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**A PRACTICAL STRATEGY TO IMPROVE CLASSROOM  
BEHAVIORS AND ACADEMIC OUTCOMES OF ELEMENTARY STUDENTS  
WHO EXHIBIT ATTENTION DEFICIT/HYPERACTIVITY TENDENCIES**

by  
Sandra Thurston

A Thesis

Submitted to the  
Department of Language, Literacy and Special Education  
College of Education  
In partial fulfillment of the requirement  
For the degree of  
Master of Arts in Learning Disabilities  
at  
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May, 2014

Thesis Chair: S. Jay Kuder, Ed.D.

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## **Dedication**

*This thesis is dedicated to my friend and colleague, Denise Leaf. Without her inspiration, I would not be writing the end of this life chapter. This thesis is also dedicated to my daughters, Caroline and Nicole, who inspire me every day through their examples. And for Jim, my silent partner.*

## **Acknowledgments**

It is with immense gratitude I acknowledge the support and guidance of my professors, S. Jay Kuder and Sharon Davis. I would also like to thank Michelle Parker for her intense dedication to her students and her willingness to try something for the good of her students which ultimately created more work for herself. Most of all, I would like to thank Adrienne Brown, Mindy Brokenshire, and Tracey Panas – my “sisters” on this journey who taught me how to manage my time, push myself, and laugh when I only thought I wanted to cry.

## **Abstract**

Sandra Thurston

### **A PRACTICAL STRATEGY TO IMPROVE CLASSROOM BEHAVIORS AND ACADEMIC OUTCOMES OF ELEMENTARY STUDENTS WHO EXHIBIT ATTENTION DEFICIT/HYPERACTIVITY TENDENCIES**

2013/2014

S. Jay Kuder, Ed.D.

Master of Arts in Learning Disabilities

Children with ADHD exhibit weakness in the area of monitoring their own behaviors. This can have a profound impact on academic outcomes. Based on the work of Rhode, Morgan, and Young (1983), this intervention focuses on teaching two students who display ADHD behaviors to rate their own behaviors throughout instruction. A description of the intervention and two case studies are included. Effectiveness of the intervention in a regular education setting, along with its limitations, is discussed.

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## Chapter 1

### Introduction

Attention Deficit Hyperactivity Disorder (ADHD) has been defined as a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequently displayed and is more severe than is typically observed in individuals at a comparable level of development (American Psychiatric Association, 2000). The primary behavioral characteristics that are prevalent in adolescents with ADHD include impulsivity, hyperactivity, and inattention (American Psychiatric Association, 1994). The lack of self-control that students exhibit through these behaviors can have devastating effects on all aspects of their academic lives. Such behaviors can affect a student's self-esteem, their ability to regulate their emotions, and a student's ability to relate to their peers in meaningful ways (Barry and Messer, 2003). Inhibitory control is necessary for an individual to be able to self-manage or self-control behavioral responding (Shapiro, DuPaul, Bradley-Klug, 1998).

Self-management may be an effective strategy that teachers can use to help their students diagnosed with ADHD because it helps them to recognize disruptive behaviors and take control over them (Barry and Messer, 2003). If a student can become more aware of their disruptive behaviors through self-management, then it may become possible for them to manage these behaviors through a tangible strategy such as having a slip of paper on their desks that include targeted behaviors they have to mark each time there is a signal. In addition, self-management may increase academic performance. Self-management is a strategy that may help a student to (a) plan and manage activities in a timeframe, (b) systematically arrange objects and assignments within space for rapid retrieval and (c) structure an approach to a task to achieve higher academic performance (Zentall, Haper, Stormont-Spurgin, 1993). The purpose of this research was to

determine if teaching self-management skills to students with ADHD tendencies could have a positive impact on their academic achievement.

### **Research Problem**

The questions to be answered in this study include:

1. What effect will teaching self-management skills to elementary students who exhibit ADHD behaviors have on their academic performance?
2. Do self-management skills have an effect on behavioral outcomes?

Two fourth grade students, one who has a specific diagnosis of ADHD but is not currently taking medication, and one who does not have a diagnosis but exhibits ADHD behaviors, are the focus of this study. They attend an elementary school in a low economic district in Southern New Jersey. The two students are not in the same homeroom class; however, they share the same two teachers. Math and science instruction is delivered by one teacher either in the morning or the afternoon depending on the schedule. The two classes switch where language arts and social studies instruction are delivered by a “cooperating teacher” in the other homeroom. Theoretically speaking, the two students who will learn to self-monitor their behavior should be able to improve their academic scores in math, as well as their behaviors which tend to distract them away from instructional time.

### **Key Terms**

*Attention Deficit Hyperactivity Disorder* - A persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequently displayed and is more severe than is typically observed in individuals at a comparable level of development (American Psychiatric Association, 2000).

*Self-Management* – a behavioral intervention that teaches individuals to recognize their own behaviors, and set behavioral goals, including identifying which behaviors to increase and decrease and recording and reinforcing their own behaviors (Koegel, Koegel, & Parks, 1995).

### **Implications**

Administrators, teachers, and para-professionals spend a certain amount of their student contact time remediating negative behaviors. Some students respond to verbal instructions about how to improve their behavior patterns, however, the majority of students who exhibit difficult behavior patterns respond more readily to a self-management system that personally involves the student in 1) identifying their negative behaviors 2) remediating these behaviors and 3) revisiting their self-management plans to evaluate behaviors that have been distinguished or add a new behavior that needs to be self-monitored. Teaching students to diminish or extinguish negative behavior patterns through personal awareness is beneficial to the student's education because it diminishes the time behavior modification takes away from instructional time. This particular skill also lends itself to an optimal learning environment for all students in a classroom. The less time a teacher is engaged in disciplinary issues in and out of the classroom, the more time and energy they can put into their facilitation of the learning process in their classrooms.

### **Summary**

Many students who exhibit ADHD behaviors experience difficulty self-monitoring negative behaviors that can have an impact on academic outcomes. This study will examine the effect of a practical intervention which teaches students to rate their behaviors in accordance with their teacher's rating scale in order to help them become more aware of and manage their behaviors independently. My hypothesis is that once the students are taught to rate their own behaviors by matching the way their teacher is rating them, they will become aware of and

remediate the behaviors that impede their success in the classroom setting. These students will first rely on their teacher to become aware of what is expected of them behaviorally during instruction and gradually become independent while self-monitoring. It is important to note, as well, the use of token reinforcement during all phases of the intervention. Students will initially rely on token reinforcement; however, as self-management becomes more natural, reinforcement should fade. This technique will inform both regular education and special education teachers as to how they can help their students successfully manage their own behaviors so as to not detract from instructional time.

## Chapter 2

### Review of the Literature

The causes of Attention Deficit Hyperactivity Disorder (ADHD) have, and continue to stir controversy in various settings. Individuals from the medical field, educators, and parents have opinions based on research and personal experience regarding causes linked to genetic factors, prenatal conditions, psychosocial factors and environmental conditions. Thapar, Cooper, Eyre, and Langley (2013) focused their review on the research literature published since 1997 regarding causes of ADHD. They found, not surprisingly, one single risk factor could not be blamed for ADHD, however, having a relative with ADHD increased ones chances of inheriting the disorder. Generally, when a student is diagnosed and treated for ADHD, it comes to light the student's familial history contains one or more adults who displayed similar symptoms when they were school-aged. Another result of the literature review suggests ADHD overlaps with neurodevelopmental problems such as autism spectrum disorder and behavioral disorders.

Symptoms of ADHD vary across settings. Generally, symptoms of ADHD are reported most frequently in terms of the school setting due to the implications these symptoms can have on academic achievement. Characteristics of ADHD include impulsivity, strong and intense reactions to daily events, difficulty with delayed gratification, becoming bored easily, talking excessively, interrupting the activities of others, moving from one activity to another, excessive activity, and doing things without thinking (Campbell, 2002; Greenhill, Posner, Vaughan, & Kratochvil, 2008). Daily curricular demands for students with ADHD often leave them unfocused, inattentive, and ultimately frustrated. Students with ADHD have difficulty with executive functioning (Semrud-Clikeman, Walkowiak, Wilkinson & Butcher, 2010). This skill set allows one to plan, monitor time, multi-task, incorporate past experiences in meaningful

discussions, assess ideas, change the course of thought while reading or writing, and wait for a turn to speak or act. All of these tasks are critical for academic success. Students with ADHD struggle to control their emotions which cause them to suffer from social repercussions in the school setting as well.

Currently, there are safe and effective treatment options for ADHD. The most typically prescribed treatment is medication. Stimulants such as methylphenidate and amphetamines are the most common type of medication used for treating ADHD. According to Pliszka (2007), two of every three patients treated with a stimulant medication positively respond. A few non-stimulant medications, such as atomoxetine, guanfacine, and clonidine, are also used to treat ADHD. For many children, ADHD medications reduce hyperactivity and impulsivity and improve their ability to focus, work, and learn. Side-effects from ADHD medications can become troublesome for students diagnosed with ADHD. The most commonly reported side effects are loss of appetite and insomnia.

### **Academic Performance of Students with ADHD**

Research indicates that students with Attention Deficit Hyperactivity Disorder experience greater academic and socialization difficulties than students without ADHD. McConaughy, Volpe, Antshel, Gordon, and Eiraldi (2011) set out to compare the academic performance and social behaviors of 6 to 11 year olds with and without ADHD. Their study differed from previous research in a few different ways. First, participants with ADHD were not only compared to control groups, they were also compared to children who were referred to the study without ADHD. Second, in addition to standardized measures and cognitive achievement, parent/teacher rating scales of academic performance and social behavior were incorporated into the study. Next, certain demographic variables such as gender, socioeconomic status, and



ethnicity, along with full scale IQ, were tested for predictors of participants with and without ADHD. Lastly, no participant in this study was taking medication for ADHD at the time of the study. 125 boys and 53 girls were chosen from mental health facilities and public/private schools in New York, Pennsylvania, and Vermont. These 178 qualifying participants fit into 1 of three diagnostic groups: ADHD, non-ADHD, and a control group.

The ADHDRS-IV (DuPaul et al., 1998) was used to interview parents and teachers. It is an 18 item rating scale assessing inattention, hyperactivity, and impulsivity. The Diagnostic Interview Schedule for Children (DISC-4) (Shaffer et al., 2000) was used to interview parents regarding ADHD along with other conduct disorders such as ODD (Oppositional Defiance Disorder) . Another measure used for parents included the Child Behavioral Checklist for Ages 6 to 18 (CBCL) (Achenbach & Rescorla, 2001) to assess Activities, Social, School and Total Competence. The Social Skills Rating System (SSRS) (Gresham & Elliot, 1990) was administered to parents and teachers to assess social skills, problem behaviors, and academic performance for kindergarteners through sixth grades. Academic performance was measured using the Teachers Report Form (TRF) (Achenbach & Rescorla, 2001). The WISC-IV was used to measure cognitive ability and the WIAT-II was used to measure academic achievement.

Using parent and teacher rating scales, McConaughy et al (2011) concluded students with ADHD have deficits in both academic and social domains. It is not only important to intervene where social behaviors are concerned regarding students with ADHD, it is also critical to directly address the academic deficits as well. Students with ADHD score significantly lower on standardized achievement tests as well as parent/teacher rating scales than students who do not have ADHD. More specifically regarding mathematical problem solving and calculation skills, Lucangeli and Cabrele (2006) provided a comprehensive review of the studies focused on

students with ADHD. They felt it was important to investigate this topic because most of the research in the area of ADHD deals with reading performance. As well, the current trend of mathematics instruction is being overhauled on a national level. Children diagnosed with ADHD inattentive type perform poorly on word problems which contain extraneous information (Marzocchi et al, 2002). This may be due to the amount of working memory the extraneous information takes up in the mind of an ADHD child. Regarding calculation skills, Zentall et al (1994) studied accuracy and speed in relation to behaviors such as vocalizations, head movements, and bottom movements of boys with ADHD in elementary school. Their results indicated students with ADHD were slower in number recognition.

ADHD is typically thought of with regards to children at the elementary levels; however, research suggests that symptoms of ADHD can manifest themselves regarding academic performance through adolescence. Birchwood and Daley (2012) sampled 324 participants, aged 15 and 16 in the United Kingdom to measure ADHD, anxiety, depression, motivation, and general cognitive ability. All participants completed questionnaires regarding current ADHD status (The Adult ADHD Rating Scale) (AARS; Barkley & Murphy, 1998), past ADHD (The Wender Utah Rating Scale) (WURS; Ward, Wender, & Reimherr, 1993), anxiety and depression (The Hospital and Anxiety Depression Scale) (HADS; Zigmond & Snaith, 1983), aggression (The Aggression Questionnaire, short form) (AQ; Bryant & Smith, 2001), and motivation (Inventory of School Motivation) (ISM; McInerney, Marsh, & Yeung, 2003). Participant's cognitive ability was measured through the Raven's Standard Progressive Matrices cognitive test (Raven, Raven, & Court, 2000) and academic performance was measured using pupil's standardized test results. The results of this research indicate student's with higher ADHD scores on the self-report questionnaires reported more problems across various domains like

anxiety, depression, and aggression. Furthermore, these students achieved lower academic grades.

ADHD in adolescence also manifests itself in delinquency, which is conduct that is not in accordance with the law. Sibley, Pelham, Gnagey, Waschbusch, Biswas, MacLean, and Babinski (2010) found in their follow up study of 8 year old males with ADHD, who were later contacted between 11 and 25 years of age, only about 30% of individuals completely abstained from delinquent offenses at any severity level. Results from this study also indicate individuals with ADHD commit a wider variety of delinquent acts at an earlier age than other groups with ADHD combined with Oppositional Defiance Disorder (ODD) and Conduct Disorder (CD).

### **Intervention Strategies**

A number of intervention strategies have been implemented to improve the academic performance of students who exhibit attention deficit behaviors. DuPaul, Weyandt, and Janusis (2011) reviewed the research on effective intervention strategies regarding Attention Deficit Hyperactivity Disorder (ADHD) in the classroom. The purpose of their research was to describe effective behavioral interventions for children with ADHD, academic interventions, and the need to incorporate communication between home and school for struggling students. Posting and consistently reviewing positively stated classroom rules is a simple way to modify a student's environment. Once rules have been established, and consistently followed, revising rules may be necessary. Children with ADHD may need to have rules posted on their desk and should receive frequent praise if they are following rules (Pfiffner, Barkley, & DuPaul, 2006).

Another strategy described by DuPaul, Weyandt, and Janusis (2011) is reducing task demands. A student's assignment length should match their attention span. If a student exhibits success on a shorter assignment, length can then increase. Choice is a motivating factor for

students with ADHD. Students who are offered assignment choices or partner choices often display fewer disruptive behaviors during their work (Dunlap, DePerczel, Clarke, Wilson, Wright & White, 1994). Academic interventions for students with ADHD include direct instruction of remedial skills. The use of technology in math (Mautone, DuPaul, & Jitendra, 2005) and reading (Clarfield & Stoner, 2005) leads to substantial improvements in on-task behavior and academic performance for students with ADHD in comparison to written seatwork situations. Finally, communication between home and school is a crucial piece for the success of students with ADHD. Communication journals, daily report cards, and self-monitoring sheets are all forms of communication that can be sent home with students for daily parental review.

### **Self-Management**

Self-management is a student's ability, often without cognitive effort, to control their behaviors and adapt them in certain situations. Students with emotional and behavioral disorder (EBD) have difficulty displaying appropriate behaviors in academic and social settings. These students, along with students who do not have EBD show positive effects from learning self-management strategies (Niesyn, 2009). There are various strategies that come under the self-management umbrella. Some of them include self-monitoring, self-instructions, goal setting (Mooney, Ryan, Uhing, Reid & Epstein, 2005) and self-reinforcement (Patton, Jolivet, & Ramsey 2006).

Self-monitoring is highly researched (Cooper, Heron & Heward, 2007) and has been shown to be effective for students at all grade levels (Reid, Trout & Schartz, 2005). It is important for a student to be able to recognize when they behave inappropriately and if they understand why their behavior is inappropriate in order for self-monitoring to be successful. Students set behavioral goals (goal setting) as a part of their self-monitoring intervention.

Having students graph their behaviors is one way to give focus to target behaviors. Once targeted behaviors are identified, students can be taught to keep track of these behaviors in various ways using agendas or monitoring forms. These tools can help students keep track of the frequency of their behaviors as well as duration. Once students learn to self-monitor independently, they can be monitored for progress. For example, if a certain target behavior is diminishing or completely distinguished, that behavior can be replaced for a different target behavior. The goal for self-monitoring is to teach students to monitor their behaviors without agendas, graphs, or forms.

Self-instruction interventions teach students to use statements to direct their behavior and have produced positive effects in terms of improving academic achievement of students with emotional and behavioral disorders (Mooney, Ryan, Uhing, Reid & Epstein, 2005). These interventions focus on “self-talk”. Attention focusing statements such as “If I want to do this, then I need to do this” are statements students can make to themselves in an effort for them to focus on positive behaviors during a given academic task. Problem defining statements (questions) can be taught to students so they ask themselves a set of questions to help them understand the appropriateness or consequences of their behaviors. These questions are also categorized by a stop and think behavior or think before you speak strategy.

Self-monitoring has been shown to be highly effective for students who lack inhibitory control when coupled with self-reinforcement (Slusarek, Velling, Bunk & Eggers, 2001). When an individual self-reinforces, they are rewarding themselves for reaching a targeted behavior or criterion. Rewards usually come in the form of tokens or points which can later be traded in for a bigger reward such as extra time on the playground or on the computer. Through meta-analysis, self-reinforcement strategies, when coupled with self-monitoring strategies, have been

shown to have a promising outcome for students with ADHD (Mooney, Ryan, Uhing, Reid and Epstein, 2005).

### **ADHD and Self-Management**

Students with ADHD experience difficulty maintaining attention and sitting still. They exhibit impulsivity and hyperactivity which means they may have a difficult time listening to instructions or find it hard to keep quiet while a teacher is delivering important material either verbally or non-verbally. Medication has been shown to have a positive effect on the parts of the brain that control executive functioning skills such as the ability to maintain control (Stahl and Mignon, 2009). However, current recommendations include medicinal interventions being coupled with behavior modification interventions for optimal outcomes regarding ADHD in school settings (Bussing, Gary, Leon, Wilson, & Reid 2002).

Barry and Messer (2003) found implementing self-management strategies in the classroom with students diagnosed with ADHD who were taking medication resulted in diminished off-task behaviors, reduced disruptive behaviors while academic performance increased. All of the six participants in this study (5 Caucasian sixth grade boys) were described as having impaired attention spans and rarely completed in-class assignments. Each student created personal menus that listed reinforcements motivating to them. Included were stickers, snack foods, and preferred classroom activities such as increased computer time or recreational time.

In the A phase of the study, on-task behaviors, academic performance, and disruptive behaviors were recorded by the classroom teacher or aide. Verbal praise was offered during this phase if on-task behaviors were sustained for at least 15 minutes. The teacher also offered verbal praise at the end of the day if 75% of responses were correct on completed academic

performances. In phase B of the study, self-management training was implemented for all 5 participants. Target behaviors were identified through individual teacher/student interview during center time. Behavioral goals were set and reinforcements were negotiated. During modeling and practice, students were taught to use self-instruction questions to direct their behaviors during data recording times that took place every 15 minutes for initial implantation. Verbal prompts every 15 minutes were faded to a written prompt on the blackboard. These written prompts then faded to every 30 minutes. At the end of the month, students were being prompted every 45 minutes with a written prompt. Across all phases of this study, student's on-task behavior and academic performance improved. These findings supported previous research regarding self-management having positive student outcomes when coupled with ADHD medication.

Blood and Johnson (2011) found there is strong evidence for the effectiveness of video modeling when it is coupled with self-monitoring strategies. A single subject design was implemented to investigate the difference between the effects of video modeling on a ten year old boy who was frequently off task exhibiting disruptive behaviors versus the effects of video modeling combined with self-management strategies. A 10-year-old male 5<sup>th</sup> grade student who was abandoned at birth in a Russian hospital was the focus of this study. The student was diagnosed with Fetal Alcohol Syndrome, Complex Post Traumatic Stress Disorder, and Attention Deficit Hyperactivity Disorder. His Full Scale IQ score on the WISC-IV was 82 and as a result, he received special education services in math, reading, language arts and writing. Accommodations were made for the student in science, social studies, and special area classes. At the time of the study, he was having difficulty relating to peers socially. The student was

subsequently assigned to a modified recess with only one or two of his peers in which he was able to get along with on the playground.

An iPod Touch was used to incorporate video modeling. This strategy was based on recent research suggesting handheld computers, when used as prompting systems, are effective for prompting independent correct responding among individuals with developmental disabilities (Van Laarhoven, Johnson, Van Laarhoven-Myers, Grider&Grider, 2009). In addition to video modeling, a self-monitoring strategy was taught using a form which displayed happy faces for on-task behavior and sad faces for off-task behavior.

In order to diminish the student's disruptive behaviors, he was shown a video of his peers who were exhibiting appropriate behaviors during a math lesson. He was also shown videos of him during math lessons and asked to differentiate between on/off task behaviors. This was implemented in order to help him self-monitor correctly when video monitoring and self-monitoring were combined. As a result, the student responded positively to the video modeling intervention, however, his improved behavior was inconsistent. After video modeling was combined with self-monitoring, the student consistently exhibited on-task behavior with diminished disruptive behaviors.

Rhode, Morgan, and Young (1983) reported positive outcomes for students with identified behavior disorders utilizing self-monitoring strategies combined with self-evaluation strategies. Replication studies have been conducted regarding their technique and although not all student populations targeted during replication studies were ADHD specific, participants did exhibit behaviors which could be regarded as ADHD behaviors (Smith, Young, Nelson, & West, 1992; Smith, Young, West, Morgan, & Rhode, 1988). Rhode et al. (1983) developed a self-management intervention widely used by the Lehigh University-Consulting Center for



Adolescence with Attention Deficit Disorder (LU-CCAADD), an organization developed through a grant from 1992-1995 by the U.S. Department of Education. LU-CCAADD worked on a consultative basis with middle school personnel to implement programs geared towards education of the core knowledge of ADHD, physiology, and treatment. Part of the consultation included 15 days of on-site services where Rhode et al. (1983) incorporated their intervention technique.

During the baseline phase of the study, teachers were asked to identify target behaviors for students which could be academic or non-academic. Using a numerical scale, the teachers then rated student's target behaviors during a designated 60 minute interval of academic instruction. The 60 minute interval was divided into four 15 minute sections. At the end of each 15 minute interval, teachers were asked to rate target behaviors as consistently as possible. During phase 2 (Teacher Management), the teacher informs the student of their ratings. The ratings are accumulated for points in exchange for rewards from a menu which was compiled by teacher and student earlier. Ratings are graphed and discussed with student. This phase continued until higher ratings were achieved for a few days in a row. During phase 3 (Matching) of the study, student's rated their own behaviors at the end of each interval while the teacher continued rating as well. If teacher/student rates matched exactly, students are rewarded with points to match their rate plus one bonus point. A 1 point discrepancy earned a student the points of their rate with a discussion regarding the difference in rates. If a student's rate was more than 1 point away from the teacher rate, they earned 0 points during the interval. Students learned to accurately judge their own behavior in regards to another's expectations during this phase.

Phase 4 of the study (Fading to Self-Management) incorporated two techniques. First, frequency of ratings between student and teacher was diminished by having rate comparisons drop from 100% to 75% to 50% and so on until matching was discontinued. At the same time this matching reduction is taking place, the interval time is lengthened. For example, the 15 minute interval is increased from 15 minutes to 20 minutes to 30 minutes and so on until there is one rating session at the end of the 60 minute period. Phase 5 of the study (Complete Self-Management) is when the student did not require teacher rates or back up rewards. Oral rates are substituted for written rates which are faded out to occasional prompts from the teacher telling the students to think about how they behaved during the time period.

An adaptation to this study, implemented in two case studies with 12 year old boys diagnosed with ADHD and learning disabilities (Shapiro, DuPaul, and Bradley-Klug, 1998) included the teacher providing 5 target behaviors where a student could circle a “yes” or “no” response for the rating purpose. Yes responses included a point value. Both participants showed substantial reductions in behavior problems reported on a teacher rating scale.

## **Summary**

After a review of the literature regarding Attention Deficit Hyperactivity Disorder a few things are clear. The causes of ADHD include genetics, neuropsychological factors, and environment. ADHD is linked with autism spectrum disorders as well as behavioral disorders. Symptoms of ADHD include inattention, hyperactivity, and impulsivity. Students who exhibit these tendencies have a more difficult time keeping up with the rigorous demands of a classroom setting. They are often unfocused and become frustrated easily. This results in a struggle for the ADHD student when it comes to their academic work completion, organization, and general ability to achieve success in a classroom setting.

Diagnosing ADHD takes into account several areas of concern and many people play a part in the process. Strict guidelines should be followed by doctors, psychiatrists, and therapists to reduce over-diagnosis of ADHD. Medication is the first line of treatment regarding ADHD, however, research suggests medication coupled with behavior management plans result in better outcomes for students than with medication alone.

Involving students in managing their own behavior can have positive effects on academic outcomes. A review of effective intervention strategies for students with ADHD suggest manipulating a student's environment will show positive results for behavior modification. Video modeling, as a means of reducing ADHD behaviors, is effective in improving off task behaviors during classroom instruction for students with ADHD. Self-management strategies have a high success rate for students with ADHD regarding behavioral outcomes as well as academic outcomes.

This study will show the effects self-management strategies have on academic performance in math. By comparing student's average math scores in classwork and chapter test scores pre, during, and post intervention, the results will show if the intervention had positive results for students with ADHD. By comparing pre and post teacher report forms, it will also show results regarding behaviors associated with ADHD. This research may also lend itself to answering the following questions:

- What effect does self-management have on academic outcomes in math?
- Does self-management have an effect on the behavior of students who exhibit ADHD tendencies?

## Chapter 3

### Methodology

#### Setting and Participants

The school in which the participants in the study attend is considered an “upper elementary” school which houses grades 4 through 6. There are currently 5 classrooms at each grade level with 454 students on role. The district is considered “low income” by the state department of education in that 58% of the entire enrollment is considered economically disadvantaged. According to the state department of education, 65.2% of the districts population is Black, 19.2% of the population is White, 11.9% is Hispanic, 2.6% is Asian and .9% is Other. 34% of the population has been absent from school between 6 and 15 days. In 2013, the district’s transient rate was 35%.

In total, 2 fourth grade students took part in the study. Student A is a 9 year old male African American and is described by his teacher as behaviorally extreme. He “bounces” into the classroom in the morning and often leaves the same way. Student A is often very happy and excited while he is eager to talk to everyone all of the time – including himself. He seeks approval from his peers, impulsively talking to them throughout instruction, often making comments of encouragement or explanation at inappropriate times. Student A will “shut down” in an extreme fashion when peers are upset with him or he receives consequences. He may exhibit this behavior for a short period of time or for the entire day. Student A can be drawn out of this pattern for a reward, however this is inconsistent. He is easily drawn to the inappropriate behaviors of his peers.

Academically, regarding math skills, Student A struggles with basic math facts.

Additionally, he struggles with concepts that involve a multi-step process such as long division

and sequencing. Student A will put his hood up and put his head down on the desk when he doesn't get his work correct. Student A was recently diagnosed with ADHD but not currently taking medication. He is, however, going through child study team evaluations to rule out any learning disability.

Student B is also a 9 year old African American described by his teacher as often fidgeting in his seat and playing with objects during instruction. He is usually engaged quietly with his peers having conversations during instruction about outside school topics such as wrestling. Student B shows little concern for academics. Physically he is described as thin and often comes to school "sickly". Student B responds well to "extra" attention and seeks approval from his teacher. He often seeks praise, however, when he does not get it immediately, he can quickly be defensive. Student B is often caught in lies regarding the day to day social and academic routines in the school setting. He is often caught being "sneaky" however he is not always made aware of this observation by his teacher.

Academically, regarding math skills, Student B has recently shown improvement with his basic math facts. He struggles with multi-step problems and accuracy. Student B will begin playing with objects rather than see a problem through to the end. Student B is not diagnosed with ADHD, however he has been recommended to the Intervention and Referral Team to start the process of identification for special education.

The setting for the intervention was a general education classroom during math instruction that took place in the morning for student A from 9:00am to 10:00am. Student B was taught and utilized the intervention strategy from either 12:00pm to 1:00 pm or 12:30pm to 1:30pm during math instruction. Students sat at individual desks during certain parts of each

math lesson and then moved to other areas throughout the room for either independent or group work.

**Variables**

The independent variable in the study was the intervention of self-management.

Students utilized pencils and a protocol with a list of 3 desired behaviors on it that was sectioned off in four segments to represent 15-minute intervals equaling an hour during math instruction.

The dependent variable in the study was the student’s academic performance regarding their math chapter assessments that was completed before and after the intervention was implemented.

Overall Rating Scale 1 (poor) to 5(excellent)	Interval 1	Interval 2	Interval 3	Interval 4
<ul style="list-style-type: none"> <li>·Talking at appropriate times (i.e. I raise my hand to speak)</li> <li>·Complete independent work accurately</li> <li>·Exhibit respectful group discussion skills (i.e. wait your turn to speak while you are listening to others attentively)</li> </ul>				

*Figure 1.* Independent Variable Rating Sheet

**Experimental Design**

This study has a single subject design involving two participants in which an investigation will present the effects of the independent variable (self-management) on the dependent variable (math test scores). Five phases of implementation took place over a four to five week span.

## Data Collection and Procedure

The teacher was asked to fill out the teacher report form from the Conner's Rating Scale (Conners, Sitarenios, Parker, & Epstein, 1998) pre and post independent variable implementation. Curriculum based math classwork and chapter assessments were used to measure the dependent variable pre and post implementation.

Phase 1, baseline, took place over five days starting on March 10, 2014. During phase 1, the teacher was asked to identify three desired target behaviors for each student. The target behaviors could be academic or nonacademic related. A numerical scale was established for the teacher to rate these behaviors on a scale of 1 to 5 – 1 being poor and 5 being excellent. The teacher was asked to rate the students behavior overall performance regarding the target behaviors 4 times, every 15 minutes during an hour of math instruction. These ratings were not shared with the students during the baseline phase.

Phase 2, teacher management, took place over four days starting on March 17, 2014. During this phase, the students were taught the rating scale and made aware of the target behaviors. The teacher continued to rate target behaviors and the students were verbally informed of their overall rate at the end of each interval. The rates were accumulated as points and exchanged at the end of the period for back up rewards. The ratings were graphed and shared with the student.

Phase 3, matching, took place over 6 days starting March 24, 2014. Student's moved through the phases only until at least three days of consecutive desirable ratings were matched. During this phase, the students were asked to rate their own behavior at the end of each interval using their self-management sheets as the teacher continued to rate as well. The students were signaled with the sound of chimes coming from an iPhone at the end of every 15 minute interval.

The ratings were quickly compared and a brief explanation took place if there was a discrepancy between the teacher and student rates. If a perfect match was made, the students earned points to exchange for back up rewards at the end of the hour lesson.

During Phase 4, fading to self-management, the teacher and student continue to rate at the end of each interval, however; the frequency the teacher and student compare ratings is diminished at the teacher's discretion. The number of rating intervals is also decreased from four, to three, to two, and one.

Phase 5, complete self-management, took place for Student B, Student A did not make it to phase 5. During this phase, Student B was asked to orally rate himself at the end of the math lesson. Oral rates were then diminished to the teacher occasionally asking the student to think about how well they performed.



## Chapter 4

### Results

In this single subject, pretest-posttest design, the results of teaching self-management to students who exhibit ADHD behaviors are discussed regarding the effects on academic performance in math. The research questions answered were:

1. What effect will teaching self-management skills to elementary students who exhibit ADHD behaviors have on their academic performance?
2. Do self-management skills have an effect on behavioral outcomes?

The students were assessed in March of 2014 with curriculum based measures regarding classwork and chapter test scores prior to the intervention. Their teacher filled out the teacher report form on the Conner's Rating Scale. The intervention was implemented during the third marking period of reporting and data was collected regarding classwork and chapter tests. The students were assessed again with curriculum based measures after the intervention was complete and their teacher filled out the Conner's Rating Scale again as well.

#### Student Results

Figure 2 shows student A's math grades for classwork pre, during, and after intervention. Figure 3 shows Student A's test grades pre, during, and post intervention. Student A's classwork outcomes improved during the intervention and continued to improve following the intervention phase of the study. For test grades, Student A's performance during the baseline and intervention phases was inconsistent but improved following the intervention phase.

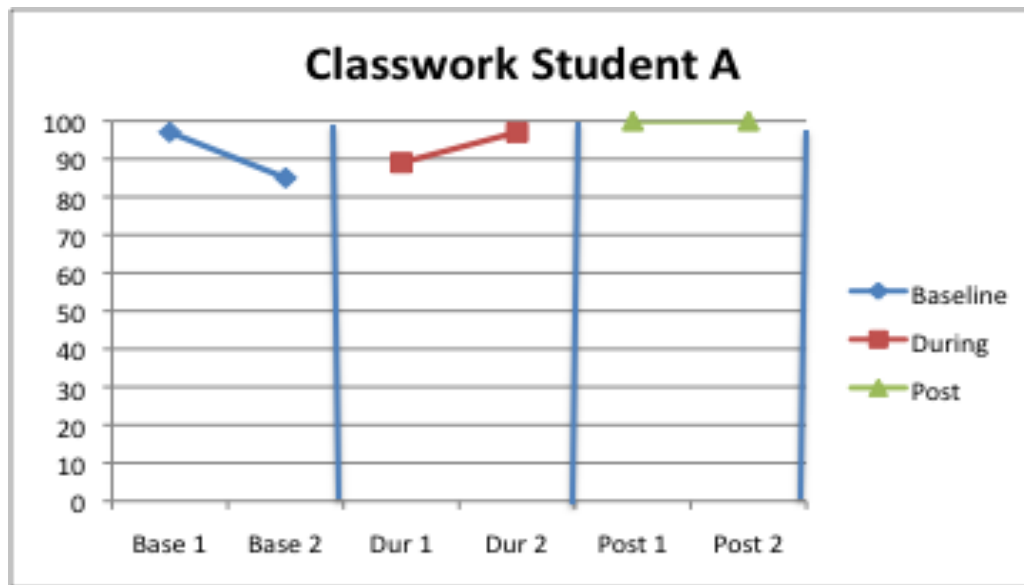


Figure 2. Classwork Results for Student A

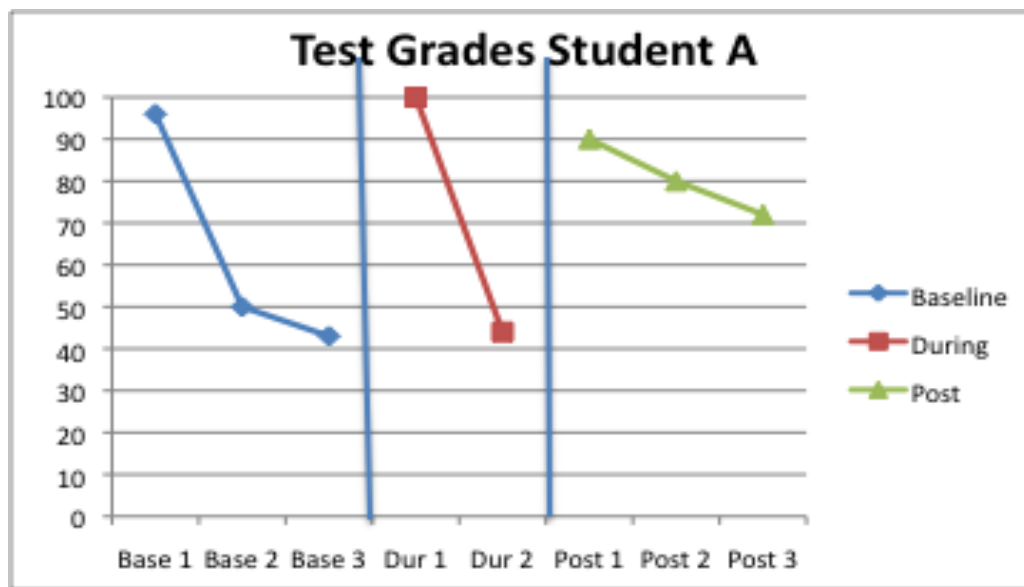


Figure 3. Test Results for Student A

Figure 4 shows student B's classwork pre, during, and after intervention. Classwork performance was good across each phase of the study but did improve slightly. Figure 5 shows Student B test grades pre, during, and post intervention. Student B y improved on test grades during the intervention phase, and maintained this profess following intervention.

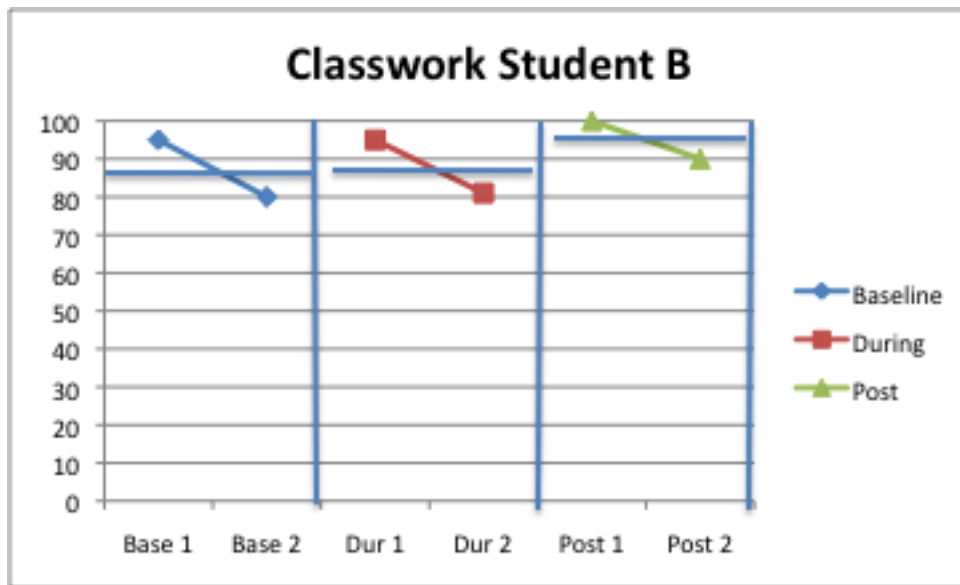


Figure 4. Classwork Results for Student B

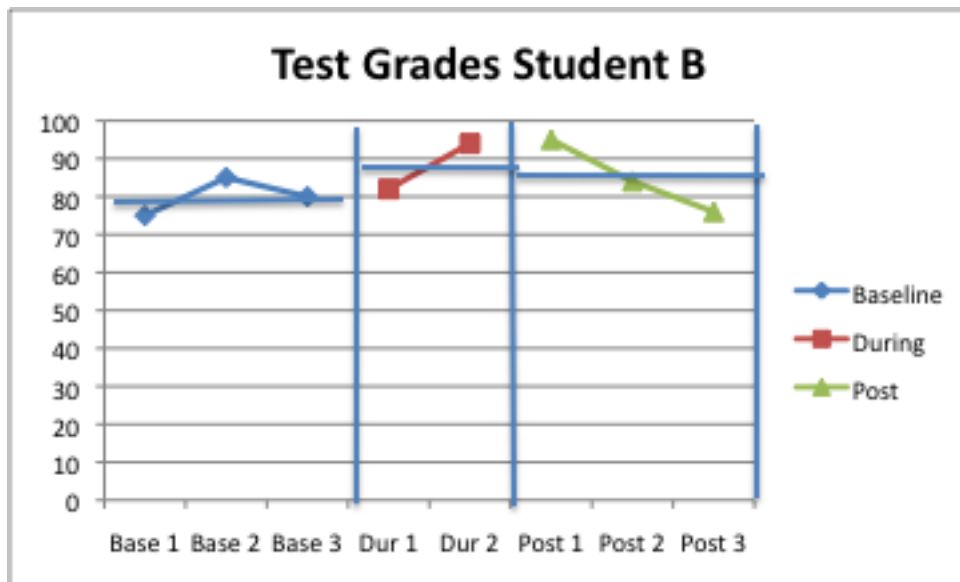


Figure 5. Test Results for Student B

Table 1 shows teacher report results on the Conner’s Rating Scale (1998) for Student A pre and post intervention. The Conner’s Rating Scale is an instrument used by doctors, educators, and child study teams to evaluate, diagnose, and treat children with attention deficit hyperactivity disorder (ADHD).

Table 1

*Student A Conners 3 – Teacher Report*

Student A	Baseline	Post Intervention
Inattention	75	61
Hyperactivity/impulsivity	≥90	74
Learning Problems/Executive Functioning	86	59
Defiance/Aggression	86	72
Peer Relations	62	56

*Note.* 70+ = very elevated 60-69=elevated 40-59=average

For Student A, the Conner's Rating Scale results indicate that on the inattention subscale, the student made improvement by moving from a very elevated level to an elevated level. Hyperactivity/impulsivity remained in the very elevated level while the most significant improvement for Student A was made in the area of learning problems/executive functioning decreasing from a very elevated level to an average level. This suggests self-management not only helped to improve Student A's academic outcomes in math, it improved his functioning in the classroom regarding skills to include planning, organizing, strategizing, remembering details and managing time and space. All of which are necessary for successful classroom environments. Student A's aggression and defiance remained at the very elevated level while peer relations improved from a very elevated level to an average level.

Table 2

*Student B Conners 3 – Teacher Report*

Student B	Baseline	Post Intervention
Inattention	68	59
Hyperactivity/impulsivity	89	62
Learning Problems/Executive Functioning	65	55
Defiance/Aggression	86	72
Peer Relations	50	50

*Note.* 70+ = very elevated 60-69=elevated 40-59=average

Student B's behaviors, as measured by the Conner's Rating Scale – teacher report form, showed the most improvement in the area of hyperactivity/impulsivity moving from the very elevated level to the low end of an elevated level. Student B's inattention improved through self-management from an elevated level to an average level. Learning problems/executive functioning skills improved for Student B, however; defiance/aggression and peer relations stayed in the same level.

During Phase 1 (baseline) of the intervention, the teacher rated the student's target behaviors on a scale of 1 to 5, 1 being poor and 5 being excellent every 15 minutes during a one hour math lesson. The target behaviors were the same for both students and included talking at appropriate times, completing independent work accurately, and exhibiting respectful group discussion skills. During Phase 1, the students were unaware of teacher ratings. During Phase 2 of the intervention, the students were taught the rating scale and made aware of their target behaviors, as well as what the teacher was rating their overall performance at the end of each 15 minute interval. During Phase 3, the students were asked to rate themselves in the same fashion

their teacher was rating them in order to match their teacher ratings. Below are the results for each student regarding the rating scales.

During baseline of the intervention, the teacher was rating each student's overall performance regarding their three target behaviors giving them a 1 for poor performance and a 5 for excellent performance four times in one hour at fifteen minute intervals during a math lesson. The students were not made aware of teacher rates during the baseline phase. In Phase 2 of the study, the students were taught the rating system and their target behaviors were revealed. Behavioral parameters were discussed as to how the students could earn high rates. At the end of each fifteen minute interval, the students were verbally made aware of the teacher's rate during this phase. During Phase 3 of the study, the teacher continued to rate at fifteen minute intervals and the students rated themselves as well to see how close they could match the teacher's rates.

The teacher's ratings for Student A's target behaviors of talking at appropriate times, completing independent work accurately, and exhibiting respectful group discussion skills appear in Figure 6. In examining Student A's rates, during baseline, his overall performance regarding his target behaviors was poor. During Phase 2 of the intervention, his awareness of his teacher rates along with token reinforcement was enough to enhance his performance. After a few days of being aware of his own behaviors, student A was able to show an overall improvement in his behavior when he was rating himself and trying to match his teacher rates.

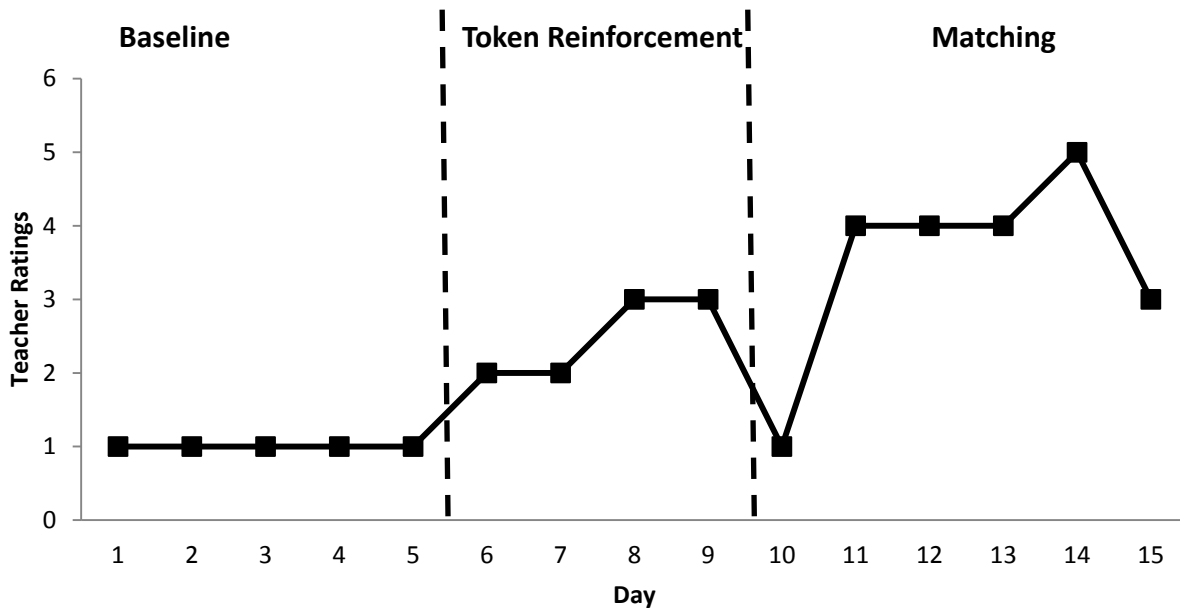


Figure 6. Teacher Ratings on Target Behaviors for Student A

The teacher’s ratings for Student B’s target behaviors of talking at appropriate times, completing independent work accurately, and exhibiting respectful group discussion skills appear in Figure 7. In examining Student B’s ratings, his overall performance during baseline was poor to fair. Once Student B was made aware of his ratings and was reinforced with tokens in Phase 2, he made significant improvement. Student B remained motivated regarding his behaviors during Phase 3 where he was trying to match his teacher’s rates. Both students showed improved overall behavior once they were made aware of these behaviors and were reinforced with tokens, however; Student B showed a more significant and consistent improvement.

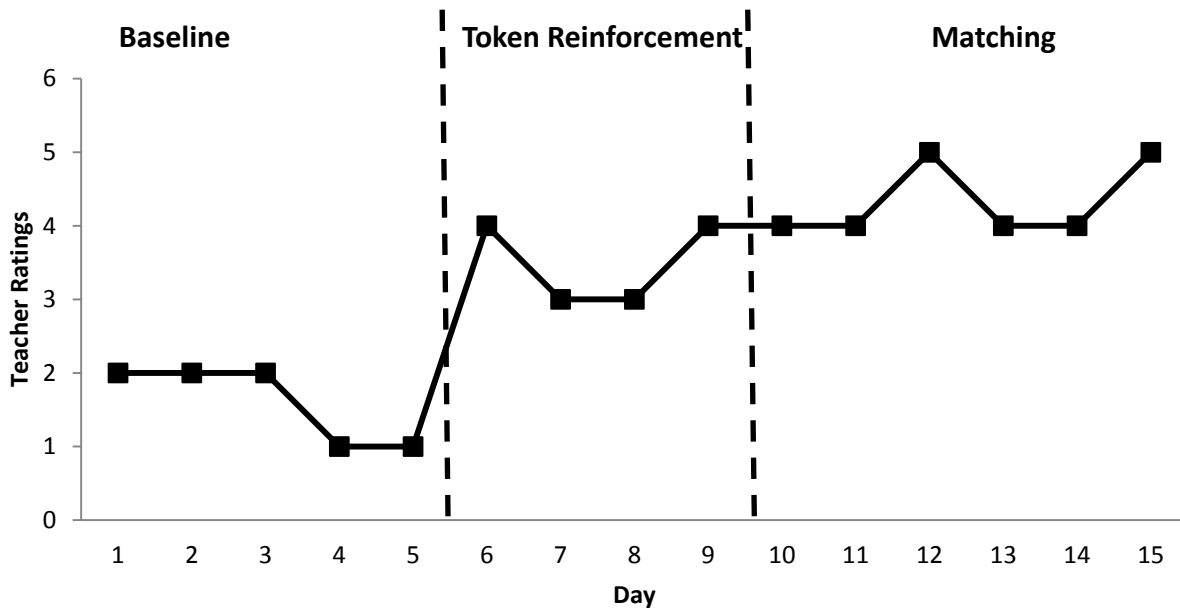


Figure 7. Teacher Ratings on Target Behaviors for Student B

Overall for both students, regarding typical ADHD behaviors rated by the teacher on the Conner’s Rating Scale, improvement was made through the use of the self-management intervention. Additionally for both students, regarding the rating scale directly focused on specific desired behaviors critical for classroom success, improvement was made during the hour math lesson in Phase 2 and Phase 3 of the intervention. The results from the rating scales indicate bringing awareness and specific teacher attention to undesirable behaviors is enough to change them on a consistent basis provided the student is directly involved in the process.



## Chapter 5

### Discussion

#### Review

This study examined the effect that teaching self-management skills to students with attention deficit hyperactivity disorder (ADHD) had on academic outcomes regarding math performance and target behaviors. The participants in the study were two fourth grade boys, both of which were nine years old. The school they attend is in a low income district in a suburban setting in southern New Jersey. This study had a single subject design which utilized curriculum based assessments regarding student's average classwork grades and average chapter test grades pre, during, and post intervention.

Teaching self-management skills proved to be effective for both students. Both participants in the study showed consistent academic improvement regarding their math classwork grades as well as math test grades. In addition, teaching self-management skills proved to be effective for behavioral outcomes during math instruction in a regular education setting. It was hypothesized that involving students in the active participation of self-management, academic outcomes would improve as well as behavioral outcomes. This hypothesis was confirmed as a result of the intervention.

Student A showed consistent improvement in both math classwork averages as well as chapter test grades from baseline phase to post intervention phase. Regarding behavioral outcomes, two indicators were used. Pre and post teacher reports from The Conner Ratings Scale indicated improvement for Student A regarding his classroom functioning skills to include planning, organizing, strategizing, remembering details and managing time and space. Teacher rating scales were also utilized to teach self-management and in Student A's case, these

scales showed improvement regarding Student A's target behaviours. Student B showed consistent improvement regarding math classwork grades; however, he was inconsistent with improved test scores. It is notable that even though Student B's tests scores did not increase consistently, the grades fell in a desirable range. The Conner's rating Scale teacher reports for Student B showed the most improvement in the area of hyperactivity/impulsivity. His inattention improved as well as learning problems/executive functioning skills through learning self-management. Although the end of the third marking period precluded the achievement of total self-management for Student A, the intervention was viewed as highly successful for both students by their math teacher.

A study of five sixth grade boys diagnosed with ADHD and taking medication reported positive results regarding self-management (Barry and Messer, 2003). Using an ABABAB design, a self-management intervention was used to teach students to monitor behaviors such as physical disruptions, talking out of turn, and inability to stay in a designated area. In this case, by reducing disruptive behaviors, academic performance increased as well. In 1983, Rhode et al. set out to improve student behavior through teaching students self-evaluation skills. In this study, student behaviors improved in a resource room setting. These improved behaviors were also generalized for the regular classroom. In comparison to the previous research, the results of this study with fourth grade boys who exhibit ADHD tendencies in a regular education math setting, behavioral outcomes increased as well as academic outcomes.

### **Limitations**

Although the regular education math teacher agreed with the effectiveness of teaching self-management skills to students who exhibit ADHD tendencies, the procedures implemented were limited by some factors. First, the practicality of classroom implementation, given the

multitude of teacher responsibilities in a one teacher model, is questionable. The classroom teacher in this study started thinking she would be able to incorporate this strategy with five or six individuals simultaneously. It soon became apparent, during baseline implementation; it would only be practical to focus on one student in her morning math class and one in her afternoon class. Certainly, in a team teaching scenario or in a classroom with a paraprofessional, implementation on a broader basis would be possible. Perhaps if, in a single teacher classroom, each student was taught self-management on an individual basis starting in September, total self-management could be achieved for the entire class before Christmas break.

Another limitation to the study is the subjectivity in teacher ratings. Students who exhibit ADHD behaviors may display a higher rate of defiance and aggression. This should be taken into consideration when ratings are assigned using the model proposed in the study. It may be for a high number of these students, a four or a five will be impossible for them to attain at any phase of the study depending on what the teacher's expectations are as far as behavior is concerned. If a regular education teacher, who has had limited exposure to special needs children, particularly the ones diagnosed (or not) with ADHD, implements the rating scale and expects these students to meet her ratings of fours or fives, failure is eminent.

### **Practical Implications**

Most classroom teachers are going to encounter students who exhibit ADHD behaviors whether they are diagnosed or not. Many of these children who are diagnosed will not be in a combination treatment of medicine and individual/group therapy. Their behaviors will have profound impacts on their own education, both academically and socially, as well as the education of their typically developing peers. The intervention in this study showed positive results for two fourth grade students in a regular education classroom with one teacher during

math instruction. The intervention was time intensive in phases one, two, and three. When Student B moved away from matching his teacher rates on a less frequent basis and moved towards total self-management, time became less of an issue. With that being said, the teacher partaking in this study felt the benefits outweighed the issues of added responsibility on her part. It made for a more conducive learning environment for both students during her math class. Both students gained specific attention from the teacher that lent itself to an emotional connection for the boys. Regarding their home lives, this was extremely important for them to experience while at school.

### **Future Studies**

More research in the area of self-management should include students who are formally diagnosed with ADHD and specifically being treated with a combination of medicine and therapy. Since this is not typically the case, more research can also incorporate students who are being taught to utilize self-management techniques across subjects and teachers regarding their academic schedules. Additionally, studies can incorporate nonacademic areas as well such as physical education, music, and art. Many students are exposed to a variety of settings and personnel throughout their school day. Further research may also study the use of self-management on a broad level to include whole school implementation.

### **Conclusion**

In this study, two questions were to be answered. First, what effect would teaching self-management skills to students who exhibit ADHD tendencies have on academic outcomes regarding math performance? Results of this study indicate improved math scores regarding classwork and chapter test averages for both participants. Second, what effect will self-management skills have on behavioral outcomes? Both participants showed improvement

regarding their ADHD tendencies target through teacher reports on the Conner's Rating Scale and with their target behaviors via the intervention rating scale used throughout the study's phases. These results suggest the intervention of teaching self-management can be used for any student struggling with behaviors in a regular education setting.

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