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Enhancing a Middle School Student's Self-Management Skills in the Classroom

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ENHANCING A MIDDLE SCHOOL STUDENT'S
SELF-MANAGEMENT SKILLS IN THE CLASSROOM

A Specialist Project
Presented to
The Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Specialist in Education

By
Lanie J. Rudisill

August 2018

ENHANCING A MIDDLE SCHOOL STUDENT'S
SELF-MANAGEMENT SKILLS IN THE CLASSROOM

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Self-regulation (SR) and executive functioning (EF) are important factors for successful student outcomes. Research suggests that executive skills facilitate the process of behavioral self-regulation. Well-developed SR and EF skills make learning more likely. Proper SR has the ability to improve attention levels and EF includes the use of working memory, both of which are essential components of the information processing system that students use continuously. One type of SR, referred to as self-management, involves a cycle of observing and recording one's own behavior, then evaluating one's self-assessments against those of an external observer. Self-management interventions have previously been found to reduce students' inappropriate and off-task behaviors as well as increase classroom preparedness, on-task behavior, and academic performance. This study investigated the impact of a self-management intervention on a middle school student's classroom preparation behaviors and his EF skills. Results suggest the participant's overall classroom preparation behaviors were enhanced through his participation in the intervention. A few significant changes were also found in the participant's pre- and post-intervention EF scores.

Introduction

Self-regulation is one of the most important skill areas needed for an individual's successful progression through daily life. Humans are constantly interacting with the environment and responding to both external and internal stimuli. The ability to navigate and process those stimuli to regulate oneself in a constantly changing environment is fundamental. Self-regulatory skills become especially important for children upon their entry into school (Sasser & Bierman, 2012). The attainment of successful experiences in educational environments is most certainly dependent on the use of self-regulatory skills and processes.

In its simplest definition, self-regulation involves the observation, monitoring, assessment, and management of one's own behavior (Reid, Trout, & Schartz, 2005). It is the mind's method of controlling the many functions of the body (Martin & McLellan, 2007). Like many other skills and abilities, most children acquire self-regulation skills along a natural, developmentally appropriate timeline. However, others experience delays ranging from mild to significant in the development of self-regulatory skills. In educational settings, delays may require interventions which provide children with extra supports to ensure they acquire these essential skills to increase their level of functioning to that of their same-age peers.

Self-regulatory skill interventions have been studied in a variety of children with regard to gender, ethnicity, age, grade level, background, geographic location, disability classification, and educational placement (Albers & Hoffman, 2012; Carr & Punzo, 1993; Crabtree, Alber-Morgan, & Konrad, 2010; Hagaman, Casey, & Reid, 2012; Jitendra, Cole, Hoppes, & Wilson, 1998; Jitendra, Hoppes, & Xin, 2000; Mason, Snyder,

Sukhram, & Kedem, 2006; Prater, Hogan, & Miller, 1992; & Rock, 2005). Under the umbrella of self-regulatory skills are subcategories such as self-monitoring, self-reinforcement, and self-management, which have also been studied to examine their impact on student behavior and academic performance (Reid et al., 2005). These studies will be discussed at greater length in the literature review.

Another skill area that is important for academic, social, career, and life success is executive functioning. Executive functions involve the mental processes individuals must have to be able to consciously control their thoughts and actions to achieve goals (Moreno, Shwayder, & Friedman, 2016). Various theoretical conceptualizations of executive functions exist, but the consensus among researchers is that executive functions are the mental processes associated with self-regulatory frontal lobe functioning (i.e., planning, organization of thoughts/materials, initiation, task shifting, self-monitoring, performance modification, inhibitory control, emotional control, and working memory) (Denckla, 1996; Cooper-Kahn & Dietzel, 2008; Moreno et al., 2016). In broader terms, executive functioning consists of three main areas of higher cortical functioning: inhibition, working memory, and task shifting (Best, Miller, & Jones, 2009).

Self-regulation and executive functions are so closely intertwined that self-regulation is often considered to be encompassed by the term executive functions. (Denckla, 1998; Denckla & Reader, as cited in Singer & Bashir, 1999). One comprehensive review on the topic (Nigg, 2017) indicates a general consensus that a person's executive skills permit the process of self-regulation. This occurs when the executive skills that individuals use to achieve goals also allow for the management and

monitoring of thoughts and emotions (i.e., self-regulation) that make the attainment of those goals more likely.

Executive functions are an increasingly identified skill area in which students of all ages experience delays and struggles. Deficits in executive functioning can lead to negative academic outcomes for middle school students. A longitudinal study found that scores on an objective measure of executive functioning predicted grade point averages of middle school students (Samuels, Tournakia, Blackman, & Zilinski, 2016). Deficits in executive functioning have also been found to be connected to behavior problems in children. A meta-analysis (Schoemaker, Mulder, Deković, & Matthys, 2012) found a medium effect size and a significant relationship between overall executive functioning levels and behavior problems in children.

If interventions are not appropriately identified and effectively implemented to combat executive functioning struggles, the student's academic performance and/or classroom behavior may continue to decline. As a result, the school psychologist is often contacted to evaluate those students for special education eligibility due to the adverse educational impact of the student's continued struggles. Therefore, investigating the effectiveness of existing interventions that address executive functioning skills is an important part of the prevention of academic failure and behavioral problems in school-age children.

Another role of the school psychologist is to assist in the development and implementation of research-based interventions to provide extra supports for students experiencing delays or difficulties with behavior and/or academics in the school setting. In middle school, children and adolescents are expected to possess and self-regulate their

own organizational skills to successfully transition between multiple teachers and classrooms so that they enter each class period fully prepared for instruction. The current study investigates the implementation of a self-management intervention for a student who struggles with organization, classroom preparedness behaviors, and work completion. More specifically, the intervention package targets self-regulatory elements such as self-management, self-monitoring via a checklist, and self-reinforcement via personal goal setting—and, ideally, goal attainment—to investigate their impact on a student’s executive functioning and classroom preparation skills.

Literature Review

One of the fundamental ways in which humans impact their own behavior is through the use of self-regulation and its sub-processes. Many theoretical descriptions of self-regulation exist. While this collection of attempts at explaining and defining self-regulation has expanded knowledge and understanding of self-regulation as a concept, the unfortunate side effect is difficulty in reaching consensus on a true definition (Martin & McLellen, 2007). Further investigation of the evolution of study on self-regulation provides some insight to the overarching themes and consistencies across theories. Overall, most theoretical perspectives involve the view that self-regulation arises from an intricate interaction of internal and external factors and processes.

In his social cognitive theory of self-regulation, Bandura (1991) conceptualized self-regulation as a complex operating system with three primary sub-operations: (a) self-monitoring through self-observation (i.e., self-monitoring), (b) judging one's behavior in the context of both the environmental expectations and one's own personal standards (i.e., self-assessment), and (c) self-evaluation. At the very least, self-regulation is viewed by social cognitive theorists as "a triadic interaction of personal, behavioral, and environmental processes" (Martin & McLellan, 2007, p. 435). Behavioral theorists have stated that self-regulation is a set of self-control behaviors learned over time via the interaction between motivation and behavioral responses to rewards (Lynn, Cuskelly, O'Callaghan, & Gray, 2011). Developmental psychologists have discussed the impact of caregiver interactions and internal factors such as Vygotsky's private speech on a child's successful development of self-regulatory behaviors and skills (Lynn et al., 2011).

Cognitive neuroscience research incorporates self-regulation in the executive functioning processes of the prefrontal cortex (Martin & McLellan, 2007). Information-processing theories on self-regulation view it as a process that occurs when attention is turned to oneself, causing an evaluation of one's current self against one's ideal self, and then, when the current and ideal selves do not match, motivation to change one's behavior (Hoyle, 2012). Essentially, this process is one of self-awareness, the analysis of the self against a standard, and the behavioral management of any undesired incompatibility between the two.

In educational psychology, self-regulation is viewed through the lens of self-regulated learning; that is, self-regulation for the purpose of having control over one's own learning experiences in educational environments. Martin and McLellan (2007) reviewed the historical progression of the study of self-regulation and reported their findings in great detail. They found that the majority of studies of educational self-regulation have occurred over the last three decades and have resulted in a variety of definitions and conceptions of both self-regulation in general and self-regulation as it pertains to education. Some educational psychologists view self-regulation as a cyclical cognitive-behavioral procedure, much like the conceptions of Bandura and other social-cognitive theorists. Others highlight the cognitive and metacognitive elements of self-regulation more so than the behavioral elements proposed by behavioral and cognitive-behavioral theorists. Often, the debate has centered on the struggle to distinguish exactly when the activity of a person is truly self-produced versus when it is a reaction resulting from external forces. Many researchers have concluded that, similar to the nature versus nurture debate, self-regulation is likely a complex and sometimes mutual interaction of

internal states and external forces. Ultimately, Martin and McLellan (2007) stated that in educational environments, self-regulation may not necessarily be regarded as fully self-determined, particularly because many external forces (e.g., teacher expectations, school rules, assignment instructions) guide students' behavioral standards and goals. Rather, it redirects responsibility so that a student is in charge of regulating himself or herself to achieve a self-imposed and/or externally-imposed goal or standard.

According to a meta-analysis by Reid et al. (2005), the overall process of self-regulation involves the organized and cyclical self-assessment and self-evaluation of one's own behavior. The cyclical aspect of self-regulation refers to the continual process of evaluating the results of current behavior to inform, guide, and improve future behavior. Four primary methods of attaining this self-regulatory feedback sequence can be found in the existing research: self-monitoring, self-monitoring with reinforcement, self-reinforcement, and self-management. Each of these methods will be discussed in detail below.

Self-monitoring

Self-monitoring has been defined in the literature as the combination of observing and recording one's own behavior (Amato-Zech, Hoff, & Doepke, 2006; Shapiro & Cole, 1999). Several methods of self-monitoring have been researched, such as self-monitoring of attention, comprehension, and performance. Results and effect size calculations from several studies have found self-monitoring interventions to be effective in increasing attention and on-task behavior (Prater et al., 1992; Rafferty, 2012; Rock, 2005; Shimabukuro, Prater, Jenkins, & Edelen-Smith, 1999; Todd, Horner, & Sugai, 1999). Peterson, Young, West, and Hill (2006) found that self-monitoring improved students'

classroom social skills. Yet other studies have found self-monitoring interventions to aid in increasing academic behaviors such as productivity and accuracy (Maag, Reid, & DiGangi, 1993) and grades (Wood, Murdock, & Cronin, 2002) as well as academic skills such as reading comprehension (Crabtree et al., 2010; Edwards, Salant, Howard, Brougher, & McLaughlin, 1995), vocabulary (Lalli & Shapiro, 1990), reading fluency (Albers & Hoffman, 2012; Gunter, Miller, & Venn, 2003), math calculation (Carr & Punzo, 1993; Levendoski & Cartledge, 2000) and math fluency (Boswell, Knight, & Spriggs, 2013).

Many existing studies on self-monitoring of attention have used auditory cues from a device or an instructor (Amato-Zech et al., 2006; Cole & Bambara, 1992; McDougall, Morrison, & Awana, 2012), which are advantageous to the individuals using them, but can be distracting to others and thus not always appropriate for educational environments. Other types of self-monitoring interventions used for monitoring behavior, comprehension, and performance that are less intrusive and more suitable for a variety of students and classroom environments include the use of tactile-cued devices (Boswell et al., 2012), visual organizers (Rock, 2005), and checklists (Snyder & Bambara, 1997). These tools are less intrusive to the overall classroom environment while preserving their value for the individual using them.

Self-monitoring interventions thus have the ability to improve both behavioral and academic skills and academic performance, which typically share a reciprocal relationship in educational settings. These studies on the effectiveness of self-monitoring interventions have primarily been conducted in elementary and middle schools, most often with male students in both general education and special education classroom

settings. Students identified as having a learning disability or emotional disturbance are those who have most frequently been identified for participation in these studies. To analyze the magnitude of effect of a treatment or intervention and to determine its practicality for use outside of experimental conditions, researchers often use measures of effect size. In a meta-analysis, Guzman, Goldberg, and Swanson (2017) calculated effect sizes for self-monitoring interventions using results from Albers and Hoffman (2012), Carr and Punzo (1993), Crabtree et al. (2010), Edwards et al. (1995), Gunter et al. (2003), Lalli & Shapiro (1990), Prater et al. (1992), Rock (2005), Rafferty (2012), and Shimbukuro et al. (1999). When averaged, these effect sizes equaled 0.94, which is indicative of a strong magnitude of effect (Cohen, 1988).

Self-monitoring plus reinforcement

Self-monitoring plus reinforcement simply involves the addition of a reinforcement step to the self-monitoring process described in the previous section. After observing and recording his or her behavior, the student is given some type of reinforcement for exhibiting and successfully self-monitoring the target behavior. In their meta-analysis, Reid et al. (2005) stated that the reinforcement element serves to increase the relevance and significance of the self-monitoring portion. The work of Reid et al. (2005) and a systematic review of self-monitoring research conducted by Bruhn, McDaniel, and Kreigh (2015) revealed that the type of reinforcement used in self-monitoring studies can vary. Previous studies have utilized the following types of reinforcement: tangible rewards such as tokens, stickers, points to be used in an existing token economy (Barkley, Copeland, & Sivage, 1980; Davis et al., 2014; Edwards et al., 1995); teacher praise (Smith & Sugai, 2000); or choices—such as activities and edibles—

from a pre-set rewards menu (Davies & Witte, 2000; Otero & Haut, 2016; Smith & Sugai, 2000).

Results from the studies mentioned above have demonstrated that intervention packages involving self-monitoring plus reinforcement were successful in decreasing misbehavior (Barkley et al., 1980) and inappropriate talking-out (Davies & Witte, 2000) and increasing on-task behavior/academic engagement (Barkley et al., 1980; Davis et al., 2014; Otero & Haut, 2016; Rock, 2005; Smith & Sugai, 2000), reading comprehension accuracy (Edwards et al., 1995), self-monitoring accuracy (Otero & Haut, 2016), work completion (Smith & Sugai, 2000), and following instructions (Mitchem, Young, West, & Benyo, 2001). The vast majority of these studies have been conducted with male participants in lower elementary to upper elementary grade levels, primarily in general education settings. Two meta-analyses utilized information from the above studies to calculate effect size for interventions involving self-monitoring plus reinforcement. They found that the average effect size was 1.12, which is indicative of a strong magnitude of effect (Guzman, Goldberg, & Swanson, 2017; Reid et al., 2005).

Self-reinforcement

Self-reinforcement interventions are almost identical to the self-monitoring plus reinforcement interventions described above. However, a key difference in self-reinforcement is that participants award their own reinforcement for reaching a pre-determined performance criterion, rather than having that reinforcement delivered to them from an external source (Reid et al., 2005). Investigations of the effectiveness of self-reinforcement interventions are less common, but still represent an importance piece of the immense literature on self-regulation interventions.

Results from existing studies demonstrate that self-reinforcement has been particularly beneficial in increasing the academic accuracy (i.e., number of questions answered correctly) and productivity of elementary to middle school age males with ADHD. Using various formulas to calculate effect size and Cohen's scale to determine effect magnitude across three separate studies, a meta-analysis by Reid et al. (2005) found that self-reinforcement had strong positive effects on academic productivity and had a moderate to strong effect on academic accuracy. In recent years, however, it has become more common to see self-reinforcement used as one of several components of intervention packages, rather than as a single intervention.

Self-management

In applied behavior analysis, self-management is defined as “the personal application of behavior change tactics to produce a desired change in behavior” (Cooper, Heron, & Heward, 2007, p. 704). Shapiro and Cole (1999) stated that self-management is similar to self-monitoring in that it requires students to assess and record their own behavior. However, the process of self-management also requires students to complete an additional step: evaluating the accuracy of their self-assessments. This is achieved by matching the student's self-ratings of their behavior to the ratings an external observer (e.g., teacher, parent, other professional) has made of their behavior. These matched ratings between the student and his or her observer is similar to the process of obtaining interobserver agreement, which is commonly used in research studies involving the use of observational data. Reinforcement is sometimes involved in self-management in that students receive a pre-selected type of reinforcement, but only when their self-ratings closely match the external observer's ratings (Reid et al., 2005).

One beneficial aspect of self-management is that it encourages students to take ownership of their own behavior, which increases the probability that they will adopt their newly learned skills and generalize those skills to other settings (Gureasko-Moore, DuPaul, & White, 2006). Another unique aspect of self-management is found in its ability to encourage a child's mastery of other important behaviors across environmental conditions (Otero & Haut, 2016). Additionally, the desired behaviors facilitated by a student's participation in self-management interventions are often directly incompatible with—and thus likely to decrease—negative or undesired behaviors.

Results of previous studies have demonstrated that self-management is effective in reducing inappropriate behaviors (Blood, Johnson, Ridenour, Simmons, & Crouch, 2011; Davies & Witte, 2000) and off-task behavior (Chafouleas, Hagermoser-Sanetti, Jaffery, & Fallon, 2012; Peterson et al., 2006) as well as increasing classroom preparedness (Gureasko-Moore et al., 2006), homework completion (Gureasko-Moore, DuPaul, & White, 2007), on-task behavior (Blood et al., 2011; Chafouleas et al., 2012; Mitchem et al., 2001; Smith & Sugai, 2000) and academic performance (Barry & Messer, 2003; Mitchem et al., 2001). Most of these studies were conducted with male participants in upper elementary to middle school grade levels and have primarily occurred in general education settings. The majority of participants in these studies were students with ADHD, but some also included students who had emotional/behavioral disabilities and/or learning disabilities, and others were students with no identified disabilities.

Several of the studies above calculated effect size for their self-management interventions using Percent Non-overlapping Data (PND) or included enough data that PND could be calculated by the author of the present study. PND is a common statistic

used to determine the effect size of interventions implemented in single-subject studies (Olive & Franco, 2008; Scruggs & Mastropieri, 2013). More specifically, PND is extensively utilized for analyzing the magnitude of treatment effects in single-case designs (Olive & Franco, 2008, p. 5). PND scores > 90% represent a very effective intervention, PND scores 70-90% represent an effective intervention, PND scores 50-70% demonstrate a questionable intervention, and PND scores < 50% demonstrate an ineffective intervention (Scruggs & Mastropieri, 2013).

Blood et al. (2011) demonstrated that self-management had an effect size of 100% for increasing on-task behavior in a single participant. Mitchem et al. (2001) demonstrated that self-management had an effect size of 100% for increasing on-task behavior of an entire group or classroom of students. Results from Smith and Sugai (2000) suggest that self-management had an effect size of 100% for increasing on-task behavior from the initial baseline to intervention phases in Smith and Sugai (2000). Results of the self-management intervention conducted by Peterson et al. (2006) found an average effect size of 53.5% across five participants for decreasing off-task behavior. These PND percentages indicate that, in some cases, self-management was effective in producing a reduction in students' off-task behavior, but in other cases its effect was questionable. The present study sought to expand the existing literature on the implementation of self-management interventions with single subjects.

Executive Functioning Skills

Executive functioning skills have been frequently defined in the existing research as a specific group of abilities associated with the prefrontal cortex of the brain which allow people to self-regulate their behavior based on a goal and adapt and monitor their

own behavior depending on their environment (Denckla, as cited in Nigg, Quamma, Greenberg, & Kusche, 1999; Pennington & Ozonoff, 1996). Best et al. (2009) described the construct of executive functioning as having three generally agreed-upon developmental sub-components: (a) Inhibition, or the ability to suppress a dominant response and exhibit control over interfering stimuli, emotions, and motor movement; (b) Working Memory, or the ability to hold and manipulate information for a short period of time; and (c) Shifting, or one's ability to switch between mental states, processes, or tasks, sometimes referred to as task-switching.

The effects of executive functioning deficits in school-age students have been widely studied. According to Nigg et al. (1999), problems or malfunctions with executive functioning have been associated with various developmental psychopathologies such as Attention Deficit Hyperactivity Disorder (ADHD), conduct disorder, learning disabilities, and autism. Im-Bolter, Johnson, and Pascual-Leone (2006) found a connection between the executive functioning area of working memory and language impairment. Executive functioning skills have also been found to impact the level of math and literacy functioning in elementary-age children (Roebbers, Cimeli, R othlisberger, & Neuenschwander, 2012). Findings from several studies suggest that deficits in working memory, inhibition, and task shifting impact math achievement for students from Kindergarten through middle school age (Blair & Razza, 2007; Bull & Scerif, 2001; Bull, Johnston, & Roy, 1999; & St. Clair-Thompson & Gathercole, 2006). Other studies have demonstrated that executive functioning deficits in the areas of inhibition and shifting are associated with reading and writing difficulties (Hooper, Swartz, Wakely, de Kruif, & Montgomery, 2002; Protopapas, Archonti, & Skaloumbakas, 2006).

School psychologists regularly identify and evaluate students who may qualify for specially designed instruction based on the educational impact of one or more of the above conditions or academic performance deficits. Thus, the topic of executive functioning and its potential impact on students is vital in the delivery of school psychological services. Although the connection between executive functioning, psychopathology, and school problems has been extensively studied, a more current perspective suggests the need for a deeper investigation of the specific interactions and processes involved in the shared relationship between them in order to design and implement more beneficial interventions (Snyder, Miyake, & Hankin, 2015).

Connection between Self-regulation and Executive Functioning

Executive functioning and self-regulation have been investigated in a variety of studies to attempt to determine the overlap and correlation between the two. One such study found a significant correlation between children's executive functioning skills in first grade and their metacognitive control in second grade (Roebbers et al., 2012). That is, second graders' executive functioning skills in first grade were found to be significant predictors of their ability to control their own learning in second grade. However, these findings did not allow for a precise explanation of the exact way in which executive functioning skills and metacognitive control interact. The researchers were unable to determine whether or not one occurs before the other or if the two simply have a reciprocal relationship. Overall, their results suggested a link between executive functioning and self-regulatory functions (e.g., metacognitive control) and therefore provide helpful information for creating and implementing interventions for executive functioning and/or self-regulatory skill deficits.

Lynn et al. (2011) suggested that behaviors such as paying attention, following directions, and focusing on important information (i.e., behaviors that are driven by executive functioning) can be improved by the successful development of behavioral and emotional regulation. These are behaviors that have particular importance in a classroom or other educational environment. Thus, the improvement of self-regulation ability should ideally lead to improvements in classroom behaviors such as attentiveness, focus, and following instructions.

Exactly how do executive functioning and self-regulation interact? One author (Nigg, 2017) reviewed the literature on the relationship between executive functioning and self-regulation and found a general consensus: executive functioning and self-regulation are not the same, but the executive skills people use each day to direct themselves toward their goals also allow them to manage and monitor the thoughts and emotions that are necessary to successfully achieve their goals. Essentially, a person's executive skills facilitate and permit the process of self-regulation of his or her own behavior (Snyder et al., 2015). As a result, self-regulation almost always incorporates the use of executive functions, but executive functions are not always used for the sole purpose of self-regulation and can occur separately from self-regulation in other contexts. A common example of this can be seen when a person calculates the tip on their bill at a restaurant; this process may involve executive functioning elements such as organization and working memory, but does not necessarily occur strictly for the purpose of self-regulation. According to Martin and McLellan (2007), self-regulation in the context of learning involves such activities as goal setting, self-monitoring, and the use of executive skills such as concentrating, remembering information, and organizing ideas and

materials to support a productive work environment. This is another example of executive functions permitting the process of self-regulation.

Self-regulation, Executive Functioning, and Information Processing

Self-regulation may improve information processing due to its ability to improve one's attention to task through self-regulatory techniques such as self-monitoring and self-management (Blood et al., 2011; Otero & Haut, 2016; Rafferty, 2012). Attention is vital for moving through daily life, especially in school or work environments. The modal model of memory suggests that attention impacts information processing by occurring just after sensory stimuli or input are received, but just before the information reaches short term working memory (Bruning, Schraw, & Norby, 2011). If one does not ever attend to stimuli or sensory input, then that information will not reach one's short term memory, thus nullifying any additional steps of the information processing system. Therefore, improved attention to task is highly beneficial to the effective encoding of new information, such as the new information continually presented in a school classroom.

Working memory is an executive function supported by the pre-frontal cortex of the brain (Snyder et al., 2015). Working memory is where information is given further analysis to determine its meaning, and expert consensus indicates that continued improvements in the regulation of working memory skills over time can develop one's working memory (Bruning et al., 2011). Within the modal model of memory discussed above, working memory is a crucial step in the successful processing and encoding of information into long term memory. Students must utilize their working memory every day in the classroom as they learn new concepts, review previously learned concepts, and connect old to new information. Cognitive load theory suggests that in addition to the

educational environment in general and the level of difficulty of the information being taught, a student's working memory capacity is one of the largest possible limitations on the efficiency of his or her learning (Bruning et al., 2011). That is, when a student is unable to selectively attend to the most important information while ignoring unimportant information (i.e., an executive skill), this places excessive strain, or load, on the student's working memory. If a student's working memory becomes overloaded, cognition and learning become much more effortful and time-consuming.

Because of the limitations of cognitive resources, students must become self-regulated learners. At the center of self-regulated learning is the development of the ability to utilize one's limited cognitive resources in a strategic way (Bruning et al., 2011). Thus, there are clear indications in the literature regarding the benefits of utilizing interventions which might have the potential to enhance both a student's self-regulation and executive functioning skills. Additionally, regardless of the specific nature of their interaction, existing research indicates the high level of importance of both self-regulation and executive functioning skills in the attainment of positive outcomes in educational environments. It is logical, then, that when investigating the impact of an intervention involving a higher order cognitive process such as self-management and self-monitoring (i.e., tasks situated within the realm of self-regulation), it would also be beneficial to measure the impact of that intervention on an individual's executive functioning skills. The present study sought to do just that.

Measurement of Executive Functioning Skills

Measurement of executive functioning skills in school settings has several barriers. One such barrier is that many traditional methods of executive functioning

measurement have more of a neuropsychological basis and involve the use of instruments such as the Stroop task, the Wisconsin Card Sorting Task, or the Tower of Hanoi, but these measures may not always be readily accessible or permitted for use by school-based practitioners. Another barrier is that the results obtained from research studies which have measured children's executive functioning skills using the aforementioned clinical instruments have an insufficient level of generalizability to non-clinical or classroom settings (Miyake & Friedman, 2012). As such, the results from the formal clinical measures do not always provide information that can be effectively applied to inform classroom interventions or instructional practices. In response to the difficulty of utilizing traditional clinical methods of executive functioning measurement, broad- and narrow-band behavior rating scales were developed to assess a child's executive functioning deficits. Broad-band measures assess many different behaviors and skills on one rating scale, while narrow-band measures collect information about one specific area or type of behavior or skill.

School psychologists routinely utilize behavior rating scales to assess the behaviors and skills of students who are referred to them for an evaluation of eligibility for special education services (Whitcomb, 2018). Due to its “easy administration and scoring,...thorough standardization sample,...high reliability and construct validity” and its ability to provide a “quick and efficient measure of executive dysfunction” (Fitzpatrick, n.d.), the *Behavior Rating Inventory of Executive Functions, Second Edition* (BRIEF-2) is a measure well-suited for use in school settings. The BRIEF-2 is a narrow-band rating scale with both parent and teacher forms created to be used specifically in the assessment of the executive functioning behaviors and skills of school-aged children in

home and school settings (Gioia, Isquith, Guy, & Kenworthy, 2015). The BRIEF-2 is intended to be used with children ages five to 18 years, including those with learning disabilities, attentional disorders, traumatic brain injuries, developmental disorders, depression, and other conditions.

The BRIEF-2 manual provides the following technical information: (a) it has improved internal structure and its scales are supported by factor analysis; (b) it is an evidence-based assessment based on clinical data; (c) its use of reliable change statistics allow for easier measurement of the significance of score changes over time; and (d) the standardization sample for the Teacher Form consisted of 1,400 subjects matched by age, gender, ethnicity, and parent education level to U.S. Census statistics (Gioia et al., 2015). The manual also states that through its norming process, the BRIEF-2 has achieved internal consistency and test-retest reliabilities at similar levels across age ranges on the Teacher Form, which was the only form used in the present study. Across scale, index, and composites on the Teacher Form, internal consistency reliability ranged from .89 to .97 and test-retest reliability ranged from .76 to .90 for the standardization sample.

The composites of the BRIEF-2 are considered to be more reliable than the individual scales, but all composites and scales—with the exception of the Initiate and Shift scales—have strong enough reliability to be used in making decisions (Gioia et al., 2015). The scales of the BRIEF-2 Teacher Form that was utilized in this study include the following: Inhibit, Self-Monitor, Shift, Emotional Control, Initiate, Working Memory, Plan/Organize, Task Monitor, and Organization of Materials. These are explained in detail in Table 1.

Table 1

BRIEF-2 Scales and Associated Definitions

Index	Definition
Inhibit	Control impulses; appropriately stop own behavior at the proper time.
Self-Monitor	Keep track of the effect of own behavior on others.
Shift	Move freely from one situation, activity, or aspect of a problem to another as the situation demands; transition; solve problems flexibly.
Emotional Control	Modulate emotional responses appropriately.
Initiate	Begin a task or activity; independently generate ideas.
Working Memory	Hold information in mind for the purpose of completing a task; stay with, or stick to, an activity.
Plan/Organize	Anticipate future events; set goals; develop appropriate steps ahead of time to carry out an associated task or action; carry out tasks in a systematic manner; understand and communicate main ideas or key concepts.
Task Monitor	Check work; assess performance during or after finishing a task to ensure attainment of goal.
Organization of Materials	Keep work space, play areas, and materials in an orderly manner.

Note. Adapted from: Gioia, G. A., Isquith, P. K., Guy, S. C., & Kenworthy, L. (2015). *BRIEF®2: Behavior Rating Inventory of Executive Function® Professional Manual & Fast Guide* (2nd ed.). Lutz, FL: Psychological Assessment Resources, Inc.

Purpose

Self-monitoring and self-management were investigated in the present study to determine their impact on the classroom preparation behaviors and executive functioning skills of a middle school student, as measured by teacher ratings. Self-monitoring was an embedded component of an overall self-management intervention package designed to improve the student’s classroom preparation and organizational skills. For the purpose of the present study, self-monitoring was defined as it has been in the existing literature: observing and recording one’s own behavior. Specifically, the student participant utilized a checklist which required him to observe, record, and reflect on his own behavior. Self-

management was defined as it has been in the existing literature: the self-assessment and self-recording of one's own behavior combined with an evaluation of the accuracy of one's self-assessments compared to the ratings of an external observer. In this case, the external observer was the student's classroom teacher.

Previous studies on the impact of self-monitoring and self-management interventions on student outcomes have been conducted with a variety of participants, including those from public schools, private schools, hospital settings, general education settings, and special education settings; students with disabilities such as emotional behavioral disorders, learning disabilities, Attention Deficit-Hyperactivity Disorder (ADHD), and speech language impairment; students without disabilities; students from grade levels ranging from elementary school to high school; and students from a variety of racial and ethnic backgrounds.

To expand upon the existing literature on the use of self-management interventions in school settings with middle school age students with disabilities, the current study limited participation selection to $n = 1$ male or female student in sixth through eighth grade who was receiving special education services in a co-teach and/or resource setting for an identified learning disability, with or without Attention Deficit-Hyperactivity Disorder. The participant selection process was also limited to a student who was exhibiting struggles with executive functioning skills such as organization and consistent classroom preparedness.

The following research questions were addressed:

1. Does participation in a self-management intervention change a student's classroom preparation behaviors, as measured by teacher responses on a checklist used for monitoring the student's behavior?
2. Is participation in a self-management intervention associated with improved teacher ratings of the participant's level of executive functioning as measured by the BRIEF-2?

Method

Participant

The participant in the present study was obtained from a convenience sample of students in a western Kentucky school district. For the 2017-2018 school year, there were approximately 7,500 students in this district being served in eight elementary schools with grades kindergarten through five, two middle schools with grades six through eight, one high school with grades nine through twelve, one preschool center, and one alternative learning center with students at various grade levels. According to the school district's website, total student population included approximately 82% Caucasian, 9% African American, 6% Two of More Races, and less than 1% Asian, Hispanic, Native Hawaiian, and American Indian. Approximately 14% of its students were receiving special education services and 59% of its students were on free or reduced lunch.

The participant selected was a male sixth grade special education student identified as having a Specific Learning Disability (SLD) in the area of reading comprehension as well as Attention Deficit-Hyperactivity Disorder which was not being managed with any medications at any time during this study. Additionally, the participant was a student whose teachers indicated was struggling with exhibiting appropriate levels of attention, classroom preparation, and work completion behaviors. The student attended one of the middle schools in the district previously described. Specific details of the participant selection process are provided in the Procedures section.

Design

The current study was a multiple baseline across behavioral skill sets design, which was utilized to evaluate whether a self-management intervention enhanced the

classroom preparation behaviors and/or executive functioning skills of the aforementioned middle school student. This study was only conducted with a single participant. Single case designs are commonly used in educational and psychological research to investigate whether an intervention (i.e., independent variable) produces change in an outcome (i.e., dependent variable) by working directly with one student or a small group of students (Kratochwill et al., 2010). Targeted behaviors were those listed on a Self-Monitoring Checklist (Appendix B) adapted from Gureasko-Moore et al. (2006) and included the following areas of classroom preparedness: being seated and making eye contact with the teacher at the start of instruction, stopping other activities during instruction, having necessary supplies and materials out and ready (i.e., pen/pencil, notebook/paper, and Chromebook), answering each item on homework assignments, and turning in homework as requested by the teacher.

The specific classroom preparation behaviors used by Gureasko-Moore et al. (2006) were modified to be more suitable for the classroom set-up, school procedures, materials, and supplies that were used at the school of the participant in the current study. For example, the items “Did I get out my Chromebook only when my teacher told me to do so?” and “Did I have my binder on my desk at the beginning of class?” were added to the list of targeted classroom preparation behaviors due to the participant’s school being one that provided Chromebooks and binders for all student and expected students to bring both of those items to all of their classes each day. Additionally, the wording of the items “Did I respond to each item in my homework assignment?” and “Did I turn in my homework as requested by my teacher?” from Gureasko-Moore et al. (2006) were changed to “Did I complete all items on my classwork?” and “Did I turn in my classwork

as requested by my teacher?”, respectively, to accommodate the fact homework was not assigned every day in the targeted classroom of the participant from the current study.

Materials

The following materials from Gureasko-Moore et al. (2006) were utilized for various purposes described in further detail in the Procedures section: (a) the Self-Monitoring Checklist (Appendix B); (b) the Operational Definitions and Explicit Instructions for Using Checklist handout (Appendix C); (c) the Procedural Integrity Checklist for Training (Appendix D); (d) an adapted version of the Intervention Rating Profile (IRP; Appendix E) originally developed by Witt and Martens (1983); and (e) an adapted version of the Children’s Intervention Rating Profile (CIRP; Appendix F). The IRP was adapted to be presented to the teacher on a scale ranging from one, indicating strong disagreement, to five, indicating strong agreement. The CIRP, which was developed by Witt and Elliott (1985), was modified to include fewer questions and only those which would be relevant to the current study. Teacher Forms of the *Behavior Rating Inventory of Executive Function – Second Edition* (BRIEF-2) rating scale were also utilized as a pre- and post-intervention measure of the participant’s executive functioning skills.

Procedure

The following procedure was adapted from Gureasko-Moore et al. (2006): First, an email was sent out to teachers at the participating middle school with a brief explanation of the study and a request for a list of students—male or female—whom each teacher would describe as being chronically poorly prepared for class based on the following criteria: (a) struggles with being on-task, (b) frequently does not arrive with

necessary materials, (c) does not consistently complete assigned tasks, and (d) does not consistently hand in completed work. Once the teachers provided lists of prospective students, those students' names were pooled and one student (hereafter referred to as the participant) was drawn at random. The Superintendent of the participating school district had previously signed a letter of agreement providing consent for the present study to be conducted at the participating middle school. Approval from the Institutional Review Board (IRB) of Western Kentucky University was also obtained (Appendix A).

Next, the participant's parent/guardian was contacted via phone. The parent provided verbal consent and a meeting was scheduled, at which written informed consent was obtained. Because the participant was a minor, his verbal assent was obtained and he signed a written assent prior to starting the first training session. Next, the referring classroom teacher was notified that her student was selected for participation in the intervention and she signed the teacher version of the written informed consent document. The investigator discussed the general intervention procedures and the necessity of maintaining confidentiality of the participant's information with the participating teacher and shared the intervention packet with her.

The intervention packet contained the following items: (a) a copy of the Self-Monitoring Checklist (Appendix B) that both the participant and teacher used to monitor the participant's behaviors in his targeted classroom (i.e., the classroom of the referring teacher) each day; (b) the Operational Definitions and Explicit Instructions for Using Checklist handout (Appendix C), which included a list of operational definitions for the classroom preparation behaviors being targeted on the Self-Monitoring Checklist (hereafter referred to as 'Checklist') along with instructions on how to use the Checklist

to record observations of the participant's behaviors in the targeted class each day; and (c) the Teacher Form of the *BRIEF-2* rating scale, which was used as a pre- and post-intervention measure of the participant's executive functioning skills. The investigator thoroughly explained each element of the intervention package to the teacher and reviewed the instructions printed on the *BRIEF-2* Teacher Form to ensure the teacher's understanding of the procedure and to obtain her agreement with all of the intervention activities. In addition to serving as the primary data source, the teacher's daily recordings of the participant's behavior was also intended to fulfill the self-management and interobserver agreement portions of the procedure. Table 2 provides a summary of each aspect of the procedure: the materials used; the criterion for moving to the next intervention phase (i.e., the next training session for the next Skill Set of behaviors); the tasks involved for the examiner, teacher, and participant in each phase; and the assessments that were completed during specific phases.

Table 2

Procedural Summary for Each Phase

Phase	Baseline	Training of Skill Set 1	Training of Skill Set 2	Training of Skill Set 3
Materials used	Self-Monitoring Checklist (SMC)-all areas	Teacher SMC, SMC-Set 1, Procedural Integrity Checklist (PIC)	SMC-Set 2 and PIC	SMC-Set 3 and PIC
Criterion for moving to next phase	3 consecutive stable data points or 5 variable data points	Ideal: 5 consecutive days at 100% (no more than 2 weeks)	Ideal: 5 consecutive days at 100% (no more than 2 weeks)	Ideal: 5 consecutive days at 100% (no more than 2 weeks)
Task for Teacher	Use SMC to monitor participant; Complete BRIEF-2	Use Teacher SMC to monitor participant	Use Teacher SMC to monitor participant	Use Teacher SMC to monitor participant; Complete BRIEF-2 (1 week later)
Task for Participant	None	Set goals for SMC-Set 1; Use it to self-monitor; Evaluate satisfaction w/ goal attainment	Set goals for SMC-Set 2; Use it to self-monitor; Evaluate satisfaction w/ goal attainment	Set goals for SMC-Set 3; Use it to self-monitor; Evaluate satisfaction w/ goal attainment daily
Task for Experimenter	Collect teacher's SMCs	Collect teacher's & participant's SMCs; Conduct Training session; Meet with Participant 1x for feedback; Follow PIC	Collect teacher's & participant's SMCs; Conduct Training session; Meet with Participant 1x for feedback; Follow PIC	Collect teacher's & participant's SMCs; Conduct Training session; Meet with Participant 1x for feedback; Follow PIC

Baseline. Prior to beginning the study, it was determined that during the baseline phase, stable responding (i.e., three consecutive data points in which the participant exhibited consistent behaviors of the Skill Set) and/or variable responding (i.e., five consecutive data points in which the participant exhibited varied response percentages of the behaviors of the Skill Set), would be obtained before implementing the first training session. Data were obtained from the teacher's recorded observations of the participant's behaviors on the teacher version of the Checklist in the targeted class. After the criterion for responding was achieved, the first of three training phases of the intervention began.

Training. During each phase of the intervention, self-management training sessions as described by Gureasko-Moore et al. (2006) were held during the participant's Study Skills/RTI period in the investigator's private office within the school building. Training sessions were approximately 20 minutes long and the participant worked directly with the investigator during each one. The first half of each session consisted of a general discussion which included: (a) a description of self-management; (b) a rationale for the importance of taking responsibility for one's own behavior; and (c) the advantages of using self-management strategies in school and life. The second half of the sessions included: (a) introduction to each Skill Set of behaviors (i.e., the three student versions of the Checklist); (b) an explanation of the participant's current level of classroom functioning based on his teacher's recordings of his behavior; (c) a review of the behavioral expectations he must successfully exhibit and maintain to be considered prepared for class (i.e., the behaviors from each Skill Set on the student version of the Checklist); and (d) guided instruction and practice on how to exhibit each individual behavior from the Skill Set. At the end of each session, the participant was also taught

how to set goals and document them on his own Checklist. In this way, self-management education sessions were tailored specifically to the participant to help him learn about his areas of struggle and learn how to monitor his own behavior in his targeted classroom. A Procedural Integrity Checklist was utilized for each Training session and was self-completed by the investigator (Appendix D). Fidelity for all training sessions was 100%. A detailed explanation of the behaviors that comprised each Skill Set is provided in the following paragraphs.

During training session one, the participant was introduced to two behaviors from Skill Set 1 of the student version of the Checklist. These behaviors were “Was I in my seat when the bell rang?” and “Did I have eye contact with my teacher and stop my other activities when the teacher began class instruction?” Skill Set 1 was intended to allow the participant to monitor both his readiness for instruction and his attention to his instructor.

During training session two, the participant was introduced to four new behaviors on Skill Set 2 of the student version of the Checklist. These behaviors were: “Did I have my pen/pencil on my desk at the beginning of class?” “Did I have my notebook or paper on my desk at the beginning of class?” “Did I have my binder on my desk at the beginning of class?” and “Did I get out my Chromebook only when my teacher told me to do so?” Skill Set 2 was intended to allow the participant to monitor his behaviors in the area of classroom materials preparedness.

During training session three, the participant was introduced to two new behaviors on Skill Set 3 of the student version of the Checklist. These behaviors were: “Did I complete all items on my classwork?” and “Did I turn in my classwork as requested by

my teacher?” Skill Set 3 was intended to allow the participant to monitor his work completion behaviors.

In all three training sessions, the participant was given an opportunity to explain and demonstrate his understanding of what each new behavior would look like and was offered additional instruction if his explanations or demonstrations revealed any gaps in his understanding of how to correctly exhibit the behavior. After all three training sessions, the participant was provided with his own student version Checklist and instructed to do the following: set his goal for how many behaviors he would successfully exhibit that week, write his goal down on his Checklist, and use the Checklist in his targeted class. He was also told to be ready to show his completed Checklist to the investigator at a brief feedback meeting mid-way through data collection for that Skill Set. These brief feedback meetings consisted of the investigator checking the participant’s self-ratings against his teacher’s ratings, a discussion of discrepancies, a discussion of goals reached and/or how to achieve goals that were not reached, and instruction for the participant to write down how to achieve any unmet goals. The participant was also provided with his choice of bite size candy for each class period where his ratings were in full agreement with his teacher’s ratings.

It was determined that ideally, once the participant exhibited 100% of the classroom preparation behaviors from Skill Set 1 on the Checklist for four of five consecutive days in his targeted classroom(s), the next phase of training on Skill Set 2 would begin. This same process would be followed for choosing when to initiate the third phase of training on Skill Set 3. However, because the study was being conducted in the school setting at the end of a school year, it was also determined that if the data indicated

that the participant was not likely to meet the four out of five consecutive days criterion during the current phase, the next phase would be initiated anyway after two weeks (i.e., ten school days). Due to time constraints and scheduling changes which were outside of the investigator's control and imposed by school administration to accommodate district and state testing preparation, this criterion was changed. The final criterion used was as follows: if, after six consecutive school days, the participant's responding remained variable, the intervention would proceed to the next phase/Skill Set of behaviors regardless.

Measures and Recording Procedures

The primary dependent variables used in this study were the percentage of classroom preparation behaviors exhibited by the participant as measured by responses from his teacher on the Checklist (Appendix B) as well as pre- and post-intervention ratings from his teacher on the Teacher Form of the *BRIEF-2*. The participant also filled out the checklist in order to self-record his observations of his own behaviors, and he had been notified during training sessions that his teacher would be filling out the very same checklist. The teacher filled out the checklist each day during the targeted class period. The percentage of classroom preparation skills for each Skill Set were calculated using the following formula: (number of observed behaviors from the Skill Set/number of total required behaviors on the Skill Set) times 100.

Interobserver Agreement and Social Validity

Interobserver agreement (IOA) was determined by comparing the teacher's data with the participant's data on seven randomly selected days during the intervention. Thus, IOA was measured in the participant's targeted class for approximately 33% of the total

intervention days. At the conclusion of the study, teacher satisfaction information was collected via the adapted Intervention Rating Profile (IRP, Appendix E) developed by Witt and Martens (1983). Participant satisfaction information was also collected via an adapted version of the Children's Intervention Rating Profile (CIRP, Appendix F) developed by Witt and Elliott (1985).

The IRP served to evaluate the teacher's opinions on matters such as the effectiveness of the intervention, her satisfaction with its implementation, and whether she would be willing to use it in the future. The teacher from the participant's targeted classroom also received a more detailed explanation of the purpose of the intervention, then was asked to fill out the IRP. Like the IRP, the CIRP served to evaluate the participant's opinions regarding the effectiveness and fairness of the intervention, his satisfaction with its implementation, and whether he would be willing to use it again.

Results

Classroom Preparation Behaviors

The percentages of classroom preparation behaviors exhibited across each Skill Set for the participant are displayed in Figure 1. The percentage of classroom preparation behaviors he exhibited during baseline was highly variable for each of the three Skill Sets, ranging from 0% to 100% for all three (Set 1, $M = 40\%$, $SD = 41.8$; Set 2, $M = 65\%$, $SD = 18.4$; Set 3, $M = 64\%$, $SD = 42.4$).

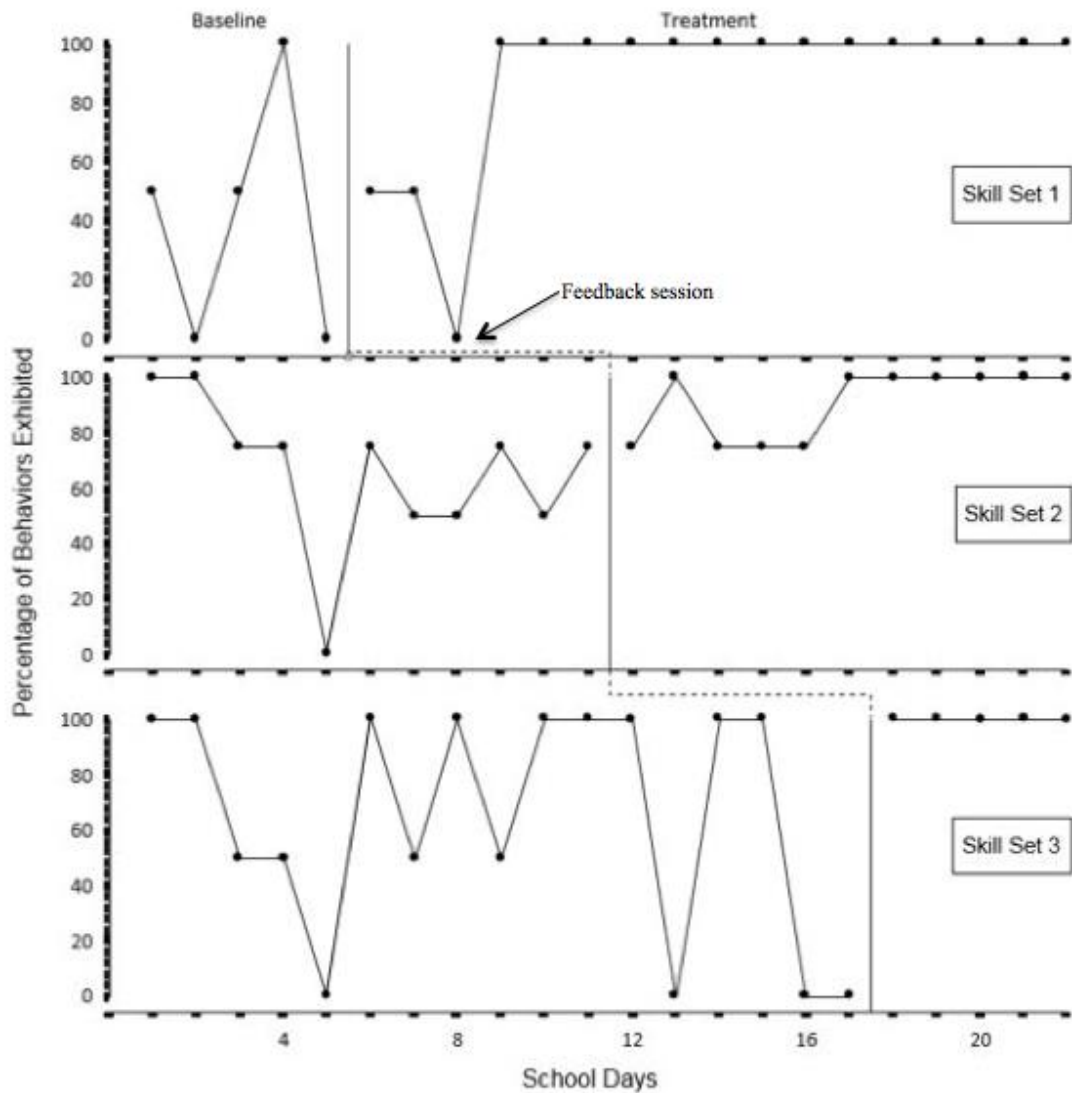


Figure 1. Multiple baseline across classroom preparation behaviors of a middle school male student.

Interpretation of these results using visual analysis indicates that the participant's performance on Skill Set 1 increased from 0% on the last day of baseline to 50% performance on the first two days of the intervention phase and then down to 0%. After that session, a feedback session to the student was provided. After that, the participant's performance went up to 100%, where it remained for the rest of the intervention sessions. The mean percentage of classroom preparation behaviors he exhibited for Skill Set 1 increased from 40% in baseline to 88% ($SD = 28.1$) during the intervention. The participant's performance on Skill Set 2 was relatively high during the baseline phase. However, the mean percentage of classroom preparation behaviors he exhibited for Skill Set 2 increased from 65% in baseline to 90% ($SD = 12.6$) during the intervention. The participant's performance on Skill Set 3 was variable (i.e., 0% to 100%) and relatively high during the baseline phase. Even so, the mean percentage of classroom preparation behaviors he exhibited for Skill Set 3 increased from 64% in baseline to a stable 100% during the intervention. For all skill sets, the last five observations were at 100% ($SD = 0$). Additional methods of interpreting these data, such as effect size calculations, were not utilized due to the high variability in the participant's baseline responding and the restricted range of response percentages that were possible within each Skill Set.

BRIEF-2

According to Gioia et al. (2015), the BRIEF-2 uses "T" scores to compare a student's scores to those of the individuals in the standardization sample. T scores ranging from 60 to 64 reflect mildly elevated ratings, scores ranging from 65 to 69 reflect potentially clinically elevated ratings, and scores at or above 70 indicate clinically elevated ratings. Gioia et al. (2015) also states that validity scales on the BRIEF-2 serve

to investigate the legitimacy of the rater's response patterns. There are three validity scales: Negativity, Inconsistency, and Infrequency. All three validity scales were found to be within the acceptable range on both the pre- and post-intervention teacher rating forms. The participant's pre- and post-intervention BRIEF-2 Global Executive Composite score, index scores, and individual scale scores were measured by ratings on the Teacher Form. Some differences between the participant's pre- and post-intervention scores were found. Reliable change statistics were utilized to assess the significance of any potential change in the participant's scores over time. According to Gioia et al. (2015), reliable change is the amount of change between an individual's scores which "falls beyond the range that could be attributed to the measurement variability of the instrument or the effects of practice" (p. 70). In the present study, significant change was found between the participant's scores on the Inhibit and Emotional Control scales and the composite areas of the Behavior Regulation Index and the Global Executive Composite. All T scores and the significance level of the changes are presented in Table 3.

Interobserver Agreement and Social Validity

Interobserver agreement (IOA) was found to be 73%, indicating only a moderate level of agreement between the teacher's ratings of the participant and the participant's self-ratings. Social validity ratings were captured via participant and teacher responses on the Intervention Rating Profile (IRP) and Children's Intervention Rating Profile (CIRP). The teacher selected Agree on all items of the IRP. The participant selected Strongly Disagree for the following CIRP items: my teacher was too harsh on me; the method used to deal with my behavior may cause problems with my friends; and there are better ways to handle my problem than the intervention we used. The participant selected Strongly

Table 3

Significance of Change in Participant's Pre- and Post-Intervention BRIEF-2 Scores

Index/Scale	Pre-intervention T score	Post-intervention T score	Amount of change	Significance level
Inhibit	67	54	-13	.01
Self-Monitor	59	56	-3	<i>ns</i>
Behavior Regulation Index	65	55	-10	.05
Shift	58	55	-3	<i>ns</i>
Emotional Control	55	45	-10	.05
Emotion Regulation Index	57	50	-7	.10
Initiate	56	56	0	<i>ns</i>
Working Memory	70	62	-8	.10
Plan/Organize	62	54	-8	.20
Task-Monitor	71	64	-7	.20
Organization of Materials	62	54	-8	.10
Cognitive Regulation Index	67	60	-7	.10
Global Executive Composite	65	57	-8	.05

Note. Significance level values were obtained from Gioia et al. (2015).

Agree for the following items on the CIRP: the method used to help me with my behavior was fair; the method used by my teachers would be a good one to use with other students; I liked this intervention; and I would be willing to use this intervention package in the classroom setting in the future.

Discussion

In a variety of educational settings, school psychologists must investigate and evaluate the effectiveness and appropriateness of research-based academic and behavioral interventions to support the individual needs of the students they serve. When evaluating which option is best for a student in the top tier of a response to intervention program, the intervention must be highly individualized to the student. However, some practitioners struggle with minimal access to resources, personnel shortages, and other factors which inhibit the amount of time one is able to devote to selecting and implementing these evidence-based interventions. It is beneficial, therefore, to understand the impact certain interventions have previously had on specific populations of students. This helps reduce time investment, streamline the intervention selection process by providing a starting point for practitioners, and decrease the latency between the presentation of a concern and the implementation of targeted supports.

The current study's results indicate that the self-management intervention utilized here may be successful in enhancing the classroom preparation behaviors and executive functioning skills of middle school male students with specific learning disabilities and ADHD. Despite the variability in the baseline data, the participant in the current study exhibited increases that remained consistently stable in classroom preparation behaviors in the areas of attention, materials preparation, and work completion during his participation in a targeted self-management intervention. Analysis of change statistics of the participant's pre- and post-intervention executive functioning skills indicated improvements at a .05 significance level in his functioning in the in the areas of inhibition (i.e., impulse control) and the appropriate modulation of emotional responses, as well as

the composite areas of Behavior Regulation Index and Global Executive Composite. However, change scores are not highly reliable measures of progress and should be interpreted with caution.

Strengths and Limitations

One strength of the current study was its ability to obtain detailed information about the impact of participation in an intervention on the behaviors of a specific student who was in need of targeted behavioral supports in the classroom. The present study was better able to determine whether the specific intervention technique enhanced or improved the behaviors and skills of this particular student, and it did not require a highly controlled clinical environment that would be minimally comparable to a real world classroom. Thus, the setting of the current study also served as a strength in that it allowed the researcher to gather information regarding the use and acceptability of this intervention in a real middle school classroom. Traditional research studies with larger samples of students and control groups often implement interventions in highly controlled clinical or simulated classroom environments and may therefore lack the ability to provide important information on the practicality of an intervention in an actual classroom setting.

One potential limitation of the present study is its use of convenience sampling and implementation with a single student. Results from studies using convenience sampling and small sample sizes are neither representative of, nor generalizable to, a wider population of students. Another possible limitation of this study is its reliance on observational data from a source other than the principal investigator; in this case, the participant's classroom teacher. While observational data is advantageous in that it allows

the study of actual behavior rather than self-reported behavior, it is vulnerable to bias as it depends on the perception of a single person. Personal biases, subjectivity, and differences in perception can lead to faulty observations. Implementation integrity could also be a weakness of the current study. The researcher was not present during all of the teacher's daily observations of the participant in her classroom and therefore was unable to definitively conclude that the teacher's observational data was collected with a high degree of integrity.

Future Research

Due to the single subject design of this study, further information is needed to determine the ability of this particular self-management intervention to be generalized to other subjects and school settings. While single case studies such as this one can provide helpful qualitative information regarding intervention outcomes for a specific individual, they do not provide the type of evidence needed to determine if an intervention can be successfully implemented with other populations or in other environments outside of the conditions of the study. Future researchers should aim to use the intervention with a variety of students or in other settings (e.g., a special education classroom). Similarly, the only subject involved in this study was a male middle school-age student with Attention Deficit-Hyperactivity Disorder and an identified specific learning disability in the area of reading comprehension. Therefore, it is important for future researchers to investigate this intervention's usefulness with other populations with regard to gender, grade level, disability status, and disability type.

Future researchers may also find it beneficial to modify the procedural steps of the current study to allow for a simulated return to baseline condition. This could be

attempted by removing the previous Skill Set behaviors from the participant's Checklist once each new Skill Set is introduced. That is, once the participant displays stable responding levels with Skill Set 1, remove Skill Set 1 behaviors from the checklist prior to the initiation of the training of Skill Set 2 behaviors, and so forth. This may allow for further inquiry into whether or not a drop to pre-intervention levels of responding would be seen with the removal of the previous Skill Set behaviors from the student's Checklist.

Alternatively, the teacher could be asked to continue monitoring the student for several days upon the conclusion of the intervention and the removal of the student's Checklist. Due to time constraints imposed by the school in which the current study was conducted, this additional component was not attempted in the present study. Lastly, although the investigator in the current study conducted implementation integrity checks for the training sessions, similar checks of the teacher's participation in the study would be beneficial to ensure the fidelity of the observational data being collected.

Summary

This study has important implications for school psychologists or other school personnel (e.g., guidance counselors, behavioral specialists) regarding the selection and implementation of behavioral interventions to support students with self-management and/or executive functioning deficits. This study demonstrated that the self-management intervention used was associated with improvements in the classroom preparation behaviors of an adolescent male with both ADHD and an identified specific learning disability in reading comprehension. Additional data is needed to extend results of this study to a broader population of students. However, practitioners or school personnel may want to consider selecting the self-management intervention applied in this study as

a means of support for students with ADHD and/or learning disabilities who are exhibiting specific behavioral deficits in the areas of attention, classroom preparation, and work completion.

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Appendix A: Institutional Review Board Approval Letter



*INSTITUTIONAL REVIEW BOARD
OFFICE OF RESEARCH INTEGRITY*

DATE: February 23, 2018
TO: Lanie Rudisill
FROM: Western Kentucky University (WKU) IRB

PROJECT TITLE: [1191842-2] Enhancing a Student's Self-Management Skills in School
REFERENCE #: IRB 18-257
SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED
APPROVAL DATE: February 23, 2018
EXPIRATION DATE: August 28, 2018
REVIEW TYPE: Full Committee Review

Thank you for your submission of Amendment/Modification materials for this project. The Western Kentucky University (WKU) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Full Committee Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a *signed* consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of August 28, 2018.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact Paul Mooney at (270) 745-2129 or irb@wku.edu. Please include your project title and reference number in all correspondence with this committee.

Appendix B: Self-Monitoring Checklists

Student Version after Training of Skill Set 1

Classroom Preparation Behaviors	Yes	No
Was I in my seat when the bell rang?		
Did I have eye contact with my teacher and stop my other activities when the teacher began class instruction?		
Date: _____ Time: _____		

Adapted from Gureasko-Moore, DuPaul, & White (2006).

Student Version after Training of Skill Set 2

Classroom Preparation Behaviors	Yes	No
Was I in my seat when the bell rang?		
Did I have eye contact with my teacher and stop my other activities when the teacher began class instruction?		
Did I have my pen/pencil on my desk?		
Did I have my notebook or paper on my desk at the beginning of class?		
Did I have my textbook on my desk at the beginning of class?		
Did I get my Chromebook out <u>only</u> when my teacher told me to do so?		
Date: _____ Time: _____		

Adapted from Gureasko-Moore, DuPaul, & White (2006).

Teacher Version and Student Version after Training of Skill Set 3

Classroom Preparation Behaviors	Yes	No
Was I in my seat when the bell rang?		
Did I have eye contact with my teacher and stop my other activities when the teacher began class instruction?		
Did I have my pen/pencil on my desk?		
Did I have my notebook or paper on my desk at the beginning of class?		
Did I have my textbook on my desk at the beginning of class?		
Did I get my Chromebook out <u>only</u> when my teacher told me to do so?		
Did I turn in my classwork/assignment as requested by my teacher?		
Did I respond to every item on my classwork/assignment?		
Date: _____ Time: _____		

Adapted from Gureasko-Moore, DuPaul, & White (2006).

Appendix C: Operational Definitions and Explicit Instructions for Using Checklist

Behavior: *Was I in my seat when the bell rang?*

Definition: Student is in his seat in the classroom when the bell rings.

Behavior: *Did I have eye contact with my teacher and stop my other activities when the teacher began class instruction?*

Definition: The student has eye contact with the teacher and terminates other activities such as talking when the teacher initiates class instruction.

Behavior: *Did I have my pen/pencil on my desk at the beginning of class?*

Definition: Student has the appropriate writing utensil out on his desk at the start of the class period.

Behavior: *Did I have my binder on my desk at the beginning of class?*

Definition: Student has his binder sitting out on his desk at the start of the class period.

Behavior: *Did I get out my Chromebook only when my teacher told me to do so?*

Definition: Student gets out Chromebook only as instructed by the teacher.

Behavior: *Did I complete all items on my classwork?*

Definition: Student responds (correctly or incorrectly) to each item on his classwork that he was instructed to complete.

Behavior: *Did I turn in my classwork/assignment as requested by my teacher?*

Definition: Student turned his classwork and/or assignment in directly to the teacher *or* at a predetermined location in the classroom (e.g., binder, tray) *or* on the Chromebook as instructed once it was finished.

Instructions for Using the Self-Monitoring Checklist:

1. Record the student's behaviors in his targeted class periods each day using the Self-Monitoring Checklist.
2. The checklist is written in 1st person for the student to use. You may change the wording to 3rd person in your mind to assist in recording his behaviors (e.g., from "Was I in my seat when the bell rang?" to "Was the student in his seat when the bell rang?")
3. Each behavior on the Self-Monitoring Checklist should be assigned a Yes or No.
4. If the student did not have an official assignment that day, his in-class work completion behaviors can be used for the last two items on the Self-Monitoring Checklist.
5. Once the Self-Monitoring Checklist is completed each day, it must be placed inside the privacy envelope provided for you and returned to the School Psychologist directly.
6. If you have questions regarding filling out the Checklist, please seek assistance from the School Psychologist immediately at Extension 27254.

Appendix D: Procedural Integrity Checklist for Trainings

Procedural Integrity Checklist for the Training Phase

- ___ 1. Gave the student an explanation and rationale for self-management.
 - ___ 2. Told student their current classroom functioning and the results of their functioning.
 - ___ 3. Told student salience of self-responsibility of action.
 - ___ 4. Informed students of their specific responsibilities that they must maintain for class preparation.
 - ___ 5. Taught students to use procedures in their targeted classroom.
 - ___ 6. Provided students with two forms of the self-management plan: (a) the student log and (b) the self-monitoring checklist (see Appendix A).
 - ___ 7. Had students identify their present problems with class preparation.
 - ___ 8. If necessary, aided students in identifying their current problems by discussing specific incidences of inappropriate behaviors.
 - ___ 9. Had students verbally asserting their goals regarding behaviors concerning classroom preparation.
 - ___ 10. Told students to write these goals down on their self-monitoring form.
 - ___ 11. Taught students to self-monitor their behavior by checking off the behaviors on the self-monitoring checklist.
 - ___ 12. Taught students to specify the times on the form that they self-monitored.
 - ___ 13. Told students to write down what goals they accomplished.
 - ___ 14. Told students to write down what they did that caused them not to achieve their goals.
 - ___ 15. Told students to write down ideas that would be effective in achieving their goals.
 - ___ 16. Taught students to evaluate the satisfaction they had with their effort to attain their goals in their log using a Likert-type scale (ranging from 0 = *no effort/total dissatisfaction* to 5 = *best effort/total satisfaction*).
-

Note: This checklist was developed by Gureasko-Moore, DuPaul, & White (2006).

Appendix E: Intervention Rating Profile

Intervention Rating Profile

Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
Self-management was an acceptable intervention for the student's problem					
Most teachers would find this intervention package appropriate for behavior problems					
This intervention package was effective in changing the student's problem behaviors.					
I would suggest the use of this intervention package to other teachers.					
The student's behavior problem is severe enough to warrant the use of this					
Most teachers would find this intervention package suitable for the behavior problems					
I would be willing to use this intervention package in the classroom setting.					
This intervention did not result in negative side effects for the student.					
This intervention package is appropriate for a variety of students.					
This intervention is consistent with those I have used in classroom settings.					
This intervention was a fair way to handle the student's problem behaviors.					
This intervention is reasonable for the problem behaviors described.					
I liked the procedures used in this intervention strategy.					
This intervention was a good way to handle this student's behavior.					
Overall, this intervention was beneficial for the student.					

Note: The IRP was developed by Witt and Martens (1983).

Appendix F: Children's Intervention Rating Profile

Children's Intervention Rating Profile

Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
The method used to help me with my behavior was fair.					
My teacher was too harsh on me.					
The method used to deal with my behavior may cause problems with my friends.					
There are better ways to handle my problem than the intervention we used.					
The method used by my teachers would be a good one to use with other students.					
I liked this intervention.					
I would be willing to use this intervention package in the classroom setting in the future.					
I think this intervention will help me do better in school.					

Note: The above is adapted from the CIRP, which was developed by Witt and Elliott (1985).