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Using Self-Monitoring and Positive Reinforcement Increase On-Task Behavior and
Independence

A thesis
presented to
the faculty of the Department of Educational Foundations and Special Education
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Master of Arts in Special Education

by
Jon Scott
May 2020

Dr. James Fox, Chair
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Key Words: Self-Monitoring, Positive Reinforcement, On-Task Behavior, Independence

ABSTRACT

Using Self-Monitoring and Positive Reinforcement to Increase On-Task Behavior and

Independence

by

Jon Scott

Off-task behavior is a major challenge. Various interventions have addressed this problem. Self-monitoring interventions are very effective, including the *MotivAider*, a self-timer that silently signals the student to observe his/her own Academic Engagement Time (AET). Studies of the *MotivAider* have reported increased AET., (Legge, DeBar, & Alber-Morgan, 2010; Morrison, McDougal, Black, & King-Sears, 2014) systematically faded the *MotivAider* to sustain increased AET. The present study replicated and extended this research using a response-dependent fading (Fox, Shores, Lindeman, & Strain, 1984) of the *MotivAider* to sustain the observe AET of a 6th grade student with Learning Disabilities. A single subject reversal design analyzed the effects of the *MotivAider* and fading. Compared to baseline, the *MotivAider* increased AET while its temporary removal resulted in decreased AET. The signal was gradually faded with maintained AET within intervention levels. Social validity data is also presented and implications for further research and educational practice discussed.

DEDICATION

I would like to dedicate this to my family. To my awesome wife and biggest supporter Shaunah Scott and my two beautiful boys Grayson and Jackson. I would also like to thank my awesome family: my parents David and Cindy Scott, brothers Nat and Samuel Scott and my two grandparents Keith and Vivian Lyle. Your all's love and support mean the world to me and I could not have done it without you. Love you all!

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CHAPTER 1

INTRODUCTION

Background

Special education is a very important field in our society. Working with students who have learning disabilities and helping them succeed in school is an honor like no other. However, Special Education teachers face numerous challenges at their jobs on a daily basis. The biggest is the ever-evolving changes that Special Education goes through. Special Education is always changing with new information and interventions that are research backed to improve the overall learning of students and multiple disabilities.

There are also constant changes to the way school systems operate special education services. The biggest push that has been going on for the past few years has been the concept of *Inclusion*. Inclusion is the process of making sure that students who have disabilities are still included with their non-disabled peers for as much of the school day as possible. This puts considerable pressure on Special Education teachers, not only to make sure students are being included, but making sure they can function well in the general education classroom.

The general education classroom is a setting that is not designated as a special education setting. It is where there are some students with disabilities, but it is mostly made up of students without disabilities. Students with disabilities in the general education setting still receive the necessary services such as accommodations and modifications to their Individual Education Plan (IEP). However, the students are adapted and fit into the class.

Having students with disabilities in the general education classroom can be a challenge for the general education teacher and the special education teacher. For the special education teacher it is a challenge to make sure that first, students with disabilities needs are met in the

general education classroom and also that the student has the support he needs to succeed in the general education classroom.

One of the biggest challenges to helping students with disabilities succeed in the general education classroom is keeping students on-task. Off-task behavior is a common theme that many special education teachers have to deal with. Off-task behavior may include not turning in work, not paying attention in class, interacting with peers during class time regarding task unrelated topics and activities such as purely social play or talk, daydreaming, etc. Regardless of what off-task behavior is being demonstrated, it can have a strong and unfortunate negative impact on a student's academic performance.

Behavior Issues in the Classroom

Teachers, both general and special education, are faced daily with a number of issues. These include planning and implementing instruction, assessing student progress, collaborating with other teachers and professionals. Special Education teachers especially, have a complex set of roles in which they typically engage. These include planning and implementing instruction, assessing student progress, collaborating with other teachers and professionals. Special Education teachers especially, have a complex set of roles in which they typically engage. For instance Martin, Deshler, and Lenz (2012) conducted intensive direct observations of 7 special education teachers for over 7000 minutes and were able to classify teacher activities into one of 4 broad categories: a) Manager that included doing paperwork, email student transport and various off-task non-job related activities; b) Diagnostician that involved explaining and discussing assessment results, identify proper accommodations/modifications, and implementing eligibility tests; c) Collaborator – that included assisting in the classroom, consulting regarding student IEP and behavior, providing supports to and planning with general educators, communicating with

parents; and, d) Interventionist – using evidence based practices for instruction and behavior, supplemental instruction, and progress monitoring. Although the non-instructional “Manager” role accounted on average for about 33% of the teachers’ time, the “Collaborator” and “Interventionist” roles each accounted for about 27% of teacher time.

Within that interventionist role teachers are confronted with a wide and difficult array of student challenging behaviors. A number of descriptive and other studies over at least the past 40 years have repeatedly documented the range of these challenging behaviors in various categories and across cultures that include aggressive, antisocial, hyperactive, distractible, oppositional and socially withdrawn behaviors (see for example, Alter, Walker, & Landers, 2013; Arbuckle & Little, 2004; Bruggink, Goi, & Koot, 2013; Bulotsky-Shearer, Bell & Dominquez, 2012; Chapman, 1978; Conley, Marchant, & Caldarella, 2014). A particularly interesting finding of some of this this research is that the most problematic behavior challenges for teachers on a day to day basis were not the most extreme behaviors such as violent, aggressive behaviors, rather, it was those more frequent behaviors that were described as off-task, non-engagement types of behaviors such as “.... Talking out of turn (TOOT), disturbing or hindering other students, and non-attending.....” (Arbuckle & Little, 2004) , or “off task, verbal disruption, verbal aggression, noncompliance, and out of seat behaviors (Alter et al., 2013). This was true at both the primary (Wheldall & Merrett, 1988) and secondary levels (Merrett & Whedell, 1984).

Interventions for Disruptive, Off-Task Behavior

The variety of interventions or intervention approaches that can be and have been effectively applied to disruptive, off-task behaviors is considerable. DuPaul, Wyandt, and Janusis (2011) provided a comprehensive review of these interventions, the most common of

which were identified as medications and behavioral interventions. The behavioral interventions, those based on learning theory, were further characterized being antecedent- or consequence-based ones. Examples of antecedent-based strategies included: 1) posting and reviewing classroom rules, 2) reducing task demands by modifying the length and/or difficulty of assignments; and, 3) giving students choices of which assignments or steps to complete first. Consequence-based behavioral strategies were ones that involved: 1) contingent positive reinforcement using praise and/or tokens for on-task behavior/task engagement; 2) response cost (loss of tokens or privileges) or time out from reinforcement contingent upon off task behavior. Other related more comprehensive behavioral approaches discussed by DuPaul et al. (2011) were: 1) academic interventions (e.g., direct instruction in needed skills, computer assisted instruction, class-wide peer tutoring); 2) home-school communication programs such as the use of a daily behavior report card; and, 3) self-regulation/management programs in which the student(s) are taught to observe, evaluate, and self-reinforce their own on task behavior.

Self-Regulation/Management and Students with Disabilities

As Korinek and deFur (2016) have observed, all teachers want students to engage in self-control, that is, to be able to manage their own social and academic behaviors. Students with disabilities such as Learning Disabilities, Emotional Behavioral Disorders, Attention Deficit Hyperactivity Disorder, and Autism Spectrum Disorder, typically have deficits in self-control and its components (i.e., goal setting, planning, self-talk/instruction, self-monitoring and self-evaluation), resulting in low academic performance, low academic engagement, and problematic/negative interactions with peers and adults (see, for example, Korinek & deFur, 2016; Menzies & Lane, & Lee, 2009).

Reviews of research on the effectiveness of various self-management interventions have generally shown these interventions to be effective in increasing various positive behaviors and reducing problem behaviors. For example, Anderson and Wheldall (2004) analyzed 44 studies between 1991 and 2003 of students with various disabilities, the most frequent being Learning Disabilities, Emotionally Disturbed, Moderate Intellectual Disability, and Attention Deficit Disorder. Most study participants were either in primary or high school grades. While most studies had multiple target behaviors, the most frequent was “on-task” behavior and self-monitoring was the most frequently used intervention, particularly the use of audio cues and only 1 using a tactile cueing procedure. Outcomes of the studies were largely positive.

A more recent review by Bruhn, McDaniel, and Kreigh (2015) slightly overlapped with that of Anderson and Wheldall (2004) in that it reviewed 41 studies of self-monitoring interventions for students with behavior problems between the years of 2000 and 2012. Students in this review also represented various disabilities, they were most often reported to have either ADHD or EBD with the majority of participants being in the elementary followed by the middle and then high school grades. As in the Anderson and Wheldall (2004) review the most frequent target behavior reported by Bruhn et al. (2015) was “on-task” behavior and wide-variety of specific self-management and monitoring components were reported and analyzed. One interesting difference between the two reviews is that Bruhn et al. (2015) reported an increase in the use and variety of technology for student self-monitoring and recording of behavior that included kitchen timers, electronic vibrating/cueing devices, iPod Touch, cell phones, and audio tape players with pre-recorded signals. As in Anderson and Wheldall (2004) review, Bruhn et al. (2015) found the results of the various self-monitoring interventions in their review were typically positive, though the generalization and maintenance effects continue to need further

study as well as evaluating the specific contributions of the self-management components – self-observation, self-recording, the effects of feedback and reinforcement, etc.

Technology, Self-Monitoring, and Students with Attention/Task Engagement Challenges

In a relatively recent discussion of the use of technology to implement self-monitoring/management interventions with students with behavior problems, Bruhn, Waller, and Hasselbring (2016) noted some of the types of technology, the steps in developing and implementing technology-based interventions, and an example of such application. These authors noted that technology has been used especially to cue the student when to self-monitor and evaluate, while being used less so to actually record self-evaluation. Indeed, Bruhn et al. (2016) characterized the traditional paper and pencil based self-monitoring and recording process as empirically “robust” while the technological applications are less extensively documented and evaluated. The various devices that have been used include timers/watches/recorders that emit an audio cue, iPod/iPads, cell phones, kitchen timers, etc. that a teacher or student may set for constant or variable time intervals. These devices have their particular advantages (relative ease of use, availability/price, etc), they also have potential disadvantages. For example, devices that cue the student via some type of audio signal – kitchen timers, prerecorded audio signals on a personal device or tablet may serve to distract other students at least initially. Too, the size and physical appearance of kitchen timers, audio devices such as a taper recorder/player or tablet computer may be cumbersome to use under the more dynamic nature of classroom instructional activities.

One technology device that has been used and subjected to some limited research evaluation is the *MotivAider*, a pager-sized device that emits a tactile/vibratory stimulus and can be set to a variable or constant signal length. The *MotivAider* is relatively small and may be worn

on the student's belt or pants waistband or carried in a pocket. Thus, it is a potentially less obtrusive, stigmatizing device and the use of a tactile stimulus felt only by the student using it eliminates the potential distractibility of the device for peers and other classroom personnel. The nature and results of applied research evaluations of the *MotivAider* for students with task engagement and off task behavior challenges is detailed more extensively in the next section of this proposal. However, to date there have been nine published evaluations of the *MotivAider* with students ranging from elementary to high school grades, most exhibiting some type of disability such as Learning Disability, ADHD, Emotional- Behavioral Disorders, Autism Spectrum Disorder or Intellectual Disability although it has occasionally been used with students with no Special Education Diagnosis (Amato-Zech, Hoff, & Doepke, 2006; Boswell, Knight, & Spriggs, 2013; Bruhn, McDaniel, & Kreigh, 2015; Farrell & McDougall, 2008; Legge, DeBar, & Alber-Morgan, 2010; Lo & Cartledge, 2006; McDougall, Morrison, & Blaine, 2012; Morrison, McDougall, Black, & King-Sears, 2014; Silla-Zaleski & Vesloski 2010; Vance, Gresham, & Dart, 2012). As with other self-monitoring/management interventions, the *MotivAider* when applied as a tactile prompt for students to self-evaluate their behavior has typically increased on task behavior, academic work completions or correct responses and/or reduced competing off task behaviors. There have been a very few such studies that have evaluated or programmed maintenance of these behavior changes (Farrell & McDougal, 2008; Lo & Cartledge, 2006).

Research Questions

This study set out to find the answers to following questions surrounding the use of a tactile signaling device, the *MotivAider*, for a student's self-monitoring of his Academic Engagement Time (AET):

1. *Will the target student's use of the MotivAider increase his/her Academic Engaged Time (AET) when compared to baseline levels of AET?*
2. *To what extent are the students increased levels of AET able to be maintained when the MotivAider is abruptly and completely withdrawn compared to when it is gradually removed over time?*
3. *Should the use of the MotivAider by itself show limited or no effects, would the addition of contingent teacher praise or other positive consequences more reliably increase the target student's AET?*

CHAPTER 2

LITERATURE REVIEW

The *MotivAider* (<https://habitchange.com>) is a small (2” x3 “) self-timing device that uses a silent, vibrating signal to indicate the passage of a specific time interval (e.g., 1 minute). Resembling an electronic pager, the *MotivAider*’s front has a window that shows a countdown clock, and small switches used to turn it on/off, adjust the vibration strength, and set the timer for a standard or variable time interval. There is a small metal clip on the back of the timer that can be attached to the user’s belt, pants waistband or it can be worn in a pocket. See the picture of the timer below in Figure 1. The general idea with the *MotivAider* is that the child is taught to self-monitor and evaluate his/her behavior each time the vibrating signal occurs. He/she does this by asking if he/she has been engaged in the target behavior (e.g., on-task) in the interval prior to the signal. If he has been so engaged, then the student silently praises himself. If not properly engaged, then the student briefly and silently says to himself what he should be doing during the next interval.

Figure 1

“*MotivAider*”



Initial Studies of the MotivAider

The first published studies of the *MotivAider* were approximately 13 years ago. Amato-Zech, Hoff, and Doepke (2006) studied the effects of the *MotivAider* on the On Task behavior

3, 11 year old, fifth grade students who had been diagnosed with Speech Language Delays and Specific Learning Disabilities or Emotional Behavioral Disorders. Using a multiple baseline across students, Amato-Zech et al. (2006) compared baseline conditions to an intervention consisting of a class-wide point system, self-monitoring training, and the subject's use of a MotivAider set initially at one- and then three-minute intervals. On Task behavior was reported to have increased for all three subjects and to have generalized to an untreated math activity. Post intervention assessment of teacher and student perceptions of the intervention using the Intervention Rating Profile (Witt & Elliott, 1985) indicated that the teacher and students saw the MotivAider as an effective, appropriate and desirable intervention.

In that same year Lo and Cartledge (2006) examined the effects of the MotivAider with four students between 7 and 9 years of age in grade 2 through 4. The students had been diagnosed as having Attention Deficit Hyperactivity Disorder and Emotional Behavioral Disorders. The target behavior was again On Task/Off Task behavior. The intervention consisted of the MotivAider and several other components including teaching the students what On Task behavior consisted of, how to recruit attention appropriately, self-monitoring with the MotivAider, and praise, points, and backup reinforcers for On Task behavior. Results indicated that On Task behavior clearly increased for three of the four students and that these increases brought them within On Task levels of typical comparison peers as well as being maintained once the intervention was terminated. Social validity data using a questionnaire with the students, teachers, and parents indicated that all recognized improvements in the students' behavior and that the students liked the intervention.

Replication Studies

Since 2006 there have been at least seven other studies of the MotivAider that have varied in terms of various parameters including age, grades, and diagnoses of the participants; target behaviors; the specific intervention conditions in addition to the MotivAider; research designs used; and, measures of social validity (Boswell, Knight, & Spriggs, 2013; Bruhn, McDaniel, & Kreigh, 2015; Farrell & McDougall 2008; Legge, DeBar, & Alber-Morgan, 2010; McDougall, Morrison, & Blaine, 2012; Morrison, McDougall, Black, & King-Sears, 2014; Silla-Zaleski, & Vesloski, 2010; Vance, Gresham, & Dart, 2012). The replication studies are addressed in the following sections in terms of these parameters.

Subject Student Populations Studied

In the intervening years MotivAider studies have addressed various subject populations as shown in Table 1 below. Inspection of Table 1.

Table 1.
MotivAider Studies' Number of Subjects, Ages, Grades and Disability

Authors	Year	# Subjects	Ages	Grades	Disabilities
Amato-Zech et al	2006	3	11	5	SLD/LD, SED/SLD
Boswell et al	2013	1	11	6	ID
Farrell & McDougall	2008	6	14 to 15	9	SED/ADHD, LD, LD/ADHD, ADHD/Tourettes
Legge et al	2010	3	13	6	Autism, Autism/CP
Lo & Carteledge	2006	4	7 to 9	2 to 4	ADHD, ADHD/SED
McDougall et al	2012	2	15	7, 10	ADHD

Morrison et al	2014	2	15	9	ADHD
Silla-Zaleski & Vesloski	2010	1	12	5	Autism/ADHD
Vance et al	2010	3	10 to 11	4 & 5	None

shows that most studies have focused primarily on students with ADHD, while a few others have included students with Autism, Tourette’s Syndrome, Cerebral Palsy, Learning Disabilities, and Emotional and Behavioral Disorders.

Target Behaviors for Intervention

There were more than one target behaviors in previous studies. These are listed in Table 2 below.

Table 2.
MotivAider Study Target Behaviors

<i>Authors</i>	<i>Year</i>	<i>Target Behavior</i>
Amato-Zech et al	2006	On Task
Boswell et al	2013	On Task
Farrell & McDougal	2008	# correct & incorrect digits
Legge et al	2010	On Task
Lo & Carteledge	2006	Off Task
McDougall et al	2012	% Correct problem answers Task completion- time
Morrison et al	2014	% Biology work completed correctly
Silla-Zaleski & Vesloski	2010	Scripting - repeating words/phrases already heard

With self-monitoring, research has predominantly focused on “On Task” behavior (five of nine studies). Some studies have targeted academic productivity such as correct/incorrect academic responses or task completion time. One study by Silla-Zaleski and Vesloski (2010) targeted a student with Autism who engaged in “scripting”, vocalizing words and/or sentences previously heard in videos, TV shows, commercials or video games without any apparent social function.

Intervention Components

MotivAider studies have not only used that device for self-monitoring but have typically included other components. Table 3 shows additional intervention components have included specific training in the target behavior, self-monitoring/recording (six of the nine studies), various contingencies for engaging in the target behavior(s) such as point systems, edible rewards, contingent free time, and teacher praise.

Table 3.
MotivAider Study Intervention Components

<i>Authors</i>	<i>Year</i>	<i>Intervention</i>
Amato-Zech et al.	2006	Class-wide point system Self monitoring training MotivAider signal interval 1 min then 3 min.
Boswell et al.	2013	MotivAider, self-recording, edible reinforcers for accurate self-recording
Farrell & McDougal	2008	Self-graphing correct/incorrects MotivAider to cue/check pace of completion Gradually increase pace
Legge et al.	2010	MotivAider training Self-Recording Free time if 80% on task

		Fading MotivAider signal on variable time intervals of 2, 4, 6, 8, 10 min.
Lo & Carteledge	2006	Skill training of on-task, recruiting attention, self-monitoring completing tasks MotivAider Praise & points for backups
McDougall et al	2012	MotivAider 90 sec signal Self-recording
Morrison et al	2014	Self-recording MotivAider
Silla-Zaleski & Vesloski	2010	Easy & difficult tasks interspersed Differential reinforcement alternative behavior MotivAider
Vance et al	2010	MotivAider 2 min. signal Self-record + reinforcement vs DRO 2 min

Research Designs and Social Validity

Table 4 shows the study research design and social validity assessment of the nine published MotivAider studies. All studies employed single subject design (Kennedy, 2005). Of the nine studies, six employed multiple baselines, the most frequent design tactic being a multiple baseline across subjects while several others involved reversal, changing criterion, or multi-element methods.

Table 4.
MotivAider Study Research Design and Social Validity Methods

Authors	Year	Design	Social Validity	Treatment Acceptability
Amato-Zech et al	2006	MBS ² Rev ³	IRP-20 CHIRP	IRP-20 ⁶ CHIRP ⁷
Boswell et al	2013	Rev ³	Instructional Assistant & student ratings ratings	
Farrell & McDougal	2008	MBS ² CC ⁴	Peer comparison	survey of SS
Legge et al	2010		(none)	(none)
Lo & Carteledge	2006	MBS ²	Peer comparison Questionnaire Teacher parent Student	
McDougall et al	2012	AB ¹	student self-report	
Morrison et al	2014	MBS ² CC ⁴	Peer comparison	students Teachers
Silla-Zaleski & Vesloski	2010	AB ¹	(none)	(none)
Vance et al	2010	MBS ² ME ⁵	(none)	(none)

AB¹ = Baseline – Intervention case study, MBS² = Multiple baseline across subjects, Rev³ = Reversal, CC⁴ = Changing Criterion, ME⁵ = Multi-element

IRP⁶ = Teacher Intervention Rating Profile CHIRP⁷ = Child Intervention Rating Profile

Six of the nine studies (Amato-Zech et al., 2006; Boswell et al., 2013; Farrell & McDougal, 2008; Lo & Cartledge, 2006; McDougall et al., 2012; Morrison et al. 2014) assessed social validity of the intervention and results. These assessments were conducted in various ways. Social validity and treatment acceptability assessment included both formal and informal rating scales or questionnaires completed by the student subjects, their teachers or instructional assistants, or parents. Two studies used observations of comparison peer students behavior to evaluate the extent to which subjects' levels of target behaviors approximated those of typical peers (Lo & Cartledge, 2006; Morrison et al., 2014).

***MotivAider* Study Results**

Not surprisingly each of the studies has generally produced positive outcomes, the target behaviors having been increased above baseline levels once the *MotivAider* intervention was implemented. The results for each study are summarized in Table 5 below. Two studies noted qualified results for some students. Farrell and McDougal (2008) reported that the *MotivAider* intervention increased “correct digits written” for 5 of 6 subjects. Legge, DeBar, & Alber-Morgan (2010) reported that self-monitoring and *MotivAider* intervention clearly increased the on-task behavior of 2 of 3 students and reduced the variability of on task for the third subject. Several studies reported that *MotivAider* related increases in target behaviors appeared to generalize to other behaviors or settings (Amato-Zech et al., 2006; Boswell et al., 2013; Lo & Cartledge, 2006). Two studies (Farrell & McDougal, 2008; Lo & Cartledge, 2006) reported maintenance of increased target behaviors (correctly written digits and on task behaviors, respectively).

Table 5.
MotivAider Study Results

<i>Authors</i>	<i>Year</i>	<i>Results</i>
Amato-Zech et al.	2006	On task increased for all 3 Ss Generalization to Math Social validity - High acceptability scores on IRP & CHIRP
Boswell et al.	2013	Increased on task, math fluency increased Self-monitoring accuracy high Social validity high
Farrell & McDougal	2008	5 of 6 subjects increased correct digits Met or exceeded criterion Maintained during follow up Peer – comparison - subjects behavior similar to or better than peers Social validity - all subjects liked the intervention
Legge et al.	2010	Increased On Task all 3 Ss Reduced variability in behavior for subject 3 On Task within intervention levels for 2 of 3 subjects Self Recording accuracy with teacher ratings
Lo & Cartledge	2006	Increased on task, , Similar to comparison peers On task within intervention levels during Maintenance Generalization more variable but some effects Questionnaire data for parents & teachers showed satisfaction 3 of 4 subjects liked intervention
McDougall et al.	2012	% correct answers increased during intervention Time to complete assignment decreased
Morrison et al.	2014	Increased percentage of biology assignment completed correctly
Silla-Zaleski & Vesloski	2010	Scripting gradually decreased
Vance et al.	2010	Self-Monitoring/MotivAider & DRO decreased disruptive & increased

***MotivAider* versus Other Interventions**

Finally, only one study appears to have contrasted the *MotivAider* intervention with the relative effects of another, active intervention. Vance, Gresham, and Dart (2010) analyzed the effects of the *MotivAider* and self-monitoring compared to Differential Reinforcement of Other behavior/DRO. The on-task behaviors of otherwise typically developing 10 and 11 years old students in the 4th and 5th grades were analyzed in a combined multiple baseline – multielement design. Vance et al., (2010) reported that while both interventions increased on task behavior, the *MotivAider* and self-monitoring intervention produced moderately greater effects than did the DRO intervention.

Summary

In summary, published studies of the *MotivAider* date from 2006. In that time there have been a total of nine such studies, generally showing that have typically produced positive increases in targeted behaviors, primarily on task behavior. Subject populations have included students in the second through tenth grades, most of whom have had a diagnosis of ADHD but also including students with other disabilities (autism, emotional behavioral disorders, intellectual disability) as well as those without a diagnosis who exhibited problems in attention and task engagement. Each of the extant *MotivAider* studies have used also combined it with one or more other tactics such as pre-training in the target behaviors, self -recording, and various contingencies for increased target behaviors. The methodology for experimentally analyzing *MotivAider* effects has been single subject design, most often multiple baseline designs. Each of the *MotivAider* studies have shown increases in targeted behaviors, particularly on task behavior, and in a few cases correct academic responses. Six of the studies assessed some form of social

validity, such as formal or informal student or teacher ratings of the *MotivAider*'s effects and appropriateness or peer comparison of target behaviors, and reported positive outcomes in these social validity indices. There have been positive but limited reports (only two studies) of maintenance or generalization of increased target behaviors.

Purposes of the Current Study and Research Questions

The present study sought to further systematically replicate the effects of the *MotivAider* with a middle school student who had difficulty attending to and engaging in academic tasks. A second purpose was to evaluate the use of an intervention fading procedure to actively program maintenance of the *MotivAider* intervention effects. A third purpose was to evaluate the social validity of the intervention by having the researcher and the subject student use a standardized instrument, the *Intervention Rating Profile* (Witt & Elliot, 1985). Using a single subject reversal design, a no intervention baseline was followed by an intervention phase in which the subject was taught the definition of On Task behavior, shown how to use the *MotivAider* and then each day was given the device to use during the targeted instructional activities. This was followed by a brief withdrawal phase of the *MotivAider* and then its re-application. Finally, a phase in which the *MotivAider* was gradually faded by lengthening the signal time from 1 to 3 to 5 minutes was implemented to evaluate maintenance of On Task behavior. Social validity was evaluated by having the teacher and student subject complete appropriate versions of a standardized rating scale, the *Intervention Rating Profile* (Witt & Elliot, 1985).

CHAPTER 3

METHODS

Participant

The participant for this study, JE, was a public middle school student in a small city school district in northeast Tennessee. The participating student was a sixth grader at the beginning of the study who was receiving special education services under the category of Specific Learning Disability in reading according to the State of Tennessee Board of Education standards (https://www.tn.gov/content/dam/tn/education/special_education/eligibility/se_eligibility_sld_standards.pdf). JE had a history of falling behind in his classes due to off-task behavior and not completing assignments. JE often was easily distracted by peers and having to constantly be prompted or verbally reprimanded to start his assignments. JE's difficulties in not attending to or completing his classwork assignments were negatively impacting both his learning and his grades. JE would be observed sitting in his desk but constantly either starrng off into space or talking to a peer. JE rarely took the initiative to independently start an assignment, rather, he frequently had to be prompted by the teacher.

JE was receiving services in a special education classroom for 55 minutes a day. During this time the principal investigator for this study was his Special Education teacher. JE and other class members were mostly responsible for engaging in instructional activities in order to close the gaps in their reading and math skills. However, students including JE had at least 15 minutes to also work on missing/incomplete assignments. Despite receiving these services, JE was still falling behind in class and having to be constantly redirected during his time in the special education setting.

Setting

The setting was a middle school in northeastern Tennessee located in a small city district with a total 2018-2019 population of approximately 15,000. The classroom in which this study was conducted was a special education class that served both special education students as well as general education students who needed extra instructional support. There were between 7 to 12 students during each class session. The class schedule was 7 periods long with 6 periods being 55 minutes and one period (4th period) that was 35 minutes long and was referred to as the “intervention”. JE was observed during 3rd period everyday (one of the 55-minute periods). Activities during this period included working on his homework, group readings and various direct instruction activities led by the Special Education teacher to support students in Language Arts.

This study and its initial baseline were begun during the middle of the Spring semester 2019. Due to various events (spring break, various school activities that interrupted the data collection process) we were unable to initiate the *MotivAider* intervention before the end of the Spring semester and summer break. When students returned to school in August of 2019, we re-initiated baseline measures in JE’s class. However, the school had initiated changes in the schedule of classes and in the Special Education service delivery for JE and others for the 2019-2020 school year. JE was observed in a special education setting that was 45 minutes long and focused on building reading skills and again during a 90-minute inclusion ELA class that was a general education class. Activities were similar in the previous year’s “Intervention” class but had more diversity in the instructional activities in inclusion which included direct instruction, reading, group work, stations and online quizzes.

Measure

Dependent Variable: The dependent variable was the amount of Academic Engaged Time behavior as defined in the *Systematic Screening for Behavior Disorders* (Walker & Severson, 1992) . According to that definition “AET refers to the amount of actual time a student spends actively engaged, attending to, and working on relevant academic material. Further more the definition specifies “the student is: 1) appropriately engaged in working on assigned academic material that is geared to his/her ability & skill levels; 2) attending to material & task; 3) making appropriate motor responses (writing, computing); 4) asking for assistance (where appropriate) in acceptable manner; 5) interacting with teacher or classmates about academic matters; or, 6) listening to teacher instructions & directions”.

To record AET, observers used duration recording. The stop watch function of their cell phones was used to time the amount of AET. When a student was engaged in AET, the observer started the stopwatch. When the student engaged in behavior other than AET, the observer temporarily stopped the stopwatch and then re-started it when the student was again engaged in AET. This continued until the end of the observation. At the end of the observation the total duration of AET was divided by the total time during which the student was observed. This was converted to a percentage of time AET (e.g., 10 min. of AET divided by 20 min. of observation time = 50% AET).

Other Measures

At the beginning of baseline, the classroom teacher (the principal investigator) completed the *Functional Assessment Screening Tool* (Iwata & DeLeon, 1995) for JE. The FAST is composed of a series of questions that cover various behavior function characteristics and contexts. The purpose of the FAST was to identify the possible function of JE’s off-task behavior

and incorporate that function into the description of participants for replication purposes and to see how a particular behavior function might respond to the *MotivAider Intervention*.

At the end of the study both the target student and the classroom teacher were asked to complete a social validity survey, the *Intervention Rating Profile* (Witt & Elliot, 1985). The IRP was modified to specifically identify the intervention as the *MotivAider*. The teacher version of the *IRP* scale consists of 15 positive statements about the intervention (e.g., “the *MotivAider* is an acceptable intervention for the child’s problem behavior”, “Most teachers would find *MotivAider* appropriate for behavior problems”, “the *MotivAider* was effective in changing in the child’s problem behavior”). The teacher rates the statements on a 6-point scale of “Strongly Agree” (6) to “Strongly Disagree” (1). A similar, age-appropriate *Child Intervention Rating Profile* was completed by JE at the end of the study.

Procedures

Baseline: During baseline the participant was simply observed using the AET definition and duration recording. The instructional activities for JE consisted of his usual activities and assignments as described in the Participants and Setting sections above. For example, during baseline only the measurement procedures were applied, that is, the AET direct observations and *FAST* interview. The teacher/principal investigator simply responded to JE’s off task and any instances of AET as he typically did prior to baseline.

MotivAider Intervention: Once a stable baseline was obtained for JE, first during the spring semester and again during the beginning of the fall 2019 semester, the *MotivAider* intervention was applied to JE. To introduce the *MotivAider* and ensure that JE understood how it was to be used, the Special Education teacher met individually with JE, showed him the *MotivAider*, demonstrated how to turn it on, adjust the vibrating signal length, and what JE

should do when the vibrating signal occurred. JE was told to wear the *MotivAider* clipped to his waist band, belt or kept in a pocket of his pants. The timer was initially set to briefly vibrate at one-minute intervals. When JE received a vibratory signal, he was to stop briefly, ask himself silently “Am I on task” and silently praise himself and then wait for the next vibratory signal and repeat the self- evaluation of his behavior at each succeeding signal. If he/she was not on task at the vibratory signal, then he/she was to say silently what he/she was supposed to be doing and then wait for the next vibratory signal. This procedure was implemented to be consistent with the suggested use as described on the *MotivAider* website (<https://habitchange.com/docn/method-behind-the-MotivAider.php>).

MotivAider with Positive Reinforcement and Fading of Signal: During this phase a positive reinforcement procedure was added to the *MotivAider* in the following manner. During the fading phase involved the PI informing the student that if his AET would stay above the 80% line, JE would be awarded a reward of his choice.

Design

The study used a single subject, ABAB reversal design (Kennedy, 2005). The design starts with a series of baseline observations during the student’s typical activity with no intervention. The intervention was then implemented with the “*MotivAider*” for a series of days. Next, the *MotivAider* was then temporarily withdrawn for a second baseline series of observations. Next, the *MotivAider* intervention was reinstated for a second time. In the final phase during the reponse-dependent fading (Fox, et al., 1984) portion of the study, the *MotivAider* signal was gradually lengthened from once a minute, to once every three minutes, to once every 5 minutes. Also, during the second *MotivAider* and Fading phases, the student was offered a tangible reward to measure the impact of positive reinforcement with the *MotivAider*.

CHAPTER 4

RESULTS

Interobserver Agreement (IOA)

Interobserver Agreement was conducted on six sessions during the study. At this time the two observers used the AET observation system and definition to simultaneously but independently observe and record JE's behavior, noting the beginning and ending time of the observation session and the total amount of AET time in minutes and seconds recorded on their cell phone clock applications. To calculate IOA, the observers' total AETs were converted to seconds and were compared, dividing the smaller total by the larger total and then multiplying by 100 to yield a percentage of IOA. Interobserver Agreement ranged from 81% to 99% with a mean of 93%.

Academic Engaged Time (AET)

Table 6 shows the Mean AET %, the amount of increase/decrease in the Mean for adjacent phases (e.g., Baseline and *MotivAider 1*), the percentage of overlapping data points between adjacent phases, and the overall trend in the data for each phase. Trend was computed by the Quickie-Split Middle method of trend line estimation (Dillon, July, 2017).

Table 6.

AET Mean, Mean Level Change, Overlap, and Trend During Study Phases

	Baseline Spring 2019	Baseline Fall 2019	MotivAider 1 Fall 2019	Reversal Fall 2019	MotivAider 2 Fall 2019	Fading Fall 2019
Mean	73.82%	55.50%	88.21%	63.50%	88%	82.40%
Mean Level Change		-18.32% decrease	+32.71 increase	-24.71% decrease	24.50 increase	-5.60 decrease
Overlap		18%	0%	0%	0%	20%

Trend	Decrease	? ¹	Decrease	Decrease	Flat	Increase
? ¹ Insufficient data to calculate trend.						

Generally, these summary descriptive statistics show that mean AET was lower during Baseline and Reversal phases of the study than during the MotivAider 1, 2, and Fading phases. Mean AET was in fact less than 80% during Baseline and Reversal phases while it was above 80% during MotivAider 1 and 2 and Fading phases. There was little or no overlap of data between Baseline/Reversal phases and MotivAider 1 and 2 Intervention conditions. This relative lack of overlap between Baseline/Reversal and MotivAider Intervention conditions supports a functional relationship between the MotivAider Intervention and increased AET. On the other hand, there was similarity in the mean AET and overlap between the MotivAider 2 and Fading conditions, indicating that the latter procedure was effective in maintaining the MotivAider increased AET whereas its temporary but complete removal during the Reversal condition did not result in sustained AET. Figure 2 shows the daily percentages of AET under each phase of the study.

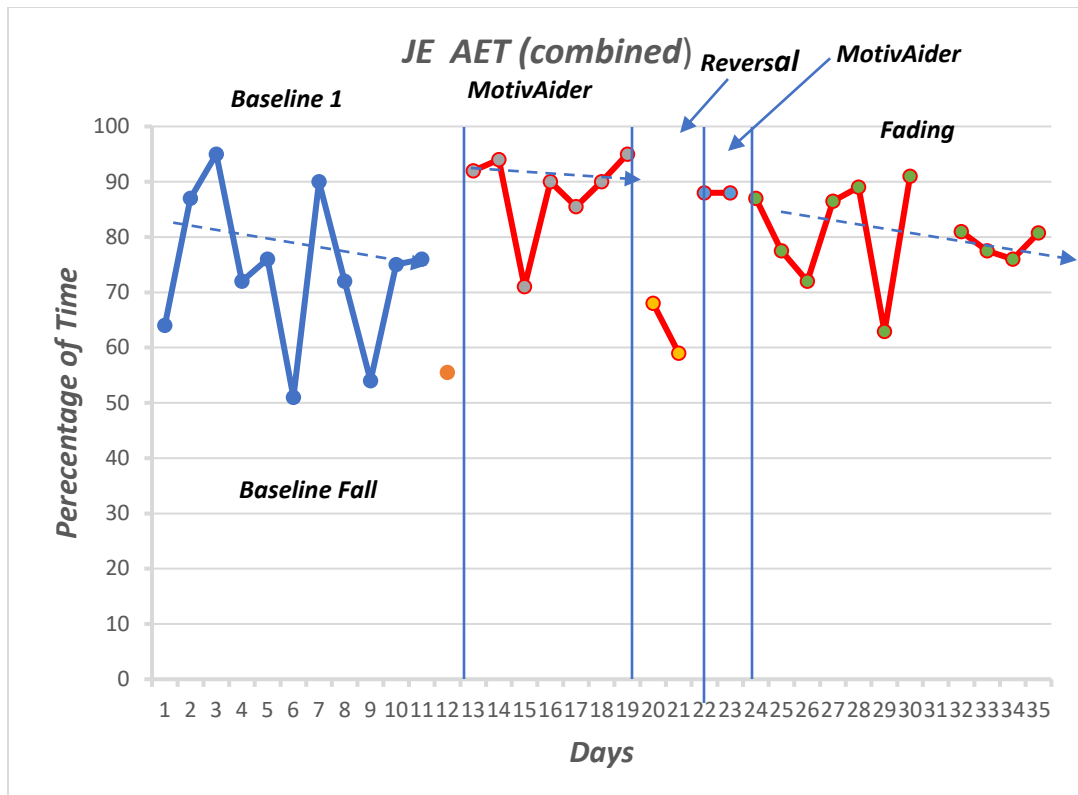


Fig. 2 Daily Percentages of AET

During Baseline Fall 2019, the daily percentages of AET were highly variable, but overall showed a decreasing trend. Most AET data points (8 out of 11) during this initial baseline were below 80%. The single baseline data point (55.5%) during the Fall 2019 phase was well below 80% and within the lower range of the Spring 2019 Baseline data points. When the MotivAider 1 Fall 2019 intervention was begun, AET immediately rose to 92% and with one exception (day 15, 71%) remained at or well above 80% during that phase. Temporary removal of the *MotivAider 1* intervention resulted in an immediate and substantial decrease in AET to 68% and 59% while re-application of the *MotivAider 2* intervention was followed by an immediate increase in AET to 88% over the next 2 sessions. This was within the range of AET noted during initial application of *MotivAider 1*. Finally, as the *MotivAider* signal was lengthened first from 1-minute intervals to 3-minute and then 5-minute intervals, became more

variable, ranging from 72% to 89%, with 3 out of those 5 data points above 80% AET with an overall decreasing trend during Fading.

Social Validity: Teacher and Student Participant Intervention Rating Profile

Data from the Child (CHIRP) and Teacher (IRP) *Intervention Rating Profile* (Witt & Elliott, 1985) are presented in Table 7 below. The original completed rating sheets are in Appendix D. Because the items on the CHIRP and IRP consist of both positively and negatively phrased statements, the actual rating values (1 – 6) were converted so that the higher ratings represented more positive evaluations. A “6” on either scale, therefore, represented the highest positive rating while a “1” represented the lowest possible rating.

Table 7.
Student and Teacher Ratings of the MotivAider the CHIRP¹ and the IRP²

	CHIRP	IRP
Mean Rating	5.14	5.53
Median Rating	5	6
Minimum Rating	4	5
Maximum Rating	6	6
Range	2	1

¹ *Child Intervention Rating Profile*

² *Intervention Rating Profile*

The mean rating of the *MotivAider* intervention by JE, the student, across the 7 items of the CHIRP was 5.14 with a range of 4 to 6. The lowest rated item of the CHIRP was “I liked the *MotivAider* that we used” which received a “4” and it was the only one of the seven scale items to receive less than a “5” rating, indicating that JE rated the intervention highly positively.

The teacher ratings of the *MotivAider* on the IRP ranged from “5” to “6”, with a mean rating of 5.53. None of the 15 items on the IRP received less than a “5” rating, indicating that the teacher rated the intervention highly positively.

CHAPTER 5

DISCUSSION

This study sought to answer the following questions: 1) first, would the target student's use of the *MotivAider* increase his/her AET when compared to his baseline levels of AET; 2) second, to what extent would the student's increased levels of AET be able to be maintained when the *MotivAider* was abruptly and completely withdrawn compared to when it was gradually removed over time; 3) finally, if the use of the *MotivAider* by itself show limited or no effects, would the addition of contingent teacher praise or other positive consequences more reliably increase the target student's AET? To those ends a series of baseline observations was conducted under which the JE, a middle school student who exhibited variable and generally low levels of AET was simply observed during his typical daily instructional activities. Next, during the initial the *MotivAider* intervention was implemented by teaching JE how to use the *MotivAider* and the check-sheet to monitor his own on-task behavior. These phases were followed by phases of temporary removal of the *MotivAider* and check-sheet, re-application of the *MotivAider* intervention and then gradual fading of the intervention. The observational data showed that JE's AET was variable but consistently higher during the *MotivAider* intervention than during baseline or during the temporary withdrawal of the intervention. When the *MotivAider* intervention was gradually lessened by increasing the length of time between *MotivAider* self-check signals from 1 to 3 to 5 minutes, JE's engaged time became more variable but overall remained higher than during Baseline or Withdrawal phases. In summary, regular application of the *MotivAider* intervention and frequent signaling clearly increased AET while the fading procedure was associated increased variability in AET. Thus the intervention was successful in increasing AET when the self-check signals were more frequent but fading was less

successful in maintaining increased AET. When the teacher and student were asked to evaluate the social validity of the *MotivAider* intervention using a standard set of rating scales, both teacher and student ratings indicated overall reasonably high acceptability and effectiveness.

The current findings were largely confirmatory of the handful of prior studies of the *MotivAider* in showing that its initial and regular use can markedly improve task engagement (Amato-Zech et al., 2006; Boswell et al., 2013; Legge et al., 2010; Lo & Cartledge, 2006; Vance et al., 2010) and that, when assessed, the *MotivAider* typically receives positive social validity evaluations (Amato-Zech et al., 2006; Boswell et al 2013; Farrell and McDougal, 2008; Lo & Cartledge, 2006).

Of the nine published *MotivAider* studies, only three reported data on the maintenance of *MotivAider* effects. Lo and Cartledge (2006) noted that on task behavior of 4 elementary students (2 with and 2 without ADHD diagnoses) remained within intervention levels during follow up observations once the *MotivAider* and associated self-recording procedures were finally withdrawn. Farrell and McDougal (2008) also reported that *MotivAider* intervention increases in correct math digits written were obtained during follow up assessments for six high school-aged students with various disabilities (learning disabilities, ADHD, or serious emotional disturbance). However, during follow up the *MotivAider* and academic target behavior goals were still being implemented. Legge et al. (2010) systematically faded the *MotivAider* signal interval in 2 minute increments (from 2 to 10 minutes between signals) similar to that used in the current study for 3 middle school boys (2 with Autism and 1 with Cerebral Palsy and stereotypic behaviors). Several maintenance checks without the *MotivAider* and self-recording intervention procedures indicated that participants on task behavior became somewhat more variable but remained within intervention levels for 2 of the 3 subjects. This is similar to the outcome in the

current study in which JE's task engagement increased and was less variable during both MotivAider 1 and 2 intervention phases but became somewhat more variable during the sequential fading of the Motivaider from 1 to 3 to 5 minute signals. We had hoped to provide a more definitive answer to the effect of response dependent fading (see, Fox et al 1986) as a strategy for maintaining task engagement effects. Unfortunately, the fading maintenance long term effects and any maintenance effects of that device remain unclear, with some studies reporting maintenance without systematic procedures (Farrell & McDougal, 2008; Lo & Cartledge 2006) and others showing variable maintenance effects of systematic fading (Legge et al 2010; the current study). Clearly what is needed are more studies that address the maintenance – intervention fading aspects of the MotivAider Intervention .

Implications for Research and Classroom Application

Research Implications

Considering the current study in the context of prior studies' findings this investigation has several implications. As with prior studies the MotivAider intervention has typically incorporated several components in addition to the MotivAider vibratory cueing device itself. These components have included such things as student self-recording (Amato-Zech et al., 2006; Boswell et al., 2013; Legge et al., 2010; , Lo & Cartledge, 2006; McDougal et al., 2012; Morrison et al., 2014; Vance et al., 2010), some type of positive consequences for increased task engagement (Amato-Zech et al. 2006; Boswell et al., 2013; Legge et al., 2010; Lo & Cartledge, 2006; Vance et al., 2010, interspersal of easy and difficult tasks (Silla-Zaleski & Vesloski, 2010), and students' self-graphing of behavior change (Farrell & McDougall, 2008). Each of these other components has been shown to be effective in promoting various positive behaviors. It would be important to conduct a component analysis (Kennedy, 2005) of the MotivAider in

which these other intervention components were systematically included and removed to determine the specific effects of the MotivAider itself versus its inclusion with these other factors. No such research has been reported to date. In particular it may be important to analyze the role of positive reinforcement for use of the MotivAider and/or meeting behavioral goals. Due to time constraints we were not fully able to get an idea of just how important positive reinforcement might have been. However, others have pointed out the usefulness of positive contingencies as (e.g., Climie & Mastoras, 2015). Graham-Day, Gardner and Hisn (2010), for example, used a different signaling system (audio taped chimes) as part of a self-monitoring program to increase the on-task behavior of three high school students. They noted that for at least one student the combination of self-monitoring with the audio tape and positive reinforcement produced better results than the self-monitoring alone.

As noted in the previous section, there has been relatively little analysis of the maintenance of behavior change in MotivAider research. Only three of the nine published MotivAider studies have reported maintenance data. It is unclear to what extent the original MotivAider-induced behavior change might result in sustained behavior change as opposed to needing some type of maintenance programming procedure. Both Lo and Cartledge (2006) and Farrell and McDougal (2008) reported that behavior gains persisted during a no intervention follow up while Legge et al., 2010 and the current study examined the effects of fading the MotivAider intervention in sustaining increased task engagement. Legge et al appeared to have used a response independent fading procedure that maintained task engagement for two of three students while the current study employed a response-dependent tactic (Fox et al 1986) that was partially successful. Maintenance effects – fading strategy – insufficient research to date

Another research issue has to do with the effectiveness of the MotivAider in addressing the task engagement of students with different disabilities and ages/grade levels. Not surprisingly most participants in MotivAider research to date have been students with ADHD or other high incidence disabilities such as Learning Disabilities (see Table 1 earlier in this document). Such students are often characterized by inattentive behavior whereas students with other disabilities, such as Emotional and Behavioral Disorders or Autism may exhibit not only inattention but acting out, disruptive and/or aggressive behaviors. The extent to which the *MotivAider* might better address the behavioral needs of inattentive versus disruptive/acting out students is a question that needs to be addressed.

A final issue that applies to single subject behavioral research in general and the *MotivAider* in particular has to do with subjects' baseline variability as compared to that during intervention. Examination of baseline trends and variability of the existing studies often reveals wide swings in some subjects' task engagement and other target behaviors (see Boswell et al., 2013; Farrell & McDougal et al., 2013; Legge et al., 2010; Silas-Zeleski & Veloski, 2010; Vance et al., 2012). This baseline variability may make it difficult to evaluate intervention effects such as the number of non-overlapping data points or behavior trend. In such cases it may be that the demonstration of intervention effects might be better based on reducing daily behavior variability rather than overlap or trend.

Classroom Application Implications

The major classroom implication of this study was first stated by Amato-Zech et al. (2006) "First, self- monitoring using the MotivAider was easy and relatively time effective. Because the students were responsible for monitoring and recording their own behavior, the intervention was easy to implement and placed few demands on the teachers' time. These are

important factors to consider, as interventions requiring low amounts of teacher time are likely to lead to increased follow-through and higher rates of treatment acceptability compared to time-intensive interventions or interventions that take away from classroom instruction” (P. 218). This was exemplified in the current investigator’s study in that the student caught on quickly regarding how to manage his own behavior via the *MotivAider*. The increase in JE’s engagement was very immediate and relatively consistent during *MotivAider* 1 and 2 conditions. Special education teachers do face increased demands on their time (see, for example, Mitchell, Deshler, & Ben-Hanania Lenz, 2012) that general educators may not . An intervention that does not require frequent prompting and/or reinforcement support as with the *MotivAider* can conceivably reduce time demands on the teacher. Relatedly, the shift from teacher managed interventions to one that is more student managed via the *MotivAider* may prove more effective (Vance et al., 2010) and may enhance the generalization and maintenance effects of the intervention (Amato-Zech et al., 2006; Farrell & McDougal, 2008 Lo & Cartledge, 2006).

Limitations of the Study

There were several limitations to this study. First, only a single student’s behavior was analyzed in terms of the effects of the *MotivAider* intervention. While the single subject reversal design used with the student is a complete experimental analysis (Kennedy, 2005), it does beg the question of to what extent were the results of this study applicable to other similar students? The only way of addressing that question is to conduct more analyses of other students, either using a multiple baseline across students design or replicating the reversal design with additional students. Originally, when the study began in the spring of 2019, there were two other students with attention issues whose behavior was being observed during baseline. However, due various

delays, it was not possible to continue the study with those two students as they graduated to the high school.

A second limitation to the study was that it did not prove possible to completely extend the response dependent fading of the *MotivAider* intervention with JE. It was originally intended to continue increasing the signal spacing from 1 to 3 to 5 minutes and hopefully, eliminate the signaling altogether. Again, time and various interruptions in the school schedule prevented a more extended fading of the intervention.

Finally, as with other studies of the *MotivAider* the specific effects of the timer itself cannot yet be separated from the use of self-recording or the application of positive reinforcers for meeting on task goals, either in terms of the initial or the long term effects. Future research will need to address these and other issues.

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APPENDICES

Appendix A

Systematic Screening for Behavior Disorders (SSBD)

Academic Engaged Time

AET refers to the amount of actual time a student spends actively engaged, attending to, and working on relevant academic material.

DEFINITION of Academic Engaged Time (AE)

The student is:

1. appropriately engaged in working on assigned academic material that is geared to his/her ability & skill levels.
2. attending to material & task
3. making appropriate motor responses (writing, computing),
4. asking for assistance (where appropriate) in acceptable manner,
5. interacting with teacher or classmates about academic matters, or
6. listening to teacher instructions & directions

NON EXAMPLES of Academic Engaged Time (NOT)

Non-examples of AET include:

1. not attending to task
2. breaking classroom rules (out of seat, talking out, disturbing others, etc.), OR
3. daydreaming

When AET is to be observed:

AET is observed and recorded during 15 – 20 minute independent seatwork periods wherein the student is expected to be working on assigned academic material(s).

RECORDING INSTRUCTIONS (paper form version)

1. Select a seatwork period in which at least 15 – 20 minutes of class time has been allocated for independent seatwork on an assigned academic task.
2. Note the hour and minute that you begin observing and record it on the AET form.
3. Record the amount of time the pupil displays behavior consistent with the definition.
4. Let the stopwatch run when the pupil is academically engaged and turn it off when he/she is not. Restart it when the pupil is again academically engaged. Repeat this procedure throughout the recording interval.
5. Record the time you stop on the AET form.
6. Compute percent AET by dividing the time on the stopwatch by the total time observed (e.g., 15 minutes) and multiplying by 100. Convert time observed and time on the stopwatch to seconds (15 minutes = 900 seconds). Note: The two classroom observations

of a single student should not be scheduled in the same week. However, if it is necessary to do so, schedule the observations as far apart as possible (e.g., Monday and Friday).

7. Record the data from the two classroom observations on the AET recording form. Average the two AET observation sessions to obtain an overall AET score. You can do this by averaging the two AET times or by adding the stopwatch times together for the two sessions and dividing by the total time of the two observation sessions.

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Academic Engaged Time (AET) Summary Form

Student:

Teacher:

**(Use Codes for Student & Teacher)*

Activity:

Time Begin:

Time End:

Was this an Inter-observer Agreement Session? _____ Yes _____ No

Observer 1:

Observer 2:

Primary Observer

Minutes:Seconds Recorded that student was AET

Minutes Observed (Time Ended – Time Began)

% Time Student AET: (# Minutes AET/#Minutes Observed) x 100

2nd Observer

Minutes:Seconds Recorded that student was AET

Minutes Observed (Time Ended – Time Began)

% Time Student AET: (# Minutes AET/#Minutes Observed) x 100

Example of AET summary & % AET calculation:

AET Summary

Observation began at 10:00 & Ended at 10:20 = 20 minutes (1200 seconds)

Observer 1 records 10 minutes: 30 seconds of AET (or 630 seconds) Observation time was 20 minutes (or 1200 seconds)

Observer 1 % Time AET = $630/1200 = 0.525 \times 100$ or 52.5 % AET

Observer 2 records 12 minutes: 15 seconds of AET (or 735 seconds) Observation time was 20 minutes (or 1200 seconds)

Observer 2 % Time AET = $735/1200 = 0.6125 \times 100$ or 61.3% AET

Interobserver agreement (IOA)

Divide smaller recorded time in AET by larger recorded time in AET Smaller time in AET = 630 seconds

Larger Time in AET = 735

$630/735 = 0.857 \times 100 = 85.7\%$ agreement (IOA)

Appendix B

FUNCTIONAL ASSESSMENT SCREENING TOOL (FAST)

Name: _____ Age: _____ Date: _____
Behavior _____
Problem: _____
Informant: _____ Interviewer: _____

To the Interviewer: The Functional Analysis Screening Tool (FAST) is designed to identify a number of factors that may influence the occurrence of problem behaviors. It should be used only as an initial screening tool and as part of a comprehensive functional assessment or analysis of problem behavior. The FAST should be administered to several individuals who interact with the person frequently. Results should then be used as the basis for conducting direct observations in several different contexts to verify likely behavioral functions, clarify ambiguous functions, and identify other relevant factors that may not have been included in this instrument.

To the Informant: After completing the section on "Informant-Person Relationship," read each of the numbered items carefully. If a statement accurately describes the person's behavior problem, circle "Yes." If not, circle "No." If the behavior problem consists of either self-injurious behavior or "repetitive stereotyped behaviors," begin with Part I. However, if the problem consists of aggression or some other form of socially disruptive behavior, such as property destruction or tantrums, complete only Part II.

Informant-Person Relationship

Indicate your relationship to the person: Staff _____ Other _____

How long have you known the person?

Do you interact with the person on a daily basis?

If "Yes," how many hours per day? _____ If "No," how many hours per week? _____ In what situations do you typically observe the person? (Mark all that apply)

_____ Parent _____ Teacher/Instructor _____ Residential

_____ Years _____ Months _____ Yes _____ No

_____ Self-care routines _____ Academic skills training _____ Meals _____ Leisure activities _____ Work/vocational training _____ Evenings

Part I. Social Influences on Behavior

1. The behavior usually occurs in your presence or in the presence of others
2. The behavior usually occurs soon after you or others interact with him/her in some way, such as delivering an instruction or reprimand, walking away from (ignoring) the him/her, taking away a "preferred" item, requiring him/her to change activities, talking to someone else in his/her presence, etc.
3. The behavior often is accompanied by other "emotional" responses, such as yelling or crying

Complete Part II if you answered "Yes" to item 1, 2, or 3. Skip Part II if you answered "No" to all three items in Part I.

_____ When (s)he has nothing to do _____ Other: _____

Yes No

Yes No

Yes No

Part II. Social Reinforcement

4. The behavior often occurs when he/she has not received much attention
5. When the behavior occurs, you or others usually respond by interacting with the him/her in some way (e.g., comforting statements, verbal correction or reprimand, response blocking, redirection)
6. (S)he often engages in other annoying behaviors that produce attention
7. (S)he frequently approaches you or others and/or initiates social interaction
8. The behavior rarely occurs when you give him/her lots of attention
9. The behavior often occurs when you take a particular item away from him/her or when you terminate a preferred leisure activity (If "Yes," identify: _____)

Yes No Yes No

Yes No Yes No Yes No

Yes No

10. The behavior often occurs when you inform the person that (s)he cannot have a certain item or cannot engage in a particular activity. (If "Yes," identify: _____)
11. When the behavior occurs, you often respond by giving him/her a specific item, such as a favorite toy, food, or some other item. (If "Yes," identify: _____)
12. (S)he often engages in other annoying behaviors that produce access to preferred items or activities.
13. The behavior rarely occurs during training activities or when you place other types of demands on him/her. (If "Yes," identify the activities: ___ self-care ___ academic ___ work ___ other)
14. The behavior often occurs during training activities or when asked to complete tasks.
15. (S)he often is noncompliant during training activities or when asked to complete tasks.
16. The behavior often occurs when the immediate environment is very noisy or crowded.
17. When the behavior occurs, you often respond by giving him/her brief "break from an ongoing task.
18. The behavior rarely occurs when you place few demands on him/her or when you leave him/her alone.

Part III. Nonsocial (Automatic) Reinforcement

19. The behavior occurs frequently when (s)he is alone or unoccupied
20. The behavior occurs at relatively high rates regardless of what is going on in his/her immediate surrounding environment
21. (S)he seems to have few known reinforcers or rarely engages in appropriate object manipulation or "play" behavior.
22. (S)he is generally unresponsive to social stimulation.
23. (S)he often engages in repetitive, stereotyped behaviors such as body rocking, hand or finger waving, object twirling, mouthing, etc.
24. When (s)he engages in the behavior, you and others usually respond by doing nothing (i.e., you never or rarely attend to the behavior.)
25. The behavior seems to occur in cycles. During a "high" cycle, the behavior occurs frequently and is extremely difficult to interrupt. During a "low" cycle the behavior rarely occurs.
26. The behavior seems to occur more often when the person is ill.
27. (S)he has a history of recurrent illness (e.g., ear or sinus infections, allergies, dermatitis).

Scoring Summary

Circle the items answered "Yes." If you completed only Part II, also circle items 1, 2, and 3

Yes No

Yes No Yes No Yes No

Yes No Yes No Yes No Yes No Yes No

Yes No Yes No

Yes No Yes No Yes No

Yes No

Yes No

Yes No Yes No

1 2 3 4 5 6 7 8 1 2 3 9 10 11 12 13 1 2 3 14 15 16 17 18 19 20 21 22 23 24
19 20 24 25 26 27

Likely Maintaining Variable

Social Reinforcement (attention)

Social Reinforcement (access to specific activities/items) Social Reinforcement (escape)

Automatic Reinforcement (sensory stimulation) Automatic Reinforcement (pain attenuation)

Comments/Notes: _____

Appendix C

Intervention Rating Profile – Teacher version

The purpose of this questionnaire is to obtain information that will aid in the selection of classroom interventions. Teachers of children with behavior problems will use these interventions. Please circle the number which best describes your agreement or disagreement with each statement.

Strongly Disagree Slightly Slightly Agree Strongly

Disagree

Disagree

Agree

Agree

1. This would be an acceptable intervention for the child's problem behavior.
2. Most teachers would find this intervention appropriate for behavior problems in addition to the one described.
3. This intervention should prove effective in changing in the child's problem behavior.
4. I would suggest the use of this intervention to other teachers.
5. The child's behavior problem is severe enough to warrant use of this intervention.
6. Most teachers would find this intervention

suitable for the behavior problem

described.

7. I would be willing to use this intervention
in the classroom setting.
8. This intervention would not result in negative side effects for the student.
9. This intervention would be appropriate for a variety of children.
10. This intervention is consistent with those I have used in classroom settings.
11. The intervention was a fair way to handle the child's problem behavior.
12. This intervention is reasonable for the problem behavior described.
13. I like the procedures used in this intervention.
14. This intervention was a good way to handle this child's behavior problem.
15. Overall, this intervention would be beneficial for the child.

Appendix D

Student Self-Checklist

Student:

Date:

Time/Class:

	<i>On Task:</i>	
	<i>YES</i>	<i>NO</i>
<i>1</i>		
<i>2</i>		
<i>3</i>		
<i>4</i>		
<i>5</i>		
<i>6</i>		
<i>7</i>		
<i>8</i>		
<i>9</i>		
<i>10</i>		
<i>Total</i>		

On Task:

Looking at teacher, paying attention

Raising my hand

Writing, reading my work

Asking questions, giving answers

Sitting in my seat

Check On Task "yes" or "no" each time the timer buzzes

Appendix E

Behavior Intervention Rating Profile

Intervention Rating Profile

The purpose of this questionnaire is to obtain information that will aid in the selection of classroom interventions. Teachers of children with behavior problems will use these interventions. Please circle the number which best describes your agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. The MotivAider was an acceptable intervention for the child's problem behavior.						
2. Most teachers would find the MotivAider appropriate for behavior problems in addition to the one described.						
3. The MotivAider proved effective in changing in the child's problem behavior.						
4. I would suggest the use of the MotivAider to other teachers.						
5. The child's behavior problem is severe enough to warrant use of the MotivAider.						
6. Most teachers would find the MotivAider suitable for the behavior problem described.						
7. I would be willing to use the MotivAider in the classroom setting.						
8. The MotivAider did not result in negative side effects for the student.						
9. The MotivAider would be appropriate for a variety of children.						
10. The MotivAider is consistent with interventions I have used in classroom settings.						
11. The MotivAider was a fair way to handle the child's problem behavior.						
12. The MotivAider is reasonable for the problem behavior described.						
13. I like the MotivAider used in this intervention.						
14. The MotivAider was a good way to handle this child's behavior problem.						

15. Overall, the MotivAider would be beneficial for the child.						
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Adapted from: Witt, J. C. and Elliott, S. N. (1985). Acceptability of classroom intervention strategies. In T. R. Kratochwill (Ed.), Advances in School Psychology, 4, 251-288. Mahwah, NJ: Erlbaum.



Appendix F

Child Intervention Rating Profile

Student:

Code:

Date:

	<i>I agree</i>  1	2	3	4	5	<i>I do not agree</i>  6
1. The MotivAider we used was fair.						
2. I think my teacher was too harsh on me.						
3. Using the MotivAider caused problems with my friends.						
4. There were better ways to teach me.						
5. The MotivAider could help other kids, too.						
6. I liked the MotivAider we used.						
7. Using the MotivAider helped me do better in school.						

Comments:

VITA

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