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Do Direct Behavior Rating-Single Item Scales (DBR-SIS) Help Students With Attention Deficit Hyperactivity Disorder Self-Regulate?

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DO DIRECT BEHAVIOR RATING-SINGLE ITEM SCALES (DBR-SIS) HELP STUDENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER SELF-REGULATE?

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ABSTRACT

As accountability of teachers has been pushed to the forefront, it has been speculated that tolerance for students with behavior problems will dissipate (Menzies & Lane, 2011). Strategies that are efficient and effective are needed to help monitor behavior change and to help students learn to regulate their behavior. Attention-Deficit/Hyperactivity Disorder (ADHD) is the most common disorder of self-regulation (Barkley, 1997). An estimated three million children in the United States take medications for attention and behavior problems associated with deficits in self-regulation (Olfson, Marcus, Weissman, & Jensen, 2002). Self-regulation interventions have been proposed as methods that are effective in increasing students' attention and productivity. This study examined the effects of a student-directed self-regulation intervention on the classroom behavior of students with ADHD in the general education setting. The purpose of this study was twofold. First, the study investigated the utility of Direct Behavior Rating-Single Item Scale (DBR-SIS) as a self-regulation intervention in elementary and middle school students with ADHD. Second, teacher perceptions about the acceptability of DBR-SIS as an intervention for self-regulation were explored.

To determine the effects of the DBR-SIS self and DBR-SIS feedback interventions on students' development of self-regulation and students' academic and behavior performance, a series of sixteen 2 x 2 split plot Analysis of Variance (ANOVA) models were used. The between-subjects independent variable was study condition with two levels, DBR-SIS self and the DBR-SIS feedback. The repeated measure independent variable was time of testing with two

levels, pre-test and post-test. The CAt-C scales Attention (ATT). Impulsivity (IMP), Hyperactivity (HYP), Internalizing (INT), Externalizing (EXT), Personal (PER), Academic (A/O), and Social (SOC) served as the dependent variables. ANOVA results indicated no significant interaction for condition and time of testing (pre-post/post-test), no change from pre-test to post-test, and no difference between pre-test and post-test ratings for both student and teacher DBR-SIS self and feedback interventions conditions on ATT, HYP, INT, EXT, PER, A/O, and SOC.

There was a significant interaction between the DBR-SIS self and DBR-SIS feedback student conditions on CAt-C ratings of Impulsivity, $V = 0.24$, $F(1, 17) = 5.44$, $p = .032$. To determine the significance of the interaction, a Repeated Measures *t*-test was conducted. Results of the *t*-test indicated that although the DBR-SIS self and DBR-SIS feedback student conditions did not differ at pre-test, they did differ at post-test with the student DBR-SIS self condition reporting higher levels of impulsivity $t(9) = 2.81$, $p = .020$ than the student DBR-SIS feedback condition $t(8) = 1.10$, $p = .319$.

Pearson correlations did not indicate significant relationships between post-test scores in self-regulation skills as measured by the CAt-C scales of Inattention, Impulsivity, and Hyperactivity and the change from baseline to post-test on the three DBR-SIS behaviors (academically engaged, respectful, and disruptive) for student and teacher DBR-SIS intervention conditions. Independent samples *t*-test indicated teachers in the DBR-SIS self-intervention condition and teachers in the DBR-SIS feedback-intervention condition both perceived DBR-SIS as an acceptable intervention, with teachers in the feedback condition indicating a higher level of intervention acceptability. Levels of intervention acceptability were not significantly different

from teachers in the DBR-SIS self-intervention condition and teachers in the DBR-SIS feedback-intervention condition.

PREFACE

It is preferable to initiate interventions and supports for disorders of dysregulated behavior, such as Attention Deficit Hyperactivity Disorder (ADHD), at a young age in effort to avert some of the frustration, loss of self-esteem, and subsequent failure. Although immediate early intervention is often not possible, it is never too late to help a student. Often, the type of support needed does not require huge effort but rather small alterations to the typical school environment. Sometimes these small changes can lead to great changes.

Given that students with ADHD are found in nearly every school setting and experience a wide breadth of difficulties, classroom-based interventions are vital to helping students learn to survive in environments that demand goal-directed behaviors and above all, self-regulation. Despite the various barriers presented by ADHD for students in the school environment, the variety of scientifically based treatments and evidence-based interventions designed to diminish these challenges is growing.

This surge in ADHD research has contributed greatly to the selection of school-based interventions with simple teacher-and student-driven interventions at the epicenter. Such interventions have begun not only to help students with ADHD develop the skills needed to monitor, evaluate, and regulate their own thoughts and behaviors but also to grow their senses of self-efficacy as well. While the research on such interventions is fairly fresh and their effects in the literature often mixed, there is hope that these supports will help students with ADHD develop the skills to navigate the world successfully both inside and outside the classroom.

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A dissertation is not a sprint, it is a marathon.
A test of endurance, a measure of strength and sanity.

To those who started me on this path,
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Dr. MacDonald
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Dr. Hampton
My uncle
My sweetie
To a little grey cat

And to the innumerable confidantes who commiserated and celebrated each step,

This journey has ended,
It is time for a new path.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

SELF-REGULATION AND SCHOOL SUCCESS

Students with behavioral difficulties present a multitude of behaviors that may not only interfere with the learning process but also challenge general education classroom teachers (Espin & Foegen, 1996; Kamps, Wendland, & Culpepper, 2006). In addition to poor academic skills, students with behavior difficulties are less prepared for class, complete fewer assignments, have a higher level of distractibility, and demonstrate more off-task behaviors and general behavior problems in comparison to their peers (Espin & Foegen, 1996). Further, academic achievement may be limited by disruptive classroom behaviors such as poor social skills, attention problems, and noncompliance with directives. Increased accountability in the schools has prompted a movement to support students with learning and behavior difficulties. Models such as Response to Intervention (RTI) have been developed to help schools identify and provide early intervention for students experiencing academic and behavioral difficulties (Sullivan & Long, 2010). Inherent to this movement is the notion that students with learning and behavior difficulties need to be active participants in the decisions and interventions that affect their academic success (Ley & Young, 2001).

Strategies aimed at fostering self-regulation have been shown to improve problems with both academics and behaviors. Self-regulation can be broadly defined as students' abilities and efforts to monitor, manipulate, and enhance their own behaviors. Executive functions such as

self-awareness, self-monitoring, and self-evaluation are critical to effective self-regulation and school performance (Ley & Young, 2001). In schools, self-regulation is critical to success. Successful school adaptation requires students to self-regulate cognitions, behaviors, and emotions to help them attain their goals (Schunk & Zimmerman, 1997). Students who are able to self-regulate, select, and utilize strategies to attain self-set goals, continuously monitor and evaluate their progress, seek feedback from others, and adjust their strategies to optimize achievement and adaptive functioning (Clearly, Platten, & Nelson, 2008). Ramdass and Zimmerman (2011) have indicated that students who can engage in self-regulatory processes when completing academic tasks such as homework are generally more motivated and high achieving than students who are not able to engage in these processes.

Evidence suggests that some students may lack the skills or abilities to self-regulate more than other students do (Ley & Young, 2001). Self-regulation deficits are most noted in students with Attention Deficit Hyperactivity Disorder (ADHD) (Barkley, 1997; Olfson et al., 2002). Despite the increasing prevalence of students with ADHD in schools, limited research has focused on simple, effective, and student-driven interventions to help students develop self-regulatory skills (Barkley, 1997). Existing interventions for ADHD and self-regulation consist of external, teacher-conducted interventions. Such interventions may interfere with students' abilities to internalize the skills being taught, resulting in limited future use of the skills. This in turn may contribute to a sense of low self-efficacy for these students (Schunk, 1990).

Carta, Greenwood, Luze, Cline, and Kuntz (2004) have proposed that many of the current progress-monitoring tools may serve as interventions as well. It is speculated that Direct Behavior Ratings-Single Item Scales (DBR-SIS) may be an effective tool for helping students learn to self-regulate their behavior. DBR-SIS is a simple rating scale that requires a rater to

record the frequency with which a behavior occurred during a specified time period (Chafouleas, Sanetti, Jaffery, & Fallon, 2012). Progress-monitoring tools such as DBR-SIS warrant further exploration due to both their ease of use and student involvement in their use. Simple and effective student-driven interventions are needed to promote not only academic success but also success outside of the school setting as well.

CHAPTER 2

LITERATURE REVIEW

Historically, schools, and special education programs, in particular, have operated under a deficit model in which children classified with an educational disability were viewed as having behavioral deficits, excesses, or both. Once the behavioral excess or deficiency was identified and quantified, the student was determined eligible for special education services, and an Individualized Education Plan (IEP) was developed to address the presenting behavior problems (Gresham, 2007). Although the deficit model was helpful in identifying students who would benefit from special education services, it resulted in the over-classification of many students. The model was also problematic in that many of the difficulties students were experiencing were not identified early in their education, allowing the academic or behavioral difficulty to worsen over time (Hoover & Love, 2011). Further, this model was shortsighted in its utility for intervention strategies and their development, yielding interventions that were typically not connected to the assessment information and practice that focused more on procedural compliance than effectiveness (Gresham, 2007; Riley-Tillman, Kalberer, & Chafouleas, 2005).

Federal educational mandates such as the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) require schools to use evaluations in the process of determining children's initial need for and continuing eligibility for special education services (Volpe & Gadow, 2010). Specifically, the mandates allowed for educational flexibility by allowing

schools to monitor students' responses to instruction and intervention, making educational professionals less tied to earlier models of identification such as the deficit model and the discrepancy model (Hoover & Love, 2011). IDEIA (2004) holds that schools must monitor the progress and functioning level of students who receive special education services across academic, developmental, social, and behavioral domains to ensure that they are progressing toward their goals in these areas (Carta et al., 2004).

IDEIA (2004) resulted in the development and implementation of RTI in schools (Fuchs & Fuchs, 2006). RTI is a multi-tiered approach to help schools identify and provide early intervention for students experiencing academic and behavioral difficulties, help prevent the development of future academic and behavioral problems, and ensure that all students have sufficient opportunities to succeed in the academic setting (Sullivan & Long, 2010). RTI is composed of an assortment of techniques and procedures that can be used to determine if and how students respond to behavioral or academic interventions (Canter, 2006). The procedures and techniques used in RTI transition schools away from pre-referral processes and hold education professionals accountable for students' responses to academic or behavioral interventions (Hoover & Love, 2011; Riley-Tillman et al., 2005). In contrast to earlier models of special education, RTI is based on determining whether a change in academic or behavioral performance is the result of an intervention (Gresham, 2007). Alone, RTI is insufficient in determining eligibility for special education services; however, it does provide a mechanism through which students at risk for difficulties in school can access intervention services with or without being referred to special education (Canter, 2006).

RTI is used by teachers and other education professionals to determine whether students are benefitting from instruction and to identify students who may not be making adequate

progress (Hughes & Dexter, 2011). Early and effective interventions can alter the educational trajectories and reduce the likelihood of future difficulties for students with learning or behavioral problems (Aron & Loprest, 2012). Schools play a unique role in intervening with the academic and behavioral challenges that students present. Unlike other settings, schools are important in addressing issues that interfere with students' abilities to learn because they are one place where adults and children spend a significant amount of time together (Gresham, 2004). School-based interventions are founded upon the idea that providing services to address students' identified needs can avoid or alleviate the need for future services by reducing the effects of the difficulties that are interfering with the students' ability to learn (Aron & Loprest, 2012). The amount of time students spend in school and the structured and unstructured environments that help form the school day create numerous opportunities for intervention development and implementation (Gresham, 2004).

Response to Intervention

Response to Intervention (RTI) is a school-based, multi-tiered approach to the early identification and support of students with learning and behavior needs. In RTI, both academic and behavioral interventions are systematically provided on a continuum based on the students' levels of need. The interventions utilized in RTI are research-based and designed to address a specific need (Benner, Nelson, Sanders, & Ralston, 2012; Berkeley, Bender, Peaster, & Saunders, 2009). Typically, the interventions delivered in RTI do not consist of specific models, tests, or procedures, but evidence-based strategies that are implemented through a three-tiered model in which the interventions increase in intensity as students move through the tiers (Berkeley et al., 2009; Burns & Coolong-Chaffin, 2006).

The three tiers that comprise the continuum of interventions in RTI are simply referred to as Tier 1, Tier 2, and Tier 3 (Burns & Coolong-Chaffin, 2006; Hawken, Vincent, & Schumann, 2008). Tier 1 consists of universal interventions and refers to the fact that all students have access to evidence-based core curriculum in the general education setting (Burns & Coolong-Chaffin, 2006; Hoover & Love, 2011). Interventions in Tier 1 address deficits in basic academic or behavioral skills and are delivered by general education teachers in the general education environment (Berkeley et al., 2009). At the Tier 1 level, students participate in progress monitoring or benchmark assessments three times a year (Burns & Coolong-Chaffin, 2006). Students who do not demonstrate progress after receiving Tier 1 interventions receive further support in their areas of difficulties with Tier 2 interventions (Sullivan & Long, 2010).

In Tier 2, students continue to receive Tier 1 interventions as well as more targeted supplemental supports (Benner et al., 2012). Tier 2 supports are delivered in small group format consisting of three to five students. Interventions at the Tier 2 level are delivered in students' classrooms as part of the regular educational setting, and students are progress monitored monthly to assess their responsiveness to and effectiveness of the intervention (Burns & Coolong-Chaffin, 2006). Students who do not demonstrate progress with Tier 2 interventions are moved to Tier 3. Tertiary interventions are the most intensive interventions and include highly specialized, intensive instruction or other interventions to address students' needs (Hoover & Love, 2011; Sullivan & Long, 2010). Tier 3 interventions are individualized to students' needs, based on problem-solving models, lengthy in duration, and involve frequent (e.g., weekly) progress monitoring via the use of informal classroom based assessments (Berkeley et al., 2009; Burns & Coolong-Chaffin, 2006).

Academic Interventions

Of the two intervention categories, academic interventions have received the most attention in research and application (Bramlett, Cates, Savina, & Lauinger, 2010). Academic interventions consist of indirect and direct techniques designed to improve academic performance in a specific educational domain (e.g., reading, writing, or math). Indirect academic interventions focus on helping improve underlying learning processes while direct interventions are designed to teach a specific academic skill (Shapiro, 2004). Four instructional interventions have been found to be beneficial for students with learning difficulties in an area: combination of direct instruction and strategy instruction, control of task difficulty and number of steps for task completion, the use of small interactive groups, and directed responses and questioning of students (Tobin & Sprague, 2002). In general, academic interventions are designed to remediate skill deficits and help students develop the requisite skills to achieve academic success (Shapiro, 2004).

Behavior Interventions

Behavior interventions target factors that affect academic performance such as depression, short attention span, and off-task behavior (Bramlett et al., 2010). Unlike academic difficulties, educational professionals often perceive students' behavioral problems as factors extending from outside of the school setting. As a result, schools are frequently reactive rather than proactive in addressing students' behavior difficulties. When schools do respond to behavior problems, they frequently utilize interventions that are ineffective in addressing students' needs. The interventions that schools select to help remediate behavior problems tend to lack empirical support and are chosen for reasons such as personal appeal, popularity, or ease of implementation (Gresham, 2004). For instance, teachers may utilize interventions such as

posting clear and appropriate classroom rules and behavior expectations, token systems, behavior contracts, differential reinforcement, and self-management strategies; however, students may or may not respond to these efforts (Sugai & Horner, 2002). In general, the overarching goal of behavioral interventions is to reduce the behavior that interferes with students' academic progress and to provide them with more appropriate social-behavioral responses (Gresham, 2004). The limited research in the area of behavioral interventions emphasizes the need for further exploration in this area to develop new behavior interventions and identify effective and efficient behavioral strategies to help schools better support students' behavior (Sugai & Horner, 2002).

Progress Monitoring

Regardless of the type of intervention, academic or behavioral, education professionals must have a basis for deciding whether and when to maintain, modify, intensify, or withdraw an intervention (Gresham, 2004). Progress monitoring can be described as a method of formative assessment due to its assistance in determining whether students are benefitting from instruction or intervention and whether or not the students are learning at an adequate rate (Mellard, McKnight, & Woods, 2009). In schools, progress monitoring can assist in the creation of instructional groups within RTI tiers, help identify specific skill deficits, assist in the early identification of deficits that may interfere with school success, provide information to assist in eligibility decision making, and help reintegrate students from the special education to the general education setting (Shapiro, 2008). At each tier in RTI, progress monitoring is used to determine students' responsiveness to evidence-based instruction. The progress monitoring approach used varies with the type of intervention. Similar to interventions, progress monitoring

is also divided into two groups, academic and behavioral, with each group utilizing different strategies to measure student progress (Barrera & Liu, 2010).

Academic Progress Monitoring

Academic progress monitoring is designed to assess key learning skills such as basic reading, mathematics computation, writing fluency and accuracy, or spelling (Barrera & Liu, 2010). Under the umbrella of academic progress monitoring, there are two major methods through which student outcomes are measured: Generalized Outcome Measures (GOM) and specific subskill mastery (Shapiro, 2008). GOM models consist of standardized, repeated measures that serve as indicators of student progress across curriculum objectives such as curriculum-based measurement (CBM) and models based on norms set by the published materials used for screening such as Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Bolt, Ysseldyke, & Patterson, 2010; Kaminski, Cummings, Powell-Smith, & Good, 2008; Shapiro, 2008). Programs such as these are well researched and developed, efficient, and practical. Although less developed than GOM based models of progress monitoring, progress monitoring models based on specific subskill mastery have demonstrated utility and effectiveness in assessing student progress in a targeted area (Shapiro, 2004). In contrast to GOM models, which focus on a broad academic skill (e.g., reading), specific subskill progress monitoring measures the development of a specific skill (e.g., letter sounds) across time (Shapiro, 2008). Both categories of academic progress monitoring tools may be used by teachers in their classrooms to collect data on student growth that is reliable and valid to aid teachers in making instructional decisions (Bolt at al., 2010; Deno et al., 2009).

Behavior Progress Monitoring

Unlike academic progress monitoring, behavior progress monitoring is often bypassed in school psychology. Behavior progress monitoring is circumvented in school psychology due to the lack of efficient, reliable, and generalizable ways to assess and monitor behavior (Cummings, Kaminski, & Merrell, 2008). Methods that allow for documentation of behaviors and progress toward behavioral goals are vital to demonstrating student progress and intervention effectiveness. Similar to academic progress monitoring, behavior progress monitoring is essential in determining students' responsiveness to behavior interventions, in assessing the effectiveness of positive behavioral support programs, and in evaluating students' progress toward their IEP behavior goals and objectives (Gresham et al., 2010). As in progress monitoring for academic problems, behavior progress monitoring consists of continuous monitoring of student behavior to determine if the student is responding to the intervention (Briesch & Chafouleas, 2009; Volpe & Gadow, 2010).

Traditionally, behavior progress monitoring involved standardized social and behavioral scales and systematic direct observation. Standardized rating scales such as the Child Behavior Checklist (Achenbach & Ruffle, 2000) and the Behavior Assessment System for Children (2nd ed.; BASC-2; Reynolds & Kamphaus, 2004) are generally well validated and have been demonstrated to have exceptional psychometric properties (Carta et al., 2004). Such measures are among the most widely used assessment methods in the school environment and are available for assessing a wide variety of emotional, behavioral, and social constructs (Volpe & Gadow, 2010). The use of rating scales permits the measurement of low-frequency behaviors that are often not easily or readily observable (Burke & Vannest, 2008). However, rating scales are

typically not used in behavior progress monitoring due to their length, insensitivity to change, and inability to inform intervention (Gresham et al., 2010; Volpe & Gadow, 2010).

To address the shortcomings of standardized scales, researchers have worked to develop other methods for monitoring social, emotional, and behavioral problems such as systematic direct observation (SDO), daily report cards, and direct behavior rating scales. Often referred to as the "gold standard" of behavioral assessment, SDO assesses intervention response by identifying, operationalizing, and coding systematically specific behaviors (Shapiro, 2008). Data obtained through SDO provide a highly sensitive assessment of the target behaviors requiring little inference due to the strong face validity of the approach. Despite the in-depth behavioral assessment SDO provides, the behavior data are limited in scope because of their relatively narrow focus. For instance, while SDO has been found to be very effective in the assessment of overt behaviors of moderate frequency it has been demonstrated to be poorly suited for the measurement of low frequency behaviors and internalizing problems. Another drawback to SDO is the amount of training and the amount of time needed to conduct observations. To obtain reliable estimates of the target behaviors, several hours of observation may be warranted, which are not only time consuming and burdensome for the observer but ill-suited in measuring low-frequency, subtle, or internal behaviors (Volpe & Gadow, 2010).

In contrast, Daily Behavior Report Cards (DBRC) are constructed rating scales, in which a specific behavior is identified, rated (at least daily) and then shared with an individual other than the rater, such as a parent (Burke & Vannest, 2008; Riley-Tillman, Chafouleas, & Briesch, 2007; Volpe & Gadow, 2010). An example of a daily report card is the Electronic Daily Behavior Report Card (e-DBRC; Burke, Vannest, Davis, Davis, & Parker, 2009). The e-DBRC is a criterion-referenced, electronic, web-based, behavioral progress-monitoring tool that

provides formative information regarding behavioral progress. The e-DBRC uses a blend of direct behavior ratings and goal-attainment scaling techniques to rate daily targeted student behaviors and can be used as a tool for sharing behavior information and progress with other school staff, students, and parents (Burke & Vannest, 2008). Riley-Tillman et al. (2007) have shown that daily report cards are not only acceptable to teachers but also a promising supplement in the formative assessment of social behavior as well. However, due to rater subjectivity, Likert-scale response format, and lack of standardized behaviors, it is suggested that daily report cards are best suited to low-stakes cases such as monitoring the effects of pre-referral interventions rather than as a replacement for SDO in high-stakes decisions (Riley-Tillman et al., 2007).

One challenge facing progress monitoring of behavior problems is the lack of general outcome measures for behaviors (Shinn, 2007). For instance, in academic progress monitoring, academic difficulties, such as reading comprehension, are operationally defined similarly across students resulting in a pool of data that provides appropriate targets of measurement for assessing students' responsiveness to interventions (Volpe & Gadow, 2010). Unlike other direct behavior rating scales, Direct Behavior Ratings-Single Item Scales (DBR-SIS) integrate aspects of both SDO and behavior rating scales to create a practical method for behavioral assessment and progress monitoring within a problem-solving model (Riley-Tillman, Chafouleas, Christ, Briesch, & LeBel, 2009). DBR-SIS are evidence-based, constructed-behavior rating scales that provide information regarding students' behavioral progress by using specific and repeatable procedures, in which an observer systematically rates a single operationally defined behavior (Chafouleas, Riley-Tillman & Christ, 2008).

Unlike other behavior rating scales, the rating forms used in DBR-SIS are standardized for three behaviors applicable to all students: disruptive behavior, academically engaged, and compliance/respect (Chafouleas, 2011). These behaviors are monitored by using a standardized rating scale ranging from 0 to 10 (0 indicating that the behavior never occurs and 10 indicating that the behavior is always present) as the behavior occurs in a natural setting. Ratings may be completed by an educational professional, student, or outside rater (Chafouleas, Riley-Tillman, & Christ, 2009). Data generated from DBR-SIS are collected across time, recorded, and then interpreted as time series data to guide decisions in determining behavioral supports and their effectiveness (Christ, Riley-Tillman, & Chafouleas, 2009).

In summary, while various methods for evaluating behavior interventions exist, many of the evaluation techniques are not suited for daily monitoring of the intervention (Riley-Tillman et al., 2007). Although behavior-rating scales allow for behavioral comparison to standardized norms, they are often insensitive to change and typically require 3–4 weeks before the scale may be readministered (Gresham et al., 2010; Volpe & Gadow, 2010). Similarly, SDO has been criticized due to the amount of training that must be received prior to the method being used. Additionally, SDO is time consuming, making it an inefficient mechanism for behavior-progress-monitoring (Volpe & Gadow, 2010). Despite the demonstrated effectiveness and efficiency of both e-DBRC and DBR-SIS in monitoring, reporting, and intervening of behavior problems that interfere with students' abilities to learn, there is limited research regarding which behaviors these methods best assess (e.g., low or high frequency behaviors; Burke & Vannest, 2008; Riley-Tillman et al., 2007). As the need for behavior-progress-monitoring continues to increase, schools will search for behavioral assessments that are not only reliable, valid, efficient, and cost-effective, but also perhaps can serve as interventions as well (Carta et al., 2004).

Self-Regulation

Helping students develop the ability to self-regulate their behaviors has become a central focus in education (Boekaerts & Cascallar, 2006). For students to engage in socially competent behavior, cognitive, behavioral, and emotional processes must operate together (McKown, Gumbiner, Russo, & Lipton, 2009). Students with behavioral challenges often have difficulties integrating cognitive, behavioral, and emotional information resulting in self-regulation deficits such as difficulties thinking about a task or action beforehand, monitoring performance during task execution, and reflecting on completed tasks in order to take additional action if needed (Reid, Trout, & Schartz, 2005; Zimmerman, 2002).

Self-regulation refers to an individual's ability to control reactions to stress, maintain focused attention, and interpret mental states in self and others (Rueda, Posner, & Rothbart, 2011). Most problems with self-regulation are noted when children enter the school environment. In schools, self-regulation is often defined as students' abilities and efforts to monitor and manipulate cognitions, emotions, and behaviors to attain educational goals (Ley & Young, 2001). The control manifested in self-regulation allows students to adjust their thoughts, feelings, and behaviors in the pursuit of short- and long-term goals (Schunk & Zimmerman, 1997). Through the alteration of responses or internal states, self-regulation allows students to use resources efficiently, resulting in productive work. The alteration of responses and internal states typically occurs by overriding one response or behavior with another and replacing the response with a more desirable response (Baumeister, Schmeichel, & Vohs, 2007). Thus, self-regulation places particular emphasis on attention, inhibition control, problem-solving, memory, and self-monitoring (Rueda et al., 2011).

Students with emotional or behavioral challenges often struggle with monitoring their own performance, evaluating their performance, and adjusting their performance based on their reflections of it (Menzies & Lane, 2011; Reid et al., 2005; Wehmeyer & Palmer, 2000). Deficits in self-regulation make it difficult for students to maintain appropriate attention and behaviors needed to be successful during the academic learning periods that form the school day (Savina, Tynan, Wan, & Ashe, 2012). Aspects of emotional, social, and behavioral competence of children, such as higher levels of self-control and lower levels of acting out, have been shown to predict children's academic performance better than their cognitive skills and family backgrounds (Raver & Knitzer, 2002). As a result, children who struggle with self-regulation demonstrate disciplinary problems or academic difficulties such as underachievement, poor grades, failure to complete assignments, and severe consequences such as expulsion (Gilliam, 2005; Reid et al., 2005). These experiences shape children's learning as they begin to define aspects of the educational environment as positive or negative, encouraging or inhibiting their learning. The relationship between the educational environment and the meaningfulness or lack of it affects students' abilities to acquire the self-regulation strategies that are critical in shaping and guiding learning in given contexts (Boekaerts & Cascallar, 2006).

Baumeister et al. (2007) and Barkley (2012) emphasized the importance of understanding the relationship of self-regulation and executive functioning. Executive functioning includes processes such as developing plans for future actions, retaining plans and action sequences in working memory until they are acted upon, and inhibiting irrelevant actions (Singer & Bashir, 1999). According to Barkley (2012), self-regulation is the most commonly agreed upon feature of executive functioning and is an essential feature in the development of self-directed actions. In executive functioning, self-regulation is needed in the selection of goals and the creation,

enactment, and sustainment of actions needed to achieve the goals. Abilities such as pre-planning, performance monitoring, and reflection are considered integral components of self-regulation (Wehmeyer, Yeager, Bolding, Agran, & Hughes, 2003).

Students with learning or behavioral challenges often require deliberate and explicit instruction in self-regulation. Strategies used to teach self-regulation are designed to be easy to use, and they impose few demands on classroom teachers and parents. The self-regulation skills taught to students typically consist of portable coping strategies that transfer across situations and behaviors, giving self-regulation techniques the potential for producing generalizable and durable behavior gains. Self-regulation interventions have been shown to decrease off-task behaviors and increase on-task behaviors (Shapiro & Cole, 1994). For instance, self-regulation strategies have been utilized to help students attend to specific tasks, such as assignment completion, attention, or listening. Self-regulation interventions consist of three broad strategies: goal setting, self-instruction, and self-monitoring (Menzies & Lane, 2011).

Goal Setting

Self-regulated learning consists of goal-directed activities instigated, modified, and sustained by students (Zimmerman, 1989). Efficient learners know how to set goals and develop plans to achieve their goals (Menzies & Lane, 2011). A goal can be defined as an objective an individual is consciously trying to achieve (Bandura, 1977; Locke, Shaw, Saari, & Latham, 1981). In learning, goal setting can help increase students' motivation and efficiency by helping students clearly identify what they are working toward (Menzies & Lane, 2011). The process of goal setting consists of two major components: goal establishment and goal monitoring/modification (Locke et al., 1981).

Students who struggle with self-regulation often cannot set a goal and reach it. These students typically need supports to help them learn to set goals to structure their learning. Tools such as direct instruction, support, and coaching may be used to help students learn how to identify, develop, and establish plans to achieve goals (Menzies & Lane, 2011). To help clarify student goals, goal instruction should incorporate specific performance standards. Specific performance standards in goal instruction reduce goal ambiguity and elucidate standards for effective behavior performance resulting in a goal that is easier to monitor (Schunk, 1990). Such behavioral specification helps students better monitor their performance toward their goals (Latham & Locke, 1991).

Providing students with a goal and information to help them attain the goal can increase self-efficacy for learning. Proximal goals are also beneficial to students with self-regulation difficulties. Unlike distal goals, proximal goals are more readily attainable, allowing students to easily observe their progress (Schunk, 1990). Goals that are proximal in nature are typically more developmentally appropriate for children with difficulties self-regulating because children with such difficulties frequently struggle with representing distant outcomes in thought (Latham & Locke, 1991; Menzies & Lane, 2011). Proximal goals boost self-regulation through independent practice and self-monitoring (Schunk, 1990). To promote self-regulation, goals do not have to be self-set. Latham and Locke (1991) have noted that goals assigned by authority figures, such as teachers, are just as motivating as individually determined goals. Assigned goals are motivating in that they imply that the individual is capable of achieving the goal, increasing the individual's self-efficacy toward the goal (Latham & Locke, 1991). Thus, goal assignment may encourage students to internalize their successes because they may attribute their accomplishments to their own efforts and abilities as opposed to stemming from external

sources. Increased self-efficacy in one's academic abilities promotes self-regulation causing students who typically would not engage in goal setting to do so. As students continue to use goal setting to guide their learning, their performance, motivation, and skill acquisition increase, which helps them self-regulate their behaviors through monitoring (Schunk, 1990).

Self-Instruction

Initially, self-instruction was designed to help students acquire effective problem-solving strategies and to help students refocus their attention. Self-instruction, also referred to as self-talk, is the use of language to self-regulate behavior (Menzies & Lane, 2011). The use of internalized speech can be used by students to solve problems, reflect on thoughts or action, direct attention to important task features, assist with strategy encoding and retention, and help students work in a systematic fashion to self-regulate their performance on tasks (Schunk, 1986). Since its development, self-instruction has also been used as a strategy to reduce impulsiveness in children (Shapiro, 2004). For instance, in students with disorders in which impulsiveness is a defining trait such as ADHD, self-instruction is frequently used to slow down a student's rate of performance in order to decrease the number of performance errors (Schunk, 2008).

When engaging in self-instruction, students talk out loud as they perform a task. With time, the overt speech becomes internalized and is more covertly utilized (Shapiro & Cole, 1994). Educationally relevant self-speech may consist of information essential to school success such as rules, strategies, and beliefs about one's ability to learn (Schunk, 1990). Students may also use self-instruction as a means of encouragement or validation regarding their efforts on a task. In learning, students can regulate their behavior through the use of self-instruction. Self-instruction can be used by students to rehearse mentally the steps in a procedure guiding them in completion of the task (Menzies & Lane, 2011). Such verbalizations may be instrumental in

increasing students' awareness of the knowledge and skills they are acquiring (Schunk, 1986). In students with learning and behavioral difficulties, self-instruction has also been shown to increase positive self-talk, leading to improved performance and increased self-efficacy as students believe they are capable of handling task demands (Menzies & Lane, 2011; Schunk 1986).

Self-Monitoring

According to Huff and Nietfeld (2009), the ability to self-monitor is a key component in the development of self-regulation. Self-monitoring has been defined as the cognitive processes that are utilized to evaluate progress toward goals and to generate feedback to help guide additional action (Bercher, 2012). In schools, the ability to self-monitor has been associated with student achievement. Research by Ley and Young (2001) indicated that young students and poor learners utilize fewer self-monitoring strategies in comparison to older students and more skilled learners. Similarly, Rafferty and Raimondi (2009) found that students who engaged in self-monitoring strategies during their math class improved their mathematical performance and increased their attention to task.

Strategies designed to help students who struggle with self-regulation develop self-monitoring are intended to help students become more aware of and deliberate in their use of self-monitoring tactics that most students perform independently (Menzies & Lane, 2011). There are two forms of self-monitoring: self-monitoring of attention and self-monitoring of performance (Rafferty & Raimondi, 2009). Self-monitoring of attention helps eliminate off-task behaviors by focusing a student's awareness to the task in which the student is engaged. In contrast, self-monitoring of performance focuses on the quantity and quality of a student's work. Self-monitoring of performance requires students to check some aspect of their work such as the

number of problems they have completed or the number of problems they have correct (Menzies & Lane, 2011).

Self-monitoring strategies for attention and performance typically consist of either students' observing and recording whether or not they have performed something or students' observing and recording their behaviors to determine if their performance has met a previously established criterion (Ley & Young, 2001). Such strategies are beneficial to students in that they increase students' awareness of inattention issues they may experience such as not listening to directions and not staying on task (Menzies & Lane, 2011). Further, self-monitoring strategies increase students' sense of self-efficacy by helping students learn to monitor their progress, providing students with feedback regarding the effectiveness of the strategies they are using and allowing students to see the successes they are obtaining as they work toward their goals (Bercher, 2012; Schunk, 1990).

Self-Regulation Interventions

In the development of self-regulation, methods such as self-recording are typically used. Self-recording consists of students noting their behaviors in close proximity to the time in which the behaviors occurred and has been argued to help change the frequency with which specific behaviors occur (Schunk & Zimmerman, 1997). To explore the use of self-recording, Wehmeyer et al. (2003) examined the effects of a multicomponent self-regulation process on students with developmental disabilities in general education classrooms.

In this study (Wehmeyer et al., 2003), self-regulation intervention packages consisting of self-monitoring, self-evaluation, and self-reinforcement strategies were used to increase classroom participation and decrease negative behaviors that might interfere with participation in the general classroom setting. Three adolescent male students with developmental disabilities in

grades seven through nine participated in the study and identified one or more behavioral goals that were limiting their participation in the general education classroom. Baseline data were collected for each behavior identified in the goal by project coordinators. After baseline data collection, students implemented their self-regulation plan with support from the project coordinator. The project coordinator provided each student with daily supports consisting of prompts as to when to use the plan if needed. Additionally, the project coordinator provided the students with instructions regarding how to implement the plan on a daily basis within the classroom setting until students could use the self-regulation processes for three consecutive sessions, indicating mastery of the strategies. During this process, the students received corrective feedback from both the project coordinator and the special education teacher. Once students reached mastery of their self-regulation procedures, they were instructed to use their strategies for the remainder of the semester without prompts or supports.

Two measures were used to indicate the effectiveness of the self-regulation procedures: student observational data and Goal Attainment Scaling (GAS). GAS measures goal achievement through the use of a 5 point scale ranging from 2 to -2 with a score of 0 meaning that the student has achieved as expected, 1 meaning more than expected, 2 meaning much more than expected, -1 meaning less than expected), and -2 indicating much less than expected. GAS produces a quantitative measurement scale providing a means of identifying and measuring goal impact and attainment (Coffee & Ray-Subramanian, 2009). Progress on the GAS was determined by the special education teacher who selected the outcome rating for each goal (Wehmeyer et al., 2003).

Upon completion of the study, the special education teachers selected the outcome that best described the students' progress toward their goals. Results of the GAS indicated that the

students achieved more than teachers expected them to across all of the goal areas. These results suggest that self-regulation and self-management strategies may serve as effective tools in assisting students with severe disabilities acquire the skills necessary to enhance their control over their learning experiences. Classroom observations of student goal behaviors in the general education setting revealed consistent improvement across all three students.

One limitation of the study by Wehmeyer et al. (2003) was its lack of direct measurement of the change in the adaptive behaviors or problem behaviors indicated in the students' goals on specific academic or performance outcomes. Another concern regarding the study was the lack of data on each student's use of the self-regulation strategies once the intervention phase ended, making it difficult to determine if students internalized and maintained the use of such strategies without external prompting. A final limitation of this study was the lack of student data. Although data regarding goal progress was attained through the students' teachers, the students were not provided with a venue to indicate their progress.

Agran, Blanchard, Wehmeyer, and Hughes (2001) examined the effects of student-directed learning strategies such as goal setting, self-monitoring, problem solving on the classroom behavior of six male students, three in grade 10 and three in grade 11, with varying disabilities in general education settings. With the assistance from their special education and general education teachers, participants identified a goal related to a target behavior from their IEP that they wanted to focus on in their general education classroom. To help each participant obtain his targeted goal, researchers taught the student to engage in the self-regulation learning strategies of self-monitoring, self-evaluation, and self-reinforcement, and each was taught a problem-solving strategy. For instance, one student's goal was to improve social skills. The learning strategy consisted of initiating a conversation with another student, making eye contact,

and greeting a student with an appropriate statement or gesture. During the study, the special education teacher and general educators created opportunities for students to perform the target behaviors and practice the learning strategies when the situations did not naturally occur.

A multiple baseline design across groups consisting of baseline, training, and post-training conditions was used to determine the effects of the student-directed learning strategies (Agran et al., 2001). During the baseline condition, both students and teachers completed the GAS in order to assess goal attainment and determine program effectiveness. Additionally, to establish a baseline of the target behaviors, observations of student performance of the target behavior were conducted. After baseline was established, students were taught the self-regulation learning strategies. In the training condition, students were taught to set a goal, monitor their performance, evaluate the outcome, and if appropriate, self-reinforce desired response. First, students were taught to self-observe if the target occurred. To help students learn to discriminate their behavior, they were presented with examples and non-examples of the target behavior, the characteristics of the behavior were discussed with the students, and the accuracy of the students' recordings were determined by comparing the frequency of occurrence recorded by the student to that of the data collector. Students recorded the occurrence of their behaviors by placing a tally mark on a card each time the desired behavior was performed. Students were taught to self-evaluate by counting how many times they performed a certain behavior and then determining if they had met their pre-established goals. After correct performance of the targeted behavior, students were taught to use self-reinforcement such as verbal praise for achievement of daily goals and selection of a reinforcer of their choice (e.g., extra computer time) for achievement of a weekly goal. Students' completion of target behaviors was also recorded by a peer tutor or the classroom teacher.

In addition to being taught goal setting, performance monitoring, outcome evaluation, and reinforcement, students received problem-solving instruction derived from the Self-Determined Learning Model (Wehmeyer & Palmer, 2000). This model consists of three instructional stages: setting a goal, taking action, and adjusting the goal or plan. In the goal setting phase, students identified their achievement objectives, determined actions needed to reach goals, and identified potential barriers to their goals. During the action phase, students were taught to develop goal attainment plans and developed schedules for execution of their plans. In the final phase adjusting the goal or plan, students were shown how to evaluate their progress and determine what actions they took, what barriers were removed, and how their situations were changed (Wehmeyer & Palmer, 2000).

In the post-training condition, students continued to keep their own data, and the teacher or peer tutor observing the students continued to observe and record data on the target behaviors. Students also checked with the data collector daily to confirm matching data. Following the post-training, an additional measure of social validation was obtained by asking the teachers to report on their perceptions of the effects of the learning strategies on student performance. Teachers were asked to describe the students' progress and any observed changes made by the students. Additionally, students were asked to answer questions from the Self-Determined Learning Model program such as "What have I learned?" "What barriers have been removed?" "What has changed about what I don't know?" "Do I know what I want to know?" "Did I finish my goal?" and "How do I feel about the results?"

Results from the baseline condition in Agran et al. (2001) indicated that all students performed their target behaviors at relatively low levels. Data from the training condition revealed that overall there was a marked increase in students' performance of the target

behaviors. However, increases in performance for some of the participants did not occur until the reinforcer and the system of reinforcing were adjusted. Baseline data on the GAS indicated that teachers anticipated that students would likely achieve 80% performance of the target behaviors. Post-training results indicated that all students exceeded the teachers' expectations. Overall, the teachers reported that they felt the program had a positive effect and provided valuable experiences for students. Analysis of student responses on the Self-Determined Learning Model worksheets indicated that the program helped students feel more confident in their abilities and that they had improved their targeted skills.

Agran et al. (2001) indicated that instructional packages consisting of student-directed learning strategies such as goal setting, self-monitoring, and problem solving, when combined with teacher-delivered reinforcement, may facilitate students' acquisition of skills and maintenance of desired behaviors. Most notably, this study highlights the effectiveness of student-directed learning strategies when the targeted behaviors are selected, monitored, evaluated, and reinforced by the students themselves.

Despite its contributions to the literature regarding self-regulation, the study by Agran et al. (2001) lacked measures to assess the changes in students' abilities to self-regulate their behaviors. The authors stated that the participants in this study were taught a full repertoire of self-regulation learning strategies; however, there was no measure specific to self-regulation to show that the change was truly related to self-regulation and not another factor such as adjustment to the task or responding to achieve reinforcement. Results in this study are also restricted to specific behaviors in the context of core classes; thus, whether students gained the abilities to generalize the skills they learned to other settings is unknown. Another deficit of this study is the lack of observational data in the monitoring of the frequency of use of the strategies.

In the study, students were rated by a peer tutor or a teacher who simply verbally reported to the researcher whether or not the students were using the strategy. A final limitation of this study is the implementation of all of the strategies as a "package," making it difficult to determine if one strategy is more effective than the others. Packaged interventions may be more difficult for teachers to implement, resulting in teachers' choosing aspects of the interventions to use. For example, if a teacher implements an intervention without goal setting, it would be difficult for the teacher and student to identify what they are trying to achieve.

The previous studies indicated the effectiveness of strategies to help students further develop their self-regulatory abilities. However, the strategies used in both studies appear cumbersome in their approach, reducing the likelihood that teachers will implement them. Both studies lacked direct measurement of self-regulation, making it difficult to determine if the strategies used truly affected it. The studies utilized students with disabilities, developmental and cognitive; however, it was unclear if self-regulation was a challenge for these participants. The aforementioned studies also used multi-component strategies making it difficult to determine the differential effects of these strategies. It could be that utilizing one strategy would be sufficient in helping develop students' abilities to self-regulate.

Self-Monitoring and Self-Regulation

Although goal-setting and self-instruction are two integral components in the development of self-regulation, research has shown that they are limited in their utility as stand-alone self-regulation interventions. While goal-setting is a metacognitive strategy that typically involves planning, monitoring, and regulating, it is affected by students' self-observations, self-judgments, and self-reactions (Kobayashi & Locke, 2008; Schunk, 1990). As a result, goal-setting may be affected by the self-defeating beliefs and ruminating thoughts of failure that

children with self-regulation difficulties often experience (Kobayashi & Locke, 2008). Additionally, goal-focused self-regulation development tactics do not require students to self-regulate much in order to achieve their goals because they are primarily focused on goal identification and development (Mullins & Devendorf, 2007).

Similar to goal-setting, self-instruction, although important to the development of self-regulation, is also limited in its use as a sole intervention. Self-instruction is self-regulatory talk that often begins to emerge during preschool. Despite its early presence, self-instruction only becomes more covert with age and experience. Thus, students with limited opportunities to practice self-instruction may have weak skills in this area resulting in continued overt expression or a lack of understanding as to how to use self-directed speech to guide actions (Ylvisaker & Feeney, 2009). As a result, students who are skilled in self-instruction are less likely to use additional self-regulation strategies such as goal-setting. Another drawback to self-instruction as a mechanism for self-regulation development is that it is predominantly used as an attention-focusing strategy, which may be helpful in reducing distractions but may not assist students in developing other skills needed to self-regulate behavior, such as monitoring progress (Kobayashi & Locke, 2008). Additionally, self-regulation strategies involving self-instruction may not improve performance when children otherwise can handle the demands of the task. Because verbalization constitutes an additional task, it could hinder performance if it interfered with children attending to and processing information relevant to the primary task (Schunk, 1986). For instance, research has shown that self-instruction is most effective when it is used at an early stage of new skill learning or when students are challenged with difficult material (Kobayashi & Locke, 2008).

Many researchers view the ability to self-monitor as the most critical skill in the development of self-regulation (Kobayashi & Locke, 2008; Schunk & Zimmerman, 1997). Unlike goal-setting and self-instruction, self-monitoring strategies comprise more than knowledge of one skill; they involve self-awareness, self-motivation, and the behavioral skills necessary to utilize knowledge and skills appropriately (Zimmerman, 2002). Self-monitoring strategies include the two other components vital to self-regulation: goal setting and self-instruction. Together, goal setting and self-instruction facilitate self-monitoring in that skilled self-regulators utilize both external and internal feedback to monitor how well they are progressing toward goals, the effectiveness of strategies and tactics being utilized, and the quality of their performance as they work toward their goals (Ley & Young, 2001).

Monitoring one's behavior is an indispensable component in learning to regulate one's behavior. Enhancing self-monitoring improves self-regulation because successful regulation of behavior is more likely to occur when people observe their own behaviors (Baumeister et al., 2007). Self-monitoring, coupled with realistic goals, helps students acquire information about their abilities in a given area based on their observations of their performance (Baumeister et al., 2007; Schunk, 1990). Accurate self-monitoring of one's abilities is thus a necessary skill for students to become effective learners (Rafferty & Raimondi, 2009). Students who are able to self-monitor are better able to self-regulate their behaviors, increasing their abilities to thrive and prosper at school, which in turn bolsters the perceptions of their self-efficacy (Schunk, 1990).

Attention Deficit Hyperactivity Disorder

The most common disorder of self-regulation is Attention Deficit Hyperactivity Disorder (ADHD; Barkley, 1997). An estimated three million children in the United States take medication for attention problems and other behavior problems associated with deficits in self-

regulation (Olfson et al., 2002). Children with ADHD constitute the greatest number of referrals to mental health counseling centers (Braaten & Rosen, 2000). ADHD is typically characterized by symptoms of inattention, hyperactivity, and impulsivity. Symptoms of inattention include difficulties in sustaining attention, following directions, organizing tasks or activities, completing tasks, engaging in tasks requiring sustained mental effort, remembering, and focusing without being distracted by external events. Symptoms of hyperactivity and impulsivity consist of fidgeting, difficulty staying in place, excessive talking, difficulty waiting turns, blurting out or interrupting, and restlessness (American Psychiatric Association, 2000). These behavioral symptoms of ADHD typically emerge during the preschool or early childhood years and are significantly inappropriate for the child's age and developmental level (Braaten & Rosen, 2000). The majority of symptoms of ADHD must be present prior to age 12 years, be present for a minimum of six months, and interfere with daily functioning in two or more settings such as home, school, or peer interactions (American Psychiatric Association, 2000). In at least half of all children diagnosed with ADHD, the symptoms persist into adolescence (Braaten & Rosen, 2000). Further, approximately one in 20 school-aged children are diagnosed with ADHD, and it is estimated that more than two million school-age children currently have ADHD (Barkley, 1997; Fabiano, Vujnovic, Naylor, Pariseau, & Robins, 2009).

ADHD is viewed as a deficit in behavioral inhibition defined by developmentally inappropriate levels of attention, impulse control, and activity modulation (Barkley, 1997; Fabiano et al., 2009). The lack of behavioral inhibition in ADHD has been linked to the executive function of self-regulation (Barkley, 1997). Executive functions are responsible for the regulation of broad human behaviors such as planning and decision-making (Shiels & Hawk, 2010). Problems with executive functioning are symptoms characteristic of ADHD. Students

with ADHD may manifest difficulties in executive functioning such as not completing schoolwork, organizing tasks, or maintaining concentration. Problems with developing goals, remembering goals, sustaining effort toward a goal, and adjusting behaviors to achieve a goal also are seen as central to ADHD (Lienemann & Reid, 2008). Further, difficulties in executive functioning have also been shown to influence negatively academic performance of students with ADHD, and students with ADHD tend to have inflated perceptions of their poor performance (Barkley, 1997; Stevens, Quittner, Zuckerman, & Moore, 2002).

Attention Deficit Hyperactivity Disorder and Self-Regulation

According to Barkley (1997), ADHD is the result of a deficit in self-regulation. While past theories of ADHD, such as cognitive dysfunction theories, have focused on single cognitive deficits in sustained attention, response inhibition, working memory, or executive function, newer theories of ADHD shift the focus to processes that may influence all of these constructs (Shiels & Hawk, 2010). Regulatory deficit models of ADHD view self-regulation as a process consisting of awareness of environmental demands, monitoring of behavior, evaluating if the behavior is environmentally appropriate, and adjusting behavior if a discrepancy among environment, behavior, and outcome is determined (Shiels & Hawk, 2010). These models view effortful control, a component of executive functioning and self-regulation, as a process that combines with self-monitoring to produce goal-directed behavior. Thus, the self-regulation deficits characteristic of students with ADHD may reflect problems in the self-monitoring of behavior (Shiels & Hawk, 2010).

With 3% to 7% of school-age children suspected of having ADHD, effective interventions to help students manage their symptoms of ADHD are integral to success for these children both inside and outside of school (Lienemann & Reid, 2008). Although studies have

shown medication as effective in treating the symptoms of ADHD, it is suggested that medication not be used in isolation. Currently, recommended treatments for children with ADHD consist of a multimodal approach combining medication, behavior modification, accommodations, and supplementary services such as counseling. Despite the prevalence of ADHD in school-aged children and societally demonstrated concern about the effects of behavioral disinhibition on academic success, there is limited research regarding the effects of self-regulation strategies on improved self-monitoring and academic success.

Attention Deficit Hyperactivity Disorder Interventions

Self-regulation interventions have been proposed as a method that is both effective and efficient in increasing students' attention and productivity. Gawrilow and Gollwitzer (2007) examined the effects of implementation intentions ("if–then" plans) on students' abilities to self-regulate automatic responses. Implementation intentions help students determine in advance when, where, and how a goal is to be transformed into action, thus reducing the role of executive function when the plan is to be implemented. It has been argued that implementation intentions help reduce the impact of unwanted influences in goal attainment by protecting the goal from internal and external factors such as bad mood and temptations.

Gawrilow and Gollwitzer (2007) hypothesized students who formed implementation intentions would experience fewer executive functioning demands, helping them perform better on tasks that require executive processing. Specifically, researchers expected that children with ADHD would demonstrate lower levels of inhibition performance than children without ADHD, and that implementation intentions would facilitate the ability to inhibit automatic responses. The benefits of implementation intentions were expected to be strongest for children with ADHD taking prescription medication.

To explore their hypothesis, Gawrilow and Gollwitzer (2007) conducted two studies in which they examined the role of implementation intention on response inhibition. Children with ADHD were randomly assigned to one of three groups: control group, goal-intention group, and implementation-intention group. In the goal-intention group, children were to develop a goal to inhibit a classification response while children in the implementation group were to develop both a goal to inhibit (intention plan) and an if–then plan. In the control group, children were presented with task instructions only.

Fifty-eight male children with ages between 8 and 14 years of age participated in the first study. Parents of participating children completed two questionnaires: the Child Behavior Check List (CBCL) and the Arbeitsgruppe Deutsche Child Behavior Checklist. Both were used to assess different aspects of their children's behavior such as social and attention problems. Additionally, parents completed a questionnaire including the current medication status of their children. In the first study, participants completed the Go/No-Go task in a single session lasting approximately 20 minutes. The Go/No-Go task consists of two concurrent tasks: the Go trials and the No-Go trials. The Go trials required the participants to classify animals and means of transportation while the no-Go trials would present a stop signal informing the participants to inhibit their classification response on that particular trial. Children in the goal-intention condition set the goal to not press any key when a sound occurred together with the stimulus (''I will not press a key for pictures that have a sound!''). In contrast, children in the implementation intention condition developed an additional plan to the goal intention, such as, ''If I hear a tone, then I will not press any key!'' In both of these conditions, children were asked to repeat the self-regulatory instruction to themselves three times. A short interview was conducted with children in all conditions at the end of the experiment. Questions pertained to assessing how

much the students felt the instructions helped them complete the task, how easy they felt the task was, how much fun they had playing the game, and how many errors they felt they had made. Participants answered these questions using a seven-point scale (1 = strongly agree, 7 = strongly disagree).

Results indicated that children in the goal-intention condition showed slower response times than children in the implementation-intention condition. Analysis of CBCL scores and performance on the Go/No Go tasks indicated that the effects of forming implementation intentions were contingent on children's ADHD status (with or without ADHD). Children without ADHD were found to perform similarly in both the goal-intention and implementation conditions. In contrast, children with ADHD in the implementation intention condition were found to perform better on tasks than children with ADHD in the goal-intention condition. Overall, children without ADHD performed better in the goal-intention condition than children with ADHD; however, children with and without ADHD performed similarly on tasks in the implementation intention condition. Analysis of the interview questions indicated that children with ADHD reported that they found the task easier than children without ADHD, suggesting that children with ADHD may overestimate their abilities.

Gawrilow and Gollwitzer (2007) conducted a second study to determine that the benefits of forming implementation intentions were not due to an increase in commitment to task. Researchers were concerned that the children's extra effort in developing implementation intentions made them more committed to the task in comparison to the children in the goal intention condition whose intervention necessitated less effort. To address this concern, Gawrilow and Gollwitzer used a goal-commitment questionnaire to assess the degree to which the children actually acted on the respective intention (i.e., goal or implementation intention).

Participants in the second study consisted of 20 males with ADHD who ranged in age from 8 to 14. To account for the effects of medication on performance, children were asked to not take their medication for 48 hours prior to the experiment. In the study, children were assigned to either the goal-intention or the implementation-intention condition. Participants completed the task procedure twice; once without their medication and a second time with their medication. Frequency of correct stop responses in the No-Go trials and the response times in the Go trials were measured. Children also completed a three-item goal commitment questionnaire to assess their levels of commitment to the tasks.

Gawrilow and Gollwitzer's (2007) results from their second study indicated that the effect of implementation intentions and goal intentions on response inhibition was dependent on whether or not the child had taken medication. Results indicated that regardless of the presence or absence of medication children with ADHD performed better when using implementation intentions than goal intentions. However, children with ADHD with medication showed greater response inhibition when using implementation intentions than children with ADHD without medications. In contrast, children using goal intentions did not improve their response inhibition under medication but instead exhibited a decrease in performance both with and without medication.

Findings from Gawrilow and Gollwitzer (2007) suggested that children with ADHD who form implementation intentions achieved a better inhibition performance than participants who only formed goal intentions. The results from these studies also suggested that implementation intentions may be useful in helping children with ADHD overcome problems with behavior inhibition. Implementation intentions may also help children with ADHD obtain enhanced outcomes when they are paired with existing therapy or medication.

Despite its treatment implications for students with ADHD, Gawrilow and Gollwitzer's (2007) study is limited in its application. One limitation of the study is the design of its intervention. For instance, children in the implementation intention condition were allowed to verbally rehearse their intervention suggesting that the results of this study could also have been affected by practice effects. Results of this study could have further been affected by the presence of comorbid disorders and the lack of assessment of children's overall intellectual ability. While Gawrilow and Gollwitzer acknowledged that some participants in their study had comorbid disorders, they did not elaborate regarding the number of participants with such disorders or the type of additional disorders.

Similar to Gawrilow and Gollwitzer (2007), research by Reid et al. (2005) also demonstrated the utility of self-monitoring as a self-regulation intervention for students with ADHD. Reid et al. (2005) examined the use of four self-regulation interventions: self-monitoring, self-monitoring plus reinforcement, self-management, and self-reinforcement through a meta-analysis of the literature on children with ADHD. Specifically, the study aimed to examine the effectiveness of these four self-regulation techniques to determine if they provided additive effects above and beyond the use of medications alone.

The meta-analysis included 16 studies published in peer-reviewed journals. To be included in the meta-analysis, studies must have met the following criteria: used one of the four prior listed self-regulation interventions, reported observational data that included an academic or behavioral outcome, employed a quantitative research design, and utilized participants age 18 or younger who were identified as having ADHD or who were currently taking medication commonly prescribed for ADHD. Participants from the analyzed studies consisted of 51 elementary students. Three of the participants were older than age 13 and the remaining

participants were 12 years and younger. None of the participants were high-school age. Participants consisted of 48 males and three females. Of the 16 studies, nine studies reported participants with comorbid conditions such as learning disabilities, oppositional defiant disorder, conduct disorder, and behavior disorders.

Two of the studies included in the analysis by Reid et al. (2005) were group studies, and the remaining 14 studies were small studies that examined individual students. Effect sizes were computed for three classes of dependent measures commonly reported in the literature and believed to affect directly the classroom performance of children with ADHD on-task behavior, disruptive behaviors, and rate of academic responses or accuracy on academic tasks. Studies were categorized based on the type of self-regulation strategy they used:

1. Self-monitoring: Included studies in which participants were required to self-assess whether or not a behavior occurred and then self-record the results in the absence of an external reinforcer.
2. Self-monitoring plus reinforcement: Consisted of studies in which self-monitoring was combined with external reinforcement, provided by an outside agent, contingent on performance of the targeted behavior.
3. Self-management: Included studies in which required participants self-evaluated some aspect of their performance and then matched their self-evaluations to an external criterion. Reinforcement was based on the extent to which the participants' self-evaluations agreed with the external criterion.
4. Self-reinforcement: Contained studies in which participants self-assessed their performance on a task, compared performance to a criterion, and then awarded themselves reinforcement based on that assessment.

Reid et al. (2005) identified three dependent measures as the outcome measures of the study: on-task behaviors, academic productivity or accuracy, and inappropriate behaviors. Results of this study indicated that self-regulation interventions can produce meaningful positive changes in student behavior, academic productivity and accuracy, and reduction of inappropriate or disruptive behaviors. Specifically, self-reinforcement was found to be more effective than the other methods in producing academic accuracy and productivity but not in increasing on-task behavior or decreasing disruptive behavior. Self-monitoring and self-monitoring with reinforcement were found to affect positively on-task behaviors, academic productivity or accuracy, and inappropriate behaviors. While self-management procedures were found to be effective in increasing on-task behaviors and reducing disruptive behaviors, the effects of self-management strategies on academic outcomes were unclear. In general, this study highlighted the potential for self-regulation techniques as useful interventions for children with ADHD.

In regard to self-regulation interventions for ADHD, the study by Reid et al. (2005) not only provided an overview of the current research conducted regarding ADHD and self-regulation, but also emphasized the different strategies that could be used to help students acquire self-regulatory behaviors. A particular strength of this study was its support of the importance of using techniques such as self-regulation interventions in addition to medication to help stabilize and reduce problem behaviors in children with ADHD. The study also provided evidence for the promise of tools such as self-assessment and self-recording in improving behavior and academic outcomes in students with ADHD. Results of this study indicate the importance of including self-regulation interventions in multi-modal treatment programs for students with ADHD.

The study by Reid et al. (2005) has some limitations affecting its generalizability. One limitation of the study is the participants of the analyzed studies. The majority of the participants included in the analysis were males age 12 and younger. This may limit the applicability of the self-regulation techniques examined in this study to younger, predominantly male students. This study was also limited in its examination of the techniques of self-regulation; not all self-regulation techniques were studied equally making it difficult to compare one method of self-regulation to another. A final limitation of this study is its methods. The study was a meta-analysis in which effect sizes were analyzed. However, there are no established guidelines for interpreting the effect sizes of small individual studies. Additionally, meta-analyses are limited by their difficulties in control of bias, inclusion of studies that may have originally been poorly designed, and their reliance on previously published works, which may exaggerate outcomes.

Research on ADHD and self-regulation has demonstrated that self-regulation strategies are effective with students with ADHD (Reid et al., 2005). Although this success has been noted, research regarding ADHD and self-regulation has typically focused on multiple strategies for helping students with ADHD. While the use of multiple strategies has been shown to help students acquire self-regulation skills, the use of such strategies may make it difficult to discern if one strategy is more effective than another or if the use of one strategy is sufficient in helping students develop self-regulation.

Teacher Acceptability of Current Self-Regulation Interventions

Although self-monitoring has been demonstrated to be an effective component of self-regulation interventions, self-regulation interventions that use a self-monitoring component can be impractical, infeasible, or disruptive in certain classroom settings (Amato-Zech, Hoff, & Doepke, 2006). The majority of such interventions rely on cuing from an external source such as

audio cues (i.e., timer, verbal prompts from teacher) to prompt students to self-monitor their behavior (Shapiro & Cole, 1994). Cues may also be noticeable by other students. For instance, the use of headphones or audible cues that can be heard by other students are not only distracting but may also be perceived as stigmatizing or aversive to the student participating in the intervention and distracting to other students in the classroom. Verbal prompts delivered by teachers are not only distracting to students who are not self-monitoring, but also to the teacher as well. Delivering the prompt requires the teacher to interrupt the lesson to provide the prompt, reducing the chance that intervention will be used. Teachers have also indicated that cuing devices such as buzzers make it difficult to implement the intervention outside of the classroom, thus limiting the generalizability of the skills (Amato-Zech et al., 2006).

Overview of Direct Behavior Rating-Single Item Scale

Since behavior problems interfere with academic and social success, simple yet effective tools are vital to the identification and intervention of behavior problems (Menzies & Lane, 2011). DBR-SIS is an evidence-based assessment that provides information regarding a student's behavior and can be used to guide decisions in determining behavioral supports (Chafouleas et al., 2008). In the school setting, ratings may be completed by a rater or raters, such as an educational professional, student, or educational professional and student. DBR-SIS focuses on a single behavior and consists of specific and repeatable procedures in which an observer systematically rates an operationally defined behavior.

Unlike other behavior progress monitoring tools, DBR-SIS integrates aspects of both SDO and behavior rating scales to create a practical method for behavioral assessment and progress monitoring within a problem-solving model (Riley-Tillman et al., 2009). Schools have begun to use problem-solving models as a proactive and preventative approach to help support

students who are experiencing or who may be at risk of experiencing social, emotional, or behavioral problems (Ervin, Schaughency, Matthews, Goodman, & McGlinchey, 2007). Problem-solving models that address social, emotional, and behavioral concerns are often referred to as school-wide positive behavioral support (SWPBS). Similar to RTI, SWPBS also use a three-tiered approach (primary, secondary, and tertiary) to help identify and provide supports to students who are in need of services (Newton, Horner, Todd, Algozzine, & Algozzine, 2012). As in RTI, as students move through the tiers, the interventions provided become more focused and intense. Primary interventions in SWPBS typically consist of school-wide screening or interventions such as the identification of common behavioral expectations. Students in the secondary or tertiary tiers are students who have been identified as in need of more intense interventions; students needing less-intense interventions often receive supports in small group format (secondary tier) while students necessitating the most intense services are provided individualized interventions typically implemented in a one-to-one setting (tertiary tier) (Ervin et al., 2007).

Throughout SWPBS tier decisions are made based on student data. DBR-SIS has been shown to help facilitate decision making within a problem-solving model because it produces data that help inform decisions and practice in meaningful ways (Riley-Tillman et al., 2009). The data generated from DBR-SIS are collected across time, recorded, and then interpreted as time-series data (Christ, et al., 2009). These data may be analyzed graphically or statistically to assess behavioral change from baseline and throughout treatment (Christ, Riley-Tillman, Chafouleas, & Jaffery, 2011). For data analysis, research by Chafouleas (2011) suggested that students be rated a minimum of five times on each targeted behavior to ensure reliable decision making. For low-stakes decision-making, five to 10 ratings are needed to ensure adequate levels

of reliability. While several DBR-SIS may be used simultaneously, data from each behavior should be analyzed and interpreted separately (Chafouleas, Kilgus, & Hernandez, 2009). Data gathered from DBR-SIS can be used formatively since they are sensitive to small but relevant changes in behavior allowing detailed profiles of student behavior to be obtained (Chafouleas, Riley-Tillman et al., 2009). The detailed behavior focus and combination of observation and direct rating, may lend DBR-SIS to be a particularly useful tool in interventions requiring a specific behavior to be addressed (Volpe & Gadow, 2010).

Implications of DBR-SIS as an Intervention for Self-Regulation

As school budgets continue to become more restrictive, strategies that are versatile, reliable, and valid will be sought. Tools such as behavior progress monitoring strategies that can serve both as a behavior screener and intervention will increasingly be needed (Carta et al., 2004). DBR-SIS has surfaced as a tool not only for behavior progress monitoring but also perhaps as a potential intervention. Although DBR-SIS has predominantly been used as a method for behavioral assessment and progress monitoring, Kilgus (2013) suggested that DBR-SIS can be used as a Tier 2 intervention within a positive behavior support program. A review of the literature regarding DBR-SIS and its application in the school setting by Kilgus (2013) indicated that because of its design, ability to assess student progress, capacity to influence student behavior, and utility as a communication tool, DBR-SIS may not only demonstrate behavior progress in students but also be used as an intervention.

While an extensive series of studies have established DBR-SIS as a viable assessment and progress-monitoring tool, limited research has been conducted regarding the use of DBR-SIS as an intervention. Despite the lack of research regarding the effectiveness of DBR-SIS as an intervention, a national survey of teachers conducted by Chafouleas, Riley-Tillman, and Sassu

(2006) indicated that 64% of teachers reported using DBR-SIS for intervention purposes. Other support for the use of DBR-SIS as an intervention stems from research by Vannest, Davis, Davis, Mason, and Burke (2010). Vannest et al. conducted a meta-analysis of 17 studies in which a variety of DBRC were evaluated (e.g., DBR-SIS, Home-School Note, and Home-Based Reinforcement). Results from Vannest et al. suggest that DBRC interventions can be applied effectively across a broad range of age and grade levels. Specifically, their findings indicated that DBRC tools, such as DBR-SIS, may be effective interventions for a variety of behavior problems.

Chafouleas et al. (2012) further investigated the effectiveness of DBR-SIS as an intervention. In their study Chafouleas et al. examined the use of DBR-SIS as part of an intervention package consisting of group contingency and self-management strategies aimed at increasing appropriate classroom behaviors in 57 eighth-grade general education students. Two eighth-grade teachers also participated in the study. The goal of the intervention package was to help increase students' classroom preparedness, academic engagement, and homework completion.

Chafouleas et al. (2012) hypothesized that the intervention package would improve student behavior and that the teachers would have a high level of treatment integrity and view the intervention as acceptable and feasible for classroom use. Treatment integrity data were assessed via observation, teacher self-report, and permanent product review. At the end of each week, researchers collected the intervention materials and completed a treatment integrity checklist. Intervention acceptability and feasibility were measured via the Usage Rating Profile-Intervention (URP-I; Chafouleas, Kilgus, et al., 2009). The URP-I is a brief self-report tool consisting of 35 statements regarding the acceptability, understanding, feasibility, and systems

support needed to implement an intervention. Raters indicate the extent to which they agree or disagree with each statement using a six-point Likert scale (1 = strongly disagree to 6 = strongly agree). Researchers also hypothesized that DBR-SIS and Systematic Direct Observation (SDO) would generate similar and consistent data profiles across baseline and intervention phases. DBR-SIS ratings and SDO were used to determine the effectiveness of the intervention. SDO data were collected one to two times a week and were used to substantiate the DBR-SIS results for engagement and to provide an additional measure of student behavior that was feasible given available resources.

Research questions were investigated using a multiple baseline with an embedded changing criterion design to allow for weekly class goals to increase once teams successfully achieved the goal. The study consisted of two phases: baseline and intervention. During baseline, students were trained and gathered their own behavioral data using DBR-SIS forms that included scales to rate each target behavior. DBR-SIS scales utilized 0–10 gradients which students used to self-monitor their behavior by estimating the extent to which they believed they engaged in the target behavior. Ratings were completed by students at the end of a pre-selected class period. Once the students had completed their ratings, the classroom teacher reviewed the form with each student and indicated her own rating on each student's form.

In the intervention phase, students were assigned to groups of three to five students in which students continued to self-monitor and earn points individually. Students earned points for their self-ratings if their ratings matched the teacher's rating or came within one point of the teacher's rating on any of the three target behaviors. Points were used to redeem rewards in a multi-tiered reinforcer system. To create the group contingency, individual student points were aggregated into a team average, which was recorded on a team graph and a team tally sheet.

Graphs were updated and reviewed by the classroom teachers each day prior to the beginning of the lesson. Teams with cumulative scores that met or exceeded the predetermined number of points earned a reinforcer each week.

Treatment integrity data indicated that teachers fluctuated between moderate to high levels of adherence to intervention steps as measured by permanent products. On average, analysis of permanent products indicated 74% treatment integrity across days of implementation. URP-I data demonstrated that the teachers' ratings of intervention usability were moderately high. Teachers' responses indicated that they felt that the intervention was acceptable and easy to understand. Feasibility data revealed that although the teachers indicated that they felt the intervention was feasible, they disagreed on the ease with which the intervention could be implemented. For instance, while both teachers reported having the skills to implement the intervention, one teacher expressed that she would need support in distributing reinforcers to the students each week. This teacher also indicated that she felt the weekly reinforcers were slightly disruptive to her typical classroom schedule.

In general, data from DBR-SIS and SDO followed fairly similar behavior estimates and patterns across baseline and intervention phases. Intervention outcomes suggested that, on average, student behavior improved slightly to moderately and decreased in variability following implementation of the intervention across all behaviors with the strongest immediate and sustained effects found for off-task behavior as measured by SDO. Differences between DBR-SIS data and SDO data were observed. Overall, data collected via SDO by an external observer indicated more substantial improvement in behavior than data collected via student-completed DBR-SIS. Results from the study suggested that the intervention package involving self-

management using DBR-SIS and group contingency has potential for improving student behavior.

Although results suggest that the intervention package may be an effective tool for improving the self-management skills of middle-school students, the variations in improvements across classes, behaviors, and data sources suggest that further research be conducted to evaluate whether certain aspects of the intervention were more challenging than others. Other limitations in the study by Chafouleas et al. (2012) include methodological concerns. One concern is the lack of assessment of student behavior prior to the implementation of the intervention. Since the intervention predominantly consisted of a self-monitoring strategy (DBR-SIS) it is difficult to discern the true effects of DBR-SIS from the influence of the reinforcer system. Another limitation is that the intervention was implemented in two classroom settings by two teachers. Acceptability, feasibility, and implementation of the intervention may vary with teachers' experience and resources available to them in the school setting. The multi-tiered reinforcer system is also a concern in this study. The reinforcer system was entirely researcher funded making it possible that such a system may not be able to be supported in the school setting without additional assistance and external financial support. Researchers also questioned the necessity of the reinforcer system, indicating that DBR-SIS alone may be sufficient for facilitating and maintaining behavior change.

In general, research demonstrates the utility of DBR-SIS as an efficient and effective method of intervening with problematic student behavior. As a tool, DBR-SIS was developed to be a repeatable, non-intrusive, and efficient tool for teachers and other education professionals to use easily in the school setting (Briesch & Chafouleas, 2009). Its uncomplicated forms, simple procedures, and minimal training requirements make it possible for DBR-SIS to be completed

quickly and daily by both teachers and students contributing to the plausibility of it being used as a classroom intervention (Chafouleas, 2011; Christ et al., 2011).

Conclusions and Future Considerations

The above studies suggest that broad strategies such as DBR-SIS can be used by students to help them acquire skills essential to the development of self-regulation: monitoring, recording, and evaluating their behavior (Reid et al., 2005). These skills are integral in the acquisition of self-regulation because they are essential to helping students to become engaged in the conscious appraisal of their immediate behavior (Barkley, 1997). Additionally, the DBR-SIS standardized form consists of behaviors characteristic of self-regulation such as inattention (measured by academic engagement) and disruptive behavior (Christ et al., 2009; Olfson et al., 2002).

In the development of self-regulation interventions, self-monitoring tools are typically used. Self-monitoring consists of students' noting and recording the frequency of their behaviors as they occur in time and context. DBR-SIS may have potential as a self-monitoring tool because it requires students to attend to their behaviors in a specific time and setting (Schunk & Zimmerman, 1997). Since DBR-SIS is designed to be completed by a variety of raters, including students, it may help students learn to exert more control over their cognitions and behaviors resulting in an increased sense of independence, competence, and acceptance from others (Agran et al., 2001). However the majority of DBR-SIS intervention research to date has considered the effectiveness of the tool as an intervention when completed by an adult such as parents or teachers or middle school-aged student (Briesch & Chafouleas, 2009). Additionally, current research regarding DBR-SIS as an intervention has only examined the use of the tool in the context of an intervention package and as a part of a reward system (Kilgus, 2013).

Research on ADHD and self-regulation has demonstrated that self-regulation strategies are effective with students with ADHD (Reid et al., 2005). Although this success has been noted, research regarding ADHD and self-regulation has typically focused on multiple strategies for helping students with ADHD. In contrast, limited research on self-regulation and ADHD has explored the effects of student-directed learning strategies or the use of single-component strategies on the development of self-regulation. While the use of multiple strategies has been shown to be beneficial to children with ADHD, the use of several strategies within an intervention make it difficult to discern whether one self-regulation strategy is more effective than another or if the use of one strategy is sufficient in helping students develop self-regulation.

Review of the previously discussed literature indicates a gap in the current literature regarding self-regulation, ADHD, and interventions. The studies above indicate the need for students not only to learn to self-regulate their behavior and attention but also to realize that they can serve as their own supports in learning to regulate these processes (Agran et al., 2001). While self-regulation interventions have been shown to have potential benefits (e.g., increased independence) for students in the general education setting, strategies are often dependent on external sources such as teachers (Wehmeyer et al., 2003). Additionally, no current self-regulation study contains measures to assess all of the following variables: behavior, self-regulation, academic performance, and teacher acceptability. Without such measures it is difficult to determine if the intervention was truly effective in improving students' self-regulation and if teachers perceive the intervention as beneficial.

Strategies that are efficient and effective will be needed not only to help monitor behavior change but also to help students acquire the skills to regulate their own behavior. The need for self-regulation strategies can be noted by the increasing number of students with self-regulation

deficits in school (Barkley, 1997). To help students with self-regulation impairments develop more control over their learning experiences, student-driven single-component self-regulation strategies need further consideration.

Theoretical Foundation of Self-Regulation

Cognitive theories construct representations of how students manage information through mechanisms such as encoding, processing, storing, and retrieving information. A cognitive perspective presents students as active participants in their learning as opposed to passive recipients of information (Schunk, 2008). However, it has been argued that cognitive theory alone may be insufficient in explaining the development and acquisition of self-regulatory abilities due to its limited focus on the learner and its lack of attention to the context in which the learner exists (Grusec, 1992). Social learning theory, a subdiscipline of cognitive theory, addresses this gap due to its emphasis on how learning occurs in the environment (Schunk, 2008). Albert Bandura (1977) developed social learning theory due to his belief that conditioning theories provided an insufficient explanation of human behavior. Bandura's social learning theory perceives human functioning as a series of reciprocal interactions between behavioral, environmental, and personal variables such as cognitions and affect. Learning in social learning theory stems from action and observation; students learn by doing or observing another doing and by reinforcement and punishment. This driving principle of social learning theory argues that anything can be learned including complex skills such as self-regulation (Bandura, 1977; Schunk, 2008).

Drawing on Bandura's (1977) work, researchers have defined self-regulation as the process in which students activate and sustain cognitions and behaviors systematically oriented toward the attainment of their learning goals (Schunk, 2008). In application to self-regulation,

social learning theory divides self-regulation into three processes: self-observation (self-monitoring), self-judgment, and self-reaction. Considered together, these factors can be argued to provide a multifaceted view of self-regulation that is sensitive to both students' developmental levels and task-dependence of specific processes such as use of strategies and self-monitoring (Schunk & Zimmerman, 1997). This broadened view of self-regulation can be effective in the classroom setting because it allows teachers to examine students' attempts at self-regulation in the classroom in relation to students' goals and the classroom environment (Boekaerts & Cascallar, 2006). By engaging students in functions of self-regulation, such as self-monitoring, the external environment is positively influenced while the students succeed at meaningful tasks occurring in relevant contexts. This helps students develop competencies in self-regulatory skills while increasing academically engaged and pro-social behaviors (Ylvisaker & Feeney, 2009).

The Current Study

Statement of Problem

Self-regulation and student-directed self-regulation strategies have the potential to benefit students with a variety of learning and behavioral problems. Students who learn self-regulation strategies increase their capacities and opportunities to self-direct their own learning experiences, requiring less external support from peers and adults (Wehmeyer et al., 2003). Having greater control over and management of their behaviors provides students with self-regulation deficits increased independence, competence, acceptance from others, and the abilities to provide themselves with the cues and consequences necessary to elicit, evaluate, and maintain the desired behaviors when external supports are not available (Agran et al., 2001).

However, to date there is little information about the use of student-directed self-regulation strategies in general education classrooms, particularly with upper elementary

students with ADHD (Wehmeyer et al., 2003). Because self-regulation strategies have been shown to be effective in helping children with ADHD acquire self-regulation skills, and current definitions of ADHD conceptualize ADHD as a deficit in self-regulation, the use of self-directed self-regulation strategies in students with ADHD should be explored (Reid et al., 2005; Lienemann & Reid, 2008).

Purpose of Study

As accountability of teachers has been pushed to the forefront, it has been speculated that tolerance for students with behavioral problems will dissipate (Menzies & Lane, 2011). Strategies that are efficient and effective will be needed not only to help monitor behavior change, but also to help students acquire the skills to regulate their own behaviors. To support students with self-regulation deficits, such as students with ADHD, further study of the effects of student-directed behavior strategies in inclusive settings is needed. The present study examined the effects of a student-directed self-regulation intervention on the classroom behaviors of students with ADHD in the general education setting. The purpose of the current study was twofold: first, the study investigated the utility of DBR-SIS as a self-regulation intervention in elementary and middle school students with ADHD; second, teacher perceptions about the utility and effectiveness of DBR-SIS as an intervention for self-regulation were explored.

Research Questions

To determine the utility and effectiveness of DBR-SIS as a self-regulation intervention in upper elementary school students with ADHD, the following research questions were investigated:

1. Does the change from pre-test to post-test in self-regulation skills [as measured by the Clinical Assessment of Attention Deficit–Child (CAt-C) Inattention (ATT), Impulsivity

(IMP), Hyperactivity (HYP) Internal (INT), and External (EXT) scales] differ for the two intervention conditions (self and teacher)?

2. Does the change from pre-test to post-test in academic and behavior performance (as measured by the CAt-C Personal (PER), Academic (A/O), and Social (SOC) scales) differ for the two intervention conditions (self and teacher)?
3. Are there significant differences between the student DBR-SIS self and student DBR-SIS teacher intervention groups on the three DBR-SIS behaviors (academically engaged, respectful, and disruptive)?
4. Are the post-test scores in self-regulation skills (as measured by the CAt-C ATT, IMP, and HYP scales) significantly correlated with the absolute change, from baseline to post-test, on the three DBR-SIS behaviors (academically engaged, respectful, and disruptive) for the student DBR-SIS self and the DBR-SIS teacher intervention groups?
5. Do teachers view DBR-SIS as an acceptable self-regulation intervention?
6. Do teachers view the DBR-SIS self and teacher interventions as equally acceptable?

Significance of Study

The significance of the current study is three-fold. Most important is the potential impact on students with ADHD who may benefit from learning self-regulation strategies. Teachers are usually the primary interventionists in the delivery of behavioral interventions. Interventions that are effective and monopolize little of teachers' time are needed to facilitate the implementation of the interventions and to help maintain instructional focus. Current self-regulation strategies require much external support in the forms of reinforcers and modeling, making them cumbersome and challenging to implement. Limited research has explored

teachers' perceptions of behavioral interventions in the classroom, making this an area of further investigation.

Second, the current study attempted to contribute to the research literature related to student-directed self-regulation strategies and their potential as an intervention for students with ADHD. Currently, the majority of the interventions available for students with ADHD are teacher driven and teacher reinforced. Interventions that are teacher driven may lead students to believe that external factors are needed for them to regulate their behavior. ADHD interventions that are directed by the students themselves with limited teacher support may encourage the students to attribute the successes they experience to themselves and not to external factors.

Finally, research has demonstrated that DBR-SIS is a sound, cost-effective, reliable measure of student behavioral progress and a potential intervention for self-regulation. As schools continually operate on smaller budgets, tools that are cost-effective, effective, and multi-faceted are growing in need. Further research regarding potential alternative uses of DBR-SIS is needed to identify and provide psychometric support for its alternate purposes in the school setting.

CHAPTER 3

METHODOLOGY

Population and Sample

The study was conducted during the fall and spring semesters in three predominantly middle-class schools (two elementary and one middle) in midwestern Indiana. Participants included 20 students with ADHD in the third (10%, *n* = 2), fourth (20%, *n* = 4), fifth (40%, *n* = 8), sixth (10%, *n* = 2), and seventh (20%, *n* = 4) grades and their classroom teachers (*n* = 10). Student participants included 13 boys and 7 girls, and they ranged in age from 9 to 13 with a mean age of 10.95. The majority of student participants were Caucasian (85%, *n* = 17), 10% were Hispanic (*n* = 2), and 5% were African-American (*n* = 1). All teacher participants were Caucasian, and 90% of teacher participants were female (*n* = 9) and 10% male (*n* =1). Teacher participants consisted of two third-grade teachers (20%), two fourth-grade teachers (20%), four fifth-grade teachers (40%), one sixth-grade teacher (10%), and one seventh-grade teacher (10%). Information regarding age or years of teaching experience was not collected.

The target number of participants for this study was 35 students, from third to seventh grades, based on power analysis (effect size = .50, power = .80, and alpha = .05; Faul, Erdfelder, Lang, & Buchner, 2007). Unfortunately, the target number of student participants was not achieved, due to the number of schools and teachers who agreed to participate in the present study. Power analysis of the obtained sample size of student participants (*n* = 20) was as

follows: effect size = .50, power = .59, and alpha = .05 (Faul et al., 2007). The number of teacher participants could not be determined prior to the study, since it was based on student participation.

Criteria for participation in the study included: (a) the student was teacher nominated as exhibiting challenges with behavior and self-regulation and (b) the student's parents verified that the student had been diagnosed by either a physician or mental health professional as having ADHD as outlined in the Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM–IV–TR; American Psychiatric Association, 2000).

Recruitment and Informed Consent

Participants were recruited through schools and special education cooperatives in midwestern Indiana. Prior to the study's commencement, superintendents, principals, and special education cooperative directors were sent an invitation letter (Appendix A) detailing the purpose of the study. Following the letter, school administrators were contacted via phone to determine their willingness for their schools to participate in the study. Interested schools were sent a letter of agreement (Appendix B) via e-mail, for schools to print and sign on their school letterhead. Completed letters of agreement were returned to the researcher via e-mail in portable document format (pdf).

After permission from schools was received, the researcher sent an invitation email (Appendix C) to the teachers of the target grades inviting them to participate in the study. The teacher invitation email mirrored the teacher consent form and included directions for returning the consent form to the researcher. Teacher consent forms (Appendix D) with return envelopes were placed in all potential teacher participants' school mailboxes to provide teachers with the opportunity to consent or dissent in private as to avoid any coercive influences that may arise in

the school setting. To help ensure confidentiality, teachers were encouraged to return the consent forms to the researcher regardless of their decisions. Schools were not notified of their teachers' consent or dissent to participate in the study.

Once teachers turned in their consents, they were asked to nominate potential student participants for the study. Teacher participants met with the principal investigator either before school, after school, or during their prep periods to help identify appropriate student participants. Teachers were asked to identify students who they felt exhibited difficulties with behavior and self-regulation that interfered with the student's abilities to learn.

Parent(s) or guardian(s) of students who were nominated by their teachers and whose teachers consented to participate in the study were contacted via mail. Parental consent forms (Appendix E) were mailed to the homes of students who met the criteria for the study and whose teachers consented to participate in the proposed study. The risk of teacher influence on parental response was reduced by the researcher sending a letter (Appendix F) with the consent form explaining the selection and participation process. Parent(s) or guardian(s) who gave permission for their students to participate in the study were also asked to verify their students' diagnoses of ADHD by initialing the ADHD verification statement on the parental consent forms. Recipients of the parental consent forms returned the forms to the principal investigator via a pre-addressed and stamped envelope included with the consent form. Recruitment letters were sent to parents one time. Students whose parent(s) or guardian(s) did not give permission were not included in the study.

Upon receipt of parental consent, the principal investigator met with potential student participants at their schools during the school day. Student meetings were conducted during the students' activity or "specials" class time. Meetings were held in a conference room or empty

class room. To help maintain student confidentiality, teacher participants were notified of the days and times of the student meetings and sent potential student participants to the meeting room at the designated time. The principal investigator met individually with potential student participants and reviewed the student assent form (Appendix G) with them. Assent forms were collected from students after the meeting. Following the meeting potential student participants chose to participate or not to participate in the study. Students indicated their choices on the assent forms and returned the assent forms, via envelopes provided to them, regardless of their decisions. Envelopes containing signed student assent forms were sealed and given to the principal investigator or to the classroom teacher for the principal investigator to collect at the end of the school day. After parent and teacher consents and student assent were received, training sessions were scheduled with the teachers and students who agreed to participate in the study.

Measures

While many studies have focused on the impact of the development of self-regulation on social behaviors, limited research has connected the development of self-regulation to improvements in academic skills or performance (Reid et al., 2005). Also, few studies have included measures assessing teachers' perceptions of the effectiveness of self-regulation interventions. To address the methodological limitations in previous self-regulation studies, the current study utilized the Clinical Assessment of Attention Deficit-Child (CAt-C) (Bracken & Boatwright, 2005) and the Intervention Rating Profile-15 (IRP-15; Carter, 2010). The CAt-C was used to measure self-regulation and the IRP-15 was used to assess teachers' views of intervention effectiveness. Both instruments are further described below. Demographic

information such as age, grade, and gender was collected from student participants. Teacher demographic information consisted of grade taught and gender.

Clinical Assessment of Attention Deficit-Child (CAt-C)

The Clinical Assessment of Attention Deficit-Child (CAt-C; Bracken & Boatwright, 2005) is a 42-item rating scale designed to assist in the diagnosis of ADHD in children and adolescents ages eight to 18. The CAt-C assesses behaviors related to Attention Deficit Disorder with and without hyperactivity via the Clinical scales, Context clusters, and Locus clusters. Clinical scales on the CAt-C help identify attention, impulsive, or hyperactive behaviors that may be related to ADHD. Three scales make up the Clinical scales: Inattention (ATT), Impulsivity (IMP), and Hyperactivity (HYP). These three scales assess the key behavioral symptoms of ADHD. For instance, ATT consists of items associated with limited concentration such as boredom, forgetfulness, and wandering thoughts, items on IMP reflect self-control and self-monitoring (e.g., interrupting and decision making), and HYP measures symptoms related to restlessness (e.g., excessive energy and hyperverbalizations; Bracken & Boatwright, 2005).

The Context clusters on the CAt-C are: Personal (PER), Academic (A/O), and Social (SOC). These clusters represent the most common life contexts in which symptoms of ADHD may be present. The PER cluster addresses the inattentive, impulsive, or hyperactive behaviors that are experienced at the intra-individual level (e.g., loses personal belongings) and the A/O and SOC clusters measure the more overt behaviors of ADHD that may be present in school setting (e.g., difficulties with attending, inhibiting impulses, and regulating behaviors) or social settings (e.g., poor listening, problems with taking turns, and irritability; Bracken & Boatwright, 2005).

The two Locus clusters, Internal (INT) and External (EXT), assess the student's experience of symptoms. These clusters measure the extent to which the student experiences difficulties with attention, impulsivity, and hyperactivity and the extent to which the student is able to inhibit these problematic impulses. The INT cluster focuses more on the behaviors that are more covert and generally experienced by the student such as day-dreaming, frustration, forgetfulness, concentration, and boredom. In contrast, the EXT cluster assesses behaviors that are more overt and readily observed by others (e.g., interrupting, squirming, hyperactivity, and unpreparedness; Bracken & Boatwright, 2005).

Additionally, the CAt-C also yields an overall score, the Clinical Index (CI) score. The CI is a summation of all of the items on the assessment and represents the best estimate of an individual's overall level of Attention Deficit with or without hyperactivity (Bracken & Boatwright, 2005). Bracken and Boatwright (2005) indicated that the disparate levels of self-reported concern on the scales and clusters could affect the overall CI. As a result, it is recommended that the interpretation of the CAt-C results should predominantly focus on the scales and clusters. In accordance with this recommendation, the current study used the scores on the Clinical scales (ATT, IMP, and HYP) and Locus clusters (INT and EXT) to measure self-regulation. Scores on the Context clusters (PER, A/O, and SOC) were used to measure academic skills and behavior performance.

The CAt-C consists of three parallel forms: a Self-Rating Form (SRF) completed by the child or adolescent, Teacher Rating Form (TRF) completed by the child's or adolescent's teacher(s), and a Parent Rating Form (PRF) completed by one or both parents. Scales and clusters are assessed separately via parallel self, parent, and teacher ratings (Bracken & Boatwright, 2005). In this study, the SRF and TRF forms were used as the pre-test and post-test

measures to assess changes in self-regulation and behavioral symptoms in the academic setting. The SRF and TRF are paper and pencil assessments that take the respondent 10–20 minutes to complete. Items are identical across respondents and are presented and scored on a four-point scale, with 1 = strongly disagree and 4 = strongly agree. For example, an item that loads on the Hyperactivity Clinical scale for self-rating is "I do not like to sit still and read," whereas for teacher rating the item is "Does not like to sit still and read."

On the CAt-C, standard T-scores (with 90% confidence interval), percentiles, and a qualitative classification (Normal Range, Mild Clinical Risk, Significant Clinical Risk, and Very Significant Clinical Risk) can be obtained for each scale and cluster (Demakis, 2007). Additionally, an overall Clinical Index can be obtained by summing the ATT, IMP, and HYP clinical scales. To assess the degree of response and frequency of response, the CAt-C utilizes three validity scales: Negative Impression (degree in which responses are unusually negative or impaired), Positive Impression (degree in which responses are unusually positive), and Infrequency Measures (extent to which responses are in an extreme manner compared to the standardization sample; Bracken & Boatwright, 2005). The clinical and educational applications of the CAt-C include diagnosis of ADHD, treatment planning, and progress monitoring. While test developers urge that the CAt-C be used with caution in clinical decision-making, it has been shown to have utility as a progress monitoring tool for assessing changes in behavior across a variety of settings due to similar operationalization of behaviors across scales across age levels (Demakis, 2007).

The CAt-C was normed using a nationally representative sample of 800 children and adolescents ages eight to 18 years, 800 matched parents of the children and adolescents, and 500 teachers of these same children (Bracken & Boatwright, 2005). It has consistently demonstrated

reliable internal consistency scores on the Clinical Index of .92 (Self) and .97 (Teacher). All of the Clinical scales exceeded .80 with the exception of the HYP scale (r = .77) on the Self form. CAt-C Context clusters exceeded the .70 criterion with coefficients ranging from .75 to .87 on the Self form, .85 to .91 and .89 to .94 on the Teacher form. On average, the test-retest interval was 17.17 days with stability coefficients for the CAt-C ranging from .68 to .88 (CI .73 to .83; Clinical scales .66 to .88; Context cluster .68 to .86). Inter-rater reliability for the Self and Teacher forms ranged from .34 to .44. Test developers suggested that the low inter-rater reliabilities may reflect the differences in perceptions and experiences of the individual rating the child as opposed to poor reliability (Bracken & Boatwright, 2005).

Intervention Rating Profile-15 (IRP-15)

The IRP-15 was developed to assess educational treatments and to help determine if the interventions were acceptable to teachers (Carter, 2010). The IRP-15 is a modified version of the Intervention Rating Profile developed by Martens, Witt, Elliott, and Darveaux (1985). It consists of 15 items, which are rated using a 6-point Likert-type rating scales with ranges from 1 (strongly disagree) to 6 (strongly agree) (Appendix F). Scores are obtained by summing all items with higher summed scores indicating greater levels of acceptability with a summed score of 52.5 indicating a moderate level of acceptability (Carter, 2010). Internal consistency on the IRP-15 has been reported to be .98 with a reliability of .93 (Carter, 2010; Power et al., 2012).

Procedures

The study consisted of two conditions: DBR-SIS self and DBR-SIS feedback and four phases: pre-test, baseline, intervention, and post-test. Participants participated in each phase and received all baseline and pre and post measures. The intervention used was teaching the students to self-monitor their behaviors using the DBR-SIS form (Appendix G). The DBR-SIS form

consists of three behaviors: academically engaged (active or passive participation in the classroom activity), respectful (compliant and polite behavior in response to adult directions, and/or peer interactions), and disruptive (student action interrupting regular school or classroom activity), with each behavior rated on a scale of 0 to 10. Students in both intervention conditions were taught to rate their own behaviors on the three DBR-SIS behaviors. The students were instructed to select the number which they felt best represented the percentage of time they perceived themselves to be engaged in academic and respectful behaviors and not engaged in disruptive behaviors (Chafouleas et al., 2008).

For both intervention conditions, data were collected at the participants' schools. Teacher and student participants completed the CAt-C rating scale during the study's pre-test and post-test phases. IRP-15 data were collected from only teacher participants at the study's completion in the post-test phase. DBR-SIS data were completed by student participants in the self-intervention condition and by student and teacher participants in the feedback-intervention condition during the baseline and intervention phases. Baseline data were gathered once daily for five days (five data points) and intervention data were gathered once daily for 15 days (15 data points). CAt-C and IRP-15 data were collected in a private room in the school, such as a conference room. DBR-SIS data were gathered in student and teacher participants' classroom during one class subject (e.g., reading, math). All data forms were collected by the researcher.

Pre-Test Phase and Intervention Training

The pre-test CAt-C rating scales were completed during the training session prior to any intervention training by student and teacher participants. Intervention trainings were conducted following completion of the CAt-C pre-test measure by teacher and student participants. Training occurred in groups with group membership based on the participant's assigned

condition (e.g., self, feedback). Separate training sessions were conducted for student and teacher participants.

All trainings were held in a conference room or empty classroom in students' and teachers' schools. Student and teacher trainings were determined by students' school and grade. Teacher training groups were determined by teachers' school. To minimize disruption to the school day, trainings occurred during students' activity periods and teachers' prep times. Training materials and DBR forms from the Direct Behavior Rating website (Chafouleas & Riley-Tillman, 2014) were used. Procedures used in the student and teacher trainings were similar to the training procedures used by Chafouleas et al. (2012). Unlike the previous study, the current study's training procedures did not have students or teachers calculate a total DBR-SIS ratings score or use a three-tiered reward system to reinforce students' behaviors, because one of the goals of the study was to demonstrate the effectiveness of the use of DBR-SIS as a single-component self-regulation intervention for students with ADHD. As such, the current study did not include a three-tiered reward system to reinforce students' behavior. Student-or teacher-calculated total DBR-SIS scores were not needed in the current study as these scores were part of the three-tiered reward system used in Chafouleas et al.'s (2012) study.

Student Intervention Training

In both the DBR-SIS self and DBR-SIS feedback conditions, intervention training involved teaching the students the behavioral goals: academically engaged, respectful behavior, and disruptive behavior. During the training, the students were taught to self-monitor their performance on the goals and were taught to record the frequency of occurrences of target behaviors using the DBR-SIS forms (Appendix F). Teaching this aspect of the intervention involved a two-step process. First, students were instructed to discriminate (i.e., self-observe) if

a target behavior occurred. Examples and non-examples of the target behaviors and discussion of the examples were used to help students learn to distinguish the characteristics of the behaviors. Second, the students were taught to circle the rating on the DBR-SIS form indicating how often they felt they were engaged in the targeted behaviors during the specified time frame (e.g., math class). Student data forms were collected by the classroom teacher each day after the students completed them. In the DBR-SIS self condition, no feedback was given regarding the ratings the students assigned themselves. Students in the DBR-SIS feedback condition reviewed their rating forms with their teachers and briefly discussed the ratings before the forms were collected. These discussions lasted less than one minute.

Teacher Intervention Training

Teachers in the DBR-SIS self and DBR-SIS feedback conditions were trained in the intervention similarly to the students in the DBR-SIS self and feedback conditions. All teacher participants were trained to implement the intervention during the class time in which the student demonstrated the most difficulties with the target behaviors. Teachers in the DBR-SIS self condition were trained to remind students to complete their self-ratings after the designated interval and to ensure students completed their ratings after prompting. No feedback was given to the students regarding the behavioral ratings the students assigned themselves. Teachers in the DBR-SIS self condition provided students with reinforcement for completing the rating forms, such as "Thank you for doing that." Student DBR-SIS forms were collected by the teachers on a daily basis.

Teachers in the DBR-SIS feedback condition were trained to compare their behavior ratings with their students' behavior ratings. After completion of the class period in which the behavior rating occurred, the teachers signaled their students to compare ratings. When signaled

by their teachers, the students approached their teachers with their forms and compared and received feedback about their ratings. Student and teacher DBR-SIS rating forms were collected by the teachers on a daily basis.

Baseline Phase

Following completion of the CAt-C and training sessions, the baseline phase began. DBR-SIS baseline data were gathered by teachers for approximately five school days. If a student missed a day during the baseline phase, the baseline phase for that student was extended until five days of baseline data were collected. If a teacher missed a day during the baseline phase, no data were collected on that day, and the baseline phase was extended for all participants until five days of baseline data were collected. Students and teachers were given feedback regarding their correct use of the DBR-SIS forms during baseline. No feedback regarding ratings on the DBR-SIS form was given.

Intervention Phase

The intervention phase commenced immediately following completion of the baseline phase. In the intervention phase, students were classified into two conditions: DBR-SIS self and DBR-SIS feedback. The intervention was implemented in the classroom setting daily for 15 school days. Students in both conditions were treated similarly in so far as teachers collected the DBR-SIS forms daily and the researcher collected the DBR-SIS forms weekly from teacher participants. The principal investigator also conducted weekly check-ins with student and teacher participants to address any questions and to provide feedback regarding the correct use of the DBR-SIS forms. No researcher feedback was given regarding ratings on the DBR-SIS forms. Student participants in the DBR-SIS self condition received no feedback from their teachers regarding their ratings while students in the DBR-SIS feedback condition compared

ratings with their teachers and received teacher feedback regarding the accuracy of their ratings. In either intervention condition, if a student missed a day during the intervention phase, the intervention phase for that student was extended until 15 days of intervention data were collected. If a teacher missed a day during the intervention phase, no data were collected on that day and the intervention phase was extended for the participant until 15 days of intervention data were collected.

Post-Test Phase

After data collection was completed for each condition in the intervention phase, teacher and student participants completed the CAt-C again. Additionally, teacher participants completed the IRP-15. The principal investigator was present for completion of post-intervention measures to address any questions regarding the measures and to collect the completed measures. All measures were hand-scored by the researcher.

No feedback was given to the students upon conclusion of the study. Students were thanked for their participation in the study and their hard work. At the conclusion of the study, students were able to receive feedback regarding their performance in the study per parent(s) or guardian(s) request. No parent or guardian feedback requests were received. Teachers did not receive any feedback regarding student CAt-C scores or DBR-SIS data.

Data Analysis

All data analyses were conducted using SPSS for Windows, Version 19. To determine the effects of the DBR-SIS self and DBR-SIS feedback interventions on students' development of self-regulation and students' academic and behavior performance, a series of sixteen 2 x 2 split plot Analysis of Variance (ANOVA) models were used. The between-subjects independent variable was study condition with two levels: DBR-SIS self-intervention and the DBR-SIS

feedback-intervention. The repeated measure independent variable was time of testing with two levels, pre-test and post-test. The CAt-C scales ATT, IMP, HYP, INT, EXT, PER, A/O, and SOC served as the dependent variables. There were 10 students in the self-intervention condition and nine students in the feedback-intervention condition. Teacher and student data for one student in the feedback-intervention condition was excluded from the data analysis due to the student withdrawing from the school during the study. There were five teachers in the self-intervention condition and five teachers in the feedback-intervention condition.

Gresham (2005) noted that exclusive reliance on social-impact measures such as the CAt-C may ignore a majority of behavior change that has occurred increasing the likelihood of a Type II error. According to Gresham (2005), absolute change can be defined as the amount of change from baseline to post-intervention levels of performance. Gresham (2005) has suggested that absolute change has utility within a problem-solving approach due to its consistency in defining behavior problems as the discrepancy between expected and desired levels of performance.

To reduce the possibility of a Type II error, the absolute change of self-regulation as measured by the DBR-SIS data for each student was calculated. Absolute change was calculated by subtracting each students', in the DBR-SIS self and the DBR-SIS feedback-intervention conditions, mean DBR-SIS score during baseline from his or her mean DBR-SIS score during intervention for each behavior rated (academically engaged, respectful, and disruptive). Independent-samples *t*-tests were used to determine the differences between the student DBR-SIS self and the student DBR-SIS feedback-intervention conditions for each of the three DBR-SIS behaviors. Additionally, Pearson correlations were conducted to determine whether there was a significant relationship between the absolute change on the DBR-SIS three behaviors (academically engaged, respectful, and disruptive) for the DBR-SIS self and the DBR-SIS

feedback student conditions and the student post-test scores on the CAt-C scales of ATT, IMP, and HYP.

Descriptive statistics were used to determine whether teachers perceived DBR-SIS self and feedback-interventions as useful and effective. Independent samples *t*-test were used to analyze the overall acceptability score (sum of all items) from the IRP-15 and determine the differences in the overall intervention acceptability between the two teacher intervention conditions, DBR-SIS self and DBR-SIS feedback. IRP-15 data from eight teachers were included in the analysis. Data from two teachers, one in each intervention group, were not included in the analysis due to incomplete IRP-15 forms.

CHAPTER 4

RESULTS

Research Question One

A series of 2 x 2 split plot Analyses of Variance (ANOVAs) were used to determine whether self-regulation skills differed from pre-test to post-test for the two intervention conditions (self and feedback) on the CAt-C measures of Inattention, Impulsivity, Hyperactivity, Internal, and External. The following questions were answered for each CAt-C scale see Table 1 for student conditions means and standard deviations and Table 2 for teacher conditions means and standard deviations.

1. Do the DBR-SIS self and the DBR-SIS feedback conditions' scores change from pre-test to post-test?
2. Are pre-test DBR-SIS self and the DBR-SIS feedback conditions' scores different from post-test DBR-SIS self and the DBR-SIS feedback conditions?
3. Is there an interaction between the study condition, DBR-SIS self and DBR-SIS feedback, and time of testing, pre-test and post-test?

Table 1.

Students' Pre-Test and Post-Test CAt-C Ratings Means and Standard Deviations

		DBR-SIS Self Condition (*n* = 10)		DBR-SIS Feedback Condition (*n* = 9)	
Time of Testing	CAt-C Scale	*M*	*SD*	*M*	*SD*
Pre-Test	Inattention	55.20	13.32	59.44	8.99
	Impulsivity	54.50	12.67	54.89	13.24
	Hyperactivity	60.20	13.53	60.11	15.15
	Internal	56.00	14.39	60.22	12.66
	External	55.50	14.06	56.33	12.72
	Personal	56.40	13.18	54.11	14.09
	Academic	57.30	11.38	56.78	12.45
	Social	56.70	11.93	59.56	14.02
Post-Test	Inattention	60.40	14.43	55.00	11.15
	Impulsivity	60.50_a	11.28	50.67_b	12.18
	Hyperactivity	60.70	10.87	57.89	16.17
	Internal	57.30	10.44	55.78	13.43
	External	59.20	9.99	53.11	13.78
	Personal	58.30	12.36	57.67	11.27
	Academic	57.40	13.29	52.56	15.27
	Social	57.10	12.00	54.00	12.64

Note. Means with different subscripts were significantly different from each other at $\alpha = .05$.

Table 2.

Teachers' Pre-Test and Post-Test CAt-C Ratings Means and Standard Deviations

		DBR-SIS Self Condition (*n* = 10)		DBR-SIS Feedback Condition (*n* = 9)	
Time of Testing	CAt-C Scale	*M*	*SD*	*M*	*SD*
Pre-Test	Inattention	64.00	6.78	59.11	9.66
	Impulsivity	61.90	11.24	55.22	14.05
	Hyperactivity	63.90	8.56	53.11	15.44
	Internal	63.30	7.21	56.89	15.53
	External	64.30	8.26	53.33	12.95
	Personal	64.80	8.27	58.11	12.69
	Academic	64.40	7.71	58.56	11.65
	Social	62.50	8.38	52.78	11.27
Post-Test	Inattention	61.00	11.82	59.56	9.48
	Impulsivity	59.90	13.01	57.67	14.23
	Hyperactivity	60.10	14.63	58.22	14.42
	Internal	61.10	10.13	59.33	11.37
	External	60.30	12.79	56.33	15.03
	Personal	61.80	12.85	60.67	13.10
	Academic	62.70	10.43	59.00	9.51
	Social	58.70	9.13	56.56	11.87

Note. Means with different subscripts were significantly different from each other at $\alpha = .05$.

Inattention

Student DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 1.23$, $p = .285$ pre-test; $F(1, 17) = 1.07$, $p = .317$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 4.71, $p = .250$) indicating no significant differences between covariances. DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Inattention as measured by the CAt-C, $V = .001$, $F(1, 17) = 0.02$, $p = .892$. The DBR-SIS self and DBR-SIS feedback conditions did

not differ significantly from one another on Inattention at either pre-test or post-test, $F(1, 17) = 0.01$, $p = .908$. There was no significant interaction between DBR-SIS self and feedback conditions and time of testing, $V = .16$, $F(1, 17) = 3.11$, $p = .096$.

Teacher DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 0.28$, $p = .605$ pre-test; $F(1, 17) = 0.90$, $p = .357$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 2.93, $p = .466$) indicating no significant differences between covariances. Teacher DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Inattention as measured by the CAt-C, $V = .03$, $F(1, 17) = 0.53$, $p = .479$. The teacher DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another on Inattention scores at either pre-test or post-test, $F(1, 17) = 0.61$, $p = .445$. There was no significant interaction between teacher DBR-SIS self and feedback conditions and time of testing, $V = .05$, $F(1, 17) = 0.95$, $p = .343$.

Impulsivity

Student DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measures variables, $F(1, 17) = .09$, $p = .773$ pre-test; $F(1, 17) = .050$, $p = .835$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 2.83, $p = .481$) indicating no significant differences between covariances. Student DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Impulsivity as measured by the CAt-C, $V = 0.01$, $F(1, 17) = 0.17$, $p = .690$. The DBR-SIS self and DBR-SIS feedback

conditions did not differ significantly from one another at either pre-test or post-test on scores of Impulsivity, $F(1, 17) = 0.82$, $p = .379$. There was a significant interaction between the DBR-SIS self and DBR-SIS feedback conditions and time of testing (pre-test, post-test) on ratings of Impulsivity, $V = 0.24$, $F(1, 17) = 5.44$, $p = .032$. To determine which groups were significantly different, repeated measures *t*-tests were conducted. Results of the *t*-tests indicated that although the DBR-SIS self and DBR-SIS feedback conditions did not differ at pre-test, they did differ at post-test, with the student DBR-SIS self condition reporting higher levels of Impulsivity, $t(9) = 2.81$, $p = .020$ than the student DBR-SIS feedback condition, $t(8) = 1.10$, $p = .319$, $d = .16$.

Teacher DBR-SIS self and DBR-SIS feedback conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measures variables, $F(1, 17) = .42$, $p = .523$ pre-test; $F(1, 17) = .004$, $p = .953$ post-test. The assumption of homoscedasticity was tested using Box's M and it was not significant (Box's M = 1.62, $p = 1.62$) indicating no significant differences between covariances. DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Impulsivity as measured by the CAt-C, $V = 0.001$, $F(1, 17) = .013$ $p = .911$. The teacher DBR-SIS self and teacher DBR-SIS feedback conditions did not differ significantly from one another at either pre-test or post-test on scores of Impulsivity, $F(1, 17) = 0.60$, $p = .448$. There was no significant interaction between teacher DBR-SIS self and feedback conditions and time of testing on ratings of Impulsivity, $V = 0.07$, $F(1, 17) = 1.29$, $p = .272$.

Hyperactivity

Student DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated

variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = .00$, $p = .986$ pre-test; $F(1, 17) = 1.86$, $p = .190$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 1.51, $p = .725$) indicating no significant differences between covariances. Student DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Hyperactivity as measured by the CAt-C, $V = .007$, $F(1, 17) = 0.12$, $p = .729$. The DBR-SIS self and DBR-SIS feedback student conditions did not differ significantly from one another on Hyperactivity scores at either pre-test or post-test, $F(1, 17) = 0.06$, $p = .810$. There was no significant interaction between student DBR-SIS self and feedback conditions and time of testing, $V = .02$, $F(1, 17) = .31$, $p = .584$.

Teacher DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 2.64$, $p = .122$ pre-test; $F(1, 17) = 0.35$, $p = .561$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 4.45, $p = .275$) indicating no significant differences between covariances. Teacher DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Hyperactivity as measured by the CAt-C, $V = .004$, $F(1, 17) = 0.06$, $p = .805$. The teacher DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another at either pre-test or post-test scores of Hyperactivity, $F(1, 17) = 1.28$, $p = .274$. There was no significant interaction between teacher DBR-SIS self and DBR-SIS feedback conditions and time of testing, $V = .15$, $F(1, 17) = 2.92$, $p = .106$.

Internal

Student DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 0.36$, $p = .556$ pre-test; $F(1, 17) = 0.78$, $p = .390$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 2.70, $p = .503$) indicating no significant differences between covariances. Student DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on score of Internal as measured by the CAt-C, $V = 0.02$, $F(1, 17) = 0.40$, $p = .536$. The student DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another either at pre-test or post-test on scores of Internal, $F(1, 17) = 0.60$, $p = .803$. There was no significant interaction between student DBR-SIS self and DBR-SIS feedback conditions and time of testing, $V = 0.07$, $F(1, 17) = 1.33$, $p = .264$.

Teacher DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 5.75$, $p = .028$ pre-test; $F(1, 17) = 0.01$, $p = .916$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 5.41, $p = .194$) indicating no significant differences between covariances. Teacher DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Internal as measured by the CAt-C, $V = .00$, $F(1, 17) = 0.00$, $p = .963$. The teacher DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another either at pre-test or post-test on scores of

Internal, $F(1, 17) = 0.82$, $p = .378$. There was no significant interaction between teacher DBR-SIS self and DBR-SIS feedback conditions and time of testing, $V = .05$, $F(1, 17) = 0.82$, $p = .379$.

External

Student DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 0.03$, $p = .856$ pre-test; $F(1, 17) = 1.03$, $p = .325$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 2.35, $p = .563$) indicating no significant differences between covariances. Student DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of External as measured by the CAt-C, $V = .001$, $F(1, 17) = 0.01$, $p = .909$. The DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another at either pre-test or post-test on External, $F(1, 17) = 0.23$, $p = .637$. There was no significant interaction between student DBR-SIS self and DBR-SIS feedback conditions and time of testing, $V = 0.14$, $F(1, 17) = 2.83$, $p = .111$.

Teacher DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 0.98$, $p = .335$ pre-test; $F(1, 17) = 0.00$, $p = .977$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 1.91, $p = .645$) indicating no significant differences between covariances. Teacher DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of External as measured by the CAt-C, $V = .00$, $F(1, 17) = 0.07$, $p = .797$. The teacher DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another at either pre-test or post-test on External,

$F(1, 17) = 1.93$, $p = .182$. There was no significant interaction between teacher DBR-SIS self and DBR-SIS feedback conditions and time of testing, $V = .16$, $F(1, 17) = 3.33$, $p = .086$.

Research Question Two

A series of 2 x 2 split plot ANOVAs were used to determine whether self-regulation skills differed from pre-test to post-test for the two intervention conditions (self and feedback) on the CAt-C measures of Personal, Academic, and Social. The between-subjects independent variable is study condition with two levels: DBR-SIS self and the DBR-SIS feedback. The repeated measure independent variable is time of testing with two levels: pre-test and post-test. See Table 1 for student groups means and standard deviations and Table 2 for teacher groups means and standard deviations. The following questions were answered for each CAt-C scale:

1. Do the DBR-SIS self and the DBR-SIS feedback conditions change from pre-test to post-test?
2. Are pre-test DBR-SIS self and the DBR-SIS feedback conditions different from post-test DBR-SIS self and the DBR-SIS feedback conditions?
3. Is there an interaction between the study condition, DBR-SIS self and DBR-SIS feedback conditions, and time of testing, pre-test and post-test?

Personal

Student DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 0.01$, $p = .920$ pre-test; $F(1, 17) = 0.05$, $p = .830$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = .80, $p = .873$) indicating no significant differences between covariances. Student DBR-SIS self and DBR-SIS feedback conditions did

not change significantly from pre-test to post-test on ratings of Personal as measured by the CAt-C, $V = .08$, $F(1, 17) = 1.41$, $p = .252$. The DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another either at pre-test or post-test on ratings of Personal, $F(1, 17) = 0.07$, $p = .790$. There was no significant interaction between DBR-SIS self and DBR-SIS feedback conditions and time of testing, $V = .01$, $F(1, 17) = 0.13$, $p = .723$.

Teacher DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 1.03$, $p = .324$ pre-test; $F(1, 17) = 0.41$, $p = .531$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 1.70, $p = .686$) indicating no significant differences between covariances. Teacher DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Personal as measured by the CAt-C, $V = .00$, $F(1, 17) = 0.01$, $p = .930$. The teacher DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another either at pre-test or post-test on Personal, $F(1, 17) = 0.65$, $p = .430$. There was no significant interaction between teacher DBR-SIS self and DBR-SIS feedback conditions and time of testing, $V = .07$, $F(1, 17) = 1.25$, $p = .280$.

Academic

Student DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = .00$, $p = .963$ pre-test; $F(1, 17) = 0.83$, $p = .376$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = .85), $p = .986$) indicating no significant differences between covariances. Student DBR-SIS self and DBR-SIS feedback conditions did

not change significantly from pre-test to post-test on ratings of Academic as measured by the CAt-C, $V = .06$, $F(1, 17) = 1.06$, $p = .317$. The student DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another at either pre-test or post-test on Academic, $F(1, 17) = 0.22$, $p = .644$. There was no significant interaction between student DBR-SIS self and feedback conditions and time of testing, $V = .06$, $F(1, 17) = 1.17$, $p = .295$.

Teacher DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 0.80$, $p = .383$ pre-test; $F(1, 17) = 1.06$, $p = .318$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 5.33, $p = .199$) indicating no significant differences between covariances. Teacher DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Academic as measured by the CAt-C, $V = .02$, $F(1, 17) = 0.25$, $p = .622$. The teacher DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another at either pre-test or post-test on Academic, $F(1, 17) = 1.28$, $p = .273$. There was no significant interaction between teacher DBR-SIS self and DBR-SIS feedback conditions and time of testing, $V = .04$, $F(1, 17) = 0.66$, $p = .429$.

Social

Student DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 0.88$, $p = .363$ pre-test; $F(1, 17) = 0.05$, $p = .819$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = .85, $p = .863$) indicating no significant

differences between covariances. Student DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Social as measured by the CAt-C, $V = 0.06$, $F(1, 17) = 1.12$, $p = .305$. The student DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another at either pre-test or post-test on Social, $F(1, 17) = .001$, $p = .982$. There was no significant interaction between student DBR-SIS self and feedback conditions and time of testing, $V = 0.08$, $F(1, 17) = 1.50$, $p = .239$.

Teacher DBR-SIS self and DBR-SIS feedback intervention conditions. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous for all levels of the repeated measure variable, $F(1, 17) = 0.46$, $p = .505$ pre-test; $F(1, 17) = 0.71$, $p = .411$ post-test. The assumption of homoscedasticity was tested using Box's M, and it was not significant (Box's M = 1.13, $p = .806$) indicating no significant differences between covariances. Teacher DBR-SIS self and DBR-SIS feedback conditions did not change significantly from pre-test to post-test on ratings of Social as measured by the CAt-C, $V = .00$, $F(1, 17) = .00$, $p = .996$. The teacher DBR-SIS self and DBR-SIS feedback conditions did not differ significantly from one another at either pre-test or post-test on Social, $F(1, 17) = 1.99$, $p = .179$. There was no significant interaction between teacher DBR-SIS self and DBR-SIS feedback conditions and time of testing, $V = .17$, $F(1, 17) = 3.58$, $p = .076$.

Research Question Three

Independent samples *t*-tests were used to determine whether there were significant differences between the student DBR-SIS self and student DBR-SIS feedback conditions on the three DBR-SIS behaviors (academically engaged, respectful, and disruptive). The difference between the student DBR-SIS self ($M = 7.90$, $SD = 1.60$) and student DBR-SIS feedback ($M = 8.85$, $SD = 8.85$) intervention conditions on academically engaged scores was not significant,

$t(17) = 1.57$, $p = .09$. There was no significant difference between student DBR-SIS self (M = 7.92, SD = 1.63) and student DBR-SIS feedback (M = 9.15, SD = 1.04) intervention conditions on respect, $t(17) = -1.93$, $p = .20$. Although the difference approached significance, the difference between the student DBR-SIS self (M = 2.26, SD = 1.61) and student DBR-SIS feedback (M = 1.06, SD = 1.00) intervention conditions on disruptive behaviors also was not significant, $t(17) = 1.91$, $p = .09$.

Research Question Four

To determine whether post-test scores in self-regulation skills (as measured by the CAt-C ATT, IMP, and HYP scales) were significantly related to the absolute change from baseline to post-test on the three DBR-SIS behaviors (academically engaged, respectful, and disruptive) for the student DBR-SIS self-intervention conditions, Pearson correlations were conducted. For students in the self-intervention group, there were no significant correlations among any of the variables (See Table 3).

Table 3.

Intercorrelations for Post CAt-C Scores and DBR-SIS Ratings for the Students in the Self-Intervention Condition (n = 10)

	DBR-SIS Scales		
	Academic	Respectful	Disruptive
Post CAt-C Attention	.38	.42	-.39
Post CAt-C Impulsivity	-.10	-.03	.12
Post CAt-C Hyperactivity	.40	.14	.09

*$p = .05$.

To determine whether post-test scores in self-regulation skills (as measured by the CAt-C ATT, IMP, and HYP scales) was significantly related to the change from baseline to post-test on the three DBR-SIS behaviors (academically engaged, respectful, and disruptive) for the student

DBR-SIS feedback-intervention condition, Pearson correlations were conducted. There were no significant correlations among any of the variables (See Table 4).

Table 4.

Intercorrelations for Post CAt-C Scores and DBR-SIS Ratings for Students in the Feedback-Intervention Condition (*n* = 9)

	DBR-SIS Scales		
	Academic	Respectful	Disruptive
Post CAt-C Attention	-.18	-.34	.52
Post CAt-C Impulsivity	.11	-.07	.12
Post CAt-C Hyperactivity	-.04	-.01	.20

*p = .05.

Research Question Five

Descriptive statistics were used to determine whether teachers viewed DBR-SIS as an acceptable self-regulation intervention for students with ADHD. A moderate level of acceptability on the IRP-15 requires a total summed score of 52.50 (Carter, 2010). Descriptive statistics indicated teachers in the DBR-SIS self-intervention condition (n = 4; M = 66.25, SD = 8.77) and teachers in the DBR-SIS feedback condition (n = 4; M = 75.50, SD = 19.84) both perceived the intervention as acceptable.

Research Question Six

To determine whether teachers viewed the DBR-SIS self and feedback interventions as equally acceptable, an independent samples *t*-test was conducted. The assumption of homogeneity of variance was tested using Levene's test. Levene's test indicated variances were homogenous, $F(1, 6) = .1.94$, $p = .213$. The difference between the acceptability ratings for the two conditions, DBR-SIS self and feedback, was not significant, $t(6) = .85$, $p = .426$. These results indicated the teachers in the DBR-SIS self-intervention condition (M = 66.25, SD = 8.77)

reported levels of intervention acceptability that were not significantly different from teachers in the DBR-SIS feedback-intervention condition (M = 75.50, SD = 19.84).

CHAPTER 5

DISCUSSION

The purpose of the present study was to investigate the utility of DBR-SIS as a student-directed self-regulation strategy for elementary and middle school students with ADHD. To address this, the current study investigated the change in students' self-regulation skills and academic and behavior performance over time; the differences between the student DBR-SIS self-and student DBR-SIS feedback-intervention conditions on the three DBR-SIS behaviors; and the relationship of post-test scores in self-regulation skills with the absolute change on the three DBR-SIS behaviors for student DBR-SIS intervention conditions. Additionally, the current study explored teacher perceptions of DBR-SIS as an acceptable self-regulation intervention and if they viewed the self- and feedback-interventions as equally acceptable.

Change in Self-Regulation and Academic and Behavior Performance

Interestingly, the investigation of change in students' self-regulation skills and academic and behavior performance over time indicated no significant differences on post-test CAt-C scores, with the exception of the student DBR-SIS self- and student DBR-SIS feedback-intervention conditions on the CAt-C score of Impulsivity. Other differences, in the DBR-SIS disruptive measure, between DBR-SIS self- and DBR-SIS feedback-intervention conditions were marginally significant and in the expected direction. Results indicated a significant interaction between student DBR-SIS self- and student DBR-SIS feedback-intervention conditions and time

of testing. Although the two groups did not differ on their CAt-C scores of Impulsivity at pre-test, they did differ on their CAt-C scores of Impulsivity at post-test. At post-test, students in the DBR-SIS self-intervention condition rated themselves higher in Impulsivity than students in the DBR-SIS feedback-intervention condition.

There are two plausible explanations for the unexpected elevations in the student DBR-SIS self-intervention conditions' ratings of Impulsivity at post-test: lack of external support and increased awareness of impulsive behaviors. First, previous research (Schunk, 1986; Ylvisaker & Feeney, 2009) has demonstrated that students with disorders in which impulsiveness is a characteristic feature may need extra support in the development of self-regulation through either modeling of the skills needed to reflect upon behavior or external feedback to assist them in developing self-regulation skills. Thus, since students in the current study received no skill modeling and behavior feedback was only given to students in the feedback-intervention condition, they may have not received the necessary supports to help them develop the desired skills. Thus, results of the current study suggest that as a self-regulation intervention, DBR-SIS may be most effective in helping students decrease impulsive behaviors when they receive feedback regarding their engagement in such behaviors.

Second, the primary behaviors associated with ADHD such as inattention, impulsivity, and hyperactivity, are highly noticeable in classrooms because school settings require students to behave in ways that are at odds with the symptoms of the disorder (Anderson, Watt, Noble, & Shanley, 2012). According to Rafferty and Raimondi (2009) and Ley and Young (2001), students are taught to self-regulate their attention and behaviors by focusing their awareness to the task or behaviors in which they are engaged and recording their behaviors to determine if their performance has met a previously established criterion. For students in the DBR-SIS self-

intervention condition, the use of DBR-SIS as an intervention may have made the impulsive behaviors characteristic of ADHD more observable to them, resulting in increased ratings of Impulsivity at post-test. As a self-regulation intervention, it could be that DBR-SIS emphasizes the impulsive and disruptive behaviors characteristic of ADHD making the target behaviors easier to identify and monitor (Schunk, 1990). According to Kobayashi and Locke (2008), students with disorders of self-regulation often experience self-defeating beliefs and ruminating thoughts of failure. Therefore, student DBR-SIS self-intervention conditions' elevated scores on Impulsivity at post-test could suggest the use of DBR-SIS as an intervention heightened the students' awareness to the behaviors resulting in inflated perceptions of poor performance as opposed to reflecting a true increase in impulsive behaviors (Barkley, 1997; Baumeister et al., 2007; Ley & Young, 2001).

The current study examined the use of DBR-SIS as a single-component, self-regulation intervention by examining the change in students' self-skills and academic and behavior performance as assessed by the post-test scores on CAt-C scales of Inattention, Impulsivity, Hyperactivity, Personal, Academic, Social, Internal, and External. However, only Impulsivity was affected by the use of DBR-SIS self-regulation. The significant change in Impulsivity and not the other CAt-C scales could be due to the high visibility of the impulsive characteristics of ADHD making them more observable to the students than other characteristics of the disorder (e.g., disorganization, high level of energy, and difficulties learning; Douglas, 2005). In the current study, the use of DBR-SIS as an intervention may have heightened the students' awareness to the impulsive behaviors, resulting in the increased report of such behaviors at post-test.

While previous research on school-based interventions with students with ADHD has demonstrated the effectiveness in managing the central symptoms of the disorder, as well as other problem behaviors associated with it (e.g., disruptive behaviors in the classroom or off-task behaviors), other research has not demonstrated such effectiveness (Miranda, Jarque, & Tárraga, 2006; Reid et al., 2005). Some research on self-regulation strategies has shown that although such strategies can decrease inappropriate behaviors and increase classwork completion and accuracy, outcomes have been mixed, most notably bringing to question the efficacy of stand-alone self-regulation strategies (DuPaul & Eckert, 1997; Reid et al., 2005). For the current study, it could be the use of DBR-SIS as a single-component, self-regulation for ADHD was insufficient for decreasing the inappropriate behaviors and increasing the appropriate behaviors associated with ADHD.

The overarching goal of behavioral interventions is to reduce the behaviors that interfere with students' academic progress and to provide them with more appropriate social-behavioral responses (Gresham, 2004). Previous research has provided support for the use of DBR-SIS as an intervention (Chafouleas et al., 2012; Kilgus, 2013). Unlike previous research, the current study did not find such support for the use of DBR-SIS as an intervention as evidenced by the lack of significant differences from pre-test to post-test CAt-C scores, with the exception of the student DBR-SIS self- and student- feedback intervention conditions on the CAt-C score of Impulsivity. The lack of significant results supporting the use of DBR-SIS as a self-regulation intervention can be explained by the differences between the current study and previous research on self-regulation interventions. The current study varied from previous research in its use of a single-component strategy, primarily student-directed intervention, and lack of explicit behavior instruction.

ADHD and self-regulation research has mainly focused on multiple strategies for helping students with ADHD develop self-regulation skills (Reid et al., 2005). The majority of such interventions rely on cuing from an external source such as audio cues (i.e., timer, verbal prompts from teacher) to prompt students to attend to their behavior (Shapiro & Cole, 1994). Unlike previous research, the goal of the current study was to discern if one predominantly student-directed strategy was sufficient in helping students with ADHD develop self-regulation. Menzies and Lane (2011) contended self-regulation interventions consist of three broad strategies: goal setting, self-instruction, and self-monitoring. The current study focused on the role of self-monitoring in its intervention due to the emphasis on self-regulation as a key component in the development of self-regulation and the support for DBR-SIS as a self-monitoring tool (Huff & Nietfeld, 2009; Reid et al., 2005; Schunk & Zimmerman, 1997). Owens et al. (2012), Kilgus (2013), and Chafouleas et al. (2006) have demonstrated the increased effectiveness of self-monitoring interventions when paired with an additional strategy such as reinforcement, self-instruction, or goal setting. Although the success of self-regulations has been demonstrated, the current study may not have mimicked this success due to its reliance on one self-regulation strategy, self-monitoring, which may have been insufficient in helping students acquire self-regulation skills.

In contrast to prior research regarding the use of DBR-SIS as an intervention, the current study explored the use of DBR-SIS as a predominantly student-directed self-regulation intervention for students with ADHD. The majority of current interventions for students with ADHD are moderated by teacher or parent involvement (Owens et al., 2012). Research by Agran et al. (2001), Gawrilow and Gollwitzer (2007), and Wehmeyer and Palmer (2000) has indicated children who participated in self-regulations primarily supported by someone else

demonstrated more growth in their self-regulation skills than students who received less external support. External support in these studies consisted of instruction in goal checking, collection of behavior ratings, and clarification of behavior expectations. Students in the current study were required to evaluate their own behaviors and review the behavioral expectations on the DBR-SIS form with limited to no feedback. Although, students in the feedback-intervention condition did receive some external support, it may have not been enough to help the students learn to self-regulate their behavior. Without the external support to help them learn the behavioral expectations and assess their behavior, students in the current study may have had difficulties accurately evaluating their behaviors, thus affecting the outcomes of the current study.

The lack of explicit behavioral instruction and application of the intervention in one setting in the current study also may have affected the results of this study. Student participants in the current study did not receive explicit behavioral instruction. Intervention training for the students consisted of helping them understand the behaviors on the DBR-SIS form and teaching them to use the DBR-SIS scales to rate their behaviors. Additionally, the intervention was only implemented in one academic setting (e.g., reading or math). Research with students with ADHD has indicated students with learning or behavioral challenges often require deliberate and explicit instruction in self-regulation (Shapiro & Cole, 1994). Previous studies of self-regulation and ADHD, e.g., Gawrilow and Gollwitzer (2007) and Zimmerman (2002), have emphasized the importance of the "how," the teaching of the behavioral skills needed to help students develop self-regulation skills. According to Shapiro and Cole (1994), self-regulation techniques have been shown to decrease off-task behaviors and increase on-task behaviors when the skills being taught are generalized across situations. The current study's lack of deliberate behavioral instruction and opportunities for students to use the intervention in different settings may have

impacted students' self-regulation growth and their ability to make and observe the changes in their behaviors.

Correlation of DBR-SIS and CAt-C Scales

While previous research has compared DBR-SIS to systematic direct observation across different raters, limited research comparing DBR-SIS to standardized behavior rating scales has been conducted (Chafouleas, McDougal, Riley-Tillman, Panahon, & Hilt, 2005). The current study expanded on the latter body of knowledge by exploring the correlation of DBR-SIS absolute change scores and post-test scores in self-regulation skills, as measured by the CAt-C scales of Inattention, Impulsivity, and Hyperactivity. Although prior research (Chafouleas et al., 2005) has found significant positive correlations between DBR-SIS and systematic direct observation, the current study did not find significant correlations between DBR-SIS and the selected scales from the CAt-C. Regardless of the methods and procedures employed, however, it is important to note that the use of difference scores as a measure of rating accuracy has received some criticism in the literature. It has been argued (Riley-Tillman et al., 2009) that calculating difference scores does not account for the possibility that raters may use a scale in a different manner, resulting in ratings that appear similar but are discrepant from the scale's purpose. Similarly, most behavior rating scales were not designed for behavior progress monitoring because they are not considered sensitive to behavior change over time (Riley-Tillman et al., 2005). It is important to note that the current study did not analyze data trends across student DBR-SIS behavior ratings, and therefore gives a limited view of behavior change across students. The lack of such analysis may have made it more difficult to obtain overall estimates of behavior change from baseline to intervention phases and to determine if the

different data sources, DBR-SIS and CAt-C, follow similar patterns from baseline and intervention phases.

Teacher Acceptability of DBR-SIS as an Intervention

Previous research (Amato-Zech et al., 2006; Shapiro & Cole, 1994) regarding the use of self-monitoring strategies, such as DBR-SIS, as an intervention contended that teachers were unlikely to implement self-regulation interventions consisting of self-monitoring due to their intrusive and disruptive nature. Results from the current study align with research by Chafouleas et al., 2006) further supporting the willingness of teachers to use DBR-SIS as an intervention. The average scores for teachers in both intervention conditions, self and feedback, on the IRP-15 indicated, in general, they perceived DBR-SIS as an acceptable self-regulation intervention. Average scores on the IRP-15 in general suggested teachers would be willing to use the current intervention in their classroom again, did not perceive the intervention to result in negative side effects for the students, and believed that it helped to address student behaviors (Carter, 2010). Considered together, teachers' scores on the IRP-15 indicated they perceived DBR-SIS as an acceptable self-regulation intervention for effectively working with students with ADHD in the general education setting.

Limitations

The focus of the current study was to examine the use of DBR-SIS as a student-directed, single-component self-regulation intervention for students with ADHD. Results of the current study provided limited support for the use of DBR-SIS as a self-regulation intervention. The outcomes of the current study may have been affected by its limitations. Limitations in the current study can be divided into three categories: design, intervention, and measure of self-regulation.

Design

In the present study, either the study design or the sample size may have affected the results. This study utilized a pre-test/post-test design. Although participants in this study were randomly assigned to the conditions, the pre-test/post-test design of this study may have limited the validity or generalizability of this study due to the possible effect of pre-testing. The pre-test may have increased or decreased participants' sensitivity or responsiveness to the experimental variable causing them to respond differently than subjects who were not pre-tested (Field, 2009).

Also, the number of student (n = 19) and teacher (n = 10) participants in the study was small and predominantly consisted of rural, low to middle socioeconomic status, male Caucasian students and female Caucasian teachers. The small sample may have affected the researcher's ability to collect sufficient data to conduct analyses without sacrificing the integrity of the assessment method while the homogeneity of the participants may have affected the generalizability of the results to other socioeconomic statuses and ethnicities. Further, the small sample size and the aggregation of pre-test/post-test data across conditions may have rendered the data analysis insensitive to any possible effects of the intervention. As such, the data analyses may have had insufficient power due to the limited number of participants, making it difficult for the analyses to distinguish any effects that may have existed.

The current study's design also limited the ability of the results to be generalized as the effects of the intervention were only measured in one context and withdrawal of the intervention was not possible due to the study's design. The design used in this study was pre-test/post-test design. In study's with a pre-test/post-test design, data are collected, an intervention implemented, and post-test data are collected. Although this type of design is useful in determining the effects of the intervention on the target behaviors, it does not account for other

factors that can affect the dependent variable (e.g., maturation, practice effects) or demonstrate a functional relationship between the target behavior and intervention; thus limiting generalizability to other contexts (Field, 2009). Further, this study lacked a control group, making it difficult to know about the changes that may occur over time without the intervention.

Intervention

Second, intervention duration and setting may also have impacted the outcomes of this study. While much research has demonstrated that a student's response to an intervention can be determined within 15–20 data points, research on interventions for students with ADHD recommends intensive and long-term interventions for students with ADHD due to the chronic and challenging aspects of the behaviors that accompany the disorder (Briesch & Chafouleas, 2009; Owens et al., 2012). The current study only gathered 15 data points during the intervention phase, which may have been insufficient time to allow students to demonstrate what, if any, gains were obtained from the intervention.

Student and teacher intervention training may also have affected the results. Intervention training for both students and teachers consisted of a single brief session of the DBR-SIS intervention that was intended to familiarize students and teachers with the DBR-SIS form and rating procedures and data collection procedures. Additionally, the extent to which teachers implemented the intervention as it was designed was not assessed. Without a measure of intervention implementation integrity, it is difficult to know for certain whether teachers and students engaged in the intervention as specified or merely reported doing so which may have caused the intervention to appear more or less effective than what it truly is (Sanetti, Chafouleas, Fallon, & Jaffery, 2014).

The implementation of the intervention in the general education setting may also have affected the results. Although there are benefits to implementing interventions in an inclusive learning environment, the use of a naturalistic setting can be fraught with challenges affecting intervention implementation. For instance in the current study, the intervention was not implemented consistently due to teacher and student absences. Additionally, it might not have been possible for teachers and students to complete their ratings immediately following the behaviors because of the various demands of the classroom setting on teachers and students (e.g., needs of other students or schedules of student participants). Schunk and Zimmerman (1997) demonstrated that self-monitoring is most efficacious when the recording of the behaviors occurs in close proximity to the time in which the behaviors occurred. While this problem can be anticipated when collecting data in actual classrooms; nevertheless, it does restrict the extent to which results of the current study can be generalized.

The detailed behavior focus and combination of observation and direct rating have been key features used to highlight the use of DBR-SIS as a tool useful in interventions requiring specific behaviors to be addressed (Volpe & Gadow, 2010). However, the standardized DBR-SIS form includes three target behaviors subsuming multiple concrete operational definitions underneath each target behavior (Chafouleas, 2011). The inclusion of multiple concrete operational definitions for each behavior may make it difficult to determine if overall improvement on the target behavior is due to changes across all or one concrete operational definitions or rater bias as students or teachers may generalize improvement on one part of the operational definition to the overall behavior (Gureasko-Moore, DuPaul, & White, 2006; Owens et al., 2012; Riley-Tillman et al., 2009).

Self-Regulation Measure

Third, a problem that has plagued self-regulation studies, including the present study, is access to valid assessment instruments to measure the effects of self-regulation strategies (Boekarets & Cascallar, 2006). The use of the CAt-C, which was used to evaluate changes in self-regulation, academic performance, and behavior is an additional limitation in the current study. According to Bracken and Boatwright (2005) the CAt-C measures symptoms of ADHD rather than self-regulation per se, which may undermine the results by focusing more on symptom reduction of ADHD rather than positive increases in self-regulative behaviors.

Behavior rating scales, such as the CAt-C, have been touted for their objective assessment of low frequency behaviors. However, the behavior changes resulting from the intervention might not have appeared in variations in the scores on the CAt-C because the targeted behavior change may have been more specific than indicated by the items on the CAt-C (Bracken & Boatwright, 2005). For instance, items on the DBR-SIS form described specific behaviors (e.g., raising hand, following directions, and fidgeting) as opposed to items on the CAt-C which were broader in scope (e.g., often does things that are dangerous, is forgetful a lot, and does not manage time carefully). As with any person-generated evaluation, including the student and teacher ratings on the CAt-C, concerns exist regarding the influence of sources of rater error (e.g., halo effects, generosity error), which may have artificially elevated or depressed the estimates of actual behavior.

While the use of rating scales has been shown to permit the measurement of low-frequency behaviors that are often not easily or readily observable (Burke & Vannest, 2008), they are typically not used in behavior progress monitoring due to their length, insensitivity to change, and inability to inform intervention (Gresham et al., 2010; Volpe & Gadow, 2010).

Additionally, although the developers of the CAt-C indicated it could be re-administered after three to four weeks, the scales on the CAt-C may have been too global and thus, not sensitive enough to detect reliable changes in student behavior (Bracken & Boatwright, 2005; Burke & Vannest, 2008). As a result some behaviors, such as academic engagement, may have been insufficiently measured. The CAt-C examines behaviors related to academic progress (e.g., daydreaming while doing schoolwork, sitting still while reading, and hurrying to finish tasks) which may be more difficult to observe over time as opposed to more direct measures of academic progress (e.g., grades, work completion, and work accuracy).

Suggestions for Future Research

Future study of the use of DBR-SIS as an intervention is needed with larger sample sizes and a different research design, such as a multiple baseline design, in which the effects of the intervention are measured in a variety of academic settings to help improve the generalizability of the intervention. The use of a control group or systematic fading of the intervention should be considered to help not only with replication but to help clarify the effects of the intervention over time (Chafouleas et al., 2012). Additionally, future research will need to examine if teacher acceptability of DBR-SIS is maintained when design components or strategies are added to the intervention.

Potential studies using DBR-SIS as an intervention should explore how many DBR-SIS recordings are needed to obtain a dependable estimate of intervention effectiveness. Future studies should delve more deeply into the possible influence that certain factors, such as duration and structure of the intervention, have on results. The current study did not investigate the effectiveness of intervention training or include a measure of intervention implementation fidelity. Therefore, the effect of training and student and ratings and adherence to intervention

implementation is unknown. Future research should further investigate these aspects, as it may be necessary to provide more explicit instructions to raters to not only ensure accurate behavior ratings but also determine fidelity to intervention implementation.

To minimize the subjectiveness of ratings and possible over or under generalization of behavior improvement, future research should focus on differences in teacher and student ratings on one specific behavior as opposed to a group of similar behaviors. The use of different self-regulation, academic, and behavior measures should be considered to examine further the effectiveness of DBR-SIS as an intervention. Future research should also include independent observations and ratings of a child's behavior to explore the possibility of rater bias.

Implications for Practice

The current study was conceived based on an identifiable need in the literature for a simple, practical, and effective self-regulation intervention for use with students with ADHD within a multi-tiered/response to intervention framework. While teachers may perceive DBR-SIS as an acceptable intervention for self-regulation, results of this study indicated teachers viewed the DBR-SIS self-regulation intervention as equally acceptable when used with or without teacher feedback. Although teachers' acceptability of DBR-SIS as an intervention lends support for its application in the school setting, the results of the current study indicated the use of DBR-SIS as a single intervention may be insufficient in helping students with ADHD develop the necessary skills to self-regulate their behavior. For teachers, the results of the current study caution the use of DBR-SIS as a single-component intervention for self-regulation. As such, teachers who implement DBR-SIS as a self-regulation intervention should be prepared to monitor students' behavior and supplement with an additional strategy such as teacher-delivered

reinforcement, in addition to the behaviors being monitored, evaluated, and reinforced by the students themselves if necessary.

Conclusions

Limited research on self-regulation and ADHD has explored the effects of student-directed learning strategies or the use of single-component strategies on the development of self-regulation. The current study sought to answer two overarching questions: Does the use of DBR-SIS as an intervention promote self-regulation skills in students with ADHD? and Do teachers perceive DBR-SIS as an acceptable and effective intervention for self-regulation? In general, the majority of the results in the current study were not significant. The important results were limited to DBR-SIS student intervention groups on the CAt-C scale of Impulsivity and teachers' perceptions of the acceptability of DBR-SIS as an intervention for students with ADHD.

Although the current results were primarily not significant, they should be considered in spite of the limitations of the study as they contribute to the current research of ADHD and self-regulation interventions. Broad implications can be drawn from the current study to support the use of DBR-SIS and its application in the school setting. While the study did not provide substantial support for the use of DBR-SIS as a single-component, student-directed self-regulation intervention for students with ADHD, two primary implications can be drawn from the results.

The primary significant result of the study indicated that the use of DBR-SIS as an intervention for self-regulation without any external support may result in elevations of students' perceptions of their engagement in impulsive behavior. Additionally, results of the current study also indicated differences in the DBR-SIS behavior performance measure, disruptive, between

the student DBR-SIS self-intervention group and the student DBR-SIS feedback-intervention conditions. Although this result was marginally significant, it reflected the significant result above in that students in the self-intervention condition indicated higher levels of disruptive behavior than students in the DBR-SIS feedback-intervention condition at post-test. While these findings could suggest DBR-SIS helps increase students' self-awareness of impulsive and disruptive behaviors, the first step in developing self-regulation, it could also suggest that the use of DBR-SIS as a sole intervention for increasing students' with ADHD self-regulation skills is insufficient and in the absence of feedback may result in increased negative perceptions of behavior for students.

Second, results from this study indicated that teacher participants perceived DBR-SIS as an acceptable self-regulation intervention for students with ADHD. Teachers' acceptability of DBR-SIS as an intervention suggests a willingness to implement the intervention. For schools, this acceptability may lead to an increase of the use of DBR-SIS as a self-regulation intervention in the general education setting, thus increasing the potential to generalize skills across classroom settings (Gureasko-Moore et al., 2006).

As teachers' roles in assisting students with ADHD to achieve academically and socially have increased, so has research on interventions in classroom settings with students with ADHD. The intent of the present study was to expand upon current self-regulation and ADHD research by investigating the use of DBR-SIS as a student-directed, self-regulation intervention with students with ADHD in the general education setting. Taken together, the results of this study present a potentially useful intervention option for helping elementary and middle school students with ADHD learn to self-regulate their behavior. The potential of DBR-SIS as an intervention for self-regulation provides a number of opportunities for students and teachers

alike. Overall, results of the current study extend what is known about the use of DBR-SIS as an intervention for self-regulation with elementary and middle school students in general education. Through this increase in understanding, future interventions can be developed to help students with ADHD not only be active participants in interventions, but also monitor and regulate their own behaviors.

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APPENDIX A: SCHOOL INVITATION LETTER

Indiana State University
More. From day one.

Indiana State University

Letter of Invitation to Participate In Research

Project Title: Do Direct Behavior Ratings –Single Item Scales (DBR-SIS) Help Students with Attention Deficit Hyperactivity Disorder Self-Regulate?

Your school is being invited to participate in a research study conducted by Regina Hildenbrand-Moore, a doctoral student from the Communication Disorders, and Counseling, School, and Educational Psychology Department at Indiana State University. In preparation for the study, Mrs. Hildenbrand-Moore, is seeking schools that are willing to participate.

The purpose of this project is to investigate the use of Direct Behavior Ratings-Single Item Scale (DBR-SIS) in helping students with ADHD improve classroom behaviors, such as inattention and disruptive behaviors (i.e., talking out of turn), that interfere with learning. For this project, students in the third, fourth, and fifth grades with ADHD will be taught how to use the DBR-SIS forms to monitor their attention and behavior during a class period selected by their general education teacher. Participating students and teachers will complete brief surveys and rating scales regarding students' academic performance and self-regulation. Additionally, teachers will complete a brief rating scale regarding their perspectives on the effectiveness of DBR-SIS as an intervention. The project will last approximately 8 weeks and is expected to begin Spring 2015.

This project has potential to benefit your teachers and students. Helping students better regulate their attention and behavior enhances their success in school. It is likely that information gained from the rating scales and surveys will help inform school practices regarding helping students with ADHD develop skills to self-monitor their behavior. Teachers will also learn a new tool to help students develop self-monitoring skills.

Mrs. Hildenbrand-Moore is conducting this study for her doctoral dissertation and Dr. Christine MacDonald is her faculty sponsor for the project. Participation in this study is entirely voluntary, and students and teachers may discontinue their participation at any time. Prior to data collection, approval from the Institutional Review Board (IRB), parent consent, teacher consent, and student assent will be obtained.

If you are interested in learning more about the study, please contact Regina Hildenbrand-Moore using the information listed below. Mrs. Hildenbrand-Moore will contact schools prior to the project's start date to inquire about your school's interest in participating in the study and to obtain a letter of agreement indicating the research can be conducted at your school if your school is interested in participating. Thank you for your time and consideration. I look forward to talking with you further.

Sincerely,

Regina Hildenbrand-Moore
Principal Investigator

Mrs. Regina Hildenbrand-Moore
Principal Investigator
Indiana State University
Department of Communication Disorders and
Counseling, School, & Educational Psychology
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Dr. Christine MacDonald
Professor
Indiana State University
Department of Communication Disorders and
Counseling, School, & Educational Psychology
Terre Haute, IN 47809
(812) 237-7787
chris.macdonald@indstate.edu

APPENDIX B: SCHOOL LETTER OF AGREEMENT

<Date>

Institutional Review Board
Indiana State University
Holmstedt Hall, Rm. 272
Terre Haute, IN 47809

Dear Institutional Review Board Members:

I have been asked by Mrs. Regina Hildenbrand-Moore to allow her to conduct her dissertation study at <School>. As principal, I will be the person responsible for providing information about the appropriateness of our population and I have granted her the permission necessary for the study to be conducted. I understand that Mrs. Hildenbrand-Moore's study focuses on methods to investigate the use of Direct Behavior Ratings-Single Item Scale (DBR-SIS) as an intervention to help students with Attention Deficit Hyperactivity Disorder (ADHD) improve classroom behaviors. Further, I understand that Mrs. Hildenbrand-Moore will seek both teacher and parent consent and student assent and that the study will involve teachers and students completing rating scales about classroom behavior.

<School> is willing and capable of following the study procedures that are approved by Indiana State University and the Institutional Review Board (IRB). I will also assure that any school faculty involved in any data collection will have the appropriate expertise and will follow IRB approved procedures. Any concerns or deviations from approved procedures will be promptly reported to Mrs. Hildenbrand-Moore. Should you have additional questions or concerns, you may contact me <Contact Information>.

Sincerely,

<Signature>
<Agency Personnel Name/Title>

APPENDIX C: TEACHER INVITATION EMAIL

Indiana State University

Letter of Invitation to Participate In Research Study

Project Title: Do Direct Behavior Ratings –Single Item Scales (DBR-SIS) Help Students with Attention Deficit Hyperactivity Disorder Self-Regulate?

Dear Teacher:

Your school has been invited to participate in a research study conducted by Regina Hildenbrand-Moore, a doctoral student from the Communication Disorders, and Counseling, School, and Educational Psychology Department at Indiana State University. In preparation for the study, Mrs. Hildenbrand-Moore, is seeking teachers who are willing to participate.

The purpose of this project is to investigate the use of Direct Behavior Ratings-Single Item Scale (DBR-SIS) in helping students with Attention Deficit Hyperactivity Disorder (ADHD) improve classroom behaviors, such as inattention and disruptive behaviors (i.e., talking out of turn), that interfere with learning. For this project, students in the third, fourth, and fifth grades with ADHD will be taught how to use the DBR-SIS forms to monitor their attention and behavior during a class period selected by their general education teacher.

Participating students and teachers will complete brief surveys and rating scales regarding students' academic performance and self-regulation. Additionally, teachers will complete a brief rating scale regarding their perspectives on the effectiveness of DBR-SIS as an intervention. The study is designed to be used during educational time and therefore will not interfere with the continuity of instruction. It is anticipated that the study will last approximately 8 weeks and is expected to begin Fall 2015.

This project has potential to benefit you and your students. Helping students better regulate their attention and behavior enhances their success in school. It is likely that information gained from the rating scales and surveys will help inform school practices regarding helping students with ADHD develop skills to self-monitor their behavior. You will also learn a new tool to help students develop self-monitoring skills.

Mrs. Hildenbrand-Moore is conducting this study for her doctoral dissertation and Dr. Christine MacDonald is her faculty sponsor for the project. Participation in the study is completely voluntary and no information regarding student or teacher participation will be shared with school administrators. All participant information, such as parent and teacher consent, student assent, and data collection materials will be de-identified to ensure confidentiality. Prior to data

collection, approval from the Institutional Review Board (IRB), parent consent, teacher consent, and student assent will be obtained.

A consent form further detailing the study has been placed in your school mailbox. Please review the consent form carefully and place a "check" next to your decision. Regardless of your decision, please sign and place the consent form in the envelope included with the consent form and give the envelope to your school secretary for collection by the principal investigator, Ms. Hildenbrand-Moore. If you have any questions regarding the study, please contact Ms. Hildenbrand-Moore.

Thank you for your time and consideration. I look forward to talking with you further.

Sincerely,

Regina Hildenbrand-Moore
Principal Investigator

APPENDIX D: TEACHER CONSENT FORM

TEACHER CONSENT TO PARTICIPATE IN RESEARCH

I Rate Me

Dear Teacher:
You are invited to participate in a research study conducted by Regina Hildenbrand-Moore, who is a doctoral student from the Communication Disorders, and Counseling, School, and Educational Psychology Department at Indiana State University. Mrs. Hildenbrand-Moore is conducting this study for her doctoral dissertation. Dr. Christine MacDonald is her faculty sponsor for the project. Your participation in this study is entirely voluntary, and you may discontinue your participation at any time. Please read the information below and ask questions about anything you do not understand, before deciding whether or not to participate. You are being asked to participate in this study because you are an elementary school teacher and your school has agreed to participate in the study.

PURPOSE OF THE STUDY
This study is designed to investigate the use of Direct Behavior Ratings Single Item Scale (DBR-SIS) in helping students with Attention Deficit Hyperactivity Disorder improve classroom behaviors such as attention and reduce disruptive behaviors that interfere with learning (i.e., talking out of turn). In addition, this study will compare self-regulation ratings of students and teachers. This study will also explore teacher perspectives about the effectiveness of DBR-SIS as an intervention.

PROCEDURES
If you volunteer to participate in this study, you will be asked to do the following things:

1. Nominate potential student participants for the study. Potential participants should exhibit difficulties with behavior and self-regulation.
2. Determine a time during the school day in which the student participant in your classroom appears to have the most difficulties with attention and classroom behavior.
3. Complete brief rating forms for each student, whose parent has provided consent, in your classroom. These forms will take approximately 5-15 minutes per student to complete.
4. Participate in a 20-30 minute intervention training session with Mrs. Hildenbrand-Moore. Facilitate the intervention in your classroom with your student participant. Intervention implementation will last no longer than 10-15 minutes and will occur daily for 7 weeks during one instructional period (e.g., reading, math). The project is designed to be used during educational time and therefore will not interfere with the continuity of instruction.
5. Complete a brief survey about your perceptions of the effectiveness of the intervention.

These tasks will occur over the course of approximately 8 weeks.

POTENTIAL RISKS AND DISCOMFORTS
It is anticipated that risks, discomforts, or inconveniences will be minor and unlikely to happen. An example of an anticipated risk in this study is loss of time. Participation in the study could detract from lesson time or teacher preparation time. Some of the questions on the rating forms might make you feel uncomfortable or be difficult to answer. It is possible that some student participants may become upset due to missed activity or "specials" class time. Students will only miss their activity period two times. Some student participants may report feeling bored, worried, or embarrassed and may act out or withdraw from class. If this occurs, please let us know and the researcher will help the student and his/her family identify someone (like your school counselor) to talk with about feelings and behaviors. If these or other discomforts become a problem, you may discontinue your participation.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY
It is likely that implementation of the DBR-SIS intervention may benefit you and your students. Helping students learn to better regulate their attention and behavior enhances their success in school. It is likely that information gained from the rating scales and surveys will help inform school practices regarding helping students with ADHD develop skills to self-monitor their behavior.

CONFIDENTIALITY
Any information that is obtained in connection with this study will remain confidential and will be disclosed only with your permission or as required by law. Research records such as consent/assent forms, rating scales, and data will be stored in locked cabinets and secure computer files. Your name will not be on any research data. Instead, data will be labeled with a study number. The master list that links your name and other information to the study number will be stored in a locked cabinet or on a secure computer file.

Mrs. Hildenbrand-Moore will use the information collected in this study to in her dissertation in other publications. If results of this research are published, identifying information would not be used. Any information used for publication will not identify you individually. Information used for publications will only be used in combined form.

There are some other reasons the information you give may be shared with others:

- If it's required by law.
- If we think you or someone else could be harmed.
- Sponsors, government agencies or research staff sometimes look at forms like this and other study records. They do this to make sure the research is done safely and legally. Anyone who reviews study records would keep your information confidential.

PARTICIPATION AND WITHDRAWAL
Although your school has agreed to participate in the study, there is no expectation of your or your students' participation in the study. You may choose whether or not to be in this study. All communication will take place directly between me as the researcher and you as the teacher

participant. School administrators will not be informed of your decision to participate or not participate in the study.

Please indicate on the form below your decision regarding participation in the study. Regardless of your choice, please sign the form below, place it in the provided envelope, and give the envelope to your school's secretary. The school secretary will place the envelope into a manila envelope for collection by the researcher.

If you volunteer to be in this study, you may withdraw at any time without consequences of any kind or loss of benefits to which you are otherwise entitled. To withdraw from the study, please inform the researcher via e-mail. You may also refuse to answer any questions you do not want to answer.

IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about this research, please feel free to contact:

Mrs. Regina Hildenbrand-Moore
Principal Investigator
Department of Communication Disorders and Counseling, School, & Educational Psychology
Indiana State University
Terre Haute, IN 47809
812-249-9558
rhildenbran@sycamores.indstate.edu

Dr. Christine MacDonald
Professor
Department of Communication Disorders and Counseling, School, & Educational Psychology
Indiana State University
Terre Haute, IN 47809
(812) 237-7787
chris.macdonald@indstate.edu

RIGHTS OF RESEARCH SUBJECTS

If you have any questions about your rights as a research subject, you may contact the Indiana State University Institutional Review Board (IRB) by mail at Indiana State University, Office of Sponsored Programs, Terre Haute, IN 47809, by phone at (812) 237-8217, or e-mail the IRB at irb@indstate.edu. You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with ISU. The IRB has reviewed and approved this study.

TEACHER CONSENT TO PARTICIPATE IN RESEARCH

I Rate Me

Please check whether or not you wish to participate in the study. Signing this form indicates that you understand and are willing to engage in the procedures and activities described above. Sign both copies and keep one for your records.

_____I agree to participate in the *I Rate Me* study.

_____I DO NOT wish to participate in the *I Rate Me* study.

Teacher Name Printed

Date

Teacher Signature

APPENDIX E: PARENTAL CONSENT FORM

I Rate Me

Dear Parent(s) or Guardian:
I am Regina Hildenbrand-Moore, a doctoral student in the Communication Disorders and Counseling, School, and Educational Psychology Department at Indiana State University. As a part of my studies, I am doing a research study on how to help children with Attention Deficit Hyperactivity Disorder (ADHD) learn to track their attention and behavior during class. I am contacting you because your school and your child's teacher have agreed to participate in my study. Your child was chosen by his or her teacher as a potential participant for the study because your child sometimes shows challenges with behavior and attention at school.

You have the choice of having your child join the "I Rate Me" study. This is a permission letter. It provides a summary of what would happen if you choose to let your child join this study. Please read it carefully. Take as much time as you need. Please ask the researcher, Mrs. Hildenbrand-Moore, questions about anything that is not clear.

What you should know about this study:
The study will last 8 weeks and will take place during the fall semester. This study is made to be used during class time so it will not take away from your child's learning time. Your child's teacher will also be in the study and will complete rating forms and help your child learn a new way to change behaviors that may affect his or her learning.

If you give permission:

1. Your child's teacher and your child will complete a brief rating scale, the Clinical Assessment of Attention Deficit-Child (CAt-C) about his or her attention, behavior, and study skills in the classroom. The CAt-C takes about 15 minutes to complete and will be completed at the beginning and end of the study. Items on the CAt-C are the same for both teachers and students. For instance, the child's CAt-C has items like "I do not like to sit still and read." The teacher's CAt-C has items like "Does not like to sit still and read." Both your child and the teacher will use a four-point scale (1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree) to mark how much they agree with an item.
2. Your child and teacher will also take part in a classroom support activity. To learn how to do the activity, your child will take part in a one-time 20-30 minute training session with Mrs. Hildenbrand-Moore. The training session will occur during your child's activity time at his or her school.
3. The classroom support activity will take place in your child's regular classroom during one classroom activity like reading or math. Your child and teacher will be taught how to use the Direct Behavior Rating-Single Item Scale (DBR-SIS) to track classroom behaviors such as staying in seat, talking in turn, and listening. On the DBR-SIS form your child and teacher will be asked to use a scale from 0 (not at all) to 10 (all the time)

to record how often a behavior happens during a classroom activity. Your child will be in the classroom support activity for 8 weeks.

POTENTIAL RISKS AND DISCOMFORTS

It is expected that risks or discomforts will be minor and unlikely to happen. One possible risk is that your child may feel uncomfortable with some of the questions on the CAt-C. Another possible risk in this study is loss of time. Your child will miss some activity or "specials" class time. This will only happen two times during the study. It is also possible that your child may feel bored, worried, or embarrassed by being in the study and may act out or withdraw from class. Please let us know if your child shares these concerns with you and we will give you a list of school and community resources to help. If your child experiences these discomforts and they become a problem, your child may stop being in the study.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

It is likely learning the DBR-SIS classroom support activity may benefit your child. Helping children learn to track their attention and behavior may improve their success in school. It is likely that information gained from this study may help change school practices about helping children with ADHD learn skills to pay attention to their behavior.

CONFIDENTIALITY

Any information that is obtained in this study will remain confidential and will only be shared with your permission or as required by law.

Care will be taken not to record the names of the students on measures. Your name or your child's name will not be on any research data. All rating scales and data forms will be identified by a study number linked to your child. A study number is a number, one to 35 that will be randomly given to each child in the study. A list containing the study numbers and your child's first name will be kept by the researcher. Only the researcher will have this list.

All data forms will be kept under lock and key to avoid unapproved use. Your child's name will not be listed on any of the computer data files. The student number list will be stored in a locked file cabinet separate from the permission forms, data forms, and rating scales.

Mrs. Hildenbrand-Moore will use the information collected in this study in her dissertation and other papers. If results of this study are published, information that identifies your child will not be used. Any information used for publication will not identify you or your child individually. Information used for publications will only be used in combined form.

There are some other reasons the information you give may be shared with others:

- If it's required by law.
- If we think you or someone else could be harmed.
- Sponsors, government agencies or research staff sometimes look at forms like this and other study records. They do this to make sure the research is done safely and legally. Anyone who reviews study records would keep your information confidential.

A report with your child's CAt-C scores and progress will be sent to you at the study's end upon request. If you would like information about your child, please inform the researcher of your request. Requests for information can be made to the researcher, Ms. Hildenbrand-Moore, via letter, email, or telephone.

PARTICIPATION AND WITHDRAWAL

Although the school and the teacher have agreed to participate in the study, you have the right to decide on your own about your child's participation. Participation in this study is voluntary. All communication will take place directly between me as the researcher, you, and your child's teacher. Your school's administrators will not be informed of your decision regarding your child's participation in the study. Your child can choose to not be in the study even if you give him/her permission to join.

Your and your child's decision whether or not to be in the study will not affect the school services normally provided to your child. You and your child are not giving up any legal claims, rights, or supports because of your child's participation in this research study.

If you and your child choose to be in the study now but change your choice later you can stop your child's participation in the study by either emailing or calling the study's researcher, Mrs. Hildenbrand-Moore. You can choose to stop participating at any point during the study.

RESEARCHER CONTACT INFORMATION

Should you have any questions or want more information, please contact:

Indiana State University

Department of Communication Disorders and Counseling, School, & Educational Psychology

Mrs. Regina Hildenbrand-Moore	Dr. Christine MacDonald
Principal Researcher	Faculty Research Sponsor
812-320-5174	812-237-7787
rhildenbran@sycamores.indstate.edu	chris.macdonald@indstate.edu

If you choose for your child to be in the study please sign and return the permission form below. Please use the enclosed, pre-stamped envelope to mail the signed permission form to the researcher. Upon receiving signed permission form, the researcher will mail you a copy of your signed permission form.

If you have any questions about your rights as a research subject, you may contact the Indiana State University Institutional Review Board (IRB) by mail at Indiana State University, Office of Sponsored Programs, Terre Haute, IN 47809, by phone at (812) 237-8217, or e-mail the IRB at irb@indstate.edu. You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with ISU. The IRB has reviewed and approved this study. Thank you for your time and consideration.

Sincerely,

Regina M. Hildenbrand-Moore

PERMISSION TO PARTICIPATE IN STUDY

I Rate Me

Please check whether or not you wish to allow your child to participate in this project by initialing one of the statements below, signing your name and returning this form to your child's teacher. If you give permission for your child to be in the study please initial the verification statement. Sign both copies and keep one for your records.

_____ I grant permission for my child to participate in Regina Hildenbrand-Moore's study about how children with Attention Deficit Hyperactivity Disorder learn to track their attention and behavior.

_____ I **do not** grant permission for my child to participate in Regina Hildenbrand-Moore's study about how children with Attention Deficit Hyperactivity Disorder learn track their attention and behavior.

_____ I verify that my child has been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) by either a doctor or mental health professional.

Child's Name	Parent/Guardian Name
Date	Parent/Guardian Signature

APPENDIX F: RESEARCHER-PARENT(S)/GUARDIAN(S) LETTER

Dear Parent(s) or Guardian(s),

Your child's classroom teacher has nominated your child as a potential participant in the "I Rate Me" research study because they sometimes exhibit challenges with behavior and self-regulation. Please review the enclosed documents regarding the study. Although the school and the teacher have agreed to participate in the study, you have the right to decide on your own about your child's participation.

Please indicate your decision on the consent form and have your child return the consent form to the front office secretary. All forms will be placed in an envelope and collected by the researcher. Again, participation in the study is entirely up to you. Thank you for your time and consideration of this opportunity.

Sincerely,

Regina M. Hildenbrand-Moore
Researcher

APPENDIX G: STUDENT ASSENT FORM

I Rate Me

Hello! My name is Regina Hildenbrand-Moore. I am a researcher from Indiana State University. I am asking you to take part in a research study called *I Rate Me.*

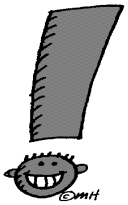
What is a research study?

Research studies help us learn new things. We can test new ideas. First, we ask a question. Then we try to find the answer.

This paper talks about my research and the choice that you have to take part in it. I want you to ask us any questions that you have. You can ask questions any time.

Important things to know…

- You get to decide if you want to take part.
- You can say 'No' or you can say 'Yes'.
- No one will be upset if you say 'No'.
- If you say 'Yes', you can always say 'No' later.
- You can say 'No' at any time.



Why are we doing this research?

We are doing this research to learn more about how rating actions and attention in class can help kids learn.

What would happen if I join this research?

If you decide to be in the research, we would ask you to do the following:

- Questions: We would ask you to read questions on a piece of paper. Then you would mark your answers on the paper. You will complete this piece of paper two times, once at the beginning of the research and again at its end.
- Rating: We would ask you to pay attention to your actions in class like listening, hand raising, and staying in your seat and mark how often you do these actions during one class activity on a piece of paper called the Direct Behavior Rating-Single Item Scale. You will use this paper one time a day every day for 5 weeks.
- Learning: You will be taught how to use the Direct Behavior Rating-Single Item Scale to rate your actions.

Where would the research happen?

- The research will happen in your classroom during one classroom activity like math or reading.
- The research will begin in August and it will last 2 months.
- Your teacher will be present and will help!

Could bad things happen if I join this research?

- Some of the questions might make you uncomfortable or the questions might be hard to answer. We will try to make sure that no bad things happen.
- You will miss some of your activity or "specials" class time. This will only happen two times.
- If you feel bored, worried, or embarrassed by being in the study, please let us know and we will help you talk to someone (like your school counselor) about those feelings.
- You can say 'no' to what we ask you to do for the research at any time and we will stop.

Could the research help me?

- We think being in this research may help you learn to pay more attention to your choices and actions at school.

What else should I know about this research?

- If you don't want to be in the study, you don't have to be.
- The researcher will also ask your parent(s) or guardian if it is ok for you to participate too.
- It is also OK to say yes and change your mind later. You can stop being in the research at any time. If you want to stop, please tell the researcher. If you do not want to tell the researcher you can tell your parent(s), guardian, or teacher and ask them to tell the researcher for you.
- You can ask questions any time. You can talk to the researcher, Mrs. Hildenbrand-Moore. Ask me any questions you have. Take the time you need to make your choice.

I RATE ME!

Is there anything else?

If you want to be in the research after we talk, please write your name below. We will write our name too. This shows we talked about the research. Check if you do or do not want to take part in the research.

_____I want to take part in the research.

_____I DO NOT want to take part in the research.

Printed Name of Student _____
(To be written by child/adolescent)

Signature of Student_____

Printed Name of Researcher _____

Signature of Researcher_____

_____
Date

APPENDIX H: INTERVENTION RATING PROFILE-15 (IRP-15)

"I Rate Me"

The purpose of this questionnaire is to obtain information that will aid in the selection of classroom interventions. The intervention you and your student (s) have participated in will be used by teachers of children with behavior problems. Please circle the number which best describes your agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
This would be an acceptable intervention for a child's behavior problem.	1	2	3	4	5	6
Most teachers would find this intervention appropriate for behavior problems in addition to the one described.	1	2	3	4	5	6
This intervention should prove effective in changing the child's problem behavior.	1	2	3	4	5	6
I would suggest the use of this intervention to other teachers.	1	2	3	4	5	6
The child's behavior is severe enough to warrant use of this intervention.	1	2	3	4	5	6
Most teachers would find this intervention suitable for the behavior problem described.	1	2	3	4	5	6
I would be willing to use this intervention in the classroom setting.	1	2	3	4	5	6
This intervention would not result in negative side-effects for the child.	1	2	3	4	5	6
This intervention would be appropriate for a variety of children.	1	2	3	4	5	6
This intervention is consistent with those I have used in classroom settings.	1	2	3	4	5	6
This intervention was a fair way to handle the child's problem behavior.	1	2	3	4	5	6
This intervention is reasonable for the behavior problem described.	1	2	3	4	5	6
I liked the procedures used in this intervention.	1	2	3	4	5	6
This intervention was a good way to handle this child's behavior problem.	1	2	3	4	5	6
Overall, this intervention would be beneficial for the child.	1	2	3	4	5	6