As an illustration, functional behavior assessments, derived from behaviorism, is a

scientifically valid method used to reveal the external conditions that contribute to

behavioral maintenance (Iwata, et al., 2000), while VSM draws on the union of internal

and external consequences to modify behavior (Creer & Miklich, 1970; Dowrick, 1999,

2012; Gelbar et al., 2012).  Together, this joint perspective allows for aggressive

behaviors to be functionally identified and measured (Baer, Wolf, & Risley, 1968; Iwata,

et al., 2000), and uses both environmental variables and internal psychological processes

(modeling and self-efficacy) to improve self-regulated behavior (Bandura, 1965, 1975;

Dowrick, 1999, 2012; Gelbar et al., 2012; Hitchcock, Dowrick, & Prater, 2003).

Consequently, this approach could be particularly advantageous for students with

persistent aggressive behavior who do not respond to typical behavior modification

strategies (Gelbar et al., 2012).  For instance, in both studies the participants had been

taught a replacement behavior using ABA strategies however, these strategies where

demonstrated inconsistently as high rates of aggressive behavior continued.  When the

VSM was introduced, the replacement behavior became effective as demonstrated by

dramatic decreases in aggression.  This study provides evidence, that the VSM improved

a performance deficit in both individuals.

Equally important, the findings in this study are consistent with previous VSM

research which describes the intervention effects occurring immediately and maintaining

over time (Bellini & Akullian, 2007; Buggey, 2005; Dowrick 1999, 2012; Gelbar et al.,

2012, Hitchcock, Dowrick, & Prater, 2003; Schreibman et al., 2000).  For both

participants, decreases in aggressive behavior were immediate following intervention

across all stimulus conditions.  Immediate effects can make this intervention cost and

time efficient for teachers.  Furthermore, the effects of the intervention lasted up to 24

days for David and up to 21 days for Nate.  The maintenance of effects over time ensures

that skills do not deteriorate at least for a month following intervention.  These types of

outcomes are exactly what one would hope for in a school-based intervention for

aggressive behavior.

**VSM Impact on Replacement Behavior.**  The results of the current study

provide moderate support provide for the effectiveness of the VSM and functional

behavior assessment intervention at increasing replacement behaviors of students with

ASD and ID.  For Nate, there was a strong effect size related to the VSM for replacement

behavior, however for David, the effect size calculations suggest that the VSM had no

effect on the replacement behavior.  David's visual analysis suggest some effectiveness

due to changes in the response patterns between baseline and interventions conditions.

For instance, David's mean level of replacement behavior was lower than the mean level

aggression during baseline (baseline replacement behavior means 4.46-9.75% vs.

baseline aggression means 11-33.5%) and was higher level than the mean level of

aggression during the intervention condition (baseline replacement behavior means 1.9-3.75% vs. baseline aggression means 0-1.31%) for all three stimulus conditions.

A possible explanation for David's mixed results could be his response to naturally maintaining contingencies in the physical environment. Often during behavior modification interventions once aggressive behavior subsides, students are introduced to naturally occurring reinforcing consequences (e.g., verbal praise) that had been previously overlooked (Baer, Wolf, & Risley, 1968; Iwata, et al., 2000). As an illustration, for David the dramatic decrease in aggression could mean that the VSM drew David's attention to natural reinforcers such as verbal praise and teacher attention, which were displayed in the video. According to behaviorism, stimuli in the physical environment following a performance (e.g., verbal praise) can cause a change in self-regulation patterns. For David, simply viewing the reinforcing consequences may have helped him appropriately regulate his behavior, rendering the replacement behavior unnecessary. Furthermore, in this study the measurement system was not designed to record responses to natural contingencies, therefore the inconsistent results in replacement behavior data for David would be plausible. It does need to be acknowledged, however, that Nate may not have been motivated by natural contingences or stimuli in the environment hence his data reflects greater instances of the replacement behavior resulting in a high intervention effect.

Another consideration could be that the replacement behavior became internalized suggesting a change in self-regulation. According to SCT self-efficacy impacts self-regulated behavior (Bandura, 1989, 1991). It's plausible to assume that the VSM offered David a chance to view himself successfully performing and receiving a desirable

consequence, thus helping him appropriately regulate his behavior and rendering the need

to request a break unnecessary.  It's equally possible that Nate internalized that

replacement behavior, but required the use of items that provide sensory input to regulate

his behavior.  Further evidence of this internalization effect is apparent during the

maintenance condition when the videos ceased from being played but patterns consistent

with the intervention condition continued for both participants.  No matter the mechanism

of change, the results are encouraging for both participants and warrant further

investigation.

**Limitations of the Current Study and Suggestions for Future Research**

Several limitations may have affected the overall interpretations of this study and

future research is needed.  First, similar to other single-subject designs a small sample

size was examined.  Further, this study was the first of its kind; therefore, the results are

in need of replication and should be interpreted with caution.  Additional studies should

also consider larger samples and multiple sites as a way to determine the generalizability

of the results.  Next, maintenance data was only collected up to one month post

intervention.  Whether or not the effects of the intervention were maintained beyond that

date is not possible to determine. Future studies should examine the effects over a longer

duration of time.  Additionally, in the current study the same function (e.g., task

avoidance) was targeted for both participants.  The effects of a VSM and functional

behavior assessment intervention should be tested on other functions for aggressive

behaviors such as attention seeking behaviors, behaviors seeking accessing to materials,

and sensory seeking behaviors.

Moreover, it is unclear why the VSM has no effect on David's replacement behavior. As noted, it is possible that the decrease in aggressive behavior could indicate that David learned to appropriately regulate his behavior. Due to lingering questions, additional studies should be carried out to analyze rates of replacement and aggressive behaviors. Additional research should find ways to record responses to naturally occurring reinforcing stimuli and measure one's self-regulation skills pre/post an intervention to treat aggressive behavior.

Next, it's possible that the stimulus conditions were too similar causing some generalization effects across stimulus conditions. Finally, from the social validity data it is clear that the teachers would like to learn to how to utilize the VSM intervention to treat aggressive behavior, but they admitted that they lacked the appropriate technology skills to develop one. A future study would determine the effectiveness of teacher development and implementation of the VSM and if the same results could be achieved.

**Implications for Practice**

There are several potential implications for practice that emerged from this study. First, many teachers are faced with finding ways to reduce aggressive behaviors in students with ASD and ID. While some interventions are available, they do not necessarily work with all types of learners, most notably those with ASD and ID. In this study, the combination of VSM and functional behavior assessment had the ability to both reduce aggressive behaviors and increase replacement behaviors. This is beneficial to teachers because it can potentially foster a replacement behavior at a similar rate that it decreases behaviors. Moreover, there are few interventions that directly target students with ASD and ID. This intervention may prove helpful to teachers working with this

type of student by way of reducing aggressive behaviors and increasing opportunities to learn.

Second, teachers need interventions that are not time consuming and immediate in their results. Literature supports that in virtually all VSM studies the intervention produced results that accelerated quickly from baseline performance and were maintained in follow up assessments (Bellini & Akullian, 2007; Buggey, 2005; Dowrick 1999, 2012; Gelbar et al., 2012, Hitchcock, Dowrick, & Prater, 2003; Schreibman et al., 2000). Of particular importance is that the VSM maintenance effects can withstand frequent interruptions common in schools (e.g., holiday breaks, schedule changes or interruptions, and/or absence from school; Bellini & Akullian, 2007; Hitchcock, Dowrick, & Prater, 2003). An intervention that maintains its effect ensures that teachers will not have to spend large amounts of instructional time re-teaching behaviors that have been previously addressed.

Third, this intervention draws on existing practices that are easily accessible to teachers. Functional behavior assessments are widely used to treat aggressive behaviors in classroom settings. Teachers could use the existing information (e.g., data, hypothesis of behavior function) to determine which behavior should be targeted in a VSM intervention. Finally, given that many students are using technology in the classroom the use of the VSM intervention may be a socially valid approach to use in the classroom setting. Students can utilize a VSM in their current classroom setting compared many other intervention approaches where instruction occurs one-on-one in a separate classroom.

**CONCLUSION**

When an individual's ability to evaluate environmental stimuli is compromised, as it is in individuals with ASD, maladaptive responses such as aggression are likely to occur (Goldin, Matson, & Cervantes, 2014; Matson & Adams, 2014; Patel, Day, Jones, & Mazefsky, 2016; Pine, Guyer, Goldwin, Towbin & Leibenlufte, 2008). Aggression is problematic for caregivers and teachers and can become debilitating for the individual. Furthermore, for individuals with ASD and ID the prognosis is poorer amongst traditional behavior intervention plans (Matson & Shoemaker, 2009; Mazefsky et al., 2013; Rojahn, et al., 2010). Based on the results from this study, VSM and functional behavior assessment has the potential to modify both aggressive behavior and replacement behavior within a classroom setting by addressing external consequences and internal mechanisms that could account for sustained maladaptive behaviors.

## APPENDIX A
## Teacher Interview Form

### Teacher Interview Form [semi-structured format]

**BACKGROUND INFORMATION**

What is the student's preferred communication style?

Can you describe his/her level of cognitive functioning?

Has psychological testing been completed?

What types of reinforcement does he/she prefer?

What tasks or activities does he/she enjoy?

Does he/she demonstrate a preference for music, pop-culture characters, etc.?

**TARGET BEHAVIOR**

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?

What is the intensity/level of danger of this behavior?

**INTERVENTION STRATIGIES**

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.

## APPENDIX B
## Parent Interview Form

### Parent Interview Form [semi-structured format]

**PERSONAL INFORMATION**
Age?

Date of birth?

Diagnosis?
(i.e.) ASD, clinical, educational, both?

Were the symptoms apparent at birth?

Discuss any early developmental milestones.

**Hobbies and/or interests**
(i.e. musical preferences, pop-culture icons, activities)

**BEHAVIOR INFORMATION**
Do you notice noncompliant behavior in the home?

What does the noncompliance look like (i.e. ignore, aggression)? Ask for specific examples.

How long does the noncompliance last when it does occur?

What is the intensity/level of danger of this behavior?

**INTERVENTION STRATIGIES**

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.

APPENDIX C

Example of a Storyboard

| Scene 1 | Scene 2 | Scene 3 |
|---|---|---|
| Student X enjoying free time on computer | "Choice time is finished. Time to work" | "Sit at your desk" |
| | Student X turns off the computer screen, gets up from his chair, and pushes the chair under the table | Student X completes 1 task |
| **Scene 4** | **Scene 5** | **Scene 6** |
| Student X showing signs of frustration | Student X requests a break from his teacher (unprompted) Break Please I am feeling.. | Student X goes to the designated "break area" and a timer is set for 2 minutes (teacher does this) The timer goes off & student X walks back to his desk |
| **Scene 7** | **Scene 8** | **Scene 9** |
| Student X completes a closed-ended task | Great job! You finished your work. It's choice time! Choice | Student X chooses computer & is shown enjoying his choice time |
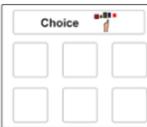
APPENDIX D

Steps for creating the VSM

| Steps for creating the VSMs |
| --- |

(1) **Determine target behavior and replacement  behavior**
A. Support these decisions by analyzing the results of the independent functional analysis


(2) **Determine when and where the dependent variables occur**
A. Create a list of situations and locations of where & when the aggressive behavior frequently occurs
B.  Observe an aggressive 2-3 episodes (take notes regarding antecedent, behavior, & consequence)
C. Observe when the replacement  skill is being used (note prompt dependence and frequency of use)
D. Take pictures of any visual prompts the student is using; upload to a secure server
E. Observe the student using his/her functional communication system
F. Create a storyboard that gives an outline of what you want the VSM to portray


(3) **Record**
A. Using the list of situations and locations & times that the dependent variables occur, observe the classroom from a non-intrusive position.
B. Record the antecedent, behavior, and consequence of both the aggressive behavior and the replacement  skill
C. Record any approximations of the replacement  skill (use physical assistance if necessary)
D. Film the student exhibiting happiness (i.e. smiling, laughing, engaging in a preferred activity)
E. If the student has a preferred teacher and/or friend film this person offering praise
F. Once an incident is recorded, upload it to a secure server and delete from the iPhone immediately


(4) **Edit**
A. Download videos into *Movie Maker* (Windows)
B. Find incidents within the video footage that replicate the scenes from the storyboard
C. Delete instances of physical aggression
D. Delete footage of teacher or para-professional assistance
E. Piece the small video clips into a cohesive sequence of appropriate behaviors
F.  Using *Movie Maker*, add music, narration, and/or captions to the video
G. (Optional) Using *Screencast-O-matic©* , add pictures and/or video clips based on the child's preferences


(5) **Publish**
A. Save movie in *Movie Maker* and publish into a format suitable for a computer and/or handheld device
B. Delete the project in *Movie Maker*
C. Use a flash-drive or download the video from a secure server onto the devices that the teacher has indicated for use.
D.  Label the VSM with the student's initials and "_VSM" behind it

APPENDIX E

Interval Data Sheet

---

**10 second Partial Interval Sheet**

Student:_____

Date:_____  Rater Initials:_____  Location:_____

Start time:_____  End time:_____

Key:

"A" = Aggression: physical contact towards self, others, or objects (as in property destruction)

"R" = Replacement: self-regulation strategy

"NO" = Non-occurrence: No demonstration of target behaviors

| START time: | | | | 7min 40s | A | R | NO | 15min 10s | A | R | NO | 22min 40s | A | R | NO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10s | A | R | NO | 7min 50s | A | R | NO | 15min 20s | A | R | NO | 22min 50s | A | R | NO |
| 20s | A | R | NO | 8min | A | R | NO | 15min 30s | A | R | NO | 23min | A | R | NO |
| 30s | A | R | NO | 8min 10s | A | R | NO | 15min 40s | A | R | NO | 23min 10s | A | R | NO |
| 40s | A | R | NO | 8min 20s | A | R | NO | 15min 50s | A | R | NO | 23min 20s | A | R | NO |
| 50s | A | R | NO | 8min 30s | A | R | NO | 16min | A | R | NO | 23min 30s | A | R | NO |
| 1min | A | R | NO | 8min 40s | A | R | NO | 16min 10s | A | R | NO | 23min 40s | A | R | NO |
| 1min 10s | A | R | NO | 8min 50s | A | R | NO | 16min 20s | A | R | NO | 23min 50s | A | R | NO |
| 1min 20s | A | R | NO | 9min | A | R | NO | 16min 30s | A | R | NO | 24min | A | R | NO |
| 1min 30s | A | R | NO | 9min 10s | A | R | NO | 16min 40s | A | R | NO | 24min 10s | A | R | NO |
| 1min 40s | A | R | NO | 9min 20s | A | R | NO | 16min 50s | A | R | NO | 24min 20s | A | R | NO |
| 1min 50s | A | R | NO | 9min 30s | A | R | NO | 17min | A | R | NO | 24min 30s | A | R | NO |
| 2min | A | R | NO | 9min 40s | A | R | NO | 17min 10s | A | R | NO | 24min 40s | A | R | NO |
| 2min 10s | A | R | NO | 9min 50s | A | R | NO | 17min 20s | A | R | NO | 24min 50s | A | R | NO |
| 2min 20s | A | R | NO | 10min | A | R | NO | 17min 30s | A | R | NO | 25min | A | R | NO |
| 2min 30s | A | R | NO | 10min 10s | A | R | NO | 17min 40s | A | R | NO | 25min 10s | A | R | NO |
| 2min 40s | A | R | NO | 10min 20s | A | R | NO | 17min 50s | A | R | NO | 25min 20s | A | R | NO |
| 2min 50s | A | R | NO | 10min 30s | A | R | NO | 18min | A | R | NO | 25min 30s | A | R | NO |
| 3min | A | R | NO | 10min 40s | A | R | NO | 18min 10s | A | R | NO | 25min 40s | A | R | NO |
| 3min 10s | A | R | NO | 10min 50s | A | R | NO | 18min 20s | A | R | NO | 25min 50s | A | R | NO |
| 3min 20s | A | R | NO | 11min | A | R | NO | 18min 30s | A | R | NO | 26min | A | R | NO |
| 3min 30s | A | R | NO | 11min 10s | A | R | NO | 18min 40s | A | R | NO | 26min 10s | A | R | NO |
| 3min 40s | A | R | NO | 11min 20s | A | R | NO | 18min 50s | A | R | NO | 26min 20s | A | R | NO |
| 3min 50s | A | R | NO | 11min 30s | A | R | NO | 19min | A | R | NO | 26min 30s | A | R | NO |
| 4min | A | R | NO | 11min 40s | A | R | NO | 19min 10s | A | R | NO | 26min 40s | A | R | NO |
| 4min 10s | A | R | NO | 11min 50s | A | R | NO | 19min 20s | A | R | NO | 26min 50s | A | R | NO |
| 4min 20s | A | R | NO | 12min | A | R | NO | 19min 30s | A | R | NO | 27min | A | R | NO |
| 4min 30s | A | R | NO | 12min 10s | A | R | NO | 19min 40s | A | R | NO | 27min 10s | A | R | NO |
| 4min 40s | A | R | NO | 12min 20s | A | R | NO | 19min 50s | A | R | NO | 27min 20s | A | R | NO |
| 4min 50s | A | R | NO | 12min 30s | A | R | NO | 20min | A | R | NO | 27min 30s | A | R | NO |
| 5min | A | R | NO | 12min 40s | A | R | NO | 20min 10s | A | R | NO | 27min 40s | A | R | NO |
| 5min 10s | A | R | NO | 12min 50s | A | R | NO | 20min 20s | A | R | NO | 27min 50s | A | R | NO |
| 5min 20s | A | R | NO | 13min | A | R | NO | 20min 30s | A | R | NO | 28min | A | R | NO |
| 5min 30s | A | R | NO | 13min 10s | A | R | NO | 20min 40s | A | R | NO | 28min 10s | A | R | NO |
| 5min 40s | A | R | NO | 13min 20s | A | R | NO | 20min 50s | A | R | NO | 28min 20s | A | R | NO |
| 5min 50s | A | R | NO | 13min 30s | A | R | NO | 21min | A | R | NO | 28min 30s | A | R | NO |
| 6min | A | R | NO | 13min 40s | A | R | NO | 21min 10s | A | R | NO | 28min 40s | A | R | NO |
| 6min 10s | A | R | NO | 13min 50s | A | R | NO | 21min 20s | A | R | NO | 28min 50s | A | R | NO |
| 6min 20s | A | R | NO | 14min | A | R | NO | 21min 30s | A | R | NO | 29min | A | R | NO |
| 6min 30s | A | R | NO | 14min 10s | A | R | NO | 21min 40s | A | R | NO | 29min 10s | A | R | NO |
| 6min 40s | A | R | NO | 14min 20s | A | R | NO | 21min 50s | A | R | NO | 29min 20s | A | R | NO |
| 6min 50s | A | R | NO | 14min 30s | A | R | NO | 22min | A | R | NO | 29min 30s | A | R | NO |
| 7min | A | R | NO | 14min 40s | A | R | NO | 22min 10s | A | R | NO | 29min 40s | A | R | NO |
| 7min 10s | A | R | NO | 14min 50s | A | R | NO | 22min 20s | A | R | NO | 29min 50s | A | R | NO |
| 7min 20s | A | R | NO | 15min | A | R | NO | 22min 30s | A | R | NO | 30min | A | R | NO |
| 7min 30s | A | R | NO | | | | | | | | | End time: | | | |

APPENDIX F

Treat Fidelity Check (David)

1

## DS DATA COLLECTION SCHEDULE

**[S1] Observe DS in classroom** (30 minutes total not including reinforcement time)
Possible times: 9:00-9:30, 10:00-11:00, 11:30-12:00

*Fidelity check (were the behavioral expectations upheld by the staff)*

| Expectation | yes | no | Not applicable (why?) |
|---|---|---|---|
| Remain seated in chair/floor | | | |
| Follow instructions | | | |
| Self-regulation available | | | |

**[S2] Observe DS during his lunch routine**
Scheduled time: 12:00-12:30

*Fidelity check (were the behavioral expectations upheld by the staff)*

| Expectation | yes | no | Not applicable (why?) |
|---|---|---|---|
| Lunch line (take 1 item) | | | |
| Remain seated at table while eating | | | |
| Follow instructions | | | |
| Self-regulation available | | | |

**[S3] Observe DS at "specials"**
Scheduled time: 12:40-1:05

*Fidelity check (were the behavioral expectations upheld by the staff)*

| Expectation | yes | no | Not applicable (why?) |
|---|---|---|---|
| Remain seated in chair/floor | | | |
| Follow instructions | | | |
| Self-regulation available | | | |

## VSM FIDELITY CHECK (For INTERVENTION and MAINTAINENCE ONLY!)

**DATE:**

| | Was the video played for the student at the beginning of the day? | Rater initials: |
|---|---|---|
| | | |
| | | |

NOTES:

- Please record data on the attached sheets
- Turn into Kate Sadler when completed
- Keep a safe distance away from behaviors
- If a crisis occurs follow instructions from staff members
- Try not to disrupt the environment

Thank you!!!!

APPENDIX G

Treat Fidelity Check (Nate)

2

## NM DATA COLLECTION SCHEDULE

**[S1] Observe NM for small group**
Possible times: 9:15-10:00, 2:00-2:30

*Fidelity check (were the behavioral expectations upheld by the staff)*

| Expectation | yes | no | Not applicable (why?) |
|---|---|---|---|
| Remain seated in chair/floor | | | |
| Follow instructions | | | |
| Self-regulation available | | | |

**[S2] Observe NM for Center Time**
Possible times: 10:30-11:15

*Fidelity check (were the behavioral expectations upheld by the staff)*

| Expectation | yes | no | Not applicable (why?) |
|---|---|---|---|
| Remain seated in chair/floor | | | |
| Follow instructions | | | |
| Self-regulation available | | | |

**[S3] Observe NM for desk work**
Possible times: 1:00-2:00

*Fidelity check (were the behavioral expectations upheld by the staff)*

| Expectation | yes | no | Not applicable (why?) |
|---|---|---|---|
| Remain seated in chair/floor | | | |
| Follow instructions | | | |
| Self-regulation available | | | |

**VSM FIDELITY CHECK** (For INTERVENTION and MAINTAINENCE ONLY!)

**DATE:**

| | Was the video played for the student at the beginning of the day? | Rater initials: |
|---|---|---|
| | | |
| | | |

NOTES:

- Please record data on the attached sheets
- Turn into Kate Sadler when completed
- Keep a safe distance away from behaviors
- If a crisis occurs follow instructions from staff members
- Try not to disrupt the environment

Thank you!!!!

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VITA

Born and raised in Saint Louis, Missouri, Kate Sadler knew at an early age that she would to devote her life to working with children with disabilities. During high school she volunteered, and later was a teacher at United Services for Children, an organization that provides early intervention services and pediatric therapy to children with developmental disabilities or delays. Those initial experiences helped to form Kate's belief that students with challenges could exceed expectations if their individual needs and abilities were identified and supported. After obtaining her bachelor's degree in Special Education at Southeast Missouri State University in 2001, she focused her efforts on instructing children significantly impacted by disabilities for over fifteen years in various classroom settings. At the University of Missouri, she obtained both her Masters of Education and Doctorate of Philosophy in Special Education. Kate's current research involves the development and testing of interventions and assessments for students with Autism Spectrum Disorder and Intellectual Disabilities. Her work has been recognized by grant funding, awards and fellowships.

Kate Sadler lives in Kirkwood, Missouri with her husband Greg, and their eight-year-old daughter, Ellinore. They are a constant source of support, pride and comfort to Kate as she continues to be inspired and challenged by the students, families, and teachers that she encounters.