The Effects of a Self-Management Procedure on the On-Task Behavior, Academic Productivity, and Academic Accuracy of Female Students with Disabilities in a Juvenile Correctional High School Setting

DISSERTATION

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By

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Abstract

Students served in juvenile correctional school settings often arrive with histories of trauma, aversive educational experiences, low achievement, and other severe risk factors that impeded psychosocial development, educational progress, and occupational outcomes. Schools serving adjudicated youth must address a higher percentage of severe behavioral health and educational needs than schools serving other populations of youth. Rehabilitation and education are essential to mediate the social and financial dilemmas that may result if youth return to communities unprepared to meet basic societal demands. Research demonstrates that lack of essential supports can lead to recidivism.

A vast body of literature over the past thirty years has shown self-management procedures to be effective across school settings, grade levels, and disability identifications. Self-management procedures allow students with disabilities to be actively involved in their educational process and these procedures encourage independence by guiding learners away from external control and toward internal control of behavior (Prater, 1994) which is essential for guiding incarcerated students toward governing their lives more constructively (Houchins, 2001).

The present study taught high school age girls with disabilities to self-monitoring on-task behavior during independent practice of math calculation skills. Students received daily feedback regarding productivity and accuracy on assignments. Additional components included goal setting and incentives for goal attainment. A single-subject reversal design was used to evaluate effectiveness of the procedure on on-task behavior (time on-task), academic productivity (percentage of problems completed), and academic accuracy (percentage of problems completed
correctly). Results indicated that the intervention was very effective for increasing participants’ on-task behavior. A modest to moderate impact on academic productivity was noted across participants, however, outcomes for academic accuracy did not show the expected improvement. Both students and teachers found the procedure to be easy to use and teachers viewed the strategy as useful for changing students’ behavior in the classroom.
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I have so many things and people to be thankful for. I once heard a graduation commencement speech in which the speaker highlighted the fact that ‘we don’t complete our education endeavors alone’. This is a profound truth. Many people have helped me complete this educational goal.

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mental health professionals who extend much of themselves to serve and encourage growth in the very valuable young lives with which they have been entrusted.
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Chapter 1: Introduction

This chapter first presents an overview of the juvenile justice system with some pertinent demographical information. This is followed by a discussion of the educational status for female juvenile offenders and those youth with emotional and behavioral disorders, the need for self-determination skills among juveniles, and a brief review of self-management studies conducted with students who have disabilities. The chapter concludes with a statement of the purpose and need for this study and a review of the research questions.

The number of females served by the juvenile justice system has been increasing since the 1960s, and more girls are entering the system at younger ages (Gavazzi, 2006, Poe-Yamagata & Butts, 1996; OJJDP, 1998a; Siegel & Senna, 2000). A number of risk factors have been cited for female juvenile delinquency. A female is more likely to engage in delinquent activity when multiple risk factors are present; these might include (a) being raised in an impoverished environment, (b) being raised in a high crime neighborhood, (c) being identified as part of an ethnic minority group, (d) having a history of aversive educational experiences or low achievement, (e) being a victim of any form of abuse, (f) reporting a sense of discouragement and hopelessness, (g) having a history of alcohol and other drug abuse, and (h) having limited access to necessary medical and mental health treatment (OJJDP, 1998b). Further, these risk factors can potentially delay psychosocial development, as their aversive effects often emerge during the teen years particularly for teens 14 to 16 years of age. For those with unresolved traumatic experiences, various types of acting out behaviors may emerge (e.g., substance use, breaking
curfew, skipping school) (OJJDP, 1998b). This diverse array of risk factors suggests a need for collaboration between multiple systems in order to address the needs of at-risk girls. Because poor academic outcomes and a pattern of disengagement from school have been cited among the key risk factors attributed to juvenile offending (Keith & McCray, 2002), school systems have a window of opportunity to cultivate protective factors such as academic progress when youth present with various signs of at-risk status. Protective factors have been described as “individual or environmental characteristics that reduce the risk of [female] juvenile offending” (Mullis, Cornille, Mullis, & Huber, 2004, p. 210). The Office of Juvenile Justice and Delinquency Prevention (OJJDP, 1998b) identified academic progress as one of the protective factors needed to counteract risks. The question then becomes one of how educators facilitate academic progress for youth who have experienced a pattern of failure, aversive educational experiences, and gradual disengagement from school.

Description of the Juvenile Justice System

The juvenile justice system represents a continuum of placements and services for youth who have been adjudicated. Court ordered placements may include community-based residential treatment facilities, group homes, or maximum security state correctional institutions. More money and effort continue to be directed toward reactive approaches to crime rather than preventing youth from committing crimes (Greenwood, Model, Rydell & Chiesa, 1988). Financial costs associated with incarcerating increasing numbers of youth continues to rise. Cost estimates vary among states with respect to the annual cost of juvenile incarceration; however, many state governments wrestle with the imminent need to minimize costs associated with incarceration. According to a July 2010 report published by a Council of State Governments, the cost to incarcerate a youth in one state is approximately $109,000 per year which was contrasted with the expenditure for educating one youth in that same state, approximately $9,000 per year,
on average (ACLU, 2010). The figures increase exponentially when criminal activity persists into adulthood. Maintenance of the adult correctional system is estimated to cost the federal government approximately $50 billion per year (Aizenman, 2008). Preventive measures have been estimated to be far less costly than the more reactive rehabilitative approach. Greenwood, Model, Rydell, and Chiesa (1988) have argued that financial resources would be better spent on prevention efforts in the areas of education (e.g., graduation incentives for disadvantaged youth, academic intervention, tutoring programs), community resources (e.g., recreation center activities, monitoring and supervision for youth exhibiting delinquent behavior), and family support programs (e.g., training for parents of young children who have demonstrated frequent aggressive behavior, home visits by child advocate and health professionals, mentoring programs).

Delinquency and antisocial behaviors become more probable when multiple risk factors are present. Research into the multiple pathways that may lead to female juvenile delinquency (OJJDP, 1998b; Mullis, Cornille, Mullis & Huber, 2004) suggests that young girls may experience multiple aversive and traumatic events very early in life.

Educational Status for Female Juvenile Offenders and Youth with Emotional and Behavioral Disorders

Female juvenile offenders have reportedly spent less time in school, have greater academic delays, and are less prepared for job acquisition than male offenders (Timmons-Mitchell et al 1997). Other risk factors leading to aversive educational outcomes for female juvenile delinquents include (a) early onset of disruptive behavior in school, (b) expulsions, (c) frequent school changes or absences, and (d) minimal involvement in extra curricular activities (Mullis et al., 2004). Compared to females in the general population, girls entering the juvenile justice system have higher incidences of educational disabilities accompanied by a history of
frustration with school and escape behaviors such as dropping out, skipping class, or “shutting down” (American Association of University Women, as cited in OJJDP, 1998b). Additionally, some studies have noted that juvenile offenders score two or more years below grade level in reading (Finn, Scott, Zarichny, 1988; Zabel & Nigro, 2001) and math (Zabel & Nigro, 2001).

The prevalence of disabilities as defined by the Individuals with Disabilities Education Improvement Act (IDEIA) is higher for youth in the juvenile justice system than youth in the general population (Gresham, Lane, & Lambros, 2000). Prevalence estimates vary across studies, ranging from 30% to 70% for JJ settings (Casey & Keilitz, 1990; Nelson, Rutherford, & Wolford, 1996) as compared to the 10% to 12% estimate for ‘typical’ public school settings. Several studies have estimated up to 50% of these youth to be identified under the Emotional Disturbance (ED) definition of IDEIA (Murphy, 1986; Quinn, Rutherford, Leon, Osher, & Poirier, 2005). Students with emotional and behavioral disorders (EBD) experience a host of challenges that adversely impact educational and occupational attainments. According to data from the National Longitudinal Transition Study of Special Education Students (NLTS), students identified with ED often exhibit detachment from school, have grade point averages that are generally lower than that of students with other disabilities, are twice as likely to be retained in a grade at the high school level as compared to students with other disabilities, have a drop out rate of 55%, and have an average of 8.5 high school credits at the time of dropout (Wagner, 1995).

Poor school outcomes and dropping out of high school can lead to long-term economic and social difficulties (Rumberger, 1987) such as difficulty maintaining employment or a sufficient income and increased risk for participation in crime (Wagner, 1995; Wagner, 1996 a, 1996 b, Wagner 2006).

In order to function effectively in the community, delinquent youth and those who find themselves transitioning from confinement back to community settings must meet with success
and adequate progress in two critical areas: education and employment (Keith & McCray, 2002). The Office for Juvenile Justice and Delinquency Prevention (OJJDP) identified academic progress as an important protective factor needed to counteract the risk of juvenile offending (OJJDP, 1998b). Effective programs and services are critical from the time a youth first interacts with the juvenile court system to the time they are ready to exit a court appointed juvenile justice placement (residential treatment facility, detention center, or correctional facility). Without adequate intervention and post release supports, there are primarily three bleak outcomes that may impact juveniles with disabilities: drop out, underemployment, and recidivism (Keith & McCray, 2002). Hence, an important goal of correctional rehabilitation and transition services is the prevention of recidivism (i.e. an individual’s return to some level of the justice system after they have served a sentence and been released), and education is one means to accomplish this goal (Coffey & Gemignani, 1994).

While in the juvenile correctional setting, students need to build and strengthen academic skill levels, work habits, and employability skills in order to earn high school credits towards a diploma, earn a General Education Degree (GED), or complete a trade specific certification program. A strong academic program is also needed to prepare girls for postsecondary employment and education (Unruh & Bullis, 2005). Howell and Wolford (2002) offered a list of educational and instructional practices that should be used with students in juvenile justice settings who have disabilities. The approaches are based on research into effective practices for educating students with disabilities in the general population and include strategies such as behavior modification, strategy instruction, and instruction in self-management strategies.

Need for Self-Determination Skills

Diagnostic criteria for emotional and behavioral disorders suggest that individuals with such diagnoses have significant difficulty managing their own behavior. This is evidenced by
difficulty with attending to instruction (Cancio, West, & Young, 2004; Mooney, Ryan, Uhing, Reid, & Epstein 2005), failure to complete assigned tasks (Cancio et al., 2004), and use of maladaptive strategies to resolve interpersonal conflict (Dodge, Price, Bachorowski & Newman, 1990; Reid, Gonzalez, Nordness, Trout, & Epstein, 2004).

Students with disabilities need to be actively involved in the education process, assuming greater control over their own learning by using self-determination strategies such as self-assessment, self-management, problem solving, goal setting, planning, and decision making (Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000). There are several drawbacks to externally managed academic and behavioral interventions. External agents such as teachers, parents, or peers are not always available in the environments where skills need to be demonstrated and they may not observe or be aware of all behaviors that need to be addressed (Nelson, Smith, Young, & Dodd, 1991) Self-management programs teach students to acknowledge and assume responsibility for controlling, modifying, or changing their own behavior. Further, these skills help students with disabilities not only take ownership of their education but can also set them on a trajectory toward more favorable adult outcomes (Wehmeyer, Yeager, Bolding, Agran, & Hughes, 2003). Acquisition of these critical skills during the formal schooling years can increase the likelihood of later career and occupational goal attainment (Wehmeyer, et al 2003). Hence, there is a significant need for self-determination interventions that can enhance both educational and transition outcomes (Agran, Wehmeyer, Cavin, & Palmer 2008; Konrad, Fowler, Walker, Test, & Wood, 2007).
Review of Literature

*Self-Management Methods*

Self-management interventions teach students to apply behavior change strategies in order to notice, evaluate, and independently direct their behavior (Dollard, Christensen, Colucci, & Epanchin 1996; Heward, 1987; Jenson, Rhode & Reavis, 1996) with the goal of becoming more productive and improving or eliminating target behaviors that are already within a student’s repertoire (Reid, 1993; Reid & Harris, 1989). The most common self-management strategies include self-monitoring, self-evaluation (assessment), and self-instruction (Mooney et al., 2005; Nelson et al., 1991). Self-monitoring is a frequently cited technique that requires students to make an assessment or judgment (self-assessment) as to whether a behavior has or has not occurred and record (self-recording) their decision in some way (Prater, 1994). A variety of methods and tools have been applied within self-monitoring interventions to assist students with assessing and recording target behaviors or desired outcomes. These include self-graphing (Stotz, Itoi, Konrad, & Alber-Morgan, 2008; Shimabukuro, Prater, Jenkins & Edelen-Smith, 1999), self-rating scales (Gereasko-Moore, DuPaul, & White, 2007; Dalton, Martella, & Marchand-Martella, 1999; Peterson, Young, Salzberg, West, & Hill, 2006), self-monitoring forms requiring students to respond to questions about their performance by recording a quantity, checking “yes” or “no” or using tally marks to document progress (Lloyd, Bateman, Landrum, & Hallahan, 1989; Levendoski & Cartledge, 2000; Harris, Friedlander, Saddler, Frizzelle, & Graham, 2005).

The most common dependent variables in self-management studies are attention (e.g., percentage of on-task behavior during independent seatwork), academic productivity (e.g., amount of work completed), and accuracy (e.g., percent of correct math facts or spelling practices). Several studies have examined the differential effects of self-management of attention (SMA) and self-management of performance (SMP). Although some variation exists for the
degree of effectiveness between these two self-management procedures, findings generally indicate that both approaches have positive effects on academic performance variables and on-task behavior. Harris and colleagues (2005) compared the effectiveness of SMA versus SMP among elementary age students diagnosed with ADHD. Dependent variables were on-task behavior and spelling study behavior. In the SMA condition, students were asked to self-record whether they were on-task whenever a tone sounded at random intervals. In the SMP condition, students were asked to self-record the number of times they practiced spelling words correctly on a graph. In the SMA condition, students’ average on-task behavior increased from 55% to 94%. This same condition (SMA) resulted in an increase in average correct spelling practices from 38 at baseline to 114 after intervention. In the SMP condition, students’ average correct spelling practices increased from 38 at baseline to an average of 83 after intervention. The SMP condition resulted in an increase in on-task behavior from 55% to 91%. Both conditions improved on-task behavior to a similar degree. While both conditions improved correct spelling practices, the SMA intervention resulted in a slightly larger improvement than the SMP intervention. Maag, Reid, and DiGangi (1993) also considered the differential effectiveness of various self-management procedures, specifically self-management of attention, productivity, and accuracy. Participants were fourth and sixth grade students with learning disabilities and the setting was an independent math practice period. Students were taught to self-monitor attention by recording whether they were on-task at the sound of a tone. They self-monitored productivity on a separate recording sheet by marking the calculation problem they were working on when the tone occurred and recording the number of math problems completed since the last tone. In the accuracy condition, student checked completed math problems against an answer sheet each time a tone occurred and recorded the number completed correctly since the last tone. Each self-management condition led to improvement in the aspect of performance (i.e., productivity, attention, or accuracy) that it was
designed to address; however, greater gains were demonstrated under the self-monitoring of performance and self-monitoring of accuracy conditions.

Self-management interventions have commonly targeted academic outcomes in the areas of reading, math calculation, and spelling. In a review of self-management interventions for students with learning disabilities, Reid (1996) found computation of arithmetic problems to be the most frequently studied outcome measure in the investigations that included academics as dependent variables. In another review, Mooney and colleagues (2005) noted that among self-management studies which included an academic focus, half used math as an outcome measure and most of these targeted calculation skills. McDougall and Brady (1998) used a multi-component self-management package (i.e., included self-graphing, audio cues for self-recording, and self-administered reinforcement) to improve the math fluency of fourth grade students with and without disabilities. Levendoski and Cartledge (2000) used self-management cards to improve on-task behavior and the percentage of math problems completed by elementary school students identified with Serious Emotional Disturbance (SED). Cancio, West, and Young (2004) improved math homework completion (i.e., all problems attempted on the assignment) and accuracy (i.e. percentage of calculation problems correct on the homework assignment) of middle school students identified with EBD. The self-management procedure included parent participation and required students to record the time needed to complete homework assignments and to match their own questionnaire ratings to a parent’s ratings. Incentives were offered for accurate matching.

Self-Management Interventions with High Incidence Disabilities

Self-management strategies have been applied to the needs of students with a variety of disability identifications. Individuals with high incidence disabilities have experienced academic and behavioral gains following the application of self-management techniques. Barry and Messer
(2003) demonstrated that students diagnosed with attention deficit hyperactivity disorder (ADHD) could increase on-task behavior and academic productivity while decreasing disruptive behavior when taught self-management techniques. Sixth grade students were taught to self-record on-task behavior and disruptive behavior in 15 minute intervals across an entire school day. They also self-recorded whether any assignments were completed within 15 minute intervals across the school day. Davies and Witt (2000) found self-management, peer monitoring strategies, and group contingencies to significantly decrease inappropriate verbalizations of third grade students with ADHD. Students used individual recording sheets to keep record of behaviors daily. As a group, all engaged in moving tokens (i.e., dots) on a group contingency chart when desired target behaviors were exhibited. Shumabukuro, Prater, Jenkins, and Edelen-Smith (1999) taught sixth and seventh grade students with both a learning disability (LD) and an attention deficit hyperactivity disorder (ADHD) diagnoses to self-monitor academic productivity and academic accuracy during reading, writing, and math instruction periods. Students self-recorded their assignment completion and accuracy rates following ten to fifteen minute independent practice activities in each subject area. Positive results were attained for academic productivity, academic accuracy, and on-task behavior for all participants. In another investigation, students with LD were instructed in the use of a self-management procedure that included use of a checklist, behavior rating scale, and self-monitoring form. This procedure led to decreases in off-task behavior in general education and study hall class periods (Dhalton, Martella, & Marchand-Martella, 1999). Snyder and Bambara (1997) taught secondary students in grades seven and eight with LD to self-monitor “classroom survival skills.” Students used checklists to self-monitor several skills including having materials required for class, submitting homework, and being in seat ready to begin instruction at the start of class. This procedure led to increased preparedness in both general education and special education classes.
Self-Management Interventions with Low Incidence Disabilities

Students with low incidence conditions such as Cognitive Disabilities, Autism, and Serious Emotional Disturbance have also experienced improved behavior and academic skills when these students applied self-management inventions. Wehmeyer et al. (2003) taught students with developmental disabilities including MR/DD and autism in grades seven through nine to self-monitor individualized behavioral goals. Students used picture cards or checklists to monitor target behaviors. This multi-component self-regulation intervention led to increased class participation (e.g. on-task behavior and listening skills) and decreased problem behaviors (e.g. inappropriate touching, inappropriate verbalizations, and other disruptive behavior) in a general education setting. Thiemann and Goldstein (2001) used picture cues, social stories and self-monitoring with videotaped feedback to improve the social communication of children with autism and social skill deficits. Improvements were noted for recruiting attention, initiating comments, making requests and contingency responses. Newman, Reinecke, and Meinberg (2000) intervened with one preschool age and two early elementary age students with autism who were functioning in the mild MR range. Restricted behavior patterns were targeted for change. Discrete trial teaching was used to encourage varied responses. Each student was offered ten opportunities (trials) to respond to verbal prompts encouraging them to vary their responding. Praise and tokens were available for appropriate responding. Results indicated that the three students demonstrated increased variation for three target behaviors: varied verbal responding, varied drawings and color use, and varied imaginary activities during play with a toy robot.

Self-Management and Students with EBD

Based on reviews of the self-management literature, Mooney, Ryan, Uhing, Reid and Epstein (2005) found self-management interventions to yield positive academic results for students with serious emotional disturbance (SED). Self-management interventions have also
been noted to have positive effects on their behavior (Nelson et al. 1991; Webber, Scheuermann, McCall, Coleman, 1993) and their social skills (Moore, 1995; Warrenfeltz, 1981; Kern, Wacker, Mace, Falk, Dunlap & Kromrey, 1995) of students with EBD. Self-monitoring is by far the most frequently cited technique in those investigations designed to intervene with students with SED (Mooney et al., 2005). Carr and Punzo (1993) implemented a self-monitoring procedure with three adolescent students identified with EBD across three academic subjects including reading, math, and spelling. Students self-monitored academic accuracy and academic productivity by self-recording the amount of items given, amount of items completed, and amount completed correctly in reading and math. They also self-recorded the number of spelling practices and number of words written correctly. On-task behavior was documented only by the classroom teacher. Intervention resulted in significant increases in average academic accuracy and moderate increases in productivity and on-task behavior. Lloyd, Bateman, Landrum, and Hallahan (1989) considered the relative effects of self-recording attention versus academic productivity for upper elementary age students identified with EBD and/or LD. To self-monitor attention, students self-recorded whether they were attending to an assignment when they heard a tone. Productivity was self-recorded at each tone by marking the problem they were working on and counting the number of problems completed. Both procedures resulted in improved attention and productivity, however, self-recording of attention led to slightly better outcomes. Hutchinson, Murdock, Williamson, and Cronin (2000) implemented a self-management intervention combined with verbal praise, points and incentives to reduce the off-task behaviors of a first grade student with SED. This student self-recorded his behavior on a self-recording page structured as a note home to his guardian, entitled “I am a Great Kid!”. This procedure led to a decrease in his latency for initiating a reading task, a decrease in disruptive behavior (e.g. talk outs, inappropriate touch), and an increase in on-task behavior. In another study, Levendoski and Cartledge (2000) found
that when elementary age students with SED were taught a new math skill then given twenty minutes to complete a math worksheet while simultaneously using individualized cards to self-record on-task behavior, they demonstrated increases in both on-task behavior and academic productivity (i.e., number of math problems completed correctly).

Statement of the Problem

There are few published studies on the application of academic interventions within juvenile correctional school settings. While self-management and self-control strategies addressing behavior and mental health problems have been applied within juvenile correctional settings (Hensley, Tung, & Gray-Ray, 1999; Houchins, 2001), only one study investigating a self-management intervention in a correctional school setting that was conducted three decades ago was located. Marshall & Heward (1979) conducted a self-management intervention at the Buckeye Youth Center, which was a juvenile reformatory in Ohio created to address the rehabilitation needs of adjudicated boys. Eight male students were taught principles of self-management and were required to complete a self-management project on a personally chosen target behavior. Self-management lessons were delivered via a Visual Response System (VRS) classroom. The VRS classroom was intended to increase teacher-student interaction and student participation in lessons. This classroom included desks with built in projectors which projected student responses on a wall or screen behind them. This allowed for simultaneous student responses to any question posed by the teacher. The self-management curriculum included thirteen lessons on topics such as defining, measuring, recording, and graphing target behaviors. Results indicated that all participants were able to successfully modify the target behaviors they initially selected for change. There is a clear need to investigate the effectiveness of self-management strategies on desired academic and behavioral outcomes for students in juvenile
correctional classroom settings. There were no studies that explored the use of self-management procedures for improving behaviors and academic performance for girls. A wide base of self-management studies have been conducted over the last 30 years offering much needed guidance on strategies that may be effectively applied when working with girls who are served in juvenile correctional facilities.

Purpose of Study

The purpose of this study was to explore the effects of self-monitoring on the academic productivity and on-task behavior of high school females who were placed at a juvenile correctional facility and were diagnosed with mental health disabilities (based on Diagnostic and Statistical Manual for Mental Disorders –Forth Edition – Text Revision (DSM-IV-TR) criteria) and disabilities defined by the Individuals with Disabilities Education Improvement Act (IDEIA 2004). The self-monitoring procedure was designed to assess on-task behavior, academic productivity, and academic accuracy during independent work periods in the students’ math class. A reversal design was employed with three students over the course of two school terms. This study was conducted in an attempt to replicate and extend the findings of a previous investigation (Levendoski & Cartledge, 2000) that considered the effects of a self-monitoring procedure used with elementary school students who had IDEA identifications of Serious Emotional Disturbance (SED) (currently termed Emotional Disturbance). These researchers employed a single-subject reversal design with a fading condition (A-B-A-B-C) to investigate the effects of a self-monitoring procedure on students’ attention and academic productivity. Four boys with EBD participated in daily practice of math calculation problems following math instruction. A different set of math worksheets was distributed daily to reflect newly taught concepts and were developed at each student’s instructional level. Students were able to request and receive assistance while they worked. Practice sessions were 20 minutes in duration and students
completed self-monitoring cards while working. Self-monitoring cards contained the question, “At this exact second, am I doing my work?” Students checked a box to indicate a response of “yes” or “no” when a bell sounded at 10 minute intervals.

Replication, Extension, and Contribution to the Literature

This investigation replicates the work of Levendoski and Cartledge (2000) in several ways. Both studies (a) accessed a population of students with EBD, (b) utilized similar self-monitoring cards to teach self-recording of on-task and off-task behavior, (c) implemented the strategy during independent math practice periods, (d) considered similar dependent variables of time on-task and percentage of math problems completed correctly (termed “academic productivity” in the former study and termed “academic accuracy” in the current study), and (e) utilized an A-B-A-B-C single-subject design. Unlike the former study, the current investigation did not focus on newly learned material, and students did not receive assistance while they worked independently.

This study represents several extensions to the work of Levendoski and Cartledge (2000). Both of these studies involved implementation with students identified with EBD; however, this study extended the findings of the previous study by exploring the effects of the self-management procedure with older students, high school age. This facet also represented a contribution to the literature based due to the fact that most self-management studies for students with disabilities have included elementary school age participants (Webber et al., 1993; Reid, 1996; Reid, Trout, Schartz, 2005; Mooney et al., 2005). This study represented an extension in terms of setting; the Levendoski and Cartledge (2000) investigation was implemented in a self-contained classroom of an elementary school. This study was implemented in a maximum security juvenile correctional facility. Another extension pertained to the inclusion of only female participants. The Levendoski and Cartledge (2000) study included only male participants.
Several other elements were added to this study. In addition to percentage of on-task behavior and percentage of problems completed correctly (termed “academic accuracy” in the current study), percentage of problems completed (termed “academic productivity” in the current study) was added as an outcome measure. Also, the self-monitoring strategy included an opportunity for students to reflect on and record how they felt each day and whether they were encountering any particular distractions. Specifically, a self-management component that encouraged students to set aside or compartmentalize their personal problems, conflicts or other concerns during class time was added. In the realm of social functioning, girls in this setting frequently experience peer or other conflicts that carry over into the school setting. They have been observed to discuss and perseverate on interpersonal conflicts during instructional time and have shown a need for frequent prompting to remain engaged with instruction and assignments.

This study also included performance feedback, goal setting, and reinforcement components. Providing students support with individual goal setting and feedback shortly after task performance supports achievement and may serve as a motivator (Madden, 1997). Based on a review of empirical studies, Locke and Latham (1984) reported that goal setting encourages persistence and application of novel strategies which enhance task performance. Studies also show that students with disabilities may increase academic productivity when self-management intervention includes a goal setting component (Konrad et al., 2007). Reinforcement in the form of incentives may be added to increase the probability that a desired behavior will occur (Gardner & Cole, 1988; Lloyd & Hillard, 1989; Reid et. al. 2005; Truhlicka, 1983). In the realm of academic functioning, students in this setting have been observed to verbally express displeasure with academic tasks that are challenging, perceived to be boring, or perceived to be of no direct or personal benefit. Such complaints may take the form of refusal to complete a task, telling a teacher why they will not complete an assigned task, using inappropriate language toward the
individual asking them to complete work (usually the teacher), or engaging in disruptive behaviors that affect the learning and work of others or results in temporary removal from the classroom which allows escape from the academic task at hand. For these reasons, students were provided with progress feedback, assistance with personal goal setting, and rewards for goal attainment (i.e., incentives for achieving on-task behavior, math product, and recording accuracy goals).

This study offers several contributions to the literature. Although self-management interventions have been conducted across a wide variety of settings (Reid et. al., 2005; Reid, 1996; Webber, 1993), only one study completed three decades ago was located whereby a self-management intervention was conducted in a juvenile correctional school setting (Marshall & Heward, 1979). Thus, the current investigation represented a contribution to the literature due to the unique setting, a state juvenile correctional facility. In addition to a lack of self-management studies in this setting, research on students with special needs in correctional education settings is equally limited. Howell & Wolford (2002) noted that “while there is considerable literature on correctional / juvenile justice education and on effective educational practices for youth with disabilities, there is little on effective practices for youth with disabilities within correctional / juvenile justice settings” (p. 1).

A final contribution to the literature was in the area of gender. Earlier studies exploring the effects of self-management among students with emotional and behavior problems have included more males than females (Webber et al., 1993; Reid et. al., 2005) and have included only boys who were placed in a juvenile correctional facility (Marshall & Heward, 1979). Mooney and colleagues (2005) conducted a review of self-management interventions for students with EBD and noted that among the twenty-two studies that met criteria for the review, six
studies included both male and female participants and none of the studies included a participant pool of females only. This investigation was conducted with three female participants with EBD.

Research Questions

The following research questions guided the current study.

1. What effects did a self-management package have on the on-task behavior (percentage of time on task) of female juvenile residents during independent practice with math facts?
2. What effects did a self-management package have on the on-task (percentage of time on task) behavior of female juvenile residents after the self-management package was faded?
3. What effects did the self-management package have on the percentage of math problems completed (academic productivity)?
4. What effects did the self-management package have on the percentage of math problems completed after the self-management package was faded?
5. What effects did the self-management package have on the percentage of problems completed accurately (academic accuracy)?
6. What effects did the self-management package have on the percentage of math problems completed accurately after the self-management package was faded?
7. To what extent did participants and teachers report satisfaction with the self-monitoring procedure?
Chapter 2: Literature Review

This chapter reviews the literature on (a) girls in the juvenile justice system, with attention to demographics and risk factors; (b) special education for youth in the juvenile justice system including education issues for girls with disabilities and youth with emotional and behavioral disorders; and (c) self-management intervention strategies as applied among students with low incidence disabilities and those with high incidence disabilities.

Girls in the Juvenile Justice System

The juvenile justice system represents a continuum of placements and services for youth who have been adjudicated. Court ordered placements may include community-based residential treatment facilities, group homes, or maximum security correctional institutions. Youth often enter this system after multiple attempts to remedy problems through traditional avenues (e.g. warnings, mediation, family intervention) have occurred.

Delinquency can in part be defined as a deviation in normal child and adolescent development (Wenar & Kerig, 2006). Research suggests that girls are more vulnerable to delinquent acts when multiple risk factors outweigh protective factors. There is some indication that girls enter the JJ system with more significant mental health needs than their male counterparts; they may also exit this system at-risk for more adverse outcomes than their male counterparts. Although there is a vast amount of literature on youthful offenders, nationwide
statistics can be difficult to aggregate because there is neither a centralized data collection entity nor a national data collection protocol for obtaining demographics on this population.

Rates of offending and interaction with the juvenile justice system. The number of females served by the juvenile justice (JJ) system has increased since the 1960’s, and girls continue to enter the system at younger ages (Gavazzi & Chesney-Lind, 2006; Poe-Yamagata & Butts, 1996; Siegel & Senna, 2000; OJJDP, 1998a). The Office for Juvenile Justice and Delinquency Prevention (OJJDP) online statistical data indicated that the number of female juvenile cases handled by U.S. courts in 1985 was 223,100. This number steadily rose to 448,900 in 2007 which was more than a 100% increase. However, females are incarcerated at much lower rates than males, representing between 25% to 30% of the total number of youth in the JJ system (Snyder & Sickmund, 2006). One longitudinal study resulted in data which showed a majority of females who had interactions with law enforcement to have either one or no arrests while males in the study were more likely to have multiple arrests (Kalb & Williams, 2003). Data indicate that female offenders commit more status offenses (e.g. shop lifting and running away from home) than criminal offenses (Siegel & Senna, 2000) as compared to juvenile males. Status offenses refer to acts that are illegal if committed by a juvenile but not illegal if committed by an adult.

Risk factors. Risk factors in isolation are not typically linked to delinquent and antisocial behavior. When multiple risk factors are present in a youth’s life, there is a greater chance that youth may engage in delinquent and antisocial behaviors. All people have some degree of risk in their backgrounds that may increase the likelihood for any number of possible adverse events. Many youth are able to thrive through aversive circumstances when certain assets or protective factors exist in their lives or environments. Protective factors are “individual or environmental characteristics that reduce the possibility of [female] juvenile offending” (Mullins et al., 2004, p.
The OJJDP (1998b) has listed some of the protective factors that girls need to counteract risks: (a) physical safety and adequate health care, (b) positive relationships with adults who can offer love and trust in healthy ways, (c) positive female role models to mediate identity development, (d) need to learn accurate information regarding sexual development, (e) connection to positive groups and activities that foster a sense of belonging and pride, (f) prosocial skills and competence, and (g) academic progress.

Many girls overcome and experience resilience despite the presence of multiple risk factors and the probability that adverse outcomes will occur, are likely a function of the type, duration, frequency, and severity of these risk factors (Christle, Nelson, Jolivette, 2002). Also, the impact of risk factors may depend on when they occur in a child’s development. Examples of risk factors include poverty, familial history of incarceration, substance use, and non-intact families.

More research is emerging which examines the multiple pathways that may lead to juvenile delinquency among girls (OJJDP, 1998b, Mullins et al. 2004). This perspective is grounded in an ecological framework which suggests that both environmental context and within child variables interact in a complex way to create conditions leading up to a youth’s incarceration (Mullins et al., 2004).

Some researchers have considered how current research on female juvenile delinquents, female drug users, and females who have been abused might apply to the population described as female juvenile offenders since youth in these groups exhibit some of the same core characteristics or background factors. Some of the common risk factors that have been identified for female juvenile offenders include: an average age between 14 years and 16 years, raised in an impoverished environment, raised in a high crime neighborhood, identified as part of an ethnic minority group, history of aversive educational experiences including low achievement, victim of
any form of abuse, likely to report a sense of discouragement and hopelessness, history of alcohol and other drug abuse, and limited access to necessary medical and mental health treatment (OJJDP, 1998b). These risk factors can potentially delay psychosocial development, and the effects often emerge during the teen years. For those with unresolved traumatic experiences, various types of acting out or delinquent behaviors may emerge (e.g., unsafe sexual practices, increased drug use, breaking curfew, skipping school) (OJJDP, 1998b).

Because adolescent females develop differently and have unique needs from adolescent males, they likely have some gender specific factors that set them on a course toward delinquency (OJJDP, 1998b ). Researchers have considered pathways to female delinquency in the development of good predictive models which have strong implications for prevention with this population. Early prediction and intervention can reduce the number of female juvenile delinquents caught in a pattern of offending and long-term antisocial behavior.

One predictive model sets forth an early–onset trajectory which has been described by Patterson, Forgath, & Stoolmiller (1998) as a path that starts with antisocial behavior in childhood and leads to illegal activity and arrest during adolescence. Early onset-offenders may develop a chronic pattern of offending throughout the adolescent years.

Leve and Chamberlain (2004) investigated whether girls might have early-onset risk factors which could predict delinquency and antisocial patterns. Researchers worked with a sample of 62 girls with significant delinquent behaviors who were being served by the Oregon Youth Authority (Oregon’s State Juvenile Corrections Agency). Researchers examined child and family variables and found that low IQ, family transitions (i.e., number of changes of adults living in the home), and natural parent criminality may be strong indicators for early-onset delinquency. A frequency distribution for the sample showed 71% of the girls had a first arrest
before age fourteen and 23% before age eleven, suggesting there could be a group of girls for whom certain child and family factors would predict early delinquency.

A different set of predictive factors were presented by Funk (1999) who studied models used to predict offending risk and recidivism for both males and females. Using statistics from a sample of juveniles referred to the courts in 1993 in a southeast state, this researcher began examining data in 1996. Only youth placed on probation or referred to the state department of juvenile justice were considered in the data analysis. For females predictive factors included: number of past offenses against other persons, running away from home, and child abuse. Funk (1999) reported that prior placement in a detention facility was the only predictive factor that females had in common with males. Early onset antisocial and delinquent behavior appeared to be an indicator of more severe future offending for both groups (Arllen, Gable & Hendrickson, 1994; Mullis, 2004; Reilly, 1999).

Silverhorn and Frick (1999) took a different position on the development of antisocial behavior for girls, one of a delayed or late-onset trajectory in which antisocial behavior develops in late adolescence. They hypothesized that girls show a delay in antisocial behavior due to strong socialization forces that encourage less aggressive and more internalizing expressions of feelings and behavior.

Socioeconomic status. Poverty is a significant risk factor for female juvenile delinquency. The American Civil Liberties Union (ACLU) prepared a Human Rights Watch Fact Sheet which compared JJ national statistics to data obtained from the New York State Office for Children and Family Services (OCFS) Division of Rehabilitative Services. In terms of poverty, it was noted that in 2004, 63% of all children sent to the New York State OCFS for placement in a JJ residential setting were from New York City, with the majority of these youth being from two of the poorest NYC counties (i.e., Bronx and Kings). Studies throughout the 1990’s revealed that
a significant proportion of female offenders became female heads of households with the associated economic disadvantages (McCabe, Lansing, Garland, Hough, 2002; OJJDP, 1998b). Poverty can affect the lives of their children through substandard housing, inadequate health care, poor nutrition and unmet supervision or emotional needs due to stresses on the single parent (Katcoski & Katcoski, 1996). Academic and school failure is common, often resulting in lack of adequate employment opportunities.

**Ethnicity.** Ethnic minorities are incarcerated in disproportionate numbers (Snyder & Sickmund, 2006). According to the 2006 OJJDP National Report (Snyder & Sickmund, 2006), a majority of females in the JJ system were ethnic minorities. When considering all juveniles in the JJ system, as of 2003, 61% were ethnic minorities and 39% Caucasian. The proportions for females were (45%) African-American, (35%) Caucasian, (15%) Hispanic, and (1%) Asian. Kalb and Williams (2003) analyzed data from the Delinquency in a Birth Cohort II Study, a longitudinal study of men and women born in Philadelphia in 1958. The study tracked individuals who had interaction with the juvenile justice system, and the study concluded in 1988. Kalb and Williams (2003) found that non-white girls were more likely to be arrested than white females among this cohort. Additionally, minority females who can be described as poor or addicted to a substance were often incarcerated rather than being assigned to treatment (Sarri,1983). Approximately 70% of cases with Caucasian females are dismissed compared to 30% of cases with African-American females (Mapson, 2005).

**Family background and parenting.** McCabe (2002) noted that some female juvenile offenders have backgrounds with characteristic breakdowns in the parent-child relationship such as intense conflict and neglectful or inconsistent parenting practices. Patterson, DeBaryshe and Ramsey (1989) considered development of antisocial behavior and reported that families who use aversive and highly punitive approaches rather than resolving conflicts using problem-solving
strategies may encourage children to apply maladaptive approaches to conflicts outside the home. Studies suggest that living with both parents decreases the probability of involvement in crime. Studies also indicate that delinquency among both genders increased as a function of how many hours a mother worked outside the home, however, this finding may be related to the amount of time a mother had available to supervise youth activities (Comanor & Phillips, 1998; and Hirschi, 1969; Levitt & Lochner, 2001). Debates still surround the topic of whether high parental control or absence of adequate control over adolescent activities leads to increases in delinquent behavior (Kratcoski & Kratcoki, 1996).

Abuse. Females experience more instances of sexual abuse (Chesney-Lind, 1987; McCabe et al., 2002). U.S. Department of Health and Human Services (1996) data indicated that girls were three times more likely to have a history of sexual abuse as compared to boys. Female delinquency has also been associated with early sexual experimentation which may be a form of self-abuse (Acoca, 1999). Calhoun, Jurgens, and Chen (1993) reported that among the female juvenile delinquent population, approximately 70% have been sexually abused; this statistic may be higher for those inside correctional or detention facilities. In comparison to males, sexual abuse for girls tends to begin at an earlier age and persist over a longer time frame (Snyder & Sickmund, 2006). Physical and sexual abuse have been noted to have detrimental effects on the psychosocial, physical and emotional well being of female adolescents. The effects can be profound and pervasive resulting in problems with self-concept, peer and adult relationships, academic achievement, self-efficacy, vulnerability to future victimization and abusive relationships (Miller & Trapani, 1995; Siegel & Senna, 2000), self injurious behavior, suicidal ideation or attempts, and increased criminal activity (Widom, 2001). Additionally, abuse and trauma may result in certain “survival reactions” (maladaptive behaviors) and acting out which are used as a means to protect oneself (Chesney-Lind, 1997 & Chesney-Lind, & Sheldon, 2003).
**Substance use.** Delinquency has been associated with illegal drug use (Dishion, McCord, Francois, 1999). A high proportion of incarcerated youth reported a history of using multiple substances, and it is not uncommon for them to have used a substance just prior to committing an act of delinquency. It has been suggested that female adolescents have different motives than male adolescents for using alcohol and drugs (Miller & Trapani, 1995), with less tendency to use as a status symbol. However, adolescent girls may also use substances for reasons similar to males, for example, to cope with stressors, improve mood, boost confidence or lower inhibitions. They experience the harmful effects of substance use at a more rapid rate than males and with smaller amounts of a given substance (Substance Abuse and Mental Health Administration (SAMHA) website). Girls who abuse substances are more likely to have co-occurring mental health disorders and are more likely to enter treatment earlier than boys. It is estimated that girls are referred to the JJ system for substance treatment at a rate of 39% and boys at a rate of 55% (SAMHA website). For students with educational disabilities, the effects of substance abuse can further complicate the expression and management of a disability (Osher, Rouse, Quinn, Kandiziora, & Woodruff, 2002). In a study of juvenile delinquency and youth with learning disabilities (LD), Keilitz and Dunivant (1987) found that youth with LD self-reported higher marijuana and alcohol use and higher rates of adjudication as compared to youth without LD.

**Peers.** In the area of peer relationships, females who offend later in the adolescent years may have exhibited behaviors that alienated peers and caused rejection (Katz, 2000). Some girls may seek out relationships with peers or gangs (Walker- Barnes & Mason, 2001) who display antisocial behavior which increases the likelihood of engaging in delinquent behavior (Enes & Bogt, 2001). Youth with chronic delinquency problems are likely to associate with mostly delinquent peers and few if any non-delinquent peers (Haynie, 2002). Some girls steeped in a sense of hopelessness may be drawn to involvement in gangs to secure a sense of belonging and
safety (Bjerregaard & Smith, 1993; Molido 1996). However, far from offering a safe haven, girls in gangs are often at even greater risk for self-destructive behaviors and exploitation by male gang members who have used them for sex or as weapon carriers (Kratcoski & Kratcoski, 1996). Gravitation toward male gangs seemed especially popular during the 1980’s. Exclusively girl gangs increased in the 1990’s, with female gangs numbering approximately seven thousand members across 27 cities, as of 1991 (Howell, 1994). Female offenders have more intense problems with developing the autonomy and confidence needed to make healthy personal choices such as seeking support. This may increase the likelihood of referral to the JJ system (Miller & Trapani, 1995). Thus, female offenders seem to need significant levels of support and guidance with making constructive choices (Grobe, Niles, and Weisstein, 2001).

Mental health status. Research indicates that female adolescent development differs from that of males. Females in general experience more depression and lower self-esteem during adolescence, whereas the self-esteem of boys tends to improve during this developmental period (Unruh & Bullis, 2005).

As female juvenile delinquents cope with multiple risk factors and adverse life circumstances (OJJDP, 1998b), mental health problems are likely to surface. These girls experience higher rates of mental illness when compared to other girls in general and when compared to juvenile male offenders specifically (Steinberg & Avenevoli, 2000). An estimated 84% of juvenile female offenders are diagnosed with mental health disorders compared to an estimated 27% of their male counterparts (Timmons-Mitchell et al., 1997). An Illinois based study using structured interviews found that 75% of female offenders, and approximately 66% of male offenders met diagnostic criteria for a DSM diagnosis (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002).
A large number of females in the JJ system enter with mental health problems including, post traumatic stress disorder and substance abuse (Snyder & Sickmund, 2006). Other research supports the contention that juvenile female offenders present more often with major depression (Rutter, 1986), anxiety disorders including post traumatic stress disorder (PTSD) personality disorders and somatic problems (Ulzen & Hamilton, 1998). Cauffman, Feldman, Waterman, & Steiner (1998) found females incarcerated in the California Youth Authority Ventura School to be diagnosed with PTSD at two times the rate of males in this same setting. In comparison to males, adolescent females exhibit more suicide attempts (Block, 1990; McCabe et al. 2002). McCabe, Lansing, Garland, & Hough (2002), completed interviews with adjudicated juvenile males and females in San Diego to examine gender differences in psychopathology. Girls reported three times the level of PTSD symptoms as compared to boys; they also reported higher rates of abuse, neglect, and family histories of mental illness. These authors also theorized that delinquent girls experience more severe risk factors and mental illness than their male counterparts; and further, that girls may not develop delinquency until risk factors and aversive circumstances are at much higher levels than they would be for boys who engage in delinquent behavior.

Females reportedly experience higher rates of comorbidity than males (Mapson, 2005). One comorbidity study indicated that 58% of juvenile males and 82% of females had multiple DSM disorders (Ulzen et al., 1998). Another study indicated that 99% of females and 69% of males with mental health disorders presented with comorbid conditions (Randall, Henggeler, Pickrel, & Brondio, 1999).

School performance of girls in the JJ System. Female offenders have reportedly spent less time in school, have greater academic delays and are less prepared for job acquisition than males (Timmons-Mitchell et al., 1997). Other school based risk factors that might be associated with female juvenile delinquents include: early onset of disruptive behavior in school, expulsions,
frequent school changes or absences, and minimal involvement in extracurricular activities (Mullis et al., 2004). Compared to females in the general population, girls entering the JJ system have higher incidences of educational disabilities accompanied by histories of frustration with school and escape behaviors such as dropping out, skipping class, or “shutting down” (American Association of University Women, as cited in OJJDP, 1998b).

Some studies have examined the cognitive and academic skills of juvenile offenders, however, data is typically inclusive of both genders. Zabel and Nigro (2007) reported that juvenile offenders are typically below average on cognitive measures. In the academic domain, one study reported an average reading level for juveniles in correctional facilities to be at approximately a fourth grade level (Brunner, 1993). Other researchers found a group of juvenile offenders to have average reading and math scores that were at least two years below grade level for non special education students, while those receiving special education services were reported to perform at even lower levels (Zabel & Nigro, 2001). Finn, Stott and Zarichny (1988) studied a data set representing a sample of 104 juvenile offenders from the Buffalo New York area who were referred by family court to a local mental health clinic for services in 1985. The sample included males (n=68), females (n=36), and ethnic groups identified as White (67%), Black (28%), and other (5%). Investigators found 43% of these youth to be two years below grade level in reading, 23% to have special education needs, and 45% who had experienced a grade retention. Emerging literature on reading intervention suggests that improving reading skills of juvenile offenders may be a contributing protective factor for youth who choose to desist or discontinue criminal activity (Keith & McCray, 2002).

The numbers of juveniles who return to school and go on to graduate after release are staggeringly low. A Washington study found 21% of youth were back in school within six months (Webb & Maddox, 1986) and a Wisconsin study found that only 1.6% of youth reentered
school and graduated (Haberman & Quinn, 1986). Youth with disabilities are even more likely to drop out of school when they return to the community (Brier, 1995).

Summary

As previously discussed, studies highlighting the needs of female delinquents indicate that these youths experience increased rates of sexual abuse, running away to escape abuse, teenage pregnancy, single parenthood (Schwartz & Orlando, 1991), more significant mental health concerns (Steinberg & Avenevoli, 2000; Unruh & Bullis, 2005), and weaker educational and employment outcomes than delinquent males (Timmons-Mitchell, et.al., 1997).

Because adolescent females have unique needs compared to adolescent males, juvenile justice settings should be geared toward meeting their unique needs. Much of the research conducted on juvenile offenders has used male subjects (Miller & Tapani, 1995) with findings being applied to the shaping of services for females. As noted above, the number of girls entering the JJ system is increasing (OJJDP, 1998b), yet the overall number of female offenders represents a smaller proportion of incarcerated youth in comparison to males (OJJDP, 1998b). Historically there has been less research and fewer gender specific inquiries to address intervention for girls in this population. Bloom and Covington (2001) suggested that gender responsive programming involves “creating an environment through site selection, staff selection, program development, and content and material that reflects an understanding of the realities of girls’ lives and is responsive to their needs and strengths” (p.11).

The importance of understanding girls’ needs and finding efficacious practices is of paramount importance for reducing interactions with the JJ system through appropriate prevention and intervention programs. This is considered of great interest to the public as “everyone pays the price for female juvenile crime directly or indirectly” (Mullis et. al. 2004, p. 215).
Special Education and Juveniles

*Emotional and Behavioral Disorders (EBD).* The federal and state statutes pertaining to the education of students with disabilities and specifically the education of students with Emotional and Behavioral Disorders (EBD) continue to evolve. The Emotional Disturbance (ED; previously termed Serious Emotional Disturbance, SED) identification under Individuals with Disabilities Education Improvement Act (IDEIA) 2004 is applicable to students who experience behavioral, emotional, or social problems that adversely affect their educational performance. ED as defined by IDEIA 2004 is based on five criteria and three qualifiers. In order to be eligible for special education services, one of the criteria and all three qualifiers must be satisfied. The five criteria include (a) an inability to learn which cannot be explained by intellectual, sensory, or health factors; (b) an inability to build or maintain satisfactory interpersonal relationships with peers or adults, (c) inappropriate types of behavior or feelings under normal circumstances, (d) a general or pervasive mood of unhappiness or depression, and (e) a tendency to develop physical symptoms or fears associated with personal or school problems. The three qualifiers indicate that the condition must exist to a significant degree, must have existed for a long period of time, and it must adversely affect educational performance. Whether students have an ED identification or some other DSM-IV-TR diagnosis, the characteristics of their condition often impair their ability to succeed in school and the community to a significant degree (Reid et. al., 2004). Numerous studies have been conducted in an attempt to describe the educational and community functioning of students with EBD. Several of those investigations are detailed in this section.

Emotional and behavioral disorders (EBD) can eventually lead to academic problems for children of all ages. Studies have shown that students of all ages with EBD consistently perform lower than same age peers across academic domains (Greenbaum et al., 1996; Trout et al. 2003; Mattison et al., 1998). Mattison, Spitznagel, and Felix (1998) studied a group of youth ages nine
to seventeen years who were identified as (S)ED and were being served in residential placements across six states. Academic status for this sample indicated that 58% were below grade level for reading and 93% were below expectancy for math. Also, the mean cognitive ability score was in the low average range.

Nelson, Benner, Lane, and Smith (2004) studied the academic achievement of kindergarten through twelfth grade students with EBD in a Midwest urban school district, specifically looking at age and gender differences. They also considered the type and degree of behavior problems as they related to specific academic problems. In order to measure and compare this sample’s achievement to a norm group, the Achenbach Child Behavior Checklist (TRF) and Woodcock–Johnson Tests of Achievement (WJ-III) were used as outcome measures. Findings indicated that when comparing the academic deficits of this group of children and adolescents, adolescents exhibited more math achievement deficits than children. Findings suggested that reading and writing deficits of students with EBD remained stable over time whereas math deficits appear to increase. Nelson and colleagues (2004) further suggested that the observed decrease in math achievement for older students may be related to a tendency to place EBD students in functional curriculums which would hinder development of the kind of higher level math skills assessed on norm-referenced math tests. Another finding indicated that externalizing problems had a stronger relationship to achievement deficits than internalizing problems. According to teacher behavior ratings on the TRF, the narrow band scales of Aggression, Delinquent, Behavior, and Attention Problems were correlated with deficits in reading, writing and math (as measured by the WJ-III). For the gender variable, results indicated no significant difference between the achievement deficits of boys and girls with EBD.

The notion that externalizing problems have a greater impact on achievement than behaviors of an internalizing nature was supported by another study that considered a sample of
children ages 7 years to 14 years diagnosed with depression (n=15) and schizophrenia (n=14) (Hamilton, Asarnow, & Tompson, 1997) Researchers analyzed data along several variables including diagnosis, social and behavioral competence, academic performance and various family interaction variables. Results revealed fairly good academic performance but poor social functioning among the children with depression diagnoses. For these children, behavioral ratings were slightly higher for internalizing than externalizing problems. Additionally, depression generally falls within the realm of internalizing symptoms, thus an implication could be that EBDs characterized by externalizing behaviors have more adverse effects on academic performance.

Anderson, Kutash, and Duchnowski (2001) conducted a longitudinal study to compare the academic progress of students with Emotional and Behavioral Disorders (EBD) and Learning Disabilities (LD) over a five year period. Participants were 79% male and 21% female. The ethnic breakdown was 66% Caucasian and 34% African-American. The study was conducted in a large school district in the Southeast region of the United States. Achievement was assessed when participants were in kindergarten or first grade and again when they were in the fifth or sixth grade. Results indicated that math and reading performance were below the norm for both groups but students with LD showed significant reading growth over time, whereas the students with EBD did not. This was despite the fact that average academic scores for students with EBD were higher than the scores of students with LD at the time of the first assessment (i.e., at the start of the study). Math scores for both groups improved over time with no significant difference between the groups for degree of improvement. These findings suggest that EBD may have a more deleterious effect on achievement over time, whereas students with LD appear more likely to show improved achievement over time. Other variables related to school performance were also considered. Students identified with EBD were absent from school more days, had more
discipline referrals, and had a higher rate of full time placement into special education services than students with learning disabilities.

Reid, Gonzales, Nordness, Trout and Epstein (2004) conducted a meta-analysis of the academic status of youth identified with EBD with clinical range functioning on behavior rating scales. Investigations between 1961 and 2000 were considered, yielding a total of 25 applicable studies. There were a total of 2,486 participants across the studies ranging in age from 5 years to 21 years. Other aggregated participant characteristics included: 80% males, 20% females, and a weighted average IQ of 94.89. There was a moderate to large weighted mean effect size across the 25 studies (-0.6905) when comparing the effects for students with EBD versus their non-disabled peers. Ninety out of 101 effect sizes were negative indicating students with EBD performed significantly lower than students without disabilities across academic skill areas. The largest differences were in math and spelling. Data suggested that students with EBD performed lower than norm group peers in academics across every setting that was considered (e.g., general education, resource room, residential, university clinic). Students with EBD in residential and self-contained settings exhibited the lowest academic performance. Results indicated that students with EBD performed lower than same age nondisabled peers academically. When variation between different age groupings of students with EBD was explored, data suggested no significant differences in academic achievement between a group of students who were 12 years of age and older and a group of students below 12 years of age. This finding contrasted with other studies which have indicated that achievement declined as students with EBD grew older (Anderson, Kutash & Duchnowski, 2001). Reid et al. (2004) noted several limitations with the analysis related to ethnicity, gender, and SES. While fifteen studies reported the gender of participants (80% boys and 20% girls), these studies did not provide separate academic data for
females. Other limitations included a lack of information on SES and only ten studies offered data on ethnicity.

In addition to academic problems, students with EBD are likely to experience social and emotional challenges that impact both school and social performance. As cited earlier, criteria for an IDEIA identification of Emotional Disturbance may include a mood or symptoms of depression, problems with interpersonal relationships, fears leading to somatic complaints, and inappropriate behaviors or feelings under normal circumstances. Students with EBD are sometimes diagnosed with DSM-IV-TR conditions which include similar features.

Negative emotional states can adversely affect an individual’s functioning in the areas of attention, memory, learning, fluid reasoning and problem solving (Amsterlaw, Lagattuta, & Meltzoff, 2009). Associated maladaptive thought patterns such as rumination and worry can impair the concentration and academic task performance of students with mental health disorders. This may be especially true of those in self-contained settings who must interact with individuals having similar mental health impairments. Although such environments present residents with opportunities for growth, they also present situations where distressing interactions are likely to occur. An individual’s personal problems paired with the challenges of living in a residential treatment setting may lead to instances of rumination (a coping tool whereby behaviors and thoughts focus one’s attention on depressive thoughts and the implications or consequences of those thoughts; Nolen-Hoeksema, 1988) and worry (“a chain of thoughts and images, negatively affect-laden, and relatively uncontrollable” ; Borkovec, Robinson, Pruzinsky, & DePree, 1983, p. 10). To counteract the effects of negative thought patterns, the cognitive behavior treatment literature suggests that distraction, diverting one’s attention to more adaptive thoughts and actions as one strategy for controlling the maladaptive thoughts arising from conditions such as anxiety (Coles and Heimberg, 2005) and depression.
There is some evidence that depressed students who tend to ruminate on their mood or self, experience impairment on academic tasks as their attentional resources are taxed. Additionally, these students appear to experience greater impairment than non depressed students who ruminate but are able to divert their attention away from themselves (Lyubomirsky, Kasri, & Zehm, 2003). The work of Roelofs, et al (2009) suggests that youth with depression symptoms may benefit from learning distraction techniques to reduce ruminative thinking. Overtime, they found lower ratio scores on measures of depression and anxiety among children and adolescents who tended to use distraction strategies. One distraction technique known as thought stopping has been noted in the cognitive behavior literature to effectively treat problematic cognitions and anxiety. Thought stopping might be defined as “a deliberate, self-initiated, cognitive control technique to block an ongoing thought sequence, which is usually followed by deliberate self-talk of some kind” (Bakker, 2009, p. 61). Although the similar concept of thought suppression has been noted to have a paradoxical influence on interfering thoughts, its corollary, thought stopping has been shown to improve symptoms of depression when paired with other distraction techniques (Bakker, 2009).

Transition concerns for students with EBD. Students with emotional and behavioral disorders (EBD) experience a host of challenges that adversely impact educational and occupational attainments. According to data from the National Longitudinal Transition Study of Special Education Students (NLTS), students identified with EBD often exhibit detachment from school, have grade point averages that are generally lower than that of students with other disability types, are twice as likely to be retained in a grade at the high school level as compared to students with other disabilities, have a drop out rate of 55% and an average of 8.5 high school credits at the time of dropout (Wagner, 1995). Poor school outcomes and dropping out of high school can lead to long-term economic and social difficulties (Rumberger, 1987) such as difficulty
maintaining employment or a sufficient income and increased risk for participation in crime (Wagner, 1995). The educational requirements for many occupations have continued to increase as technological changes in the 1990s brought about an increased demand for more educated and skilled workers (Cheeseman Day & Newberger, 2002). This led to an increased need for education and credentials beyond high school (Grossman & Cooney, 2009). As of 2000, 84% of Americans had earned a high school diploma and 26% a bachelors degree or higher (based on 1997-1999 data). The average yearly earning estimate for an adult without a high school diploma was approximately 18K while the estimate for a high school graduate was 26K and 45K for an individual with a bachelor’s degree (Cheeseman Day & Newberger, 2002).

Wagner (1995) used data from the NLTS of Special Education Students to describe educational and community outcomes for youth with Serious Emotional Disturbance (SED) identifications. The NLTS was an eight year study from 1987 to 1994 initiated by the Office for Special Education Programs (OSEP) of the U.S. Department of Education. The study included a nationally representative sample of eight thousand students across disability types. The NLTS described some of the general characteristics of students with SED. Students with SED were noted to typically exhibit more externalizing than internalizing behaviors. Most exhibited signs of disability during grade school (64%) while fewer (approximately 16%) did not exhibit significant problems until later at the secondary level. Demographic details revealed a disproportionate percentage of SED identifications among African-American boys who received special education services. Although African-Americans represented 14% of the general population, African-American boys made up 25% of youth identified with SED. Because A-A males made up similar percentages of other disability categories (e.g. visually impaired was 26%) researchers hypothesized that poverty may have been a moderator for this phenomenon rather than school policies and practices. Also, in 1987 an estimated 44% of these youth were from
single parent households and an estimated one third were from households with an annual income below 12K.

Regarding secondary outcomes, Wagner (1995) extracted data which indicated that students with SED tended to exhibit detachment from school evidenced by lower rates of participation in extracurricular groups, high absenteeism, and a tendency to connect more often with peers outside of school. In the area of academic performance, grade point averages were below that of students with other disability types. Three-fourths received no credit for one or more courses due to earning a failing grade. Students with SED were two times more likely to be retained in a grade at the high school level as compared to the overall population of students with disabilities. Data suggested a dropout rate of 55% and an average of 8.5 earned credits at the time of drop out (the national average for credits needed to graduate is 22 credits). In terms of post secondary outcomes, approximately 25% of students with SED were enrolled in a post secondary educational program three to five years after leaving high school compared to approximately 66% of students without SED. Students with SED showed a lower employment rate (approximately 47%) compared to youth without disabilities (approximately 69%) three to five years after leaving high school. Their employment rate was also lower than the rate for youth with other disabilities (approximately 57%) over the same time frame. Socially, students with SED were less likely to be married three to five years after high school compared to the general population. Females with SED were more likely to become mothers than females in the general population, females from disadvantaged backgrounds, and females with other disability identifications. This coincided with higher unemployment rates and lower wages among those mothers who were employed. Within one year of leaving high school, 25% of students with SED had been arrested as compared to 8% of youth in the general population and 12% of youth with other disabilities. This proportion increased to 58% at three to five years post high school and 73% for those who
dropped out of high school versus leaving due to graduation or acting out. Compared to youth with other disabilities, 4% of those with SED were more likely to be living in a juvenile correctional facility, drug treatment setting, or other residential setting (e.g. half way house) three to five years after high school.

Eighty-eight percent of students with SED attended typical high school settings where they spent an average of 74% of the school day in regular education classrooms. Mostly academic courses were taken at 9th and 10th grade levels. Later in high school, there was a stronger tendency to take vocational classes as approximately 64% of seniors expressed a desire to find a job directly after high school. Twenty percent expressed a desire to matriculate at an institution of high learning following high school.

Despite need for counseling, only approximately one-third of students with SED received this service through their school; most services were academic in nature with approximately 11% of these students on behavior management plans. The NLTS also revealed concerns pertaining to transition services for these youth. In 1987 they were less likely to have written transition plans as compared to students with other disabilities. However, schools made some transition planning contacts on behalf of students to employers (56.8%), vocational rehabilitation agencies (38.8%), and the military (27.2%), for example. Finally, data revealed no mental health contacts made to mental health service providers.

*Special education for youth in the JJ System.* There is limited information on educating youth with disabilities in these settings as noted by Howell and Wolford, (2002), “while there is considerable literature on correctional education and on effective educational practices for youth with disabilities, …there is little on effective practices for youth with disabilities within correctional settings” (p. 1).
The JJ system has a continuum of placements for adjudicated youth, hence they may be educated in a range of settings including detention centers, correctional facilities, or community-based residential placements such as camps or ranches (Leone, Rutherford & Nelson, 1991). Quality of educational services varies among different settings and depends on the resources available. Some placements such as camps and ranches, tend to have youth for longer time frames. However, these programs are usually small, located in rural areas and low recruitment rates of highly qualified educators (Leone et al., 1991). Quinn and colleagues (2005) found that only 17% of teachers in detention centers, juvenile facilities, and adult correctional facilities were adequately certified to teach special education youth. Some programs require youth to attend school half day and work the other half day which may not be in the best interest of youth with special education needs.

Both the procedural and substantive requirements of IDEIA (2004) apply to schools within JJ settings. IDEIA guidelines with regard to child find, evaluations, and IEPs must be followed closely despite the challenges and barriers inherent in providing services in these settings (Coffey & Gemignani, 1994). A full continuum of special education services should be provided to meet student needs, including related services where applicable. Quinn and colleagues (2005) reported results from a national survey of youth with disabilities in detention centers, juvenile correctional facilities, and adult correctional facilities from the Center for Effective Collaboration and Practice (CECP) / National Center for Education, Disability, and Juvenile Justice (EDJJ). Findings revealed that speech-language therapy services were offered by 34% of the facilities, and occupational therapy was offered by 21% of the facilities. An additional finding was that 89% of the correctional facilities and 73% of detention centers had procedures in place to carry out IDEIA (2004) child find responsibilities. Educators in JJ settings
must find ways to overcome problems such as high base rates of disruptive behavior, being understaffed, and unpredictable movement of students from one facility to another.

Some institutions have been noted to utilize instructional practices that are considered ineffective for students with disabilities. Howell and Wolford’s (2002) observations of correctional schools under state monitoring (i.e. a state auditing process to correct problems) have shown students engaged in seat work for lengthy periods with little direct explanation, engaged in repetitive tasks, provided support only when requested, and received instruction through available materials rather than according to IEP goals. Other findings indicated that students did not receive all of the services as indicated on their IEPs, experienced delays in receiving IEP services due to institution regulations (e.g. new students attending several weeks of orientation), and the existence of gaps in receiving educational services due to students receiving certain disciplinary actions such as cottage restriction.

There are also a number of external challenges that affect the ability of educators to provide services to youth. Leone and colleagues (1991) cited several obstacles. First, detained youth are often transferred from one JJ placement to another with very short notice. This action disrupted continuity of instruction and made it difficult to remediate skills and meet the instructional needs of youth with disabilities (Lewis, Schwartz & Ianacone, 1988). Secondly, educational records are difficult to obtain and often give an incomplete picture of academic history because youth were usually highly mobile prior to incarceration. Other challenges include difficulty involving parents, inadequate funding for services, incongruence between federal mandates and the everyday challenges of corrections, and difficulty finding substitute teachers (Coffey & Gemignani, 1994).

Strong educational practices need to be implemented consistently in JJ school settings. Howell and Wolford (2002) offered a list of educational and instructional practices that should be
used with students who have disabilities in JJ settings. The strategies are based on literature for students with disabilities in the general population: a) behavior modification, b) mnemonic training, c) organizers and study guides, d) teaching study strategies and how to learn, e) teacher-directed instruction with guided practice, demonstrations, and frequent teacher questioning, f) strategy instruction, g) continuous monitoring of student progress, h) instruction in self-management strategies, and i) linking assessment to intervention. Rutherford, Behrens, and Fejesk (1987) outlined important components for special education in correctional settings: (a) functional assessments of social, academic, and behavior skills; (b) a functional curriculum addressing academic, social, vocational and daily living skills; (c) transition services, and (d) preservice and ongoing training for teachers. Functional curriculums are often preferred for youth with disabilities as they focus on “social, daily living, vocational skills,…ability to interact appropriately with others, find and hold a job, purchase goods and services, live on a budget, and so forth…” (Leon et al., 1991, p.15). Although vocational programs are offered, they are sometimes closed to youth with disabilities who are not able to meet prerequisite academic skill levels (Leon et al., 1991).

Special Education and Female Juveniles. The literature on special education for youth in the JJ system generally reflects data for both genders. A fair amount of information has emerged on gender specific JJ programming for girls, however, there are minimal investigations on gender specific special education needs.

Zabel and Nigro (1999) examined and compared various characteristics of juvenile offenders with and without special education backgrounds. Researchers interviewed youth ages twelve to eighteen years in a Kansas juvenile detention facility. Results were extracted from interviews with 256 participating youth. This group consisted of 189 males and 67 females. Eighty-one males (85.3 % of all males in the sample) were receiving special education services
compared to only 14 (14.7%) of all females in the sample. When special education classification was considered, half of the females were identified as having Learning Disabilities, and the percentage was 37.7% for the males. Half of the males were identified as having Behavior Disorders (BD), and the percentage was 21.4% for the girls. For males 11.7% had a combined LD/BD identification, and the percentage was 28.6% for females. Among the special education group (not separated by gender), 60% were Caucasian, and 25% were African–American. More African–Americans were identified with behavior disorders. Zabel and Nigro (1999) used an interview in which youth were able to offer self-reports in three categories: personal, home, and school characteristics. In the area of Personal Characteristics, the special education group (SPED group) reported higher needs or problems in the following areas: need for prescription lenses, medications for emotional problems, prior offenses, and diagnoses of AD/HD. The number of youth who were themselves parents was only slightly higher for the SPED group as compared to the non-SPED group. Sexual activity was slightly lower for the SPED group. The two groups (SPED and non SPED) reported very similar levels of problems for the following characteristics: smoking, alcohol use, and drug use. In the area of Home Characteristics, similar percentages were found among both groups for the following characteristics: divorced/never married parents, a deceased parent, have a step-parent, living with step-siblings or half-siblings, living with mother only, know where father is, have incarcerated family members, and have a parent that used drugs. A greater percentage of the SPED group reported they had been in foster care placements. Similar percentages said they never assaulted a parent. Physical abuse levels were similar for the two groups. Approximately 4.3% of the SPED group reported a history of sexual abuse while the proportion was 8.7% for the non-SPED group. When asked “Is your home a nice place,” greater that 80% (including both groups) responded yes. In the area of School Characteristics, the SPED group had higher levels of the following characteristics: number of
males, AD/HD diagnoses, assaults on school staff persons, attendance at three or more middle schools, and academic difficulties in early elementary school (K - 3rd grade). The SPED group experienced a first suspension earlier than the non-SPED group. When asked about current school enrollment status within the facility, 61.7% of the SPED group indicated “enrolled” compared to 50% of the non-SPED group. A higher percent of the non-SPED group indicated they dropped out (18.9%) as compared to 9.6% of the SPED group. Also, under the school category, similar proportions of both groups reported the following characteristics: participated in Head Start, repeated a grade, attended an alternative school, and brought a weapon to school.

Overrepresentation of Youth with Disabilities in the Juvenile Justice System. Youth with DSM-IV-TR diagnosed disabilities and educational disabilities are over represented in the JJ system. Prevalence estimates for youth with disabilities vary among studies. This may be due to lack of access to school records with special education information, variance among states in the application of SLD and ED criteria in the identification process, or incongruence between IDEIA (2004) and DSM-IV-TR disability definitions (Coffey & Gemignani, 1994; Rutherford, Bullis, Anderson, Griller-Clark, 2002). The prevalence of educational disabilities (e.g. EBD, ADHD, LD, CD) is higher for youth in the JJ system than youth in the general population (Gresham, Lane & Lambros, 2000). Estimates have ranged from 30% to 70% for JJ settings (Nelson, Rutherford, Wolford, 1996; Casey & Keilitz, 1990) as compared to the 10% to 12% estimate for ‘typical’ public school settings.

The EDJJ and other organizations conducted a national survey of state correctional institutions to assess prevalence of educational disabilities and relative frequencies of subcategories (Quinn, et al., 2005). Twenty-seven out of 51 heads of state correctional departments responded. Results indicated that 81% of incarcerated youth were enrolled in school. Disability prevalence rates for individual states fluctuated between 9.1% and 77.5%, but
overall 34% of youth were reported to have disability identifications under IDEIA (2004) (both genders included). Another national survey reported a prevalence rate of 28% (Rutherford, Nelson, & Wolford, 1985). In terms of prevalence for individual disability categories, Quinn, Rutherford, Leon, Osher, and Poirier (2005) reported the following occurrence for disability categories: 47.7% ED, 38.6% SLD, 9.7% MR, 2.9% OHI, and 0.8% MD. Earlier studies were fairly consistent with these sub categorical findings. Based on a meta-analysis of prevalence studies, Casey and Keilitz (1990) estimated a weighted prevalence for LD to be 35.6% and Murphy (1986) reported a prevalence range of 20% to 53.4% for ED. Under IDEIA, students in correctional facilities are most often identified with Learning Disabilities (LD), Emotional and Behavior Disorders (ED), or mild Mental Retardation (MR). LD and ED occur at the highest frequency and MR at a lower frequency (Casey & Keilitz, 1990).

Juveniles with severe or profound MR are usually placed in community and residential programs if arrested (Santamour, 1987). Those with mild MR may have a higher probability of having contact with the JJ system and of being incarcerated (Leone et al. 1991) for the following reasons: a) Youth may engage in criminal activity to gain attention or acceptance. They are more likely to be easily led into criminal activity and used by others through manipulation or they do not consider or are unaware of possible consequences of their choices (Santamour, 1987). b) They have difficulty understanding their rights and communicating with attorneys and court officials. c) Youth may say what they think others want to hear. d) These youth may not be readily identified as MR by attorneys or courts officials. e) They are more likely to plead guilty – not plea bargain – or not seek an appeal. and f) They have difficulty learning expectations in a correctional facility, resulting in more behavioral infractions and possibly added time.

Other theories have been set forth regarding the overrepresentation of youth with disabilities in the JJ system. These theories lack sufficient empirical support and are not likely to
operate in isolation, however, they may be more plausible in combination with other risk factors. There are several long standing theories (Quinn et al., 2005; Keilitz & Dunivant, 1987; Murray, 1986) regarding variables that predispose youth with disabilities to delinquency and incarceration. One theory holds that some youth with disabilities experience school failure which leads to negative feelings toward school and increased behavior problems. These youth may gradually spiral into a negative pattern of increasing delinquent behavior and drop out. Another theory suggests that in comparison to non disabled offenders, youth with disabilities are treated with more severe consequences due to that they may interact inappropriately with law enforcement and other JJ personnel. A third theory suggests that higher incarceration rates are due to cognitive deficits in general problem solving and social problem solving skills.

Summary

Students with EBD generally exhibit academic underachievement and research suggests that emotional and behavioral challenges lead to increased academic problems over time (Anderson et. al., 2001). There is also some evidence that symptoms of an externalizing nature have greater impact on achievement than symptoms of an internalizing nature (Hamilton et. al., 1997).

In comparison to the general population, the prevalence of educational disabilities among youth in the JJ system is much higher (Gresham, Lane & Lambros, 2000). Juvenile offenders with disabilities are at increased risk for poor educational outcomes. Without adequate intervention, the probability of detachment from school, drop out, recidivism and underemployment increases (Keith & McCray, 2002).

Juvenile justice settings seek to rehabilitate youthful offenders and prevent recidivism. Education is one means to accomplish this goal (Coffey & Gemignani, 1994) and efficacious instructional practices are critical for moving these youth toward positive educational outcomes.
As previously described, two particularly strong practices include linking assessment to intervention and instruction in self-management strategies (Howell & Wolford, 2002).

**Self-Management**

Self-regulated learning consists of behavioral and meta-cognitive elements such as task initiation, goal setting, planning strategies to complete a task, monitoring progress and altering strategies as needed to accomplish a task (Risemberg & Zimmerman, 1992). Self-regulation implies a certain degree of proactive effort on the part of the student to direct their own learning process while becoming less dependent on their teacher to direct all of the aforementioned behavioral and meta-cognitive elements (Zimmerman, 1986; Risemberg & Zimmerman, 1992).

Helping students develop self-regulation strategies offers several benefits including reduced demands on the teacher’s time (Graham, Harris, Reid, 1992). Self-regulation procedures encourage independence by guiding learners away from external control and toward internal control of behavior (Prater, 1994). Furthermore, students are enabled to better manage their time and devote attention to the acquisition of new skills (Webber, Scheuermann, McCall, & Coleman, 1993). Self-regulation can benefit learners from diverse backgrounds and may foster success in students with disabilities who are seeking transition to mainstream settings (Prater, 1994). There is now a broad literature base of empirical investigations on the self-regulatory procedures categorized as self-management.

**Self-Management Terms.** Self-management has been defined as “the personal and systematic application of behavior change strategies that result in the desired modification of one’s own behavior” (Heward, 1987, p. 517). Strategies may include any of the following: (a) self-monitoring, (b) self-recording, (c) self-instruction, (d) self-evaluation, and (e) self-reinforcement and self-consequating.
Self-monitoring requires students to make an assessment or judgment (self-assessment) as to whether a behavior has or has not occurred and record (self-recording) their decision in some way (Prater, 1994). Self-assessment first requires awareness or observation of one’s behavior and then making a comparison to some standard of performance (Graham, Harris, Reid, 1992; Mace, Belfiore, & Hutchinson, 2001). In the assessment process, students may engage in “covert questioning about [their] own behavior or performance (e.g. “Am I working quickly?”) (McDougall, 1998, p. 311).

Self-recording refers to documenting the results of one’s self-assessment and may involve use of charts or graphs allowing for a visual representation of performance over time (McDougall, 1998; Graham, Harris & Reid, 1992).

Self-instruction involves use of overt or covert self-statements for the purpose of regulating or gaining control over behavior (Graham, Harris, Reid, 1992; Prater, 1994).

Self-statements are generally personalized phrases that may be used to help individuals define problems (e.g., “I need to put my ideas in order for the essay”), create an action plan (e.g., “I need to gather my sources and then take notes”), remember strategies to complete a task (e.g., COPS “I need to check Capitalization, Organization, Punctuation, and Spelling), evaluate progress and correct errors (e.g., “I forgot to write a summary..I can go back and do that now”), cope with frustration (e.g., “I can finish this essay, I’ve written one before”), and reinforce or reward their effort (e.g., “This is a good paragraph…I need to keep going”) (Graham, Harris, Reid, 1992).

Self-evaluation is similar to self-assessment, as described above; it allows one to determine if a performance criterion or target behavior has been reached, and if not, where self adjustments must occur in order to reach a goal (Risemberg & Zimmerman, 1992; Snyder & Bambara, 1997).
Self-reinforcement or self-consequating refers to self-administration of rewards or consequences for meeting, failing to meet, or even exceeding predetermined goals or criterion for success (Risemberg & Zimmerman, 1992; Graham, Harris & Reid, 1992). This emphasizes student control of contingencies.

Reviews of the Self-Management Literature. The most common dependent variables in self-management studies are attention (e.g., percentage of on-task behavior or academic engagement) and performance. Performance often includes the elements of academic productivity (e.g., number of math problems completed) and academic accuracy (e.g., percent of correct math facts). Several studies have examined the differential effects of self-management of attention (SMA) and self-management of performance (SMP). Although some variation exists for the degree of effectiveness when monitoring these two variables, findings generally indicate that both approaches have positive effects on academic performance and on-task behavior.

Harris, Friedlander, Saddler, Frizzelle, and Graham (2005) compared the effectiveness of SMA versus SMP among elementary age students diagnosed with ADHD. Dependent variables were on-task behavior and spelling study behavior. In the SMA condition, students were asked to self-record whether they were on-task whenever a tone sounded at random intervals. In the SMP condition, students were asked to self-record the number of times they practiced spelling words correctly on a graph. In the SMA condition, students’ average on-task behavior increased from 55% to 94%. This same condition (SMA) resulted in an increase in average correct spelling practices from 38 at baseline to 114 after intervention. In the SMP condition, students’ average correct spelling practices increased from 38 at baseline to an average of 83 after intervention. The SMP condition resulted in an increase in on-task behavior from 55% to 91%. Both conditions improved on-task behavior to a similar degree. While both conditions (SMA and
SMP) improved correct spelling practices, the SMA intervention resulted in a slightly larger improvement for this variable.

Maag, Reid, and DiGangi (1993) also considered the differential effectiveness of various self-management procedures, specifically self-management of attention, productivity, and accuracy. Participants were fourth and sixth grade students with learning disabilities and the setting was an independent math practice period. Students were taught to self-monitor attention by recording whether they were on-task at the sound of a tone. They self-monitored productivity on a separate recording sheet by marking the calculation problem they were working on when the tone occurred and recording the number of math problems completed since the last tone. In the accuracy condition, student’s checked completed math problems against an answer sheet each time a tone occurred and recorded the number completed correctly since the last tone. Each self-management condition led to improvement in the aspect of performance (i.e. productivity, attention, or accuracy) it was designed to address, however, greater gains were demonstrated under the self-monitoring of productivity and self-monitoring of accuracy conditions. Grade level differences were observed in that fourth grade students experienced an increase in number of problems completed and percentage of problems correct by self-monitoring productivity. Sixth graders experienced an increase in percentage of problems correct by self-monitoring accuracy; they experienced an increase in number of problems completed by monitoring productivity.

Self-management interventions have commonly targeted academic outcomes in the areas of reading, math calculation and spelling. In a review of self-management interventions for students with learning disabilities, Reid (1996) found computation of arithmetic problems to be the most frequently studied outcome measure in the investigations that included academics as dependent variables. In another review, Mooney et al. (2005) noted that among self-management
studies which included an academic focus, half used math as an outcome measure and most targeted calculation skills. McDougall and Brady (1998) used a multi-component self-management package (i.e. included self-graphing, audio cues for self-recording, and self-administered reinforcement) to improve the math fluency of fourth grade students with and without disabilities. Levendoski and Cartledge (2000) used self-management cards to improve on-task behavior and the percentage of math problems completed by elementary school students identified with Serious Emotional Disturbance (SED). Cancio, West and Young (2004) improved math homework completion (i.e. all problems attempted on the assignment) and accuracy (i.e. percentage of calculation problems correct on the homework assignment) among middle school students identified with EBD. The self-management procedure included parent participation and required students to record the time needed to complete homework assignments and to match their own questionnaire ratings to a parent’s ratings. Incentives were offered for accurate matching.

Hodge, Riccomini, Buford, and Herbst (2006) also found math calculation skills to be the most often used dependent variable among studies on math intervention for students with EBD. They advocated for more research into instruction in math problem solving. Hodge and colleagues (2006) reviewed research from 1985 to 2006 and selected 13 studies on math instructional interventions. Among the 13 studies most interventions were student directed. Only one study addressed problem solving skills. It was suggested that future research 1) examine more closely the types of math instruction offer to students with EBD to determine the degree to which classrooms focus on instruction in math computation versus higher order math skills, 2) explore the efficacy of teacher-directed instruction for new and complex material and strategy instruction for math problem solving skills, and 3) collect data on the effectiveness of other math instructional options such as peer tutoring and computer based instruction.
Self-management interventions and low incidence disabilities. Self-management strategies have been applied to the needs of students with a variety of disability identifications. Students with low incidence conditions such as Cognitive Disabilities, and Autism, have experienced improved behavior academic skills due to the application of self-management interventions. Wehmeyer, Lattimore, Jorgensen, Palmer, Thompson, and Schumaker (2003) taught students with developmental disabilities including MR/DD and autism in grades seven through nine to self-monitor individualized behavioral goals. Students used picture cards or checklists to monitor target behaviors. This multi-component self-regulation intervention led to increased class participation (e.g. on-task behavior and listening skills) and decreased problem behaviors (e.g. inappropriate touching, inappropriate verbalizations, and other disruptive behavior) in a general education setting.

Thiemann and Goldstein (2001) used picture cues, social stories and self-monitoring with videotaped feedback to improve the social communication of children with autism and social skill deficits. Improvements were noted for recruiting attention, initiating comments, making requests and contingency responses.

Newman, Reinecke, and Meinberg (2000) used a multiple baseline design to intervene with one preschool age and two early elementary age students with autism who were functioning in the mild MR range. Restricted behavior patterns were targeted for change. Discrete trial teaching was used to encourage varied responses. Each student was first verbally prompted to vary their responding with a simple statement asking them to ‘do something different’. Students were then offered ten opportunities (trials) to respond to verbal prompts encouraging them to vary their responding. Tokens could be traded in for certain incentives. Students self-managed their behavior by taking a token each time they exhibited a variation in the target behavior (e.g., varied responses to questions, varied drawings, varied imaginary activities during play with a toy robot).
At the beginning of the self-management phase an observer provided a reminder if a student failed to take a token at the appropriate moment. The observer also corrected and stopped them from taking a token if they had not varied responses. Reinforcement was non contingent during baseline, hence all students were given tokens at the end of each session, even if they did not vary responses. Results indicated that the three students demonstrated increased variation for three target behaviors: varied verbal responding, varied drawings and color use, and varied imaginary activities during play with a toy robot. Varied responding was reportedly maintained at follow-up one month later.

Rock (2005) used the ACT-REACT self-monitoring strategy to teach students with and without disabilities to self-monitor attention and academic performance. Nine elementary ages students in grades 2 through 5 were included. For those participants having exceptionalities the identifications included Asperger’s Syndrome, Floating Harbor Syndrome, Speech–Language Impairment, ADHD, Developmental Delay, and Gifted. Two of the nine participants did not have exceptionalities. All participants were reported to have a baseline of 45% off-task behavior independent seatwork time. A general education setting was used and students were placed in multiage classrooms either 2nd/3rd grade or 4th/5th grade. Students were divided into three groups. Groups 1 and 2 were in the 4th/5th grade multiage general education classroom. Group 3 was in a 2nd/3rd grade multiage general education classroom. Intervention took place during 45 minute independent math work periods for groups 1 and 2 and during math or silent sustained reading periods for the group 3.

In the math condition, students completed math assignments within a computer program that provided immediate feedback regarding the number of problems completed and the percentage correct. Students were provided with new assignments each time they reached a certain level of mastery on one assignment. In the reading condition, teachers conducted periodic
comprehension checks as students read from books that they each selected from an Accelerated Reader. Performance data (i.e. productivity and accuracy) was collected during math work periods and not during reading.

The ACT-REACT mnemonic (i.e., Articulate your academic and behavioral goals, Create a self-monitoring work-plan to record your academic and behavioral performance, Take picture(s) of your behavioral goals using self-modeling, Reflect on your academic and behavioral goal attainment after each class, Evaluate your academic and behavioral progress over time, and ACT again continuously) was embedded with a six step process. Students were taught to carry out the following six step process: Step 1) Students were asked to set goals for the amount of time they wanted to remain on-task (i.e., attention goal) and for the number of problems they wanted to complete (i.e., performance goal). They were taught the sequence “ready,” “aim,” “fire” to help them understand behaviors needed for academic engagement. Ready represented things they needed to be prepared for class (ex. getting materials out). Aim stood for on-task behavior (working on math problems and remaining seated), and fire represented behaviors needed to finalize the assigned task. Step 2) Students were taught to record their performance on paper (a booklet for younger students and a think sheet for older students) every 5 minutes at the sound of the timing device cue. They were taught to compare their actual behavior to a self-photograph of on-task behavior at the sound of a cue. If the two matched they were instructed to record their behavior as ‘being engaged’. If the photo and their actual behavior did not match they were to indicate ‘not engaged’ on the SM page. They recorded performance by writing the number of problems they finished at the time of each auditory cue. Step 3) At this stage, students posed and were photographed in positions depicting desired behaviors (i.e., attention & performance goals). These personalized photos were included on the SM pages (i.e., booklets or think sheets).
Step 4) Students were taught to continuously use self-talk to evaluate their attention and performance goals. Recording occurred at 5 minute intervals. They were able to reference semantic and visual images to aid their reflective self-talk which consisted of comments such as “I have my materials, so I’m ready...”. Step 5) At the end of the work period, students were guided to compare their overall performance (i.e. attention and number of problems completed) to goals they set at the beginning of the work period. Evaluative information was recorded in their booklets or on the think sheets. Step 6) In the final step, the interventionist explained that this strategy was to be used daily and to become a habit. Students used this strategy to record attention and performance during the intervention. At the end of each 45 minute work period, the interventionist reviewed the SM pages and personal goals students individually. Students were also asked to continue self-monitoring across their other classes, daily.

The design used to investigate intervention effects was a multiple-baseline-across-subjects with an embedded reversal design. Data were collected for four variables: 1) academic engagement or disengagement, 2) percentage of problem behaviors, 3) academic productivity, and 4) academic accuracy. Each group included three students. Group one showed a decrease in academic disengagement each time the intervention phases were implemented. Examples of problematic behaviors included call-outs, talking, and staring. For each student in group 1, the frequency of problematic behaviors was reduced by approximately 50% or more each time the intervention was implemented. Academic productivity improved for each student in this group during intervention but accuracy percentages did not improve.

Academic engagement was measured for groups two and three. Intervention brought about high and stable levels of engagement over baseline for both groups. Problem behaviors for these groups included talking, out of one’s own seat, and drawing. With intervention, these behaviors decreased by 50% or more across the two groups. Productivity and accuracy results
varied for group two. Results showed improved productivity and accuracy for all group two students during the first intervention phase. However, during the second intervention phase, only two students in the group experienced increases in productivity while productivity decreased for the other student. Only one student experienced an increase in accuracy while the other two had decreases in accuracy.

Group three also showed variable results for productivity and accuracy. During the first intervention phase, all students experienced improved productivity while accuracy remained level. During the second intervention phase productivity and accuracy declined for one student but improved or remained stable for the other two students.

Lee, Simpson, and Shogren (2007) conducted a meta-analysis of single subject research studies using self-management strategies among students with autism. Researchers located eleven applicable studies conducted between 1992 and 2001. In sum participants were 31 boys and 3 girls across these 11 studies. The age range of participants was 3 to 17 years. Most interventions were conducted in school or classroom settings. Other settings included homes, community settings, and clinical settings. A majority of participants were reported to be in need of intervention for social skills such as sharing, conversing, appropriate play and eye contact. Other participants worked on skills such as daily living skills and following schedules. There were primarily three types of self-management procedures across the 11 studies: self-reinforcement (n=1), self-monitoring (n=3), and self-management packages (i.e. some combinations of self-monitoring, self-reinforcement, and prompts) (n=7).

Overall, self-management strategies were found to be effective for improving behavior and other skills of students with autism. The average percentage of non-overlapping data (PND) was 81.9%. When the types of self-management procedures were considered individually, all three revealed relatively high mean PND scores. Self-monitoring (PND=66.4%), self-reinforcement
(PND=82.6%), and self-management packages (PND=72.4%). Lee et al. (2007) used criteria set forth by Scruggs and Mastropieri (1998) to evaluate the relative effectiveness of the interventions based on PND scores. According to this standard, PND scores between 70% and 90% would be considered “effective”. Hence in this review the self-management packages and self-reinforced interventions had the strongest impact, while self-monitoring interventions would be classified as “questionable.”

Wehmeyer & Yeager et al. (2003) considered how secondary level students with Developmental Disabilities might benefit from self-management and self-regulation strategies in a general education setting. Participants were three boys ages 13 years to 14 years who were included in general education courses. Disability identifications included Mental Retardation (MR), Cerebral Palsy (CP), and Autism. Additionally, all students received services for speech language impairments. The researchers, special education teachers, and participants collaborated to identify mutually agreed upon target behaviors. Behaviors targeted for improvement included on-task behavior and listening skills. Some behaviors targeted for decrease included inappropriate touch and disruptive verbalizations.

The student diagnosed with autism was taught to use picture prompts to self-monitor his behavior. He carried pictures of desired behaviors (one of a person with hands at their sides and one of a person with a finger over their mouth) to his classes. He was prompted to observe his behavior at various times and to identify inappropriate touch or inappropriate verbalizations then point to the picture with the alternate desired behavior.

The second student diagnosed with MR and CP was taught to use a self-management sheet to evaluate his listening skills. He used a check mark to record active listening skills and an “x” to indicate absence of the desired behavior throughout the class period. His sheet was later compared to an observer’s recordings, and he and the observer discussed his daily performance
and progress over time. The third student had a diagnosis of MR. He also used a form to self-record the presence of on-task behaviors or disruptive behaviors. Every five minutes, he used a check mark to indicate the presence of desired behaviors and an “X” to notate undesired behaviors. After class, this student compared and discussed his performance with an observer who had also been recording target behaviors.

Intervention resulted in positive behavior change for all three students. The first student experienced a reduction of inappropriate touch from 16-18 instances at baseline to 0-4 instances during intervention and a reduction of inappropriate verbalizations from 6-13 at baseline to 0-4 during intervention. The second student showed a decrease in disruptive behavior to 0 instances and a 100% increase in attending behavior. The third student showed a gradual increase in listening skills from 25% of observed intervals at baseline, up to 100% of observed intervals during the last intervention session. A maintenance phase lasted 4 to 18 sessions in which students were expected to use self-management strategies without external support. During this phase all students exhibited behavior rates that were stronger than baseline levels. However, the first student exhibited behavior rates that exceeded both his baseline and intervention rates.

**Self-Management interventions and high incidence disabilities.** Individuals with high incidence disabilities have experienced academic and behavioral gains following the application of self-management techniques. Reid (1996) sought to extend previous reviews of the self-management literature by examining the use of this strategy among students with learning disabilities. Reviewing studies published between 1979 and 1994, Reid (1996) considered the effect of self-monitoring interventions on academic productivity, academic accuracy, and on-task behavior. In comparison to academic productivity and academic accuracy, on-task behavior was the most often examined dependent variable. Studies highlighted several important findings. First, two of three studies showed no reactivity when self-monitoring was used alone. However,
behavior change was demonstrated when a form of self-recording was included. Second, a different study showed that when offered additional teaching on how to distinguish target behaviors, students improved their on-task behaviors. Third, self-management of on-task behavior has been effective for students with learning disabilities across small and large group settings and for elementary, middle, and high school age students. However, it was noted that only three studies included older adolescents. The fourth finding was that both SMA and SMP were effective for improving on-task behavior.

Several salient findings emerged as Reid (1996) examined the effects of self-monitoring on the dependent variable academic productivity. Many studies focused on the subject areas of math and spelling. Findings for early studies were mixed. One hypothesized reason was that the occasional introduction of new material may have caused variation in the amount of work students accomplished as they moved from acquisition to mastery. Introduction of new material may slow down productivity until fluency is achieved. On the other end of the spectrum, fatigue may become a problem if students are asked to work on material that had already been mastered. Extended work on already mastered tasks could have resulted in increased productivity when new material was eventually provided (i.e., students were already prepared to perform at an optimal level). Later studies showed more promising results with increases in number of spelling practices, number of correct spelling practices, number of math problems attempted, percentage of assignment completed and number of problems worked correctly.

According to Reid (1996) studies did not seem to offer consistently strong support for the effects of self-management on the dependent variable academic accuracy. This was due in part to the fact that some studies did not provide details about both rate and accuracy. Of the two investigations that did allow for interpretation of accuracy levels, one showed that Self-monitoring of performance (SMP) increased accuracy for 4th graders while SM of accuracy
increased accuracy for 6th graders. The other study found self-monitoring of strategy use superior to didactic instruction and didactic instruction with reinforcement for increasing accuracy on academic tasks. Although some studies suggested that SMP offered better results than SMA, Reid (1996) noted there was not enough evidence to confirm this as a solid conclusion. Several suggested avenues for future research included (a) exploration of the mechanisms of self-monitoring (i.e. what causes it to be effective), 2) how self-monitoring facilitates strategy use, (b) how subject variables might determine the effectiveness of self-monitoring, 4) how self-monitoring might support mainstreaming, (c) creation of new self-management procedures, (d) comparison of different self-recording methods, and (e) examination of self-monitoring as a small group and class wide intervention.

Barry and Messer (2003) demonstrated that students diagnosed with ADHD could increase on-task behavior and academic productivity while decreasing disruptive behavior when taught self-management techniques. Five sixth grade boys were taught to self-record on-task behavior and disruptive behavior (e.g. loud oral outbursts / noises, running in class, play fighting or wrestling, leaving seat often) in 15 minute intervals across an entire school day. They also self-recorded whether any assignments were completed within 15 minute intervals across the school day. All students were taking psychostimulants at the time of the study. Intervention took place in the general education classroom. Researchers used a multiple baseline design. Students were trained individually prior to intervention. During intervention phases students self-recorded on-task behavior and whether they were physically or verbally disruptive using a data collection sheet. Students asked themselves questions (as listed on the form) such as “Did I talk loudly…?”, “Was I in my seat…?”, and “Was I paying attention…?”. The teacher provided prompts at regular intervals to remind students to self-monitor. Prompts were gradually faded across intervention phases from 15 minutes to 30 minutes apart and from verbal to written (i.e. written
on a blackboard). During baseline phases, a teacher offered verbal praise for on-task behavior throughout the day. Verbal praise was offered for academic completeness and correctness at the conclusion of the school day only if students achieved scores of at least 75% for completeness and accuracy of academic performance.

In another investigation, students with LD were instructed in the use of a self-management procedure which included use of a checklist, behavior rating scale and self-monitoring form. This procedure led to decreases in off-task behavior in general education and study hall class periods (Dalton et al., 1999).

Davies and Witte (2000) implemented a class wide intervention whereby students were divided into small groups in order to monitor behavior using a chart placed in the center of the groups’ tables. Three of four students had an ADHD diagnosis and were taking stimulant medications throughout the study. The other student started a stimulant medication during the fourth week of the study. Inappropriate verbalizations were targeted for reduction based on pre-intervention observations. Five tokens were placed on the charts at the start of the intervention period. Charts were divided into three sections, green, red, and blue. When a student exhibited an inappropriate verbalization during a lesson or a work period, he/she was to move a token from the green section to the blue section of the chart. If the student did not move a token within 10 seconds the teacher moved it for him/her to the red section of the chart. The red and blue sections were used to distinguish between instances of appropriate self-monitoring on the part of students versus instances where external support was needed from the teacher. Students also maintained individual charts to monitor the number of times they displayed the target behavior and whether it was “caught” by the student or the teacher (determined by who moved the token on the group chart). Group–selected rewards were given only if groups had at least one token remaining in the green section of the chart at the end of the intervention period. Students with
ADHD exhibited 2.5 -22.5 inappropriate verbalizations at the initial baseline and exhibited a decrease of 0 to 3 instances of the target behavior at the end of the intervention.

Rock and Thead (2007) conducted a replication and extension of a self-monitoring approach that used the mnemonic ACT-REACT (Rock, 2005), i.e., Articulate your academic and behavioral goals, Create a self-monitoring work-plan to record your academic and behavioral performance, Take picture(s) of your behavioral goals using self-modeling, Reflect on your academic and behavioral goal attainment after each class, Evaluate your academic and behavioral progress over time, and ACT again continuously.

In this replication, Rock and Thead (2007) taught elementary school students to self-monitor attention and performance during independent math seat work. New skills were taught to students intermittently. Students self-monitored attention to task and the number of math problems completed (i.e. academic performance) using a recording sheet with twelve spaces to record on-task behavior and academic productivity at five minute intervals. They also sought to examine intervention effects under a fading condition. The intervention was implemented in a multiage 4th/5th grade general education reading and math class. There were a total of five participants with and without disabilities. Students identified with both high (ADHD and LD) and low incidence disabilities (autism and moderate MR) were included.

Students were required to use the ACT-REACT procedure and a recording sheet as described in the above investigation (Rock, 2005). After the independent practice period the interventionist worked with students individually to review goals and their self-recordings of on-task behavior and academic productivity (i.e., the number of math problems completed). The intervention was faded over a 14 day period. Self-monitoring intervals were increased incrementally from 5 minutes to 40 minutes. At the latter stage of the fading process students
were asked to self-monitor attention and performance mentally without use of the recording sheet or timer.

All five students experienced an increase in academic engagement and academic productivity when the ACT-REACT intervention was implemented. During the fading condition, 4 of 5 students showed levels of engagement that were higher than baseline. However, their academic accuracy levels fluctuated. Engaged behavior rates may have been linked to the way engaged behavior was defined.

For all five students academic productivity improved or remained stable during the fading condition. Authors noted that this positive result may have been due to the fact that new geometry material was introduced and the independent practice task shifted from performing math calculations to items that were visual-spatial in nature. Additionally, it was noted that this same factor regarding a shift to newly learned material may have contributed to the observation that four of the five students accuracy levels fluctuated during the fading phase. In fact, authors noted that accuracy levels most likely fluctuated throughout the study because students were frequently introduced to new math concepts throughout the study. Their accuracy was often observed to drop each time new concepts were introduced. Only one student who did not have identified disabilities showed stable accuracy levels throughout the fading phase. Satisfaction surveys indicated that all students liked the ACT-REACT procedure and noted that the pictures helped them remember what to do.

Moore and colleagues (2007) designed a self-management intervention to improve homework completion and classroom preparation of six middle school students with ADHD. Students ranged in age from 11 years to 12 years. The intervention was implemented in a public middle school setting, in general education language arts or social studies classes, depending on
where students exhibited the most difficulty. Students were divided into groups of three students each.

Two students took psychotropic medications during the study. All students were noted to have clinically significant levels of inattention and hyperactivity/impulsivity on the ADHD-IV Rating Scale (School & Home Versions). Also, teachers reported students’ to exhibit notable weaknesses with classroom preparation skills and homework completion (i.e., seated when bell rang, eye contact with teacher at start of instruction, pen or pencil on desk, and materials open at the start of the lesson).

Participants were asked to complete a classroom preparation behaviors checklist and a homework behaviors checklist daily. They also completed a “student log” by totaling the number of behaviors indicated on the checklist. Participants were required to self-evaluate their use of the self-management forms. After this self-evaluation step the school psychologist assisted each student with monitoring adherence to personal goals and setting new goals. This support was gradually faded.

The study employed a single subject methodology with five phases: baseline, training, monitoring, fading, and maintenance. All three students experienced a sharp increase in classroom preparation behaviors when comparing the baseline to the self-monitoring phase. Although most students’ preparation behaviors increased during the training phase, training resulted in average scores of 50% to 67% across all six students. The intervention had a similar effect on the percentage of homework behaviors that all students demonstrated; that is, performance generally increased during the training phase but was highly variable. Percentage of homework behaviors increased dramatically during the SM phase and as compared to the baseline phase. All students maintained high levels of both target behaviors during the fading and maintenance phases.
Shimabukuro et al. (1999) conducted a study in a private school specializing in service to students with learning disabilities. Three male students were targeted and they received all instruction in a 6th/7th grade multiage self-contained classroom. Independent practice assignments in the reading, writing and math were aligned with each students’ IEP goals and were developed for the purpose of moving each student toward a proficient level in the goal areas. Participants self-corrected assignments and then self-recorded accuracy scores on a graph after each independent practice session. They self-monitored academic productivity by comparing the number of problems assigned to the number completed and plotting the percentage on a graph. Students did not self-monitor on-task behavior. One teacher and assistant conducted observations to assess the dependent variables among participants.

Self-monitoring led to significant increases in productivity scores, above 90% in the academic areas of reading comprehension and math for all students. Self-monitoring also led to productivity increases in the area of written expression. However, productivity increased to approximately 66% to 80% which was less than the increases students experienced in the other two areas, reading comprehension and math. A similar pattern occurred with respect to academic accuracy. Students generally experienced the greatest accuracy gains in reading comprehension and math rather than written expression. All students experienced an increase in on-task behavior in all three academic areas. Students demonstrated the highest levels of attention with self-monitoring in the math condition. Students demonstrated strong increases in attention during the reading comprehension condition. Students demonstrated increases for attention during the written expression condition, however, improvements were not as strong under this condition.

Stotz et al. (2008) implemented a self-graphing strategy to help 4th grade students with high incidence disabilities (ED & SLD) improved their writing. All students exhibited delays in
written expression skills and their IEPs included written expression goals. Students’ writing products suggested problems with fluency and quality. The intervention was implemented in a resource room during language arts instruction time. During intervention students responded to a story starter; three minutes were allotted for the task. When finished, students counted the total number of words they had written (TWW) and recorded this number on a piece of graph paper. The researcher collected the data on total words written and number of correct word sequences (CWS).

During baseline, the three students averaged 29, 44, and 34 total words written. Each showed an immediate positive response when the intervention was introduced with average total words written shifting to 42, 58, and 54 respectively. Although they did not engage in self-graphing of CWSs, students showed similar improvements for the variable (CWS). The first student improved a CWS average of 14.13 at baseline to 23 during intervention. The second student improve from 29 to 36 average CWS’s and the third student from 22 to 33 CWS’s. According to maintenance phase data, student performance among both dependent variables (TWW and CWSs) remained essentially the same or averages were higher than the averages attained in the self-graphing phase.

Based on reviews of the self-management literature, Mooney, Ryan, Uthing, Reid, and Epstein (2005) found self-management interventions to yield positive academic results for students with EBD. Self-management interventions have also been noted to have positive effects on the behavior (Nelson, et. al, 1991; Webber et al., 1993) and social skills (Moore, 1995; Warrenfeltz, 1981; Kern et. al., 1995) of students with EBD. Self-monitoring is by far the most frequently cited technique in those investigations designed to intervene with students with EBD (Mooney, 2005).
Reid et al. (2005) completed a meta-analysis of self-management interventions as they were implemented among students with ADHD. Four self-management procedures were identified including self-monitoring (SM n=3), self-monitoring plus reinforcement (SM+R n=8), self-management (SMGT n=2), and self-reinforcement (SRF n=3). Sixteen studies were a part of the analysis with a total of 51 participants. Authors viewed this as a small number of participants which limited the ability to generate certain results. All participants were elementary age students except three who were reported to be 13 years or older (junior high school age). Reid et al. (2005) described this lack of high school age students as a “major gap in the self-regulation literature” (p.372). Forty-eight participants were male and three were female. Reid et al., (2005) noted that little could be discerned about the effectiveness of self-regulation interventions for girls with ADHD. In addition to being identified with ADHD, some participants were noted to have comorbid conditions: 10 with LD, 3 with ODD, 1 with CD, 1 with a BD, 1 with a seizure disorder, and 1 with minimal brain dysfunction. Authors noted great variation in the way participants were identified as having ADHD; this included 1) physician diagnosis, 2) multiple methods, and 3) Conners' Rating Scales only. Also, only half of the participants had clearly delineated diagnostic information. The sixteen studies included a variety of classroom settings including regular education, resource room, experimental classroom, hospital, residential, integrated preschool, private school, and clinic setting. The three primary dependent variables were on-task behavior, inappropriate behavior, and academic productivity and accuracy. Effect sizes were reported for these dependent variables by self-regulation intervention type. Self-monitoring plus Reinforcement (SM+R) and Self-monitoring (SM) had the strongest positive impact on decreasing inappropriate behavior. For on-task behavior, all four self-management strategies showed strong effects. For academic accuracy or academic productivity, self-management strategies had the strongest positive impact, effect sizes for SM+R were moderate to
large. Self-reinforcement (SRF) also had a positive impact but there was great variability among the calculated effect sizes (i.e. -1.3 to 2.66).

Mooney, Ryan, Uhing, Reid, and Epstein, M. H. (2005) conducted a review of studies that combined self-management and academic interventions for students with EBDs. Their literature search yielded 22 experimental studies with a total of 78 participants. A majority of the studies (16) took place in public school settings, four used psychiatric or residential settings, one was conducted in a university affiliated school and one in a special day school. The authors identified the type of self-management strategy used across 22 studies. Eight studies used self-monitoring as a treatment type, seven used self-instructions, six used self-evaluation, five used strategy instruction, and one used goal setting. Strategy instruction was considered a self-management strategy as strategy use was believed to act as a cue which the student could use to self-manage their behavior (Mooney et. al., 2005; Reid & Harris, 1993).

Interventions targeted multiple academic areas with math being the most common. Specifically, math calculation skills were the focus of ten out of eleven of the studies. Other academic areas included in the studies were reading (n=8), writing (n=7), science or social studies content areas (n=2), and multiple academic dependent variables (n=7). Mooney et. al. (2005) found that self-management interventions for students with EBD yielded positive academic effects. Results showed relatively large effect sizes across the various self-management variables. For this study, the magnitude of effect sizes was judged using criteria set forth by Cohen (1988) and was as follows: small = 0 to 0.3, medium=0.3 to 0.8 and large = 0.8 and above. The self-instruction strategy had the largest effect size (2.7). Effect sizes for the other self-management strategies were as follows: self-monitoring (1.90), self-evaluation (1.13), strategy instruction use (1.75) and multiple component interventions (2.11). The largest effect sizes for academic variables was first social studies (2.66) and then reading (2.28). Math which
was the most commonly targeted skill area yielded on effect size of 1.97. Another important finding was that self-monitoring strategies were most frequently used for students with EBDs while goal setting was used the least for this population. Authors also found that math was the most frequently targeted academic skill area represented in half of the studies identified by this investigation. This pointed to a need for studies targeting other academic skill areas. This review highlighted a need to conduct self-management interventions in general education classrooms. A need for more group based studies using students with EBD was suggested. Finally, although 15 of the 22 studies under this review indicated good generalization or maintenance of intervention effects, there appears to be a need to investigate stimulus (across settings) and response (across tasks) generalization.

Nelson, Smith, Young, and Dodd (1991) reviewed self-management studies conducted with students identified with EBDs. Sixteen studies were included in the review spanning the years 1976 to 1988. Independent variables in these studies included: self-instruction (n=5), self-recording (n=5), self-evaluation (n=3), and a combination of self-management procedures (n=3). The self-instruction investigations included dependent variables such as 1) attendance, frequency of impulsive behaviors, daily living requirements of adolescents, 2) on-task behavior and accuracy of academic assignments (of elementary age children), 3) generalization of on-task behavior across settings for preschool age children), 4) generalization across settings of rates of on-task behavior and academic behaviors. Self-instruction interventions included procedures such as talking out loud or whispering while performing a task, providing students with adaptive self-verbalizations and rehearsal of verbalizations. Self-evaluation studies included dependent variables such as 1) (effect on) off-task behavior, and 2) self-injurious behavior (of an adolescent). Self-evaluation procedures included strategies such as viewing behavior on a video tape, and matching / comparing one’s self-evaluation to a teacher’s evaluation of the same
behaviors. Self-recording investigations included dependent variables such as 1) attendance and inappropriate behavior (of elementary age children), 2) on-task behavior (of elementary age children), 3) task accuracy (of elementary age children), 4) social skills such as greeting and thanking (of an adolescent), and 5) accuracy of self-recording (of elementary age children). Most of the self-recording procedures simply involved recording behavior in writing. The combination interventions examined self-management effects on dependent variables such as: 1) on-task behavior (of elementary age students) and 2) ability to demonstrate appropriate responses to both instruction and critical feedback. A number of these produced effect sizes and PND scores indicative of at least moderately strong results for improving the social and academic behaviors of students with behavioral disorders. Regarding the generalization of treatment effects across the various types of self-management procedures, results were inconsistent pointing to a need for more research in this area.

Carr and Punzo (1993) implemented a self-monitoring intervention for adolescent students with behavioral disorders using a multiple baseline across subjects design. The intervention was carried out in a self-contained special education classroom across math, spelling and reading subject areas. Math activities consisted of computation problems, spelling consisted of writing words multiple times and writing sentences, and reading tasks included reading passages, answering comprehension questions, completing vocabulary, and grammar exercises. Students self-monitored academic accuracy and academic productivity by self-recording the amount of items given, amount of items completed, and amount completed correctly in reading and math. They also self-record the number of spelling practices and number of words written correctly. All of these numbers were written on a self-recording sheet. On-task behavior was documented only by the classroom teacher. Intervention resulted in significant mean increases in academic accuracy and moderate increases in productivity and on-task behavior.
Lloyd, Bateman, Landrum, and Hallahan (1989) considered the relative effects of self-recording attention versus academic productivity for upper elementary age students identified with EBD, LD, or both conditions using a multiple baseline across subjects design. The self-recording phase was implemented during a class that was divided into three segments. Students self-monitored while engaged in independent math practice during segments 1 and 3. They did not self-record variables during the 2nd segment, instead they engaged in academic tasks other than math. Baseline phases included audio tones at irregular intervals to prevent habituation to a particular pattern of tones. To self-monitor attention, students self-recoded whether they were attending to an assignment when they heard a tone. Productivity was self-recorded at each tone by marking the problem they were working on and counting the number of problems completed. The self-recording procedure was gradually faded; the audible cue was eliminated first, then recording of behaviors was eliminated. A maintenance phase was implemented over a five week period. The number of math practice sessions were decreased in order to consider durability of treatment effects. Both procedures resulted in improved attention and productivity, however, self-recording of attention led to slightly better outcomes. Social validity data indicated that all five students preferred self-recording of attention over self-recording of productivity.

Hutchinson, Murdock, Williamson, and Cronin (2000) implemented a self-management intervention combined with verbal praise, points and incentives to reduce the off-task behaviors of a first grade student with EBD. Although he was in an advanced reading class, he still exhibited disruptive behaviors (e.g., talk outs, inappropriate touch). During baseline he was reinforced with praise, reprimand or tokens to reduce latency for starting an assignment, reduce off-task behaviors and increase desired behaviors. During reading class he received points for nondisruptive behaviors. Various incentives (e.g., candy, video game time) were given if he earned a certain amount of points. During class, verbal praise was provided if he achieved scores
that were 50% or better than baseline scores for latency, disruptive behavior, and on-task behavior. This student self-recorded his behavior on a self-recording page structured as a note home to his guardian, entitled “I am a Great Kid!” This procedure resulted in a decrease in his latency for initiating a reading task (from 2.7 minutes to 1.15 minutes), an increase in nondisruptive behavior (from 0 to as many as 5 during the final baseline and intervention phases), and an increase in on-task behavior (100% during the last intervention phase).

Freeman and Dexter-Mazza (2004) compared the effectiveness of a self-monitoring procedure with and without specific adult feedback (i.e., matching) on the disruptive behavior of an adolescent with mental health difficulties. The participant was a 13 year old male with multiple diagnoses who was noted to exhibit off-task and disruptive behavior in the educational setting of a residential treatment facility for adolescents. Diagnoses included ADHD, Conduct Disorder, Adjustment Disorder with depressed mood and a working diagnosis of LD (math).

The self-monitoring procedure involved two different conditions. In the first condition the student self-monitored behavior with minimal adult intervention. In the second condition matching occurred between the student and teacher observations of the target behaviors. In the first condition the student was provided with a self-monitoring sheet and audio taped cue (occurrence of beeps was 2 minutes apart) with a one-ear phone headset. At the start of math class, he was instructed to take out a self-monitored sheet, and set up the tape recorded cue. He was trained in use of the self-monitored sheet prior to intervention and so no other prompts or instructions were provided unless he stopped self-monitoring before the session was completed. The self-monitoring procedure required the student to mark whether he was on- or off-task, disruptive or appropriate at the sound of each audio cue. The sheet included written examples and definitions as a reminder. In the second condition, a teacher aid recorded behaviors alongside the student during math sessions. After approximately 15 minutes, the aid and student compared
the data they collected for on-task and off-task behavior and disruptive or non-disruptive behavior. The student was rewarded when he demonstrated 80% matching accuracy and contingencies were not provided for levels of appropriate/inappropriate behavior outside of the typical classroom token economy system which was already in place.

The summary of results combined both off-task and disruptive behaviors into a single data set of problematic behaviors. The first condition self-monitoring without specific adult feedback, resulted in a minimal decrease of problematic behavior as compared to baseline; average occurrence of problem behaviors was (m=20.89) and (m=21.26) respectively. When matching (i.e. specific adult feedback) was added to self-monitoring in the second condition, his average problematic behaviors were as low as 13.2 per session. The authors noted that the introduction of a reinforcer (i.e. a piece of candy) during the self-monitoring and matching condition possibly limits the ability to make conclusions about the impact of specific adult feedback in isolation as the reward likely produced some effect on the student’s behavioral improvement.

Sutherland and Snyder (2007) used a strategy that involved reciprocal peer tutoring and self-graphing of reading fluency progress to increase active responding and decrease disruptive behavior during reading instruction. This investigation was conducted in a self-contained setting for students with EBD. Participants were four middle school students identified with EBD. One student was served for a speech-language impairment and one student was medicated for anxiety and hallucinations. Descriptors for disruptive behaviors included talking to peers, out of seat, verbally threatening other students, arguing with adults and peers, and failure to follow directions during lessons. Students were also reported to struggle with assignment completion and to be in need of frequent redirection.
During intervention, students engaged in reciprocal peer tutoring each week and were given a CBM assessment at the end of each week. A Peer-Assisted Learning Strategies (PALS) model was used for the reciprocal tutoring component of the intervention. Students engaged in three reading activities which included partner reading (i.e. each read out loud for 5 minutes in turn while the other provided error correction), paragraph shrinking (i.e. each student reads a paragraph orally then stops to identify the main idea while the other provided error correction), and prediction relay (i.e. each would make a prediction about a ½ page of text, read the text, then summarize the main idea of the text while the partner judged the accuracy of the prediction). Reading CBM measures were used to assess students once per week. Students self-graphed their reading fluency performance (i.e. number of words read correctly per minute and number of errors per minute). Only the researchers collected data on disruptive behavior (i.e. frequency counts) and active responding (i.e. duration of the target behavior daily).

During intervention, disruptive behavior increased slightly for two students while the other two experienced a decrease in disruptive behavior. All four students showed an increase in active responding during both baseline and intervention. All students experienced increases in the number of words read per minute during intervention. Three of four students experienced decreases in number of words read per minute. Maintenance data showed a decrease in the number of words read correctly per minute. Rates of disruptive behavior remained low for all students (but slightly higher than intervention) during maintenance. Finally, active responding rates for this phase were higher than baseline rates, but lower than the responding rates exhibited during intervention.

Pears, Fisher, and Bronz (2007) sought to increase the social competence and emotional / behavioral self-regulation skills for a group of foster children. Twenty-four foster children in Lane County Oregon participated and were randomly assigned to an intervention or comparison
The children were in grades Kindergarten through second. Two of the eleven children in the intervention group were receiving special education services; type of disability identification was not described. The seven week intervention consisted of 2 hour therapeutic play groups which were offered twice per week. Play groups were conducted in a classroom and each session addressed one social skill which was embedded within a basic session sequence (i.e. welcome activity, craft activity, snack, two circle times, group games) to include modeling and opportunities for practice. Examples of social skill topics included sharing, initiating and maintaining interactions and problem solving with peers. Children were expected to use self regulation skills during transitions. Examples of self-regulation skills included managing negative emotions, paying attention and listening. Participants were positively reinforced immediately for appropriate use of skills. Teacher and foster parent behavior ratings were used to assess intervention effectiveness; specifically the Achenbach Scales and The Emotional Regulation Checklist were used. According to teacher ratings there were no significant behavioral, social, or emotional differences between the control and intervention group. According to foster parent ratings the control group showed increased lability and the intervention group showed a small decrease in lability from pre to post test. Additionally, the intervention group showed a decrease in externalizing behavior post intervention.

Wolfe, Heron, and Goddard (2000) conducted a replication of the Harris, Graham, Reid, McElroy and Hamby (1994) study in order to examine the effectiveness of self-management for on-task behavior and written language performance of children identified with LD. Participants were four boys in second and third grades. The intervention was carried out in a self-contained elementary classroom. Researchers used a reversal design with a changing criterion phase at the end. The final phase included self-monitoring with public posting. Intervention was conducted during 10 minute independent writing sessions. Students were taught to self-monitor their on-
task behavior by responding to the question “Am I on-task” approximately every 60 seconds at the sound of a tone. At the end of each session, students graphed the number of “yes” responses and they were praised by the teacher for accuracy. Students engaged in a whole group webbing (i.e. prewriting) activity prior to independent writing. The constructed web remained on the board during the independent writing session (for students to reference). Students self-monitored writing performance by recording the number of words written and graphing this number at the end of the session. Again, they were praised and offered tokens for counting accuracy. Tokens could be exchanged for lunch with the teacher. During the changing criterion phase, the experimenter set goals for the number of words to be written. Students continued to count and graph the number of words written. If they reached or exceeded the set criterion, they were able to post a star on a wall chart. The stars served as tokens which again were exchanged for lunch with the teacher. Although self-monitoring of on-task behavior continued, there was neither posting of performance nor incentives for this dependent variable. Results showed that self-monitoring increased on-task behavior; two of the four students experienced a dramatic improvement. The effects of self-monitoring on written language performance were not large enough to show a functional relationship. This result did not support the positive change that was noted for written language in the previous study (Harris et al., 1994). Finally, it was noted that written language performance did change in directions consistent with goal setting (i.e. number of words written increased and decreased as the experimenter set goals increased and decreased) during the changing criterion with public posting phase.

Gureasko-Moore et al. (2006) sought to increase the classroom preparation skills of three seventh grade students diagnosed with ADHD. All students were males and were reported to be inadequately prepared for class by teachers. All students were taking stimulant medication during the study. Intervention was conducted in targeted general education classrooms; Language –Arts
classes were targeted for two students and Math was targeted for one student. Students were taught to use a self-monitoring checklist to record which classroom preparation behaviors with which they complied. There were six classroom preparation behaviors on the self-monitoring form: 1) in seat when the bell rings, 2) eye contact with the teacher and stops other activities when instruction starts, 3) have pen / pencil on desk, 4) have notebook or paper on desk and book open at the beginning of the lesson, 5) homework turned in as requested by the teacher, and 6) responded to each item in my homework assignment. Students set weekly goals for they would comply with and wrote this on the self-monitoring form. The experimenter met with students daily to review the self-monitoring checklist. Students calculated the number of behaviors demonstrated on the form. They were also required to critique the forms by answering questions in their logs (e.g. what they did or did not do to achieve their goals, what could be done more effectively). Students were verbally praised regarding met goals. They received assistance with goals not met. Students remained under the self-monitoring condition until they complied with 100% of the classroom preparation skills for 4 of 5 consecutive days. A fading condition was implemented whereby students met with the experimenter every other day for feedback and assistance with the self-monitoring forms. This condition remained in effect until each student complied with 100% of the classroom preparation skills for 4 of 5 consecutive days. The final condition was a maintenance phase; students met with the experimenter one time per week. Once students complied with 100% of the skills for five days, they continued to self-monitor but were given the option to discontinue the writing aspect of the procedure.

A very similar investigation taught secondary students in grades seven and eight with LD to self-monitor “classroom survival skills” (Snyder & Bambara, 1997). Students used checklists to self-monitor several skills including: having materials required for class, submitting
homework, and being in seat ready to begin instruction at the start of class. This procedure led to increased preparedness in both general education and special education classes.

Summary

A wide base of research over the past thirty years has proven self-management strategies to be effective across both high incidence and low incidence disabilities; this includes strong applications for students with serious emotional and behavioral difficulties. However, there is still a clear need to investigate the effectiveness of self-management strategies on desired academic and behavioral outcomes for students in juvenile correctional classroom settings.

Self-determination and self-management skills allow students with disabilities to be actively involved in their educational process. Acquisition of these critical skills during their formal schooling years can increase the likelihood of later career and occupational attainment (Wehmeyer, Lattimore, et al., 2003). Instruction in self-determination skills teaches students that they are “causal agents…[who can] make things happen in their lives…instead of being acted upon” (Wehmeyer, Lattimore, et al., 2003, p.440). Such instruction is essential for incarcerated students who often have difficulty governing their own lives constructively due to background characteristics that have placed them at risk for poor outcomes in school and the community (Houchins, 2001).
Chapter 3: Methodology

This chapter describes the methods and procedures for implementing this study. Specifically, this chapter provides a description of the participants, setting, experimenter, data collectors, independent variable(s), dependent variables, research design, procedures, and social validity assessments.

Participants

Participants were 14 to 18 year old female students who were placed in a juvenile correctional facility and were diagnosed with mental health disorders (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Text Revision, DMS-IV-TR) and/or disabilities identified according to IDEIA 2004 categories. Table 2 provides definitions of these terms. Students were selected based on three criteria. The first criterion involved selection of students who exhibited low base rates of on-task behavior or high levels of distractibility. The second criterion pertained to students who demonstrated weaknesses in math calculation and/or math fluency skills. Students demonstrating delays in math calculation skills as indicated by teacher report and their performance on assessments were included. The third criteria pertained to assent of the student participant and parent or guardian consent for the child to participate in the study.

A descriptive summary with demographics for each participant is included in Table 1, including a pseudonym, chronological age, ethnicity, regional data for home community (e.g.
suburban, rural, urban), grade level, number of high school credits earned, number of expected
credits based on length of time in high school, WJ-III Math Calculation subtest score, and WJ-III
Math Fluency subtest score. The following test data are also included as available: California
Achievement Test (CAT) Math grade equivalent score, Ohio Graduation Test (OGT) Math level,
and primary IDEIA disability, DSM-IV-TR Axis I diagnosis, and psychotropic medication by
category.

Student A. Student A was a 17-year-old Latina student. She did not have an IDEIA
(2004) identification but five DSM–IV-TR diagnoses were noted in her records: Conduct
Disorder, Bipolar Disorder without psychotic features, ADHD, Cannabis Abuse, and Alcohol
Abuse. She was taking psychotropic medications at the time of participation. Assessments
indicated that her math calculation skills were more than four years below grade expectation.
When Student A started the study, she was enrolled in school but was near the end of her
program. She graduated 1.5 months into the study which necessitated completing the remainder
of the sessions and phases in the group room of her living unit. Student A was described by staff
as a relatively compliant student who struggled with attention to task. When interviewed, she
reported that she had difficulty with concentrating for an extended period of time in class.
Regarding her math skills, she reported that she felt confident in performing basic addition,
subtraction, multiplication, and division; however, she noted that she ‘did not like fractions and
did not know how to do them’. Prior to her arrival at SJCF, she attended a large urban high
school and she noted difficulty concentrating in her math class at that school. Student A reported
plans to go on to a community college when she was released.

Student B. Student B was an 18-year-old White student. When Student B started the
study she had already obtained a GED and was planning to apply to a community college in
preparation for her future educational endeavors and eventual release. All sessions were
completed on her living unit. Student B was described by staff as needing to improve work habits and as appearing to exhibit low motivation in regard to school. However, the opportunity to work toward the GED test seemed to be highly motivating for her. Student B was also described by teachers as cheerful at times; however, she was also described as having interpersonal conflicts with peers. Student B reported that math was one of her more difficult subjects in school. She also exhibited attention problems. Student B did not have an IDEIA (2004) identification but three DSM-IV-TR diagnoses (Mood Disorder, NOS, Polysubstance Dependence, Conduct Disorder) were noted in her records. She was taking psychotropic medications at the time of participation. Assessments indicated that her math calculation skills were more than four years below grade expectation. Math reasoning skills may have been stronger, but that skill area set was not measured.

Student C. Student C was a 14-year-old African-American / Biracial student. Student C had an IDEIA (2004) identification of Emotional Disturbance (ED) and four DSM-IV-TR diagnoses (Major Depressive Disorder, recurrent; PTSD, Conduct Disorder, ADHD per history) were noted in her records. She was taking psychotropic medication at the time of participation. Testing indicated that her math calculation skills were between 1.5 and 3 grade levels below expectation. Student C was enrolled in the second period math class for the entire duration of the study. However, behaviors necessitated that she complete some of the sessions in the group room on her living unit. Student C was described by staff to present as significantly less mature than her peers. Her general emotional state was described as erratic as she exhibited extreme overreactions to common / daily events and she often refused to complete school work. On occasion, she expressed an awareness of her problematic behaviors, however, she continued to experience extreme difficulty with modifying her reactions and responses to typical events and circumstances. Student C attended school at a residential treatment facility prior to placement at
SJCF. During an interview, Student C reported that she had difficulty with concentrating on academic subjects at her previous school and at the time of this study. She reported that she could “do addition, subtraction, multiplication, and division….but could not do fractions”.

Setting

The setting for this study was a girls’ high school within a maximum security juvenile correctional facility located near a large city in the Midwestern United States. Both male and female adjudicated youth were assigned to the facility. Youth 12 to 20 years of age could be assigned to the facility. At the time of this study, the population was showing a decreasing trend. Due to the transient nature of this population, demographics with regards to the population at this facility are an approximation and the best estimate at the time of the study. The average daily population for boys was 97. Approximate numbers of male youth at each grade level were as follows: 8th (5), 9th grade (62), 10th grade (13), 11th grade (8), 12th grade (3), graduates (6). The average daily population for girls was approximately 33. The proportion of girls at each grade level was approximately: 8th (1), 9th grade (17), 10th grade (5), 11th grade (1), 12th grade (1), graduates (8). Approximate ethnic composition for the male population was African-American (56.5%), Caucasian (36.2%), Multiracial (4.3%), Latino (1.4%), Native-American (0.7%), and Not Indicated (1.4%). Ethnic composition for the female population included the following estimates: African-American (51.9%), Caucasian (44.4%), Latina (3.7%). Percentages of youth
### Table 1: Descriptive Summary for Participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Ethnicity</th>
<th>Home Community Region</th>
<th>Grade Level</th>
<th>Earned Credits</th>
<th>Expected Credits*</th>
<th>WJ-III Math Calculation</th>
<th>WJ-III Math Fluency</th>
<th>Math CAT Score</th>
<th>OGT Math Level</th>
<th>IDEA Disability</th>
<th>DSM-IV-TR Axis I Diagnoses</th>
<th>Psychotropic Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>17</td>
<td>Latina</td>
<td>Urban</td>
<td>12</td>
<td>17.5</td>
<td>15</td>
<td>6.4</td>
<td>13.0</td>
<td>6.3</td>
<td>Proficient</td>
<td>None</td>
<td>Conduct Disorder, Bipolar Disorder w/o psychotic features, ADHD, Cannabis Abuse, Alcohol Abuse</td>
<td>Yes</td>
</tr>
<tr>
<td>B</td>
<td>17</td>
<td>White</td>
<td>Urban</td>
<td>10.5</td>
<td>8.75</td>
<td>15+</td>
<td>6.4</td>
<td>6.6</td>
<td>6.7</td>
<td>Not Administered</td>
<td>None</td>
<td>Mood Disorder, NOS, Polysubstance Dependence, Conduct Disorder</td>
<td>Yes</td>
</tr>
<tr>
<td>C</td>
<td>14</td>
<td>African-American / Biracial</td>
<td>Rural</td>
<td>8.5</td>
<td>N/A</td>
<td>N/A</td>
<td>6.9</td>
<td>6.0</td>
<td>5.4</td>
<td>Not Administered</td>
<td>ED</td>
<td>Major Depressive Disorder, recurrent; PTSD, Conduct Disorder, ADHD per history</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Number reflects the expected number of credits based on length of time the student has been in high school
identified with IDEIA disabilities was 38% for boys and 54% for girls. Breakdown by category for boys was Emotional Disturbance / ED (16%), Specific Learning Disability / SLD (13%), Cognitive Disability / CD (5%), Other Health Impaired / OHI (2%), and Multiple Disabilities / MD (1%). Special education identifications for girls included the following categories, ED (38%), SLD (7%), CD (5%), OHI (2%), and MD (2%). Data for the female population as of February 2010 suggested that the most common mental health diagnoses could be subsumed under four major DSM-IV-TR diagnostic classes: Disruptive Behavior Disorders (primarily Conduct Disorder), Substance Related Disorders, Mood Disorders, and Anxiety Disorders (primarily Post Traumatic Stress Disorder (PTSD)). Approximately 70% were on the mental health case load, and approximately 53% were noted to have been prescribed psychotropic medication.

The population of girls might be considered highly transient. For example, girls are sometimes released only to return within a few months or a year later. The most common length of first stay for girls is best represented as a positively skewed distribution (i.e., mean = 244 days, median = 178 days, mode = 96 days) with a range of 3 days to 6 years 2 days. The most common length of stay (i.e. the mode) is 96 days.

The facility offers residential, educational, medical, and therapeutic services to youth. Recreational programming and religious services are available. An institution wide Positive Behavior Support System was implemented within the past year. This was a multi-level behavior motivation system designed to increase desired behaviors and decrease undesired behaviors through structured delivery of appropriate reinforcements and sanctions. This behavior motivation system was intended to augment the existing treatment program by encouraging the development of pro-social behaviors. Incentives were provided when girls met any of the three primary behavior goals: (a) appropriate compliant behavior; (b) prosocial character building behaviors such as respect, trustworthiness, fairness, caring, and citizenship; and (c) delay of
gratification and use of reflective thinking and behavior over impulsive responding. School attendance was compulsory. Girls attended school for, five days per week, except major holidays and quarterly breaks. The high school operated on a year round schedule in order to offer ongoing education to youth who might arrive over the summer and who had little continuity of education in the community due to attendance issues. At the time of the study, the average daily population for the girls’ school was approximately 33 students and the school was operating at a higher than typical staff to student ratio.

The study was initially designed to be implemented over the course of one term (i.e., one quarter). However, several factors led to an extension of the time frame and the study was conducted over the course of two quarters spanning twenty-one weeks. Issues arose with retention of participants due to policy changes in the way release dates were handled, court level decisions regarding a necessary reduction in the number and type of youth that would be adjudicated to the correctional setting, and resulting school organizational changes in how youth were scheduled for classes. Implementation occurred during the second period math class which was scheduled from 8:42 am to 9:37 am. The study was also implemented on the living units in the group rooms when necessary, for example, due to a change in a student’s schedule, a change in the school schedule, or a student’s temporary placement on the unit and due to a need to address behavior on the unit. Enrollment for this class fluctuated between seven and nine students due to schedule changes or as a result of girls being released from the facility. Data was collected for three students for whom consent was obtained.

The classroom was arranged so that students were seated at individual desks which were large enough for computer screens and keyboards. Desks were arranged around three sides of the perimeter of the classroom. The arrangement was such that students were seated facing a wall.
The teacher’s desk was situated at the front of the room in front of a white board as illustrated in

*Figure 1. Floor Plan of Math Classroom*

The experimenter was a doctoral candidate in the School of Physical Activities and Educational Services (PAES) in the fourth year of the School Psychology doctoral program. Prior to returning to the doctoral program, she spent ten years working as a school psychologist. Her internship year was completed in an urban public school district and subsequent years in suburban school districts. Over the past two years, she gained experience in a juvenile correctional school setting. She participated in professional organizations and served as both board member and president of one local school psychologist organization. Experience working with students has spanned preschool age through college age.

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Training of Assistants

Five college students were recruited to assist. Three female undergraduate students were retained and assisted with data collection. Two students were majoring in psychology, and one student was majoring in criminology. Two students assisted at the time data collection began in February 2010 through mid March 2010. The other student assistant was added in June 2010.

Student assistants had to first complete an IRB approval process. This was followed by a required approval process by the research site which included training and background check. The student assistants were trained prior to the study to ensure that they could accurately and efficiently collect data and evaluate student performance. The assistants were trained on the observation coding method, permanent product scoring, and interobserver agreement (IOA) checks. Two assistants were trained together and engaged in observation practice sessions in the natural setting before the intervention began. The assistant added in June was trained individually on permanent product scoring and IOA checks for academic productivity and academic accuracy. In order to aim for a high degree of observation accuracy before the study began, criteria was set at 90% for observation IOA. The experimenter and the assistants discussed the observations daily during the training period and during the first session of data collection. IOA data collection forms are in Appendix A.

Independent Observers

The college students assisted with conducting independent observations using a behavior coding sheet. Procedural integrity checks were also conducted to evaluate intervention adherence on the part of the experimenter (Appendix C) and the participants (Appendix D). The college student assistants and an Intervention Specialist assigned to co-teach in the classroom completed procedural integrity checklists which involved watching the experimenter during implementation and checking ‘yes’ or ‘no’ regarding the steps to be completed.

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Materials

Materials required to carry out the self-monitoring intervention included math calculation worksheets, self-monitoring cards, graph pages, and two electronic devices (a tone device used with the self-monitoring intervention and a recording device with recorded cues for the observation system).

Math Calculation Probes

Math calculation problems were developed by the experimenter and assistants using three internet sites that allowed for construction of free math calculation probes (i.e., http://www.interventioncentral.com, http://www.superkids.com/aweb/tools/math/multiply/times1.shtml, and http://www.homeschoolmath.net/worksheets/fraction.php). Worksheet packets were developed for each participant which consisted of several pages of math calculation problems (140 problems). A large number of items were included in order to prevent a ceiling effect when measuring academic productivity and accuracy. Individualized packets were developed reflecting a skill level appropriate for each student (i.e., problems for which students had a working knowledge). Worksheet packets contained approximately equal quantities of problem types (e.g., 35 division, 35 multiplication, 35 adding fractions with like denominators, 25 subtracting fractions with like denominators, etc.). Each worksheet page contained the same types of math items, however, the items on the pages were always arranged randomly. Students were permitted to complete the pages in any order desired. It should be noted that the first student to begin intervention started with approximately 50 problems in a worksheet packet as it was originally thought that packets containing 40 to 50 items would ensure students had enough items to work during the 16 minute session without reaching a ceiling. Worksheet packets for the first two sessions for Student A contained 56 items. Her worksheet packets were adjusted for sessions three through six to contain 108 items based on the number of problems completed in the first
two sessions. Worksheet packets were adjusted once more to 140 items and remained constant across the remainder of sessions and for any other students who joined the study.

Calculation problems were based on students’ skill levels as determined by norm-referenced and informal evaluations. Evaluation details are described in the section on subject selection. Worksheets included only problems for which students had a working knowledge. Hence, math work periods were considered practice sessions and not sessions in which students were applying a recently learned skill. Appendix E contains a sample math worksheet. During the course of the study, individual folders were used to store participants’ math worksheets, graphs containing performance data, and self-monitoring cards.

Self-Monitoring Cards

Each self-monitoring card consisted of an 8.5” X 11” page divided into two sections with a student’s name at the top. Appendix F contains a sample self-monitoring card. The first section included three questions and space for students to circle a response. The first question related to whether or not they had made a decision to set aside any personal worries or concerns that might affect their focus on the class activity, the second question requested that they indicate if they would like to later discuss any concerns with the school psychologist, and the third question asked them to indicate how they were feeling at the moment. The second section of the card included a chart with the question, “At this exact second, am I on-task?” The chart was divided into four segments with the words “yes” and “no” in each segment, which allowed students to respond to the above question each time a tone was heard (i.e. one tone every four minutes). An operational definition of the term “on-task” was noted at the bottom of the self-monitoring card as a reminder for students.
**Graph Page**

A graph page was used to chart each student’s performance on the daily math practice worksheets during the intervention phases and fading phase. The graph page contained the student’s name and a scale to shade in the number of problems completed and the number of problems completed accurately for each session of the intervention phases. The experimenter graded the math worksheets following each math practice session. Prior to the start of the next practice session, the experimenter reviewed each student’s performance; this included providing feedback on which problems were completed accurately and which problems were incorrect. Each student graphed their own performance (i.e. number of problems completed and number of problems completed accurately) prior to the start of each math practice session. The bottom of the graph page contained an area entitled “My Goal for Today”. Prior to the start of each math practice session and after the review of performance from the previous session, participants used this area to record personal productivity and accuracy goals for the current day. A sample graph page can be found in Appendix G.

**Electronic Devices and Behavior Coding Sheet**

A timer with a short bell alarm was used as the auditory cue that signaled students to self-record performance for the ‘on-task question’ on the self-monitoring card. A small recording device with prerecorded cues was used to cue observers using the behavior coding sheet (an adapted version of the B.O.S.S observation system, Shapiro, 2004). For example, the prerecorded cue indicated when the observer had to prepare to observe (“get ready”) and when the observer should watch and note the target student’s behavior, (“observe (interval number)”). A sample behavior coding sheet can be found in Appendix H.
Dependent Variables

Dependent variables for this study were percentage of time on-task, academic productivity, and academic accuracy during independent math practice. An additional outcome measure was social acceptance for the intervention which was determined by administration of questionnaires. Time on-task was operationally defined as being engaged in the assigned independent math practice as reflected by any of the following behaviors: (a) eyes looking at the math worksheet or self-monitoring card, (b) calculating problems (writing) on the math worksheet or a scrap piece of paper, (c) writing responses to math problems, (d) recording an appropriate response on the self-monitoring card after the audible cue, and/or (e) “thinking”, that is looking away from the paper but appeared to be thinking. Observation of “thinking” could be coded as on-task for up to two consecutive intervals. If this behavior occurred beyond two consecutive intervals it was coded as off-task. Two intervals of “thinking” behavior had to be followed by an interval of another type of on-task behavior before “thinking” could be coded as on-task again.

Behavioral observations were conducted daily across all phases of the study. Observations occurred while students were engaged in independent math practice sessions that were 16 minutes in duration. The structured observation was an adaptation of the B.O.S.S., Behavioral Observation of Students in Schools (Shapiro, 2004). Refer to Appendix H for an example of the behavior coding sheet. The observation procedure was considered a momentary time sampling method whereby the 16 minute observation period was divided into a series of 15-second intervals (a total of 64 intervals). Intervals were kept short to avoid the problem of overestimating or underestimating the overall percentage of behavior. The observers recorded whether or not the target behavior was occurring at the moment each time an interval ended. The observers listened to prerecorded cues and coded behavior on the behavior coding sheet each time
an interval number was spoken (e.g. “observe 17”). On-task behavior was recorded as a percentage of the total intervals (i.e. 64) that the target behavior occurred and was therefore considered an estimate of the total duration. The coding sheet included one category for off-task behavior and five categories for on-task behavior. Only one category could be checked during any given interval. For example, during interval one, a student’s behavior could be coded as either off-task, or on-task. If the behavior was coded as being on-task, only one additional descriptive category of on-task behavior could be checked (i.e. eyes on paper, self-monitoring, appropriate writing, appropriate writing, or thinking) to describe the type of on-task behavior. Coding the on-task and off-task categories was a priority, the additional descriptors were checked only on occasion. The tone cued students to mark their self-monitoring cards every four minutes throughout the sixteen minute math practice session. The self-monitoring category of on-task behaviors was only counted as “on-task” if a student was marking her card at the time of the tone. Definitions of measured behaviors are included in Table 3.

Academic productivity was defined as the number of math problems completed. All items that students attempted, whether complete or not were counted in the ‘completed’ total. Academic accuracy was operationally defined as the number of math problems completed correctly. Math worksheets were graded against an answer sheet containing correct answers. Students’ answers had to match those given on the answer sheet to be counted as correct. For example, if the answer sheet required that fractions be reduced, students’ answers also had to be reduced to be counted as correct. Math worksheets were graded by the experimenter and student assistants using answer keys after each session. They tallied the number of problems completed and the number of problems completed correctly and wrote these numbers on the top page of each worksheet packet on a daily basis. Additionally, this accuracy and productivity data was recorded on a graph page by the participants at the start of each session.

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Social validity data were collected from student participants and teachers. Social validity was measured through questionnaires designed to measure the importance of the target behaviors, appropriateness of the procedures, and social importance of the intervention effects. Social validity questionnaires were administered to students (Appendix I) and teachers (Appendix J) at the conclusion of the study. Social validity surveys are essentially measures of consumer satisfaction designed to solicit the opinions of those receiving treatment for a target behavior and other persons who may be affected by the target behavior. These surveys are often designed to detect the extent to which “consumers” (i.e. teachers and students participating in this study) perceived positive benefits from the intervention. In this study, student questionnaires contained twelve questions that were rated on a 7-point Likert scale. Teacher questionnaires also contained twelve questions rated on a 7-point Likert scale. Student participants completed the surveys individually in a quiet setting with minimal distractions. The following instructions were provided to students:

“We want to know how you feel about the self-monitoring cards and math practice sessions. Check the box that best describes how you feel about the intervention you just completed.”

The survey was given to the two teachers who were assigned to cover the second period math class. Teachers were asked to read and complete the surveys and return them to the experimenter within one week.

Interobserver Agreement

Interobserver agreement (IOA) checks for on-task behavior were scheduled to be taken for classroom observations during the training sessions and then every third session for the duration of the study in order to include IOA data across all of the phases. This would have resulted in a minimum of five IOA checks for the observations. Several systemic changes
occurred over the course of the study, it was not possible to collect all of the intended IOA checks for on-task behavior. First, student assistants were difficult to recruit and retain due to their school scheduling needs. Hence, they were not available to complete IOA checks (for on-task behavior) across all phases of the study. Second, issues arose with retention of participants due to court level changes in the way release dates were handled, court level decisions regarding reduction in the number and type of youth that would be assigned to the Ohio Department of Youth Services and resulting school organizational changes in how youth were scheduled for classes. These factors resulted in the loss of several participants, an extension of the study time frame, and a time frame which exceeded OSU student assistant availability. This issue will be discussed further in regard to study limitations in Chapter 5. Observation IOA data was collected for three training sessions and one baseline session of the study. Both occurrence (scored intervals) and nonoccurrence (unscored intervals) IOA was calculated because the former is most suitable for low frequency behaviors and the latter for high frequency behaviors. Occurrence Agreement IOA considers the degree of agreement where both observers mark the occurrence of the target behavior (on-task behavior) and is calculated using the following formula:

Occurrence (Scored) Agreement

\[
\frac{A_{\text{occurrence}}}{A_{\text{occurrence}} + D_{\text{occurrence}}} \times 100
\]

(A occurrence + D occurrence)

Nonoccurrence Agreement IOA considers the degree of agreement where both observers mark nonoccurrence of the target behavior and will be calculated using the formula:

Nonoccurrence (Unscored) Agreement

\[
\frac{A_{\text{nonoccurrence}}}{A_{\text{nonoccurrence}} + D_{\text{nonoccurrence}}} \times 100
\]

(A nonoccurrence + D nonoccurrence)
For math worksheets, Total Count IOA, an indicator of the percentage of agreement between the total number of responses recorded by two independent scorers was established for 100% of the math worksheets. This was possible because the math worksheets were permanent products. When the third student assistant was added, she was able to assist with completing the IOA checks. Total Count IOA data was established for both accuracy (i.e. number of problems a student completes correctly) and productivity (i.e. total number of problems a student completes during the 16 minute practice session) using the following formula:

\[
\text{Total Count Agreement} = \frac{\text{Smaller Count}}{\text{Larger Count}} \times 100
\]

The criterion for an acceptable level of IOA was set at 80% for the observations and 90% for permanent product scoring during the study. IOA data recording sheets are included in Appendices A and B.

**Independent Variable(s)**

The independent variable for this study was a self–management procedure that involved application of a self-monitoring card which was used as a reminder to compartmentalize personal concerns and as a tool to monitor on-task behavior during independent math practice sessions. The procedure included opportunities for performance feedback, goal setting and incentives.

Self-monitoring cards were 8.5” X 11” pages divided into two sections with a student’s name at the top (Appendix F). The first section included a space for students to answer three questions (described above) and to indicate whether or not they made a decision to set aside any personal worries or concerns which might affect their focus on the class activity. The second section included a chart with the question, “At this exact second, am I on-task?” The chart was
divided into four segments with the words “yes” and “no” in each segment, which allowed students to respond each time an audible tone occurred (i.e. one tone every four minutes). An operational definition of the term on-task behavior was noted at the bottom of the self-monitoring card as a reminder for students.

A separate graph page was used for individual feedback and goal setting. The graph page was individualized to include a bar graph showing academic productivity (i.e. number of problems completed) and accuracy (i.e. number of problems correct) data for each math practice session. This graph page included space for students to record productivity and accuracy data for each session they completed. It will also include space at the bottom of the page for students to record personal goals at the start of each intervention phase session.

*Procedural Integrity*

The primary aim of procedural integrity is that each individual implementing the treatment (i.e., intervention or independent variable) applies the treatment exactly as defined. Treatment drift occurs when the intervention is not carried out as planned, especially in the later stages of the study. Hence, the results could potentially be skewed in that they may not reflect what happens to the dependent variable when the independent variable is applied appropriately or as planned.

In this study, the experimenter had a role in introducing the intervention at the start of each session; however, the independent variable (i.e., self-monitoring card) was implemented by the participants themselves. The experimenter was responsible for providing students with feedback on their performance (e.g., academic productivity and accuracy of math problems), administering incentives when indicated, and guiding students with goal setting. For the participant, procedural integrity included five components: (a) Did the student review the graph page and record a productivity goal and an accuracy goal on the graph page. (b) Did the student
respond to the first three questions on the self-monitoring card, “Did I compartmentalize my (nonacademic) concerns or worries?”, “I would like to talk to the School Psychologist later about my concerns later?”, and “How I feel today?”, (c) Did the student begin work on the math calculation worksheet when the experimenter asked students to start, (d) Did the student respond to the second question on the self-monitoring card which is “At this exact second, am I on-task?”, each time the auditory cue occurred, and (d) Did the student stop working on the math worksheets when the experimenter asked her to stop?

To ensure treatment fidelity on the part of the experimenter, an intervention script was employed by the experimenter and a procedural integrity checklist was completed to evaluate how the experimenter (Appendix D) and the participants (Appendix C) implemented the intervention. The same form functioned as both the intervention script and the procedural integrity checklist for the experimenter. The experimenter acted as the independent observer. A booster session or retraining was offered to the participants at the end of the second baseline phase and prior to the start of the second intervention phase and the fading phase. Retraining consisted of a brief description of the procedure for using the self-management card and asking participants questions to ensure understanding.

Research Design

Single-subject research methodology has long been used in the field of special education to examine the effectiveness of instructional practices at the level of individuals (Horner, Carr, Halle, McGee, Odom, Wolery, 2005). Because single-subject research allows for the investigation of functional relationships between independent and dependent variables, this methodology is applied across a variety of scholarly disciplines (Horner et al., 2005).
In this study, a single-subject reversal design, A-B-A-B-C, was implemented to examine treatment effects across participants. An added element, phase C was included to examine student performance under a fading condition (i.e., without the aid of a self-monitoring card).

The experimental conditions consisted of a Baseline Phase I (A), Self Monitoring Intervention Phase I (B), Return to Baseline Phase II (A), Self-Monitoring Intervention Phase II (B), and a Fading Phase (C). The reversal design is said to be “the most straightforward and generally most powerful within-subject design for demonstrating a functional relation between an environmental manipulation and a behavior” (Cooper, Heron, & Heward, 2007, p.177). More specifically, this design allows one to visually analyze a graphical display of the effects that implementing, withdrawing, and re-implementing an independent variable has on a target behavior (Cooper et al., 2007). Experimental control is demonstrated when baseline conditions show undesirable levels of the target behavior, and treatment conditions consistently lead to change in the target behavior in the direction desired. More specifically, a functional relation exists when the second baseline condition approximates levels of responding found in the first baseline condition, and the second treatment condition replicates improvements in the target behavior that were demonstrated in the first treatment condition.

In this study certain decision rules were applied when transitioning between baseline and treatment conditions and were based on students’ on-task behavior, the primary dependent variable. Stable responding was desired for all participants in the first baseline condition prior to a transition to the first intervention condition. However, exceptions were in order given the data obtained. Based on principals outlined in Horner et al. (2005), experimental control was considered to be obtained with three demonstrations of improved on-task behavior (e.g., increase in level or decrease in variability) following a baseline phase. Decision rules are detailed below under procedures.
Procedures

*Participant Selection*

All girls attending school were considered possible candidates for inclusion in the study. Students with disabilities who also exhibited low base rates of on-task behavior and delayed math skills (grade levels showing two or more years delay) were sought. Data from educational records was considered first as these records contained information regarding standardized math test performance and educational disability identifications (IDEIA 2004). Grade level scores from the California Achievement Test (CAT) and proficiency level from any administrations of the Ohio Graduation Test (OGT) were reviewed. Also, teachers who are familiar with students’ class performance were questioned regarding students’ typical levels of attention to tasks. The consent process was completed for students who met initial screening criteria. These students were given selected assessments including norm-referenced assessments (Woodcock-Johnson, Third Edition (WJ-III) Math Fluency and Math Calculation subtests) and informal measures consisting of various pages of math calculation problems that were very similar to a curriculum based measurement (CBM) tool. The informal assessment consisted of four pages of calculation problems categorized as addition, subtraction, division and multiplication. All pages contained some fractions. At the start of the study (February 2010), students who met criteria for inclusion were placed in the second period math class along with other students who were not study participants.

This selection process occurred several times between January 2010 and April 2010 due to issues that arose with retention of participants. Early release dates were implemented with many youth due to changes in state and court level policies. This resulted in a significant reduction of the overall facility population and a reduction in the girls’ school enrollment level. This further led to changes in how students were scheduled for classes. An additional selection
criterion was added to seek participants assigned to SJCF for at least three months from the time of their anticipated inclusion in the study. However, this was not a guarantee of retention as youth were sometimes granted an early release. The initial intent was to work with a group of students guiding them through all phases of the intervention as a group but due to the variation in enrollment dates, the experimenter was required to work with students individually most of the time.

**Baseline Phase I: Initial Baseline**

The first baseline phase consisted of classroom-based observations of all participating students. Students were observed during independent math practice and data was collected for three dependent variables, (a) on-task behavior, (b) academic productivity, and (c) academic accuracy. The experimenter and OSU student assistants acted as observers. Math worksheet packets that included math problems of each student’s predetermined skill level (i.e. a level of working knowledge) were used during this phase and all phases. At the beginning of each baseline session, students were provided with the following instructions:

“We would like for you to complete some math problems. Please try to focus on the math worksheet as you complete the problems. You should continue to work on the math worksheet until one of the adults in the classroom asks you to stop working. When we pass out the worksheets, don’t turn them over until we ask you to start working. This is an independent work time, you will not receive assistance, just try your best.”

Students were asked to stop working after 16 minutes and worksheets were collected. The experimenter and assistants graded the math worksheets and recorded data on academic productivity and accuracy on the top page of each worksheet packet. This step was completed in another room. It should be noted that a 16 minute time frame was selected because students
needed time to working on other computer based class assignments; the entire class period (55 minutes) could not be used for intervention.

The decision to move from the first baseline phase to the first intervention phase was based on student performance along the primary dependent variable, percentage of on-task behavior. Due to participant recruitment and retention challenges, the decision was based on individual student performance rather than group performance. When a participant showed a stable trend, a declining trend, or a persistent variable data pattern she was moved from baseline to intervention. A training session for the intervention procedure was provided to participants after the first baseline phase.

*Pre-Intervention Training*

Prior to implementing the intervention and after the first baseline phase, participants were trained on how to self-monitor on-task behavior, graph performance for math productivity and accuracy, and set personal productivity and accuracy goals. Lesson plans for this training are detailed in Appendix K. Initial training sessions were conducted either individually or with small groups of students. Student A was trained in a small group in the school library. Student B was trained individually in the group room on her living unit since she entered this stage after completing the GED and was not enrolled in school. Student C was trained individually in the math classroom due to resistant behaviors. Instructional strategies associated with the Self-Regulated Strategy Development (SRSD) approach were adapted and used as a guide to train students to self-monitor on-task behavior (Graham, & Harris, 1988, 1989; Graham, Harris, & Mason, 2005). This involved (a) *Background Knowledge*: activating students’ background knowledge about appropriate classroom behaviors, (b) *Discussion*: defining on-task behavior and discussing how they were currently performing the skill, (c) *Modeling*: the experimenter modeled off-task behavior and then on-task behavior while talking out loud and using self-instructions
(e.g., “I need to keep working even though people beside me are talking”, “I need to work on another problem while I’m waiting for the teacher to help me”), (d) **Memorization**: Students used cue cards to write down personal self-statements to be used as a reminder when they practiced on-task behavior; they were also taught the acronym KIT (Keep working on the assignment, Ignore distractions, (the) Tone means “Am I on task?”), (e) **Collaborative Practice**: Students practiced on-task behavior using the self-monitoring card (see Appendix D) with support from the experimenter, as needed, and finally (f) **Independent Practice**: Students independently practiced monitoring their on-task behavior while completing a sample practice math assignment.

Students were praised when they demonstrated accuracy with the self-monitoring procedure, and corrective feedback was offered during the collaborative practice stage of training. The training sessions were approximately 30 minutes in duration.

At the end of this pre-intervention training stage, a Choice Reinforcement Survey was administered to participants (Appendix I). This survey was based, in part, on categories identified by Northup, George, Jones, Broussard, & Vollmer (1996) and in part on a list of items which girls were permitted to have within the facility. A variety of incentives were made available during the intervention phases of the study.

**Intervention Phase I: Self-Monitoring**

This procedure was implemented until the decision rule indicated that a participant should transition to the next baseline phase. Movement between phases was decided on an individual basis according to each participants’ unique data pattern, hence, the number of days that the intervention was applied varied among participants.

First, students were shown their math worksheet packets from the previous session, and they were provided with feedback on their math practice performance (e.g., shown errors, the
number of problems completed, and the number of problems correct). Next, graph pages were given to students. Students were asked to graph their performance data (i.e. data on academic productivity and accuracy) from the worksheet packet they just reviewed (i.e. the previous session) and then set and record personal productivity and accuracy goals for the current session at the bottom of the graph page. The following instructions were provided:

“Please graph your performance from the last math practice session. The number complete and the number correct are written on the top page of the packet. Now set your goal for today. Do you want to increase the number of problems you complete or complete at least the same number of problems? Do you want to increase the number you get correct or keep this number at least the same? Please write the date and your goal on the chart at the bottom of the page.”

After students completed this step, self-monitoring cards were distributed. Students were provided with the following instructions:

“Sometimes students come to class thinking about problems they have or things that happened before class. When you get to school it is important to push those problems, worries or concerns out of your mind so that you can focus on your school work and reach your educational goals. Putting our problems aside in this way is called “compartmentalizing”. In the first box, please indicating whether or not you have compartmentalized your concerns. Please circle ‘Yes’, ‘No’, or ‘No problems today’. If you circled ‘Yes’ (you have set aside concerns) or ‘No’ (you are having a hard time pushing concerns out of your mind) you can answer the next question in this box to tell whether you would like to meet with the school psychologist later to talk about your problems or concerns. If you say yes, you will be given time to meet with the school psychologist later. Next, I’d like you to tell how you feel today, circle one option from each line.”
Next, students were given instructions for completing the second section of the self-monitoring card for on-task behavior. After this, math worksheets were distributed. The following instructions were provided:

“While you are working on the math worksheets, you will hear a tone every four minutes. When you hear the tone, ask yourself, ‘At this exact second, am I on-task?’; if you are on-task, circle ‘yes’ and if you are not on-task, circle ‘no’. Be very careful to circle your responses under the correct tone number (e.g. at tone 1, circle ‘yes’ or ‘no’ in the correct box for tone 1). Your card has reminders of what actions count as on-task behavior. Remember, it’s important that you are accurate when you circle ‘yes’ or ‘no’. [Math worksheets will be distributed] Please wait until I say “start”. You will not be able to receive help with the math problems, just do your best. You can have scratch paper to work problems. [Provide scratch paper to any who want it.] You can start working now”.

Data were collected by the experimenter for on-task behavior, academic productivity, and academic accuracy during each session. The experimenter also collected data for participant procedural integrity. Given that students needed to complete assignments on the CSLS during this math class time, they did not have time to grade their own papers. The experimenter and assistants scored worksheets after the practice session in another room. They recorded data for academic productivity and accuracy on the front page of the worksheet packets. If students maintained or improved academic productivity and accuracy during the second and subsequent session(s), they were allowed to choose an incentive from a set of available options. Incentives were provided approximately every other session. There were times that an incentive could not be delivered due to an unexpected change in the facility’s master schedule, thus the student had to wait until the next opportunity to earn an incentive. Incentives were delivered either during school or after school on the living units.
The decision to move from this first intervention phase to the second baseline phase was based on individual student performance along the primary dependent variable (percentage of on-task behavior). When data points showed a stable, increasing or variable trend, that were higher than the data point average for the first baseline condition, participants were moved to the next phase.

*Baseline Phase II: Return to Baseline*

Procedures for the return to baseline were the same as the initial baseline phase. A participant’s time in this phase was based on individualized data trends. Data was collected on the same three dependent variables. Math worksheets were distributed at the start of class. Students were instructed when to begin working and told when to stop. Self-monitoring cards were not distributed, performance feedback was not provided, and students did not engage in data recording or goal setting. The experimenter collected data for on-task behavior, academic productivity, and academic accuracy.

*Intervention Phase II: Return to Self-Monitoring*

Prior to starting this phase, students were provided with a brief review of the self-monitoring procedure in which the experimenter briefly described the procedure and asked students questions to ensure understanding. Procedures for this phase were the same as those in the first intervention phase. A participants’ time in this phase was based on individualized data trends. Incentives were provided approximately every other session just as in Intervention I. Student feedback became a concern to the experimenter shortly after the first intervention phase. Students began to express a dislike for the number of sessions and the need for repeated skill practice. The experimenter made a decision to inform students that they were approaching the end of the study as a motivational tool. Also, an additional incentive was added at the end of the study, after the Fading phase. Students chose to work on a group craft at the end of the study as
Due to facility and living unit schedules, Student C worked on the craft incentive individually.

**Fading Phase: Final Phase**

This phase was designed to examine participant performance along three dependent variables (i.e., on-task behavior, academic productivity, and academic accuracy) while components of the intervention were faded. Only the experimenter collected data for on-task behavior, academic accuracy, and academic productivity. The experimenter also graphed student performance for each session. Performance feedback was offered each day (students shown graph with performance data) and students were asked to think about personal goals for productivity and accuracy but they were not required to record these goals on the graph page. Incentives were not administered during this phase, however, due to negative student feedback in the first intervention phase an additional incentive was added at the end of the fading phase as a motivational tool. Students remained in this phase for six days.

For two days, the tone was used in the same manner as the intervention phase as a cue for students to self-monitor. Students did not use self-monitoring cards but were instructed to ask themselves if they were working when the tone occurred. Performance data from the previous session was provided to students. The following instructions were given:

[Individual graph pages were passed out.] “This graph shows your performance from the last practice session. Please look at the number of math problems you completed and the number of problems you got correct. Now, think about your goals for today using the same questions we have discussed before.” [Graph pages were collected]

“Today, just as in the other days, please set aside any problems or concerns you may be thinking about in order to focus on the assignment. If you have concerns I can address those with you after the session. You will hear the same tone as you work on the math worksheets.
When you hear the tone this time, I want you to ask yourself if you are working but you will not have to circle your response on the Self-monitoring card. If you need scratch paper please let me know. [Math worksheets were disturbed along with scratch paper as necessary.] You can start working now”. [Worksheets were collected. The experimenter later graded the worksheets and recorded performance data on the graph pages.]

For two days, the tone was eliminated and students were asked to give the experimenter a report regarding their on-task behavior at the end of the work period. The following instructions were given:

[Individual graph pages were passed out.] “This graph shows your performance from the last practice session. Please look at the number of math problems you completed and the number of problems you got correct. Now, think about your goals for today using the same questions we have discussed before.” [Graph pages were collected]

“Today, just as in the other days, please set aside any problems or concerns you may be thinking about in order to focus on the assignment. If you have concerns I can address those with you after the session. You will not hear a tone as you work today. When you finish working I will ask you to tell me if you were on-task or off-task most of the time. If you need scratch paper to help with working the math problems, please let me know. [Math worksheets were disturbed along with scratch paper as needed.] You can start working now”.

During the final two session days, there was no tone, students were not asked to set aside concerns and were not asked to report their on-task behavior to the experimenter. Instructions were as follows:

[Individual graph pages were passed out.] “This graph shows your performance from the last practice session. Please look at the number of math problems you completed and the number of
problems you got correct. Now, think about your goals for today using the same questions we have discussed before.” [Graph pages were collected]

“Today, you will complete the math assignment just as you have on other days. You will not need to complete any other steps. When you finish working I will collect the assignment. If you need scratch paper to help with working the math problems, please let me know. [Math worksheets were disturbed along with scratch paper as needed.] You can start working now”.

Table 2: Definitions of Terms

<table>
<thead>
<tr>
<th>Mental Health Case Load</th>
<th>Those youth whose mental impairments are sufficient to warrant being followed by psychology or psychiatry staff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seclusion</td>
<td>The involuntary confinement of a youth alone in their own room or in a safe-room. Youth can be confined to Immediate Seclusion (up to one hour) or Extended Seclusion (up to three hours) for behaviors that put others or themselves at risk.</td>
</tr>
<tr>
<td>Unit</td>
<td>Building of residence where the youth are housed (may also be referred to as a cottage).</td>
</tr>
<tr>
<td>Group Room</td>
<td>A separate room within the living unit. The room contains a table, chairs, white board, and computer. The room is often used for meetings or therapy groups with youth.</td>
</tr>
</tbody>
</table>

IDEIA Disability Definitions:

**Emotional Disturbance (ED)** – means a condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree that adversely affects a child’s educational performance: An inability to learn which cannot be explained by intellectual, sensory, or health factors; An inability to build or maintain satisfactory interpersonal relationships with peers or teachers; Inappropriate types of behavior or feelings under normal circumstances; A general pervasive mood of unhappiness or depression; A tendency to develop physical symptoms or fears associated with school or personal problems.

**DSM-IV-TR Diagnostic Category Descriptions:**

**Conduct Disorder** - The essential feature is a repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated. These behaviors fall into four main groupings: aggressive conduct that causes or threatens harm
Table 2: Continued

to other people or animals, non-aggressive conduct that causes property loss or damage, deceitfulness or theft, and serious violations of rules (DSM-IV-TR, p.98).

**Substance Abuse** - The essential feature of substance abuse is a maladaptive pattern of substance use manifested by recurrent and significant adverse consequences related to the repeated use of substances (DSM-IV-TR, p.198). The abuse may be concentrated on one substance or multiple substances as in **Polysubstance Abuse**.

**Substance Dependence** - The essential feature is a cluster of cognitive, behavioral, and physiological symptoms indicating that the individual continues use of the substance despite significant substance-related problems. There is a pattern of repeated self-administration that can result in tolerance, withdrawal, and compulsive drug taking behavior. The dependence may be concentrated on one substance or on multiple substances. (DSM-IV-TR, p.192)

**Mood Disorders** – Disorders that have a disturbance in mood as the predominant feature including Major Depressive Disorder, Dysthymic Disorder, and Bipolar Disorders (DSM-IV-TR, p.345)

**Major Depressive Disorder, recurrent** – The essential feature is a period of two weeks during which there is either depressed mood or the loss of interest or pleasure in nearly all activities. In children and adolescents, the mood may be irritable rather than sad. The individual must also experience at least four additional symptoms drawn from a list…The “recurrent” specifier refers to the presence of two or more Major Depressive Episodes. (DSM-IV-TR, p.349)

**Attention Deficit Hyperactivity Disorder** – The essential feature is a persistent pattern of inattention and / or hyperactivity-impulsivity that is more frequently displayed and more severe than is typically observed in individual at a comparable level of development. Some impairment from symptoms must be present in at least two settings…Symptoms may include failure to give close attention to details, making careless mistakes in school work or other tasks, difficulty sustaining attention in tasks, difficulty persisting with tasks until they are complete, frequent shifts from one uncompleted activity to another… (DSM-IV-TR, p.85)

**Post Traumatic Stress Disorder (PTSD)** – The essential feature is the development of characteristic symptoms following exposure to an extreme traumatic stressor involving direct personal experience of an event that involves the actual or threatened death or serious injury, or other threat to one’s physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm or threat of death or injury experienced by a family member or other close associate (DSM-IV-TR, p.463)

*Terms were defined and paraphrased as set forth in the Ohio Department of Youth Services Standard Operating Procedures, IDEIA 2004 (20 U.S.C. 1402), and the DSM-IV- Text Revision. DSM-IV-TR definitions are partial definitions.*
Table 3: Definitions of Measured Behaviors

<table>
<thead>
<tr>
<th>Time On-Task</th>
<th>Off-Task</th>
<th>Academic accuracy</th>
<th>Academic productivity</th>
</tr>
</thead>
</table>

**Time On-Task** was defined as being actively or passively engaged with the independent math practice assignment. The following behaviors were included as being on-task:

- **Eyes on Paper** - Looking at the assignment.
- **Self-Monitoring** - Marking the self-monitoring card at the time of the tone.
- **Thinking** – looking away from paper and appears to be thinking.
- **Appropriate Writing** - Working a math problem or writing an answer to a problem.

**Off-Task** was defined as not being actively or passively engaged with the assignment as indicated by the absence of the behaviors described above.

**Academic accuracy** is defined as the number of math problems completed correctly.

**Academic productivity** is defined as the number of math problems completed.
Chapter 4: Results

This chapter describes the results of this study organized by research questions. Seven research questions were used to investigate the effects of a self-management procedure on the on-task behavior, academic productivity and academic accuracy of girls in a juvenile correctional high school during independent math practice sessions. On-task behavior was the primary dependent variable; results are described under the first two research questions. The purpose of the academic productivity and academic accuracy research questions was to investigate how the self-management package which was primarily aimed at increasing on-task behavior might have an indirect impact on math skill improvement as students became more engaged during math practice sessions. Data were collected for all three dependent variables during every math practice session. Data for all research questions is presented in terms of individual performance. Interobserver agreement and procedural integrity results are presented last.

Research Questions 1 & 2: What effects will a self-management package have on the on-task behavior of participants during independent practice with math facts? What effects will a self-management package have on the on-task behavior of participants after the self-management package is faded?

On-task behavior was calculated using the following formula: Number of intervals coded as on-task divided by the total number of observation intervals (i.e., 64) multiplied by 100.
Participant A

Baseline I. Descriptive statistics for on-task behavior are presented in Table 4. Figure 2 offers a graphic display results for on-task behavior for Student A across all conditions. Student A was in the Baseline I condition for 11 sessions. Her on-task behavior rate ranged from 18.75% to 67.18% during this phase and her performance under this condition showed high variability. Student A’s typical performance within the condition is represented best by a median level line of .46 (i.e., on-task 46% of the time). There was no detectible trend due to high variability. All Baseline I sessions were conducted in the math classroom which consisted of a small group, usually ranging between seven and nine students.

Self-Management Intervention I: Student A was in the Intervention I condition for 7 sessions. Her on-task behavior ranged from 34.37% to 100% during this phase. There was a delayed change in the level of on-task behavior between Baseline I and Intervention I, however, Student A’s performance in this condition showed a rapidly increasing trend that stabilized at a high level suggesting the intervention had a positive effect in the desired direction. The median level line for this condition was .93 (i.e. on-task 93% of the time). Student A completed her high school credits after the third session of the Intervention I condition. Hence, subsequent sessions for this condition were conducted on the living unit in the group room. During some sessions she worked alone, other sessions included one other participant.

Return to Baseline II: This condition consisted of 11 sessions. Student A’s on-task behavior ranged from 0% to 84.37% during this phase. Baseline II offered verification of Baseline I. When comparing this condition to Intervention I, there was an immediate change in the level of on-task behavior (from 100% to 84% time on-task). Her time on-task for the first session was relatively high suggesting that there may have been some carry over effects from Intervention I. The median level line for this Baseline II phase was .73 (i.e. a median of 73%
time on-task), which was higher than the median for the first baseline condition (median = .46) but lower than the median for Intervention I (median = .93). Student A’s performance under this Baseline II showed high variability (no detectable trend) just as in the first baseline condition. All sessions were conducted on the living unit in the group room. One or two other participants were present during some of the sessions.

Self-Management Intervention II: This condition spanned 4 sessions and Student A’s on-task behavior ranged from 95.31% to 100% during this phase. There was an immediate change in the level of on-task behavior between Baseline II and Intervention II. Student A’s time on-task under this condition was high with a median level of .95; a stable trend was evident and her behavior in this condition offered verification of her behavioral responding in the first intervention condition indicating the intervention had a positive effect in the desired direction.

Fading: Components of the intervention were gradually withdrawn under this condition. This condition continued for 6 sessions, and on-task behavior ranged from 70.31% to 100%. There was an immediate level change from Intervention II to this phase; a drop from 100% to 92.18%. There was some fluctuation in Student A’s on-task behavior; the trend would be best described as rapidly descending. The median level line was high .92, however, the trend was descending.

**Conclusion:** In response to research questions 1 and 2, Student A’s on-task behavior improved each time the intervention was applied. The median level of on-task behavior was high during the fading phase, however, this phase showed a descending trend. This suggests that the effects of the intervention were not as durable as desired when components were systematically faded. Percentage of nonoverlapping data points (PND) for the intervention’s effect with on-task-behavior was .85 (85%) for the first AB phase grouping and 1.0 (100%) for the second AB phase grouping.
Participant B

Baseline I: Descriptive statistics for on-task behavior are presented in Table 5. Figure 3 offers a graphic representation of on-task behavior for participant B across all conditions. Baseline I consisted of 7 sessions. Student B’s on-task behavior ranged from 42.18% to 100% during this phase. Her performance under this condition was variable and then showed a decreasing trend after the 4th session. Student B’s typical performance within the condition might be represented best by a median level line of .79 (i.e. on-task 79% of the time).

Self-Management Intervention I: The Intervention I condition consisted of 3 sessions and Student B’s on-task behavior ranged from 81.25% to 100% across sessions. There was an immediate change in the level of on-task behavior between the last data point in Baseline I and the first data point for Intervention I (from 42.18% to 100%), however, because Student B demonstrated high on-task behavior across the initial sessions of the first baseline, there was a high degree of overlapping data for these two conditions. Student B’s performance in this condition remained high, however, slightly variable. The median level line for this condition was .95 (i.e. on-task 95% of the time). Initially Student B seemed to be eager to participate and very interested in the incentive aspect of the project.

After, the first intervention condition her eagerness to remain engaged in the task appeared to diminish. She began to linger on the living unit before entering the group room to start practice sessions. Student B also began to question why she was “working on the same types of math problems” and she asked how much longer the project would take to complete. The purpose of practicing similar types of math calculations was explained to Student B. It was preferable to conduct additional sessions within this phase, however, due to behavioral concerns as noted above, the experimenter decided to change phases after three data points to increase chances that this student would complete all phases of the study.
It is common for some youth in this setting to struggle with task persistence and diminished desire to engage in consistent academic work due to background factors. As described in Chapter 3, to help motivate students, the school district in which this study took place, implemented a Positive Behavior Support System.

Return to Baseline II: This condition consisted of 4 sessions. The range for on-task behavior was 0% to 62.50%. When comparing the first data point of this condition to the last data point for Intervention I, there was an immediate change in the level of on-task behavior (from 95.31% to 0%). The median level line for this condition decreased to .45 (i.e. a median of 45% time on-task). Overall, on-task behavior for this second baseline was lower than the median for the first baseline condition (median = .79). Student B’s performance under this condition showed slight variability and no detectable trend. Student B’s attitude toward the project was perhaps weakest during this phase as observed by her facial expressions and body language. Also, during one session, she expressed displeasure that she was asked to end a nonacademic activity in order to complete a practice session (Session 16). A staff person with whom she had good rapport provided her with some encouragement regarding the need to work on her math skills.

Self-Management Intervention II: This condition consisted of 3 sessions and the range for on-task behavior was 79.68% to 98.43%. There was an immediate change in the level of on-task behavior between Baseline II and Intervention II (from 39.06% to 96.87%). Student B’s time on-task under this condition was high with a median level of .96; no trend was observed. Data for this condition offered verification of the first intervention condition suggesting the intervention had a positive effect in the desired direction. Student B’s approach toward working appeared to be improving during the second session of this phase but her demeanor was sometimes a concern across all of the sessions. As noted for Intervention I, it was preferable to conduct additional
sessions within this phase, however, the experimenter decided to change phases after the third data point to increase chances that Student B would complete all phases of the study.

Fading: Components of the intervention were gradually withdrawn under this condition. This condition continued for 6 sessions and the range for on-task behavior was 53.12% to 95.31%. There was an immediate level change from Intervention II to this phase but it would not be considered a large degree of change (98.43% to 93.75%). Also, there was a level change within the phase. Student B’s on-task behavior was variable with a median level line of .93. The variability observed near the end of this phase suggests the intervention had less impact as components were systematically faded. Her on-task behavior was lowest during the last two sessions of this condition when major components of the self-management intervention were not implemented.

**Conclusion:** Student B’s on-task behavior improved each time the intervention was applied. The median level of on-task behavior during intervention phases was higher than baseline phases. The median level remained high during fading, however, there was a level change within the fading condition. Percentage of nonoverlapping data points (PND) for the intervention’s effectiveness with on-task behavior was 0 (0%) for the first AB phase grouping and 1.0 (100%) for the second AB phase grouping.

**Participant C**

Baseline I. Descriptive statistics for on-task behavior are presented in Table 6. Figure 4 offers a graphic display of results for participant C across all conditions. Student C was in the Baseline I condition for 6 sessions. The range for on-task behavior was 0% to 98.43%. Her on-task behavior under this condition showed high variability. Student C’s on-task behavior started at a high level but eventually dropped off to a lower level with variability. Student C’s typical performance within the condition is best represented by a median level line of .54 (i.e. on-task
54% of the time). The trend would be characterized as a zero trend due to high variability. All but one session was conducted in the math classroom during second period. One session was completed on the living unit in the group room with two other students present.

Self-Management Intervention I: Student C was in the Intervention I condition for 4 sessions. The range for on-task behavior was 65.62% to 100%. There was an immediate change in the level of on-task behavior between Baseline I and Intervention I (0% to 100%); on-task behavior remained high with a median level line of 1.0 (i.e. on-task100% of the time) suggesting the intervention had a positive effect in the desired direction. There was no observable trend. All sessions were completed in the math classroom during second period.

Return to Baseline II: This condition consisted of 6 sessions and offered verification of the first baseline condition. When comparing this condition to Intervention I, there was an immediate change in the level of on-task behavior, from 100% to 79.68%. The range for on-task behavior was 0% to 92.18%. The median level line for this condition was between .06 and .79 (i.e. a median of approximately .425 or 43% time on-task) and much lower than the median level for Intervention I (1.0). Student C’s performance under this condition revealed high variability (no detectable trend). There were two sessions in which Student C would not engage in math practice, commenting that she did not ‘feel like doing anything today’ or was not going to ‘do anything today and did not even want to look at it (the worksheet packet)’. One of these days, she placed the math worksheet packet at the corner of her desk and turned her back to the experimenter. During the other session she was observed to later engage in a disagreement with a peer.

Sessions were completed in the math classroom or in the group room of the living unit. The three sessions with the highest on-task percentages were completed in the group room on the living unit. Some sessions were completed in the group room due to her behaviors and
emotional status which was highly variable from day to day and moment to moment. Sharp fluctuations in mood and behavior (e.g. non compliance, being argumentative, and other undesirable behaviors) were observed and noted daily by both the experimenter and Student C’s teachers. At times, behaviors resulted in her removal from class to a designated ‘time-out’ room where she could complete her work. Return back to the living unit was also necessary at times in order to allow her to improve her mood and/or behavior.

Self-Management Intervention II: This condition consisted of 4 sessions. The range for on-task behavior was 0% to 100%. The first data point represented an overlap with data in the preceding condition, however, an immediate increase occurred with the second data point which was measured at 96.87% time on-task. Her performance remained high. The median level for this condition was between .968 and 1.0 (approximately .98 or 98% time on-task); there was no observable trend. This phase did not offer verification of the first intervention phase, however, data for the majority of sessions under this condition were at a level similar to most sessions in Intervention I. Student C would not engage in practice during the first session of this phase when the activity was offered, stating that she ‘did not want to work today’.

Fading: This condition was implemented for 6 sessions. The range for on-task behavior was 98% to 100%. Student C’s on-task behavior showed a stable trend and remained high as indicated by a median level line of 1.0.

**Conclusion:** Student C’s on-task behavior improved each time the intervention was implemented. The median level for on-task behavior during intervention phases was higher than baseline phases. Percentage of nonoverlapping data points (PND) for the intervention’s effectiveness was .75 (75%) for the first AB phase grouping and .75 (75%) for the second AB phase grouping.
Table 4. Student A: Descriptive Statistics for On-Task Behavior with Range, Level, Trend, Variability, Latency of Change, and Percentage of Nonoverlapping Data

<table>
<thead>
<tr>
<th></th>
<th>BL I</th>
<th></th>
<th>INT I</th>
<th></th>
<th>BL II</th>
<th></th>
<th>INT II</th>
<th></th>
<th>Fading</th>
</tr>
</thead>
<tbody>
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<td>34.37%</td>
<td>Session 19</td>
<td>84.37%</td>
<td>Session 30</td>
<td>95.31%</td>
<td>Session 34</td>
<td>92.18%</td>
</tr>
<tr>
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<td>Session 13</td>
<td>71.87%</td>
<td>Session 20</td>
<td>84.37%</td>
<td>Session 31</td>
<td>95.31%</td>
<td>Session 35</td>
<td>100%</td>
</tr>
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<td>75.00%</td>
<td>Session 21</td>
<td>65.62%</td>
<td>Session 32</td>
<td>95.31%</td>
<td>Session 36</td>
<td>100%</td>
</tr>
<tr>
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<td>93.75%</td>
<td>Session 22</td>
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<td>100%</td>
<td>Session 37</td>
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</tr>
<tr>
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<td>100%</td>
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</tr>
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<td></td>
</tr>
<tr>
<td>Range</td>
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<td>Range</td>
<td>34.37% to 100%</td>
<td>Range</td>
<td>0% to 84.37%</td>
<td>Range</td>
<td>95.31% to 100%</td>
<td>Range</td>
<td>70.31% to 100%</td>
</tr>
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<td>Level (Median)</td>
<td>93%</td>
<td>Level (Median)</td>
<td>73%</td>
<td>Level (Median)</td>
<td>95%</td>
<td>Level (Median)</td>
<td>92%</td>
</tr>
<tr>
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<td>Trend</td>
<td>Rapidly Incr’sng</td>
<td>Trend</td>
<td>None</td>
<td>Trend</td>
<td>Stable</td>
<td>Trend</td>
<td>Rapidly descendin</td>
</tr>
<tr>
<td>Variability</td>
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<td>Variability</td>
<td>N/A</td>
<td>Variability</td>
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<td>Variability</td>
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<td>Variability</td>
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</tr>
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<td>Latency of Change</td>
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<td>Immediate</td>
<td>Latency of Change</td>
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<td>PND 1st AB Set</td>
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<td></td>
</tr>
</tbody>
</table>

Note: Due to the presence of outliers, the median was selected over the average as descriptor for level.
Figure 2. Student A: Percentage of On-Task Behavior Across Phases
Table 5. Student B: Descriptive Statistics for On-Task Behavior with Range, Level, Trend, Variability, Latency of Change, and Percentage of Nonoverlapping Data

<table>
<thead>
<tr>
<th>BL I</th>
<th>INT I</th>
<th>BL II</th>
<th>INT II</th>
<th>Fading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>100%</td>
<td>Session 11</td>
<td>0%</td>
<td>Session 15</td>
</tr>
<tr>
<td>Session 2</td>
<td>82.81%</td>
<td>Session 12</td>
<td>50.00%</td>
<td>Session 16</td>
</tr>
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<td>Session 3</td>
<td>79.68%</td>
<td>Session 13</td>
<td>62.50%</td>
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</tr>
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<td>Session 4</td>
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<td>Session 7</td>
<td>42.18%</td>
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Range: 42.18% to 100%  
Range: 81.25% to 100%  
Range: 0% to 62.50%  
Range: 79.68% to 98.43%  
Range: 53.12% to 95.31%

Level (Median): 79%  
Level (Median): 95%  
Level (Median): 45%  
Level (Median): 96%  
Level (Median): 93%

Trend: Gradually decreasing  
Trend: None  
Trend: None  
Trend: None  
Trend: None

Variability: N/A  
Variability: N/A  
Variability: N/A  
Variability: N/A  
Variability: N/A

Latency of Change: Immediate  
Latency of Change: Immediate  
Latency of Change: Immediate  
Latency of Change: Immediate  
Latency of Change: Immediate

PND 1st AB Set: 0%  
PND 2nd AB Set: 100%

Note: Due to the presence of outliers, the median was selected over the average as descriptor for level.
Figure 3. Student B: Percentage of On-Task Behavior Across Phases
Table 6. Student C: Descriptive Statistics for On-Task Behavior with Range, Level, Trend, Variability, Latency of Change, and Percentage of Nonoverlapping Data

<table>
<thead>
<tr>
<th></th>
<th>BL I</th>
<th>BL II</th>
<th>INT I</th>
<th>INT II</th>
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<td>79.68%</td>
<td>100%</td>
<td>0%</td>
<td>Session 21 100%</td>
</tr>
<tr>
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<td>0%</td>
<td>Session 17</td>
<td>0%</td>
</tr>
<tr>
<td>Session 3</td>
<td>98.43%</td>
<td>Session 13</td>
<td>92.18%</td>
<td>Session 19</td>
<td>100%</td>
</tr>
<tr>
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<td>100%</td>
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<td>98%</td>
</tr>
<tr>
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</tr>
<tr>
<td>Range</td>
<td>0% to 98.43%</td>
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</tr>
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<td>Immediate</td>
</tr>
<tr>
<td>PND 1st AB Set</td>
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<td>Immediate</td>
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<tr>
<td>PND 2nd AB Set</td>
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<td>Latency of Change</td>
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</tr>
</tbody>
</table>

Note: Due to the presence of outliers, the median was selected over the average as a descriptor for level.
Figure 4. Student C: Percentage of On-Task Behavior Across Phases

BL I    INT I    BL II    INT II    FADING

Sessions

Percentage On-Task Behavior
Research Questions 3 & 4: What effects will the self-management package have on the percentage of math problems completed (academic productivity)? What effects will the self-management package have on the percentage of math problems completed after the self-management package is faded?

Academic productivity for a single session was calculated using the following formula:
Number of problems completed divided by Number of problems in a worksheet packet (i.e., 140), multiplied by 100. Academic productivity for a phase (Average Percentage of Problems Completed / APC) was calculated using the following formula: Total number of problems completed for all sessions in a phase divided by Number of sessions in a phase divided by Number of problems in a worksheet packet, i.e. 140, multiplied by 100.

Participant A

Baseline I: Descriptive statistics for academic productivity are presented in Table 7. The graph in Figure 5 displays productivity results across all conditions. Student A’s problem completion rate ranged from 39.29% to 88% during this phase. The average percentage complete (APC) was not calculated for this condition because Student A started the study with varying numbers of items for sessions 1 through 6. As explained in Chapter 3, she was one of the initial participants and it was originally thought that packets containing less than 140 items would ensure students had enough items to work during the 16 minute session without reaching a ceiling. Worksheet packets were gradually adjusted between sessions 1 through 6 to contain 56, 108, and then 140 items. Worksheet packets across the remainder of sessions contained 140 items.

Self-Management Intervention I: The percentage of problems that Student A completed ranged from 47.14% to 64.29% during this first intervention phase. The average percentage of
problems completed (APC) for this phase was 56.12%. She achieved productivity goals for 75% of the sessions in which she set goals. Incentives were administered during this phase.

Return to Baseline II: There was one session in which Student A did not engage in the task; the resulting zero score was not included in the range or average. The percentage of problems that Student A completed ranged from 47.14% to 67.14% during this phase. As predicted there was a decrease in performance during return to baseline. The average percentage of problems completed (APC) was 52.14%; this presented a slight decrease in comparison to the previous phase (from 56.12% to 52.14%). The average percentage of problems completed (APC) remained fairly stable from the previous phase.

Self-Management Intervention II: The percentage of problems that Student A completed ranged from 66.43% to 93.57% during this phase. The average percentage of problems completed (APC) was 74.64%. During this phase, there was a moderate increase in the average percentage of problems completed (APC) as compared to the previous Baseline II phase (22.5 percentage points). She achieved productivity goals for 100% of the sessions in which she set goals. Incentives were administered during this phase.

Fading: The percentage of problems Student A completed ranged from 56.43% to 67.86% during this phase. The average percentage complete was 64.29%. The increase observed during Intervention II was not maintained during the fading phase, instead APC decreased during fading by 10.35 percentage points.

Conclusion: Research questions 3 and 4 related to academic productivity. Based on available data, a strong conclusion regarding the interventions’ impact on productivity cannot be stated. Although the amount of change from Baseline I to Intervention I could not be estimated, the average percentage of problems completed (APC) increased moderately (22.5 percentage points)
from Baseline II to Intervention II. This increase was not maintained throughout the fading condition. APA dropped by 10.35 percentage points during the fading condition.

**Participant B**

Baseline I: Descriptive statistics for academic productivity are presented in Table 8. Figure 6 shows productivity across phases. The percentage of problems Student B completed ranged from 52.86% to 75.71% during this phase. Average percentage of problems completed (APC) was 63.57%.

Self-Management Intervention I: The percentage of problems Student B’s completed ranged from 52.14% to 75.71% during this first intervention phase. The APC was 66.43%. The prediction was that APC would increase when the intervention was implemented. There was a very small increase in APC of 2.86 percentage points from Baseline I to this phase. Student B achieved productivity goals for 100% of the sessions in which she set goals. Incentives were administered during this phase.

Return to Baseline II: There was one session in which Student B did not engage in the task. The resulting zero score was not included in the range or average as summarized here. The percentage of problems Student B completed ranged from 50.71% to 60.71% during this phase. The APC was 54.76%. It was predicted that percentages for problems completed would decrease upon return to baseline; the APC decreased by 11.67 percentage points.

Self-Management Intervention II: The percentage of problems Student B completed ranged from 58.59% to 83.57% during this phase. The average percentage complete was 70.48%. Compared to all other phases, the average for percentage complete was highest for this second intervention phase, 70.48%. It was predicted that APC would increase from Baseline II to Intervention II; there was an increase of 15.72 percentage points. She achieved productivity
goals for 100% of the sessions in which she set goals. Incentives were administered during this phase.

Fading: The percentage of problems Student B completed ranged from 65.71% to 97.14% during this phase. The average percentage complete was 76.19%.

**Conclusion:** Student B. In response to research questions 3 and 4, intervention had a modest impact on Student B’s productivity. There was a modest increase in the percentage of problems completed from Baseline I to Intervention I (3%). As expected, productivity decreased during the Baseline II phase. Productivity increased moderately from Baseline II to Intervention II (15.72 percentage points), however, this pattern was not validated by the initial phases, Baseline I and Intervention I which showed more overlapping data points. APC remained high during the fading condition and there was a modest increase from Intervention II to Fading (5.71 percentage points).

**Participant C**

Baseline I: Descriptive statistics for academic productivity are presented in Table 9. Figure 7 displays productivity results across phases. Student C did not engage in the assignment during two sessions, earning scores of zero for productivity (problems completed). The range and average presented here are based on the four sessions in which she did engage in the math practice assignment. Student C’s problem completion rate ranged from 12.86% to 23.57% during this phase. APC was 17.86%.

Self-Management Intervention I: The percentage of problems Student C completed ranged from 15% to 60.71% during this first intervention phase. The APC was 38.04%. It was predicted that APC would increase from Baseline I to Intervention I. There was a moderate increase in the APC as compared to the first baseline phase (20.18% percentage points). She achieved productivity goals for 67% of the sessions in which she set goals. Student C asked if
she was going to obtain an incentive before the start of the third session. Incentives were administered during this phase; they were provided if one of the two goals (productivity or accuracy) were reached. Student C was not required to achieve both goals due to the emotional and behavioral concerns as noted above, and as a strategy to help maintain her level of motivation.

Return to Baseline II: Student C did not engage in the assigned task during two sessions; the resulting zero scores were not included in the range or the APC. APC is based on the worksheet packets that were complete when she chose to engage in the task). The percentage of problems Student C completed ranged from 4.29% to 47.14% during this phase. APC was 31.79%. During this phase Student C’s performance decreased as expected and her performance showed variability across sessions in which she chose to engage in the task.

Self-Management Intervention II: There was one session in which Student C did not engage in the assigned task; the resulting zero score was not included in the range or average reported here. Student C’s problem completion rate ranged from 47.14% to 50% during this phase. APC was 48.57%. As predicted there was an increase when the intervention was reintroduced. There was a moderate increase in APC over the previous baseline phase (16.78 percentage points). She achieved productivity goals for 33% of the sessions in which she set goals. Incentives were administered during this phase.

Fading: Student C’s problem completion rate ranged from 48.57% to 82.86% during this phase. The average percentage complete was 66.07% which represented a moderate increase over the Intervention II phase (17.5 percentage points).

**Conclusion:** Student C. In response to research questions 3 and 4, there were moderate increases in Student C’s average percentage of problems completed (APC) when comparing
baseline phases to intervention phases. Her productivity increase during the Fading condition was gradual.
**Table 7.** Student A: Descriptive Statistics for Academic Productivity (Percentage of Problems Completed) by Session with Range and Average Percentage of Problems Completed (APC) by Phase

<table>
<thead>
<tr>
<th></th>
<th>BL I</th>
<th>INT I</th>
<th>BL II</th>
<th>INT II</th>
<th>Fading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>80%</td>
<td>Session 12</td>
<td>57.86%</td>
<td>Session 19</td>
<td>60.00%</td>
</tr>
<tr>
<td>Session 2</td>
<td>88%</td>
<td>Session 13</td>
<td>55.71%</td>
<td>Session 20</td>
<td>56.43%</td>
</tr>
<tr>
<td>Session 3</td>
<td>44.44%</td>
<td>Session 14</td>
<td>50.00%</td>
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<td>58.57%</td>
</tr>
<tr>
<td>Session 4</td>
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<td>Session 15</td>
<td>64.29%</td>
<td>Session 22</td>
<td>53.57%</td>
</tr>
<tr>
<td>Session 5</td>
<td>44.44%</td>
<td>Session 16</td>
<td>54.29%</td>
<td>Session 23</td>
<td>47.14%</td>
</tr>
<tr>
<td>Session 6</td>
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<td>Session 17</td>
<td>47.14%</td>
<td>Session 24</td>
<td>56.43%</td>
</tr>
<tr>
<td>Session 7</td>
<td>47.14%</td>
<td>Session 18</td>
<td>63.57%</td>
<td>Session 25</td>
<td>60.00%</td>
</tr>
<tr>
<td>Session 8</td>
<td>39.29%</td>
<td>Session 26</td>
<td>58.57%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 9</td>
<td>47.86%</td>
<td>Session 27</td>
<td>55.71%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 10</td>
<td>61.43%</td>
<td>Session 28</td>
<td>67.14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 11</td>
<td>61.43%</td>
<td>Session 29</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>39.29% to 88%</td>
<td><strong>Range</strong></td>
<td>47.14% to 64.29%</td>
<td><strong>Range</strong></td>
<td>0% to 67.14%</td>
</tr>
<tr>
<td><strong>APC</strong></td>
<td>N/A*</td>
<td><strong>APC</strong></td>
<td>56.12%</td>
<td><strong>APC</strong></td>
<td>52.14%</td>
</tr>
</tbody>
</table>

N/A* - APC was not calculated because Student A started the study with varying numbers of worksheet items for sessions 1 through 6.
Figure 5. Student A: Percentage of Math Problems Completed (Academic Productivity) Across Phases
Table 8. Student B: Descriptive Statistics for Academic Productivity (Percentage of Problems Completed) by Session with Range and Average Percentage of Problems Completed (APC) by Phase

<table>
<thead>
<tr>
<th></th>
<th>BL I</th>
<th>INT I</th>
<th>BL II</th>
<th>INT II</th>
<th>Fading</th>
<th></th>
</tr>
</thead>
<tbody>
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<td>71.43%</td>
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<td>Session 12</td>
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<td>Session 16</td>
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<td>Session 3</td>
<td>62.86%</td>
<td>Session 10</td>
<td>75.71%</td>
<td>Session 13</td>
<td>60.71%</td>
<td>Session 17</td>
</tr>
<tr>
<td>Session 4</td>
<td>65.71%</td>
<td></td>
<td>Session 14</td>
<td>52.86%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 5</td>
<td>68.57%</td>
<td></td>
<td></td>
<td></td>
<td>Session 22</td>
<td>65.71%</td>
</tr>
<tr>
<td>Session 6</td>
<td>52.86%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Session 7</td>
<td>53.57%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>52.86% to 75.71%</td>
<td>Range</td>
<td>52.14% to 75.71%</td>
<td>Range</td>
<td>0% to 60.71%</td>
<td>Range</td>
</tr>
<tr>
<td>APC</td>
<td>63.57%</td>
<td>APC</td>
<td>66.43%</td>
<td>APC</td>
<td>54.76%</td>
<td>APC</td>
</tr>
</tbody>
</table>
Figure 6. Student B: Percentage of Math Problems Completed (Academic Productivity) Across Phases
### Table 9. Student C: Descriptive Statistics for Academic Productivity (Percentage of Problems Completed) by Session with Range and Average Percentage of Problems Completed (APC) by Phase

<table>
<thead>
<tr>
<th></th>
<th>BL I</th>
<th>INT I</th>
<th>BL II</th>
<th>INT II</th>
<th>Fading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>12.86%</td>
<td>Session 7</td>
<td>21.43%</td>
<td>Session 11</td>
<td>42.86%</td>
</tr>
<tr>
<td>Session 2</td>
<td>15.71%</td>
<td>Session 8</td>
<td>15.00%</td>
<td>Session 12</td>
<td>0%</td>
</tr>
<tr>
<td>Session 3</td>
<td>23.57%</td>
<td>Session 9</td>
<td>55.00%</td>
<td>Session 13</td>
<td>47.14%</td>
</tr>
<tr>
<td>Session 4</td>
<td>0%</td>
<td>Session 10</td>
<td>60.71%</td>
<td>Session 14</td>
<td>0%</td>
</tr>
<tr>
<td>Session 5</td>
<td>19.29%</td>
<td>Session 15</td>
<td>32.86%</td>
<td>Session 16</td>
<td>4.29%</td>
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<tr>
<td>Session 6</td>
<td>0%</td>
<td>Session 17</td>
<td>21.43%</td>
<td>Session 18</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>0% to 23.57%</td>
<td><strong>Range</strong></td>
<td>15.00% to 60.71%</td>
<td><strong>Range</strong></td>
<td>0% to 47.14%</td>
</tr>
<tr>
<td><strong>APC</strong></td>
<td>17.86%</td>
<td><strong>APC</strong></td>
<td>38.04%</td>
<td><strong>APC</strong></td>
<td>31.79%</td>
</tr>
</tbody>
</table>
Figure 7. Student C: Percentage of Math Problems Completed (Academic Productivity) Across Phases
Research Questions 5 & 6: What effects will the self-management package have on the percentage of problems completed accurately (academic accuracy)? What effects will the self-management package have on the number of math problems completed accurately after the self-management package is faded?

Academic accuracy for a single session was calculated using the following formula: Number of problems completed accurately divided by Number of problems completed, multiplied by 100. Academic accuracy for a phase (Average Percentage of Problems Completed Accurately/ APA) was calculated using the following formula: Total number of problems completed accurately for all sessions in a phase divided by Total number of problems completed for all sessions in a phase multiplied by 100.

Participant A

Baseline I: Descriptive statistics for academic accuracy are presented in Table 10. The graph in Figure 8 displays accuracy across all phases of the study. Student A’s accuracy rate ranged from 43.64% to 69.44%. The average percentage of problems completed accurately (APA) was 58.68. This calculation accounted for the irregularity or variation in the number of worksheet items that Student A received during early sessions within this condition.

Self-Management Intervention I: The percentage of problems completed accurately for Student A ranged from 47.14% to 74.36% and the average percentage of problems completed accurately (APA) was 58.73%. The APA remained relatively stable from Baseline I to this phase (increase was negligible, < 1 percentage point). She achieved accuracy goals for 50% of the sessions in which she set goals. Incentives were administered during this phase.
Return to Baseline II: There was one session in which Student A did not engage in the task; the resulting zero score was not included in this range or average. The percentage of problems completed accurately for Student A ranged from 36.71% to 78.79% and the average percentage of problems completed accurately (APA) was 59.53%. A decrease would be predicted for this return to baseline phase, instead there was a slight increase in APA.

Self-Management Intervention II: The percentage of problems completed accurately for Student A ranged from 50% to 60.31% and the average percentage of problems completed accurately (APA) was 55.74%. The prediction was that APA would increase during this return to intervention phase, however, the APA decreased by a small amount (3.79 percentage points) as compared to the previous Baseline II phase. She achieved accuracy goals for 100% of the sessions in which she set goals. Incentives were administered during this phase.

Fading: The percentage of problems completed accurately for Student A during this phase ranged from 54.43% to 64.04% and the accuracy average was 57.96% which represented a small increase of 2.22 percentage points over the average obtained in the Intervention II phase.

Conclusion: In response to research questions 5 and 6, Student A’s accuracy was not impacted positively by the intervention in that her performance did not improve in the direction or to the degree expected across phases. There was a negligible increase from BL I to INT I (>1 percentage point), a small decrease from BL II to INT II (3.79 percentage points), and a small increase in APA from Intervention II to Fading (2.22 percentage points).

Participant B

Baseline I: Descriptive statistics for academic accuracy are presented in Table 11. The graph in Figure 9. The percentage of problems completed accurately for Student B ranged from 33.02% to 86.49% and the average percentage of problems completed accurately (APA) was 50.1%
Self-Management Intervention I: The percentage of problems completed accurately for Student B ranged from 42.47% to 49% and the APA was 46.59%. There a modest decrease in the APA from the Baseline I to the Intervention I phase of 3.51 percentage points. This was contrary to the prediction of an increase. She achieved accuracy goals for 100% of the sessions in which she set goals. Incentives were administered during this phase.

Return to Baseline II: There was one session in which Student B did not engage in the task. The resulting zero score was not included in the range or APA. Percentage of problems completed accurately for Student B ranged from 39.44% to 55.29% and the APA was 47.39%. It was predicted that APA would decrease upon return to baseline, however, APA increased by a negligible amount (<1 percentage point).

Self-Management Intervention II: Student B’s accuracy rate ranged from 47.56% to 56.41% and the APA was 52.86%. There was a modest increase in APA from Baseline II to Intervention II (5.47 percentage points). She achieved accuracy goals for 100% of the sessions in which she set goals. Incentives were administered during this phase.

Fading: The percentage of problems completed accurately for Student B ranged from 40.88% to 50.47% and the accuracy average was 47.66% which was 5.2 percentage points lower than the preceding Intervention II phase.

Conclusion: Student B. In response to research questions 5 and 6, Student B’s accuracy was not impacted positively by the intervention in that her performance did not improve in the direction or to the degree expected between Baseline I and Intervention I (i.e., there was a decrease by 3.51 percentage points) or between Intervention II and Fading (i.e., there was a decrease by 5.2 percentage points). There was a modest increase of 5.47 percentage points between Baseline II and Intervention II.
Participant C

Baseline I: Descriptive statistics for academic accuracy are presented in Table 12. The graph in Figure 10 displays accuracy across phases. Student C did not engage in the assignment during two sessions, earning scores of zero for problems completed and problems correct. The range and average presented here are based on the four sessions in which she did attempt the math practice assignment. Student C’s accuracy rate ranged from 51.85% to 81.82% and APA was 69% for sessions in which she engaged in the task.

Self-Management Intervention I: Student C’s accuracy level ranged from 35.06% to 61.90% and the APA was 39.91%. The prediction was that APA would increase with introduction of the self-management intervention. Instead there was a moderate decrease in the APA during this phase. However, it should be noted that Student C’s performance for Intervention I is being compared to Baseline I which was derived from a generally lower amount of problems completed. As a result, accuracy may appear inflated for Baseline I due to the low number of problems completed. She did not achieve accuracy goals for any of the sessions in which she set goals, however, incentives were administered during this phase due to motivation concerns as noted above.

Return to Baseline II: Student C did not engage in the assigned task during two sessions; those zero scores were not included in the range of the APA. Student C’s accuracy rate ranged from 33.33% to 41.67% and the APA was 37.08%. As predicted there was a decrease in APA during this phase, albeit very small, 3.15 percentage points.

Self-Management Intervention II: There was one session in which Student C did not engage in the assigned task; the resulting zero score was not included in the range or the average. Student C’s accuracy rate ranged from 29.41% to 41.43% and APA was 36.76%. During this phase APA decreased by a negligible amount (< 1 percentage point), but opposite the predicted
change. She did not achieve accuracy goals for any of the sessions in which she set goals, however, incentives were administered during this phase as noted above.

Fading: Student C’s accuracy rate ranged from 36.59% to 53.66% and the accuracy average was 42.16%. Her APA increased modestly from Intervention II to Fading (5.4 percentage points).

**Conclusion:** Overall, application of the self-monitoring strategy did not lead to a strong impact on Student C’s level of accuracy. Average percentage of problems completed accurately (APA) decreased from Baseline I to Intervention I (29.09 percentage points) and from Baseline II to Intervention II (<1 percentage point). Student C demonstrated a modest improvement in APA from Intervention II to Fading (5.4 percentage points). Although her APA was highest during the Baseline I phase, this result should be interpreted with caution as she completed a very low number of items during that phase. Since the APA is calculated based on the number of problems completed within a phase, APA is somewhat inflated relative to other phases in which she completed more worksheet items.
Table 10. Student A: Descriptive Statistics for Academic Accuracy (Percentage of Problems Completed Accurately) by Session with Range and Average Percentage of Problems Completed Accurately (APA) by Phase

<table>
<thead>
<tr>
<th></th>
<th>BL I</th>
<th></th>
<th>BL II</th>
<th></th>
<th>BL II</th>
<th></th>
<th>Fading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>53.33%</td>
<td>Session 12</td>
<td>59.26%</td>
<td>Session 19</td>
<td>67.86%</td>
<td>Session 30</td>
<td>50.00%</td>
</tr>
<tr>
<td>Session 2</td>
<td>61.22%</td>
<td>Session 13</td>
<td>74.36%</td>
<td>Session 20</td>
<td>70.89%</td>
<td>Session 31</td>
<td>60.31%</td>
</tr>
<tr>
<td>Session 3</td>
<td>58.33%</td>
<td>Session 14</td>
<td>47.14%</td>
<td>Session 21</td>
<td>47.56%</td>
<td>Session 32</td>
<td>55.00%</td>
</tr>
<tr>
<td>Session 4</td>
<td>69.44%</td>
<td>Session 15</td>
<td>66.67%</td>
<td>Session 22</td>
<td>74.67%</td>
<td>Session 33</td>
<td>55.91%</td>
</tr>
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<td>Session 5</td>
<td>58.33%</td>
<td>Session 16</td>
<td>50.00%</td>
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<td>36.71%</td>
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<td>55.06%</td>
<td>Session 26</td>
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</tr>
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<td>59.09%</td>
<td>Session 18</td>
<td>55.06%</td>
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<td>57.14%</td>
<td>Session 28</td>
<td>62.77%</td>
</tr>
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<td>43.64%</td>
<td>Session 19</td>
<td>50.00%</td>
<td>Session 29</td>
<td>0%</td>
<td>Session 30</td>
<td>50.00%</td>
</tr>
<tr>
<td>Session 9</td>
<td>49.25%</td>
<td>Session 20</td>
<td>47.14%</td>
<td>Session 32</td>
<td>74.36%</td>
<td>Session 33</td>
<td>55.91%</td>
</tr>
<tr>
<td>Session 10</td>
<td>59.30%</td>
<td>Session 21</td>
<td>58.33%</td>
<td>Session 34</td>
<td>69.44%</td>
<td>Session 35</td>
<td>55.79%</td>
</tr>
<tr>
<td>Session 11</td>
<td>65.12%</td>
<td>Session 22</td>
<td>62.07%</td>
<td>Session 36</td>
<td>54.43%</td>
<td>Session 37</td>
<td>58.14%</td>
</tr>
<tr>
<td><strong>Range</strong></td>
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<td><strong>Range</strong></td>
<td><strong>47.14% to 74.36%</strong></td>
<td><strong>Range</strong></td>
<td><strong>0% to 78.79%</strong></td>
<td><strong>Range</strong></td>
<td><strong>50.00% to 60.31%</strong></td>
</tr>
<tr>
<td><strong>APA</strong></td>
<td><strong>58.68%</strong></td>
<td><strong>APA</strong></td>
<td><strong>58.73%</strong></td>
<td><strong>APA</strong></td>
<td><strong>59.53%</strong></td>
<td><strong>APA</strong></td>
<td><strong>55.74%</strong></td>
</tr>
</tbody>
</table>
Figure 8. Student A: Percentage of Math Problems Completed Accurately (Academic Accuracy) Across Phases
Table 11. Student B: Descriptive Statistics for Academic Accuracy (Percentage of Problems Completed Accurately) by Session with Range and Average Percentage of Problems Completed Accurately (APA) by Phase

<table>
<thead>
<tr>
<th>BL I</th>
<th>INT I</th>
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<th>INT II</th>
<th>Fading</th>
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</thead>
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<td>49.00%</td>
<td>Session 11</td>
</tr>
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<td>Range</td>
</tr>
<tr>
<td>APA</td>
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<td>APA</td>
<td>46.59%</td>
<td>APA</td>
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</tbody>
</table>
Figure 9. Student B: Percentage of Math Problems Completed Accurately (Academic Accuracy) Across Phases
Table 12. Student C: Descriptive Statistics for Academic Accuracy (Percentage of Problems Completed Accurately) by Session with Range and Average Percentage of Problems Completed Accurately (APA) by Phase

<table>
<thead>
<tr>
<th></th>
<th>BL I</th>
<th>INT I</th>
<th>BL II</th>
<th>INT II</th>
<th>Fading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>72.22%</td>
<td>46.67%</td>
<td>41.67%</td>
<td>0%</td>
<td>42.65%</td>
</tr>
<tr>
<td>Session 2</td>
<td>81.82%</td>
<td>61.90%</td>
<td>0%</td>
<td>29.41%</td>
<td>36.59%</td>
</tr>
<tr>
<td>Session 3</td>
<td>72.73%</td>
<td>35.06%</td>
<td>33.33%</td>
<td>39.39%</td>
<td>53.66%</td>
</tr>
<tr>
<td>Session 4</td>
<td>0%</td>
<td>36.47%</td>
<td>0%</td>
<td>41.43%</td>
<td>39.62%</td>
</tr>
<tr>
<td>Session 5</td>
<td>51.85%</td>
<td>36.96%</td>
<td>Session 15</td>
<td>42.57%</td>
<td></td>
</tr>
<tr>
<td>Session 6</td>
<td>0%</td>
<td>33.33%</td>
<td>Session 16</td>
<td></td>
<td>39.66%</td>
</tr>
<tr>
<td>Range</td>
<td>0% to 81.82%</td>
<td>Range</td>
<td>0% to 41.67%</td>
<td></td>
<td>Range</td>
</tr>
<tr>
<td>APA</td>
<td>69%</td>
<td>APA</td>
<td>APA</td>
<td>APA</td>
<td>APA</td>
</tr>
</tbody>
</table>
Figure 10. Student C: Percentage of Math Problems Completed Accurately (Academic Accuracy) Across Phases
Research Question 7: To what extent did participants and teachers report satisfaction with the self-monitoring procedure?

Students’ Opinions

Research question seven pertained to the extent that participants and teachers reported satisfaction with the self-monitoring procedure? Social validity surveys were given to all three participants and two classroom teachers. Surveys were in a questionnaire format with a seven point Likert scale. For students, response options were in the form of semantic descriptors. Numbers were attached to descriptors on the student survey for the purpose of aggregating results. Student B did not respond to items 7 and 9 as they pertained to the school’s classroom and she was not enrolled in classes at the time of her participation. She was working toward applying to a community college. Results of the student participant surveys are displayed in Table 13. For teachers, response options were in the form of both semantic and numerical labels. Results are displayed in Table 14.

In response to the first question on the Student Intervention Survey, all three participants felt the self-monitoring card was easy to use (Totally Right -6).

In response to the second question about whether the audio taped tone helped with focus as a reminder to stay on task, one student affirmed this with the highest rating (Totally Right -6), one indicated ‘a little’ (A little bit right – 4), the other responded ‘not at all’ (Totally Wrong – 0).

In response to the third question, only one student felt that her math calculation skills improved significantly (Totally Right -6). For this student, her productivity actually improved throughout intervention but she did not demonstrate significant gains in accuracy. One student felt there was some improvement (A little bit right – 4). One student expressed neutrality (Not right or wrong -3).
In response to the fourth question regarding their ability to complete more problems as a result of the self-monitoring strategy, one student affirmed this with the highest rating (Totally Right -6). She did complete more problems when intervention phases were compared to baseline (no intervention) phases. One indicated this was very accurate (A lot right -5), the other student response was neutral (Not right or wrong – 3).

In response to the fifth question, which asked if the self-monitoring strategy was distracting or hard to use, two students indicated it was not distracting or hard to use (Totally wrong-0 and A lot wrong -1). The other student indicated this was somewhat accurate (A little bit right -4).

In responding to question six, regarding whether the self-monitoring strategy was appropriate for a high school age student, one student responded that it was appropriate (A lot right -5), one responded it was not (Totally wrong -0), and the other student was neutral (Not right or wrong – 3).

In regard to the seventh question, both students who responded felt that the strategy did not result in better focus in all of their other classes (Totally wrong – 0 and A lot wrong -1). The third student did not respond to the question.

In response to the eighth question about whether they had more confidence in their math calculation skills, one student replied there was a little improvement (A little bit right -4), one indicated no (A lot wrong -1), the other student was neutral (Not right or wrong – 3).

Two students responded to the ninth question. One reported that she would like for other teachers to use the self-monitoring strategy (A lot right-5). One student reported that she would not want other teachers to use the strategy (Totally wrong -0).

In response to the tenth question asking if they would like for the strategy to be discontinued in their math class, two students responded affirmatively (Totally Right -6) and the
other student indicated she would want to continue use of the strategy (A lot wrong - 1). Student B’s respond was “6” and since she was not enrolled in the math class, this question was interpreted in light of whether she would want the experimenter to discontinue the project.

In response to question eleven, whether they thought the strategy would help other students, they all affirmed this idea. Two responded with the highest rating (Totally Right -6) and one responded somewhat (A little bit right - 4).

In responding to question twelve, whether they would feel comfortable using the self-monitoring strategy on their own, two responded they would not feel comfortable using the strategy without the experimenter (Totally wrong -0) and one responded she would feel comfortable (A lot right-5).

**Table 13. Student Intervention Survey Results**

<table>
<thead>
<tr>
<th>Item</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The self-monitoring card was easy to use.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>2. The audio taped tone card helped me focus and reminded me to stay on-task.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>3. My math calculation skills improved because of the self-monitoring strategy. I got better at doing different kinds of problems.</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>

Continued
Table 13. Continued

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>B</th>
<th>A</th>
<th>C</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>I was able to complete more and more math problems because of the self-monitoring strategy.</td>
<td></td>
<td>4.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>The self-monitoring strategy was <strong>distracting</strong> or <strong>hard to use</strong> and I <strong>had trouble</strong> completing my work because of the strategy.</td>
<td>C</td>
<td>B</td>
<td>A</td>
<td>1.7</td>
</tr>
<tr>
<td>6.</td>
<td>The self-monitoring strategy was <strong>appropriate for a high school age student</strong>. It did not seem like something younger students would use.</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>2.7</td>
</tr>
<tr>
<td>7.</td>
<td>Now, I focus better in all of my classes.</td>
<td>A</td>
<td></td>
<td>C</td>
<td>*</td>
</tr>
<tr>
<td>8.</td>
<td>Now, I have more confidence in my math calculation skills.</td>
<td>A</td>
<td>C</td>
<td>B</td>
<td>2.7</td>
</tr>
<tr>
<td>9.</td>
<td>I would like for other teachers to use the self-monitoring strategy in my other classes.</td>
<td>A</td>
<td></td>
<td>C</td>
<td>3.3</td>
</tr>
<tr>
<td>10.</td>
<td>I do not want the teacher to keep using this self-monitoring strategy in this math class.</td>
<td>B</td>
<td></td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td>11.</td>
<td>I think the self-monitoring strategy could help other students.</td>
<td>A</td>
<td></td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>12.</td>
<td>I do not feel comfortable using the self-monitoring strategy without the OSU researcher.</td>
<td>B</td>
<td>A</td>
<td>C</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Note. The questionnaire used a seven point Likert scale for responses: (6) Totally right, (5) A lot right, (4) A little bit right, (3) Not right or wrong, (2) A little bit wrong, (1) A lot wrong, (0) Totally wrong

*Mean not calculated as only two participants responded

**Teacher's Opinions**

The general education math teacher and the intervention specialist completed teacher intervention surveys. Results are displayed in Table 14. Both teachers either Agreed (6) or Strongly Agreed (7) that the student’s on-task behavior, productivity and math skills improved during implementation of the self-monitoring strategy. Teachers indicated that students demonstrated high accuracy with math calculations after the intervention (Agree – 6 and Slightly Agree – 5). Teachers Agreed (6) that the strategy helped students gain control over their
behavior. In regard to the strategy, both teachers perceived the self-monitoring strategy to be easy to implement and did not feel that the audio taped tones created a distraction in the classroom environment. They reported that the self-monitoring cards were simple or clear enough for students to use and monitor time on-task (Slightly Agree – 5). Both teachers indicated they would like to use the self-monitoring strategy in the future but would not have enough time to implement the strategy (Agree-6). Teachers did not necessarily feel there would be a need to change aspects of the strategy. In response to the question about whether they would need additional training to implement the strategy, one teacher responded Agree (6), the other responded Neither Agree nor Disagree (4). Lastly, both teachers reported they would recommend the strategy to other teachers (Agree – 6).

*Table 14. Teacher Intervention Survey Results*

<table>
<thead>
<tr>
<th>Item</th>
<th>1 Strongly Disagree</th>
<th>2 Disagree</th>
<th>3 Slightly Disagree</th>
<th>4 Neither Agree nor Disagree</th>
<th>5 Slightly Agree</th>
<th>6 Agree</th>
<th>7 Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I perceived the self-monitoring strategy to be easy to implement. The procedures I observed seemed clear and easy to follow as outlined on the intervention script.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T IS</td>
</tr>
<tr>
<td>2. Students’ math skills improved during implementation of self-monitoring strategy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T IS</td>
</tr>
<tr>
<td>3. Students’ ability to focus, on-task behavior and work productivity improved during implementation of self-monitoring strategy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T IS</td>
</tr>
</tbody>
</table>

Continued
Table 14. Continued

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>T</th>
<th>IS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. The self-monitoring cards were simple / clear enough to prompt subjects to accurately monitor time on task.</td>
<td></td>
<td></td>
<td>T</td>
<td>IS</td>
</tr>
<tr>
<td>6. The self-monitoring strategy helped students gain control over their behavior.</td>
<td></td>
<td></td>
<td>T</td>
<td>IS</td>
</tr>
<tr>
<td>7. After the intervention, students’ demonstrated high accuracy with math calculations (specify type on lines below).</td>
<td></td>
<td>IS</td>
<td>T</td>
<td></td>
</tr>
<tr>
<td>8. If I were to use the self-monitoring strategy in the future, I would change some aspects of the procedure (please specify below).</td>
<td>T</td>
<td>IS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I plan on using the self-monitoring strategy in the future with other students because I feel it is worthwhile and effective. I think other students would benefit from the strategy.</td>
<td></td>
<td></td>
<td>T</td>
<td>IS</td>
</tr>
<tr>
<td>10. I would consider using the self-monitoring strategy with other students that I teach but I do not have enough time to implement the intervention.</td>
<td></td>
<td></td>
<td>T</td>
<td>IS</td>
</tr>
<tr>
<td>11. I would not feel comfortable implementing the steps of this intervention without the OSU researcher. I believe I would need additional training with this intervention.</td>
<td></td>
<td>T</td>
<td>IS</td>
<td></td>
</tr>
<tr>
<td>12. I will recommend this self-monitoring strategy to other teachers.</td>
<td></td>
<td></td>
<td>T</td>
<td>IS</td>
</tr>
</tbody>
</table>

T= Teacher  IS= Intervention Specialist

Note. The questionnaire used a seven point Likert scale for responses: (1) Strongly (2) Disagree (3) Slightly Disagree (4) Neither Agree nor Disagree (5) Slightly Agree (6) Agree (7) Strongly Agree

Interobserver Agreement

On-Task Behavior

IOA data was collected for on-task behavior during training of the student assistants and for one session of the Baseline I condition. Together, two student assistants conducted a total of 12 observations during training and one of the assistants conducted 1 observation during the study.
(during the Baseline I phase). A total of 4 Observation Interobserver Agreement (IOA) checks were conducted; 3 of these checks were conducted during training sessions and 1 was conducted during the study. The study was designed to include IOA data every third session in order to gain observation agreement data across all phases. Observation IOA data was limited due to the availability of student assistants and factors that extended the study, as described in Chapter 3 and earlier in this chapter. During training, Occurrence Agreement IOA ranged from 0% to 79.6% and Nonoccurrence Agreement IOA ranged from 23.18% to 96.77%. As noted in Chapter 3, the assistants and the experimenter discussed or processed each observation in detail. Due to time constrains, training sessions were discontinued and IOA data was collected for one baseline session. Occurrence Agreement was 100% and Nonoccurrence Agreement was 100% for that baseline session. Table 15 provides a summary of IOA data for on-task behavior.

Table 15. Interobserver Agreement Percentage for Behavior Observations During Training Sessions and Baseline Phase

<table>
<thead>
<tr>
<th>Session</th>
<th>Occurrence Percentage</th>
<th>Non-Occurrence Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training Session 1</td>
<td>77.14%</td>
<td>23.18%</td>
</tr>
<tr>
<td>Training Session 2</td>
<td>0%</td>
<td>96.77%</td>
</tr>
<tr>
<td>Training Session 3</td>
<td>79.6%</td>
<td>71.42%</td>
</tr>
<tr>
<td><strong>Baseline I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 9</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Academic Productivity

IOA data was collected for academic productivity (i.e. number of math problems completed in a single session) across all conditions and for 100% of the math worksheet packets. This was possible because the math worksheets were permanent products and a third student assistant was added near the end of the study. IOA was established by comparing the total number of problems completed in each worksheet packet as counted by the primary and
secondary (student assistant) reviewers, dividing the lower count by the higher count. Table 16 summarizes IOA data for academic productivity (number of problems completed). Percentage of agreement ranged from 86% to 100%. IOA was 100% on 84.25% of the worksheet packets, 96% or greater on 12.35% of the worksheet packets, and 86% or greater on 3.4% of the worksheet packets.

Academic Accuracy

IOA data was collected for academic accuracy (i.e. number of math problems completed accurately in a single session) across all conditions and for 100% of the math worksheet packets.

IOA was established by comparing the total number of problems completed accurately in each worksheet packet as counted by the primary and secondary (student assistant) reviewers, dividing the lower count by the higher count. Table 4.3 summarizes IOA data for academic accuracy (number of problems completed accurately). Percentage of agreement ranged from 74% to 100%. IOA was 100% on 51.69% of the worksheet packets and 90% or greater on 41.57% of the worksheet packets, 84% to 88% on 3.37% of the packets, and 74% to 76% on 3.37% of the worksheet packets. There were instances when scorers had difficulty discerning a written response due to poor handwriting and this impacted the level of agreement. For example, on some worksheets a 5 appeared to be an 8 or a 1 appeared to be a 7.

Table 16. Interobserver Agreement Percentage for Math Probe Scoring (Academic Productivity) by Session for Each Participant

<table>
<thead>
<tr>
<th>STUDENT A</th>
<th>STUDENT B</th>
<th>STUDENT C</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL I</td>
<td>BL I</td>
<td>BL I</td>
</tr>
<tr>
<td>Session 1</td>
<td>100%</td>
<td>Session 1</td>
</tr>
<tr>
<td>Session 2</td>
<td>100%</td>
<td>Session 2</td>
</tr>
<tr>
<td>Session 3</td>
<td>100%</td>
<td>Session 3</td>
</tr>
<tr>
<td>Session 4</td>
<td>100%</td>
<td>Session 4</td>
</tr>
<tr>
<td>Session 5</td>
<td>100%</td>
<td>Session 5</td>
</tr>
<tr>
<td>Session 6</td>
<td>100%</td>
<td>Session 6</td>
</tr>
<tr>
<td>Session 7</td>
<td>100%</td>
<td>Session 7</td>
</tr>
</tbody>
</table>

Continued
Table 16. Continued

<table>
<thead>
<tr>
<th>Session</th>
<th>Percentage</th>
<th>Condition</th>
<th>Session</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>100%</td>
<td>INT I</td>
<td>7</td>
<td>100%</td>
</tr>
<tr>
<td>9</td>
<td>100%</td>
<td>Session 8</td>
<td>8</td>
<td>100%</td>
</tr>
<tr>
<td>10</td>
<td>100%</td>
<td>Session 9</td>
<td>9</td>
<td>86%</td>
</tr>
<tr>
<td>11</td>
<td>100%</td>
<td>Session 10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>INT I</td>
<td></td>
<td></td>
<td>BL II</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>100%</td>
<td>Session 11</td>
<td>11</td>
<td>100%</td>
</tr>
<tr>
<td>13</td>
<td>100%</td>
<td>Session 12</td>
<td>12</td>
<td>96%</td>
</tr>
<tr>
<td>14</td>
<td>100%</td>
<td>Session 13</td>
<td>13</td>
<td>99%</td>
</tr>
<tr>
<td>15</td>
<td>100%</td>
<td>Session 14</td>
<td>14</td>
<td>100%</td>
</tr>
<tr>
<td>16</td>
<td>100%</td>
<td>Session 15</td>
<td>15</td>
<td>100%</td>
</tr>
<tr>
<td>INT II</td>
<td></td>
<td></td>
<td>BL II</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>88%</td>
<td>INT II</td>
<td>16</td>
<td>100%</td>
</tr>
<tr>
<td>18</td>
<td>100%</td>
<td>Session 16</td>
<td>17</td>
<td>100%</td>
</tr>
<tr>
<td>BL II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>100%</td>
<td>Session 17</td>
<td>18</td>
<td>99%</td>
</tr>
<tr>
<td>20</td>
<td>100%</td>
<td>Session 18</td>
<td>19</td>
<td>100%</td>
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<tr>
<td>21</td>
<td>99%</td>
<td>Session 19</td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>22</td>
<td>100%</td>
<td>Session 20</td>
<td>21</td>
<td>99%</td>
</tr>
<tr>
<td>23</td>
<td>100%</td>
<td>Session 21</td>
<td>22</td>
<td>100%</td>
</tr>
<tr>
<td>24</td>
<td>100%</td>
<td>Session 22</td>
<td>23</td>
<td>99%</td>
</tr>
<tr>
<td>25</td>
<td>98%</td>
<td>Session 23</td>
<td>24</td>
<td>100%</td>
</tr>
<tr>
<td>26</td>
<td>100%</td>
<td>Session 24</td>
<td>25</td>
<td>100%</td>
</tr>
<tr>
<td>27</td>
<td>100%</td>
<td>Session 25</td>
<td>26</td>
<td>99%</td>
</tr>
<tr>
<td>28</td>
<td>100%</td>
<td>Session 26</td>
<td>27</td>
<td>89%</td>
</tr>
<tr>
<td>29</td>
<td>100%</td>
<td>Session 27</td>
<td>28</td>
<td>100%</td>
</tr>
<tr>
<td>INT II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>100%</td>
<td>Session 28</td>
<td>31</td>
<td>100%</td>
</tr>
<tr>
<td>32</td>
<td>100%</td>
<td>Session 30</td>
<td>33</td>
<td>100%</td>
</tr>
<tr>
<td>Fading</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>100%</td>
<td>Session 31</td>
<td>35</td>
<td>100%</td>
</tr>
<tr>
<td>36</td>
<td>100%</td>
<td>Session 32</td>
<td>37</td>
<td>100%</td>
</tr>
<tr>
<td>38</td>
<td>100%</td>
<td>Session 33</td>
<td>39</td>
<td>100%</td>
</tr>
</tbody>
</table>
Table 17. Interobserver Agreement Percentage for Math Probe Scoring (Academic Accuracy) by Session for Each Participant

<table>
<thead>
<tr>
<th>Student A</th>
<th>Student B</th>
<th>Student C</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL I</td>
<td>BL I</td>
<td>BL I</td>
</tr>
<tr>
<td>Session 1</td>
<td>88%</td>
<td>Session 1</td>
</tr>
<tr>
<td>Session 2</td>
<td>97%</td>
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Procedural Integrity

In this study, the experimenter had a role in introducing the intervention at the start of each session; however, the independent variable (i.e., self-monitoring card) was implemented by the participants themselves. For the participant, procedural integrity included five components: (a) Did the participant set academic productivity and accuracy goals after reviewing their performance from the previous session?, (b) Did the participant respond to the initial set of questions on the top half of the self-monitoring card, “Did I compartmentalize my problems or worries?, “Would I like to talk to the school psychologist about my concerns later?” , and “How do I feel today? ”, (c) Did the participant begin work on the math calculation worksheets when instructed, (d) Did the participant respond to the next question on the bottom half of the self-monitoring card which was “At this exact second, am I on-task ?”, each time the auditory cue occurred, and (e) Did the participant stop working on the math worksheet packet when the experimenter said “you can stop working now”. A procedural integrity checklist was completed by the experimenter to evaluate how the participants implemented the self-monitoring card.

Student A: Six checks (67%) were completed for the Intervention I phase. Student A completed 5 of 5 (100%) steps accurately on two (33.33%) of these procedural integrity checks and 3 of 5 (60%) steps accurately on four (66.67%) of the checks. Incomplete steps included
failure to stop working at the time limit and failure to respond in writing to the on-task question at all four tones. At times, she stopped working before the time limit; other times she continued to finish a problem beyond the time limit. In regard to the on-task question, Student A either failed to respond to the question at a tone or she circled responses to the third and fourth intervals at the sound of the third tone. Two checks (50%) were completed for the Intervention II phase. Student A complete 4 of 5 (80%) steps accurately on one check. According to this assessment, she had a delayed response at the time of the first tone because she was finishing a calculation problem. Student A completed and 3 of 5 steps (60%) accurately on the other check; again she failed to stop working at the time limit and did not respond in writing to the on-task question for two of the four tones.

**Student B:** Two checks (67%) were completed for the Intervention I phase. Student B completed 5 of 5 (100%) steps accurately on the first check and 4 of 5 (80%) steps accurately on the second check. The last step was incomplete in that she continued working on a problem after the time limit. Two checks (67%) were completed for Intervention II. Student B completed 5 of 5 (100%) steps accurately on the first check. She completed 3 of 5 steps (60%) accurately on the second check. Steps four and five were incomplete; again she continued to finish a problem beyond the time limit and she failed to circle an answer to the on-task question at the fourth tone.

**Student C:** Two checks (50%) were completed for the Intervention I phase and two checks (50%) were completed for the Intervention II phase. During Intervention phase I, Student C completed 5 of 5 (100%) steps accurately on both procedural integrity checks. During Intervention II, she completed 5 of 5 (100%) steps accurately on one check and 4 of 5 (80%) steps accurately on the other check. The incomplete step was failure to stop at the time limit; Student C continued to finish the problem she was working on when the time limit occurred.
In addition to introducing the intervention at the start of each session, the experimenter was also responsible for providing students with feedback on their performance (e.g., academic productivity and accuracy of math problems), administering incentives when indicated, and guiding students with goal setting. To ensure treatment fidelity on the part of the experimenter, an intervention script was used as a guide. A procedural integrity checklist was completed by an independent observer to evaluate how the experimenter implemented the intervention. Procedural integrity checklists were completed across three phases, Baseline I, Intervention I, and Intervention II by a student assistant or the Intervention Specialist who was co-teaching in the classroom. They were not completed during Baseline II or Fading phases since none of the sessions within these phases occurred in the math classroom. Procedural integrity checklists were completed as an independent observer watched the experimenter work with individual students.

Three checklists (12.5%) were completed for the Baseline I phase; the overall percentage of steps completed accurately and in proper sequence across phases was 100%. Three checklists (21.42%) were completed for the Intervention I phase; the overall percentage of steps completed accurately and in proper sequence across phases was 91.6%. One checklist (8.3%) was completed during the Intervention II phase; the overall percentage of steps completed accurately and in proper sequence across phases was 100%.
Chapter 5: Discussion

This chapter presents a discussion of the findings. The chapter is divided into three sections. The first section reviews major findings organized around the seven research questions. Second, limitations of the study are presented. The chapter concludes with a discussion of implications for research and practice.

Major Findings

The purpose of this investigation was to determine if a self-management procedure could improve the on-task behavior, academic productivity and academic accuracy of high school students in a juvenile correctional setting. This study was a systematic replication of the Levendoski and Cartledge (2000) study that taught elementary age students with EBD to self-monitor on-task behavior.

Research Questions One and Two

The first and second research questions centered on what effects the self-management intervention would have on the on-task behavior of students during independent practice of math facts and after the intervention was faded. These research questions were evaluated through review of each students’ percentage of time on-task across phases. Specifically, the median level line, which represents the most typical performance within a phase was used as the point of comparison. Behavioral observations were conducted using a momentary time sampling method, daily, across all phases of the study. Like the Levendoski and Cartledge (2000) study, the current
study was also very effective for increasing participants’ on-task behavior. The Levendoski and Cartledge (2000) intervention led to large increases in time on-task for all four students. In that study the group average for baseline phases was 50% while the group average for self-monitoring phases was 95%. Outcome data for the current study indicated that all three students experienced either an increase in on-task behavior or an improvement (i.e., high stable performance compared to variable baseline conditions) of on-task behavior each time the intervention was implemented. For Student A, on-task behavior during intervention sessions was generally higher than behavior during baseline sessions, however, there was a delayed response to the first intervention attempt resulting in an overlap of data points when comparing the early sessions of the first intervention phase to the baseline phase. However, on-task behavior increased rapidly in the first intervention phase and then stabilized at a high level. Two students (B and C) demonstrated some instances of high level on-task behavior during the early sessions of the first baseline phase, whereby some of the baseline data points overlapped with data obtained during intervention sessions. It is hypothesized that Student B and Student C may have demonstrated high on-task behavior early in the first baseline phase due to the novelty of the task or as a result of reactivity, that is, a temporary change in behavior due to the presence of a new adult or new activity. Their initial high levels of performance may have decreased or returned to “typical” levels of responding as they habituated to experimenter’s presence and the task. Performance during the fading phase varied among the three students. Student C maintained a high percentage of on-task behaviors across the entire fading phase. Her performance for this fading phase may have been influenced by the fact that some sessions were temporally closer (i.e. closer together in time) than others. Also, her performance during this phase may have been influenced by anticipation of an additional incentive at the end of intervention and the knowledge that she was near the end of the study. Both Student A and Student B exhibited declines in on-
task behaviors near the end of the fading phase. Their expression of displeasure with the continuous nature of the practice sessions continued from the end of the first intervention session through the end of the study. It is possible that students experienced fatigue with working the same types of math problems and this may have contributed to the decline in on-task behavior during the fading phase. The Levendoski and Cartledge (2000) study used novel math problems and did not report concerns related to student dissatisfaction with the type of assigned task. Also, it is possible the knowledge that they were near the end of the study worked in an opposite direction for these two students leading them to exert less effort.

Prior to starting this intervention, students were observed to exhibit highly variable levels of on-task behavior even when working on their typical computer based lessons. A number of other self-management studies including students with EBD and other disabilities also revealed highly variable behaviors during baseline phases (Levendoski & Cartledge, 2000; Carr & Punzo 1993; Sutherland & Snyder, 2007).

The current study’s result for on-task behavior is consistent with other studies that used self-management techniques to improve the attention or disruptive behaviors of students with EBD (Freeman & Dexter-Mazza, 2004; Levendoski & Cartledge, 2000). The literature further documents the effectiveness of self-management interventions for improving and stabilizing the on-task behavior of students with AD/HD diagnoses. Reid et al. (2005) conducted a meta-analysis of studies using various self-regulation strategies to improve or change on-task behavior, inappropriate behavior, and academic variables for students diagnosed with ADHD. Self-regulation strategies included self-monitoring, and all strategies were noted to be highly effective for increasing on-task behavior. In a study designed to compare the effectiveness of self-management of attention (SMA) with self-management of performance (SMP) among students diagnosed with ADHD, Harris, Friedlander, Saddler, Frizzelle, & Graham (2005) noted
improved attention when students were taught to record whether they were on-task whenever a
tone sounded at random intervals. Both SMA and SMP were found to increase on-task behavior
to a similar degree.

*Research Questions Three and Four*

The third and fourth research questions focused on academic productivity (percentage of
problems completed), specifically what effects would the self-management intervention have on
the percentage of math problems completed during independent practice of math facts and after
the intervention was faded. These research questions were evaluated by considering the average
percentage of problems students completed, APC, (attempts included) across phases. Results of
the current study indicated that intervention had a modest to moderate impact on academic
productivity for all three participants. The study being replicated (Levendoski & Cartledge,
2000) did not include percentage of problems competed as a dependent variable, hence there was
no comparison to be made for this outcome.

Outcome data for the current study indicated that intervention had a positive effect on
productivity for two of the three participants. The impact appeared greater for Student B and
Student C than it did for Student A. For Student A the change in APC from Baseline I to
Intervention I could not be derived. For Student A the average percentage of problems completed
(APC) increased moderately from Baseline II to Intervention II. However, the increase was not
maintained during the fading phase, instead APC decreased during fading. For Student B there
were increases in APC each time the intervention was implemented. The increase during
Intervention I was modest but the increase for Intervention II was moderate and her performance
remained high during the Fading phase. For Student C, the average percentage of problems
completed (APC) increased moderately from baseline phases to the intervention phases and a
moderate increase was demonstrated during the Fading phase. The consistent productivity gains
for Student C were particularly notable given that her behaviors throughout the study were the most problematic and inconsistent.

Research Questions Five and Six

The fourth and sixth research questions pertained to academic accuracy, specifically what effects would the self-management intervention have on the percentage of math problems completed accurately during independent practice of math facts and after the intervention was faded. These research questions were evaluated by reviewing the average percentage of problems completed accurately (APA) across phases. The Levendoski and Cartledge (2000) intervention resulted in an increase in the percentage of math problems completed correctly (this dependent variable was termed “academic productivity” in their study) for three of the four participants. In that study, the group average for productivity was 26% for baseline phases and 78% for self-monitoring phases. Outcome data for the current study indicated that intervention did not lead to notable improvement in accuracy for the three participants. The average percentage of problems completed accurately (APA) across most phases was fairly stable (i.e. APA did not increase or decrease much across phases) for each participant with one exception. Student C demonstrated a moderate increase improvement in APA during Intervention I, however, this was qualified by the fact that she completed a relatively low number of items on the worksheets. There are several possible explanations for the weaker academic accuracy findings. First, limited improvement for the accuracy variable may have been due to the fact that feedback involved a review of correct and incorrect answers rather than corrective feedback. Students were shown correct and incorrect items in their worksheet packets and errors were described (e.g. “this fraction needed to be reduced”). However, teaching was not offered to address the inaccuracies since worksheet packets were based on problems for which they had a working knowledge. Another implication is that they may have been practicing errors to an extent. The Levendoski and Cartledge (2000)
intervention allowed for students to receive assistance while they completed math calculations which may have contributed to improvement in the accuracy (academic productivity) variable for that study. Secondly, observations showed that students’ attitudes toward the intervention deteriorated over time even with the inclusion of incentives. Their comments about the number of sessions and repeated skill practice may have resulted in less attention to detail or decreased effort. This feedback became a concern, and the experimenter made a decision to inform students that they were approaching the end of the study as a motivational tool. Also, an additional incentive was added at the end of the study. Students chose to work on a group craft at the end of the study as the final incentive. Third, students may have perceived the math calculation worksheets used in this study to be less relevant than the types of math problems that students were asked to complete in their math class. For example, they may have worked on geometry concepts in their math class rather than practicing calculation problems. Moreover, students sometimes used calculators when completing math word problems and the instructional emphasis was on process and not calculation skill. As a result they likely had less opportunity for practice of calculation skills using a paper-pencil format. A fourth possible explanation for weak academic accuracy outcomes relates to two format differences between the intervention and typical classroom lessons. First, students were accustomed to completing math class assignments within a computerized learning system and that system offered immediate feedback as to the accuracy of responses. Second, the math task in the current study was structured as a paper / pencil format, and feedback was provided just once, after the practice task was completed. Education policy required that students not spend 100% of instructional time on the computers and that they be provided with some assignments off of the computers to accommodate those with other learning styles and preferences. The paper / pencil format was used in this study to provide students with some variation. A fifth consideration regarding the weaker accuracy
outcome pertains to subject characteristics. One student, B, had completed requirements for a GED prior to starting the study; she was not enrolled in a math class, rather she was pursuing post graduate activities. Another student, C, struggled with emotional self-regulation, motivation, effort, and attention when she was in class, hence reinforcement of any skills was limited at times by her behaviors.

The academic accuracy outcomes for this study did not replicate the strong findings produced by some other investigations among students with EBD (Carr & Punzo, 1993; Lazarus, 1993; Lloyd, Bateman, Landrum, & Hallahan, 1993). In a review of self-management interventions targeting academic outcomes among students with EBD, Mooney et al. (2005) found large effect sizes for academic outcomes including productivity and accuracy with math calculation tasks. In the current study there was a notable improvement in productivity for two participants, however, self-management intervention did not result in notable improvement of participants’ accuracy levels. The Mooney et al. (2005) review sampled multiple published studies with a relatively large number of participants overall while this study examined a small number of participants. It is possible that a larger sample may have shown improvements in academic accuracy. It is not yet possible to make any solid claims regarding external validity for the academic outcome variables as replication with this population in a correctional school setting is necessary.

Research Question Seven

The final research question regarded the extent to which participants and teachers reported satisfaction with the self-monitoring intervention. All three participants completed surveys, however one student, B, did not respond to the questions regarding the present math class (i.e. items 7 and 9) given that she was not enrolled in that class when she joined the study. Students reported the highest level of satisfaction with ease of use of the self-monitoring card (all
three gave highest rating), being able to complete more math problems as a result of the self-monitoring strategy (2 of 3 students), wanting other teachers to use the self-monitoring strategy (2 of 3 students), and whether they thought the strategy would be helpful to other students (2 responded with the highest ratings). Responses to the question regarding ease of use of the self-monitoring card were consistent with their performance on measures of treatment integrity. All students had high ratings for appropriate application of the strategy in which use of the self-monitoring card was a primary component. Although 2 of 3 felt the strategy would be helpful to other students, they both indicated that the strategy was not appropriate for high school age students. This response could have been influenced by their feelings about then element of continuous practice.

Two of three agreed the self-monitoring strategy was not distracting. Two students indicated they would feel comfortable using the strategy without support from the experimenter, the other student indicated a need for support if she were to use the strategy again.

One student felt the strategy resulted in better focus in her other classes, the other reported it did not help in this way. Two students agreed (4-A little bit right, 6-Totally right) when asked whether they thought their math calculation skills improved. The two students who were enrolled in the math class at the initiation of the study reported that they wanted the strategy discontinued in their math class, however, in contrast one of these students reported that she would like for other teachers to use the strategy in her other classes.

Student responses were mixed for two questions making it more difficult to conclude that any particular pattern existed: whether they thought the audio tone was responsible for helping with focus -as a reminder to stay on task, and whether they had more confidence in their math calculation skills after intervention. Responses in favor of stopping the strategy in math class may have been due to the fact that students were eager to reach a point of completion with the
project. As noted previously, they expressed displeasure about the continuous nature of practice sessions and the need to practice the same math skills. Student C was the only student to write in additional comments to which she responded “I’m glad I’m done” with a smiley face and two exclamation points.

Overall, teacher reports on the social validity measure reflected highly favorable responses for usefulness and effectiveness of the strategy in changing student’s behavior in the classroom. Teachers perceived the strategy to be effective for improving student’s math skills. They also noted that students demonstrated high accuracy with math calculations after the intervention ended. In follow-up discussion, the teacher highlighted the importance of acknowledging and being sensitive to the social-emotional needs of students. The learning environment needs to be positive and one in which youth can develop trusting connections. Relationship building and positive rapport are vital to the process of educating youth in this setting.

Limitations of the Study
There were several limitations in the current study. They are discussed according to sampling issues, setting, support, and analysis of components.

Sample

The number for this study was smaller than desired. Because students in this setting have such a wide range of academic and psychosocial backgrounds, the initial aim was to include six participants. However, three students completed the study due to issues related to retention of participants which was due to court level changes in the way release dates were handled, court level decisions regarding reduction in the number and type of youth that would be assigned to the Ohio Department of Youth Services and resulting school organizational changes in how youth were scheduled for classes.
The participants in this study were three females with DSM-IV-TR diagnosed mental health disabilities (i.e. Participant A: Conduct Disorder, Bipolar Disorder without psychotic features, ADHD, Cannabis Abuse, and Alcohol Abuse; Participant B: Mood Disorder, NOS, Polysubstance Dependence, Conduct Disorder, Participant C: Major Depressive Disorder, recurrent; PTSD, Conduct Disorder, ADHD per history) and IDEIA 2004 identified disabilities (i.e. Participant C: Emotional Disturbance). One student was Latina, one was Caucasian and one was African-American (Biracial). Students had previous interactions with the court system and one with the foster care system. They were placed in a juvenile correctional facility for girls. In relation to external validity an unknown is the extent to which results of this intervention can generalize to other students: a) in other types of juvenile justice or alternative educational settings, b) from other ethnic groups, or c) who are male.

Setting

Several factors may limit generalization to other settings. First, the study was conducted in a math classroom with a range of only six to ten students at any given time. Second, there was a high staff-to-student ratio in the school and classrooms. The extent to which results would generalize to correctional school and classroom settings containing larger numbers of students is unknown. Third, implementation occurred in two different settings. In addition to the math classroom, intervention also occurred in a separate group room on the living units. One student completed all sessions in the group room. The setting shifted just once for a second student, with the exception of one session near the end of the study (fading phase) which had to be conducted in a classroom due to a sudden schedule change on that given day. The setting fluctuated for the other student due to her behaviors and the need to manage her behaviors on the living unit. Although setting change was a potential threat to internal validity, it can also be viewed as a
necessary factor for inclusion since it represents the actual construction of educational programming and conditions for the participants.

Support

Delivery of this intervention required considerable time and preparation. Although the experimenter was able to carry out most critical aspects of the intervention strategy (e.g., providing instructions to students at the start of sessions, grading worksheets, providing students with performance feedback), support was needed to conduct observation interobserver agreement (IOA) checks for the academic productivity and academic accuracy variables, and treatment integrity checks (experimenter version). As previously described in Chapter 3, several systemic issues occurred over the course of the study and it was not possible to collect all of the intended observation IOA checks. First, student assistants were difficult to recruit and retain due to their school scheduling needs. Hence, they were not available to complete IOA checks (for on-task behavior) across all phases of the study. Second, issues arose with retention of participants that resulted in an extension of the study time frame, and a time frame which exceeded student assistant availability. The student assistants conducted 12 observations during the training stage and discussed each of the observations with the experimenter. Observation IOA data was collected during three of the training sessions and a wide range of IOA percentages were noted. The experimenter and student assistants discussed all of these observations. One Observation IOA was conducted during the Baseline I phase. That observation IOA resulted in 100% occurrence agreement and 100% non-occurrence agreement.

Support was also needed to construct enough individualized math worksheets with the skills needed for each participant. The student assistants were able to help with this task near the start of the study, but this task became the sole responsibility of the experimenter once the assistants finished.
Analysis of Components

Juveniles with lengthy histories of behavior problems and a pattern of detachment from school are likely to struggle with motivation to complete extended academic tasks. Opportunities for success and individualized attention are critical for those with histories of truancy, high absenteeism, and academic failure. The population under study attended a school with a positive behavior support system already in place. Level systems with built in token economies can be important when structuring education for students with EBD as they have been shown to increase desired behaviors (Alter, Wyrick, Brown, & Lingo, 2008). For this population, tangible incentives were an important aspect of the intervention package. If students maintained or improved academic productivity and accuracy during intervention phases, they were allowed to choose an incentive from a set of available options (i.e., selected based on reinforcement menus and a list of items allowed within the facility). Incentives were provided approximately every other session during intervention phases.

Students were observed to express positive regard for incentives. They inquired as to when incentives would be given on several occasions throughout the study. Although the intervention was not designed to examine the effects of incentives in isolation, questions about the value of rewards could have been included on the measure of social validity and would have offered some insight into their level of importance from the perspective of participants. Similarly, questions about the use of goal setting and self-graphing may have offered insight into participants’ value of these components if included on the social validity measures. Students appeared much more eager to complete the goal setting and self-graphing tasks during intervention sessions. As the results show Students A and B achieved a high percentage of the goals they set. Although they were observed to be reflective during the process of goal setting, their comments were indication they attempted to set goals low enough to ensure they would at
least reach a level of item completion and accuracy to earn an incentive. Student C was also reflective and even seemed to experience a little angst with wanting to set goals appropriately. Her goals appeared to be more appropriate and were not unrealistically high. As previously noted, she did not achieve most goals set, however some incentives were permitted in order to maintain motivation.

Student responses to the questions at the top of the self-monitoring card (i.e. Did I Compartmentalize My Issues or Concerns?, Would you like to talk to the school psychologist about your concerns later?, How I feel today?) bear mention. During intervention sessions, Student A usually responded that she had “no problems today” to the compartmentalization question. She generally described her mental status as “alert” and her mood as “happy” or “ok”. On the last day of INT II she described her mood as “angry” but also reported “no problems” on that day. She always indicated that she did not have any concerns to address with the school psychologist. During intervention sessions, Student B always responded “no” to the compartmentalization question and always indicated that she did not have any concerns to address with the school psychologist. Student B always described her mental status as “tired” and generally labeled her mood as “other” or “don’t know”. On the last day of INT I she described her mood as “frustrated”. Student C’s responses to the compartmentalization question alternated between “yes” and “no”; yet she always indicated she had no concerns to address with the school psychologist. Student C’s responses regarding her mental status fluctuated between “tired” and “alert”. Her responses regarding her mood also varied; descriptions included “good”, “frustrated”, “happy”, “sad” and “ok”. The variation in mood descriptions was consistent with the frequent mood changes observed during the study.
Implications for Practice

Students were able to successfully use this self-monitoring strategy to increase their time on-task. This led to increased academic productivity for at least one student. Researchers have questioned whether self-management interventions are enough to help integrate students with disabilities into general education classrooms (Hughes, Copeland, Agran, Wehmeyer, Rodi, & Presley, 2002; Gureasko-Moore, DuPaul & White, 2006; Maag et al. 1993). Typical public school settings may not always be the best fit for students leaving correctional settings. However, this type of strategy may be enough to help them develop basic self-regulatory skills needed to sustain attention to tasks, improve task completion rates, in the alternative settings to which they typically return.

The literature suggests that goal setting (Konrad et al., 2007) and incentives or tangible reinforcers (Alter, Wyrick, Brown, & Lingo, 2008) can enhance academic outcomes for students with disabilities. Although their isolated effects were not measured in this study, students’ positive response to these components suggests a need to integrate them into self-management interventions with this population of students.

Finding uncomplicated intervention techniques is critical given the multiple demands on teachers’ time, especially for those who address high rates of problem behaviors. Social validity questionnaire outcomes indicated this procedure was easy to use. Additionally, students and the experimenter demonstrated high levels of performance on measures of procedural integrity. Taken together this information suggests the procedure would be easy for a teacher to implement when students are engaged in independent academic work. However, teachers reported concern that they may not have enough time to implement this type of procedure given the high demand on their time to address behavioral issues as they arise (for example, highly disruptive behaviors have the potential of disrupting a significant portion of class time and the teacher’s time due to
paper documentation that must be generated). The time involved with addressing various behavioral concerns can vary from day to day.

The importance of feedback on academic performance has been well documented (Hattie & Temperly, 2007; Glenn, Heath, Karagiannakis & Hoida, 2004). Because academic accuracy outcomes were weak, it may be necessary to include a corrective feedback component after students complete an assigned task. The degree of corrective feedback may be contingent on whether students are receiving reinforcement and review of targeted skills in the normal course of curriculum delivery.

Because task persistence tends to be an area of struggle for youth in this setting and because they tire of working on the same math skills, future practitioners might consider a change to the way that practice worksheet packets are constructed by varying items across sessions in order to minimize any possible adverse effects of repetition on students’ attitude or motivation. As a final consideration, future practitioners might consider using students’ existing learning format when implementing self-management procedures. Increasing numbers of high school age students with EBD are attending schools that offer a computerized learning system. Valuable information may be gathered by examining the effects of these procedures while students work within a computerized curriculum.

Implications for Future Research

Repetition

External validity is demonstrated when multiple investigations replicate intervention results. An important aim of this study was to consider the effects of a self-management procedure in a juvenile correctional high school setting. The literature has documented positive effects when these strategies were applied among diverse groups of students with EBD, however, investigations of self-management interventions in juvenile correctional girls’ schools were not
located in the literature. Repeating this study would be an important next step to determine if the results can be reproduced in a juvenile correctional school setting with girls. In a review of self-management studies targeting academic outcomes for students with EBD, Mooney et al. (2005) noted that “no studies involved only females” (p. 209). Finally, including more students may enhance analysis of intervention effects.

**Academic and Non Academic Components**

Educational research generally supports the practice of conducting investigations in the natural environments in which students learn. While this study occurred in the natural setting, the nature of the academic task involved paper–pencil practice and hence differed from the computerized format in which students typically work. Designing self-management strategies to fit within students’ existing learning conditions will enhance internal validity of future investigations.

As noted earlier, two students experienced a decline in on-task behavior during the fading condition. The fading condition was fixed at two day increments and components were withdrawn every two days (e.g., withdraw of self-monitoring card during days 1 and 2, withdraw of tone during days 3 and 4; withdraw of “compartmentalization question” during days 5 and 6). It is possible that on-task behavior decreased because components were withdrawn too soon when students continued to need more and not less support. Maintaining the self-monitoring card and/or the tone for more days may have prevented the observed decline. Future investigations might consider variations to the fading procedures such as: 1) maintaining an auditor cue (tone) for more than two days and perhaps increasing the length of time between tones from four to eight minutes for example, 2) using an auditory cue at random intervals, for example, 3 minutes,
8 minutes, and 6 minutes, or 3) fading elements of the self-monitoring card such as removal of the initial questions regarding present concerns, mental status, and mood while maintaining the question about on-task behavior.

Multiple variations in terms of design and skill targets have potential for increasing knowledge of how to develop effective self-management strategies for students attending school in correctional settings: (a) provision of corrective feedback whereby students are provided with error correction and teaching to improve skill performance, (b) using novel material or targeting academic skills that are new to students, (c) targeting higher order skills such as reading comprehension and math application (Reid et al., 2005), (d) selecting non academic targets that impact academic performance such as study skills, following classroom rules, preparedness and class participation, (e) designs that include an incentive-only or goal-setting-only phase in order to investigate mechanisms leading to change and explain the incremental effects of various components as suggested by Konrad et al. (2007), and (f) allowing students to self-select behavioral or academic skill targets thereby increasing the chance that they will be motivated to address skills they may find personally relevant. One caveat regarding the use of novel material or application of new skills should be offered. Use of new material may slow down productivity until fluency is established (Reid, 1996), hence investigators may elect to use dependent variables other than amount of work completed.

A final and perhaps critical area of needed exploration for this population is the relative effects of medication on performance during intervention. Students in correctional settings have a higher incidence of behavioral health needs and pharmacological intervention. In this study, students were taking psychotropic medications but level of consistency with taking medications and any possible medication changes were not tracked. It is possible that medication factors could have contributed to student performance if new medications were introduced or had not
reached a therapeutic level during the intervention time frame. Future investigations might consider tracking medication classes, level of participant compliance with medication regimens, and any other notable changes to prescribed medications.

Summary

This chapter presented major findings, limitations, and implications for future practice and research for the current study. Three students attending a juvenile correctional high school participated in this study. At the time of enrollment, one student was in 8th grade, one was in 12th grade and one had completed GED requirements and was seeking admission to a community college. At the time of enrollment, two were participating in a small math class that was co-taught by a general education teacher and an intervention specialist. One student was Latina, one White, and one African-American (Biracial). School experiences prior to adjudication included attendance at large urban public high schools and attendance at a school within a therapeutic residential setting. All students’ records and pre-intervention assessments indicated delays in math calculations skills.

All participants showed improvement in on-task behavior when taught to use a self-management procedure. The positive response in on-task behavior was consistent with the literature. Results were mixed for academic productivity and there was no increase along the academic accuracy variable. Unlike other studies of youth with EBD, this intervention did not bring about the expected gains in academic productivity and accuracy when students engaged in independent math calculation skill practice. Data showed modest to moderate gains in productivity for two of the three participants and accuracy did not generally change in the direction or to the degree expected. Outcomes for the productivity and accuracy variables suggest a need to modify components (e.g., type of feedback offered, type of academic targets used) of the intervention in future investigations.
References


American Civil Liberties Union of Ohio (ACLU) (2010). Reform Cannot Wait: A
Comprehensive Examination of the Cost of Incarceration in Ohio from 1991-2010.


Individuals with Disabilities Education Improvement Act of 2004 (IDEIA), 20 U.S.C. sec. 1400


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# Appendix A

## IOA Data Recording Sheet for On-Task Behavior

| Occurrence (Scored) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Nonoccurrence (Unscored) |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Occurrence (Scored) | 23| 24| 25| 26| 27| 28| 29| 30| 31| 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 |    |
| Nonoccurrence (Unscored) |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Occurrence (Scored) | 45| 46| 47| 48| 49| 50| 51| 52| 53| 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |    |    |    |    |
| Nonoccurrence (Unscored) |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

**Occurrence (Scored) Agreement**
- A Occurrence
- A Occurrence + D Occurrence

**Nonoccurrence (Unscored) Agreement**
- A NonOccurrence
- A NonOccurrence + D NonOccurrence
Appendix B

**Interobserver Agreement & Data Recording Sheet**

for Academic Productivity & Accuracy

Student Name: ________________

**Directions:** Complete a separate sheet for each student. For each session / math worksheet packet indicate the number of items the student completed and number correct. Include IOA data between two observers for all worksheets. Use the Total Count IOA formula as indicated below to calculate percentage of agreement on both productivity and accuracy outcome measures.

<table>
<thead>
<tr>
<th>Session No.</th>
<th>Date</th>
<th>Phase</th>
<th>Number Completed</th>
<th>Number Correct</th>
<th>Number Incorrect</th>
<th>Percentage Correct</th>
<th>IOA Calculations</th>
<th>Smaller Count (No. correct)</th>
<th>Larger Count / (No. correct)</th>
<th>Total Count Agreement Percentage</th>
</tr>
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<tbody>
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</tbody>
</table>

**Total Count Agreement Percentage**

=\frac{\text{Smaller Count} \times 100}{\text{Larger Count}}
Appendix C  

Procedural Integrity Checklist for Students

Date: ____________________ Phase: ___________ Session Number: ___

Participant Name: __________________________

<table>
<thead>
<tr>
<th>STEPS:</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Student reviews the graph page and records a productivity goal and an accuracy goal on the graph page.</td>
<td></td>
</tr>
<tr>
<td>2. Student completes first section of the SM Card by responding in writing to the three questions listed</td>
<td></td>
</tr>
<tr>
<td>(Completion of the index card is optional – do not check)</td>
<td></td>
</tr>
<tr>
<td>3. Student starts working on the math worksheet packet only after experimenter asks students to start work.</td>
<td></td>
</tr>
<tr>
<td>4. Student completes second section of the SM Card each time the tone occurs: ___1,____2, ____3,____4.</td>
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<tr>
<td>(Request for scratch paper is optional – do not check)</td>
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<tr>
<td>5. Student stops work on the math worksheet when the interventionist says “stop”.</td>
<td></td>
</tr>
</tbody>
</table>

Total Count Agreement Percentage  
= Smaller Count X 100  
Larger Count
## Appendix D

### Intervention & Procedural Integrity Checklist

For Experimenter

<table>
<thead>
<tr>
<th>STEPS:</th>
<th>Baseline Phases</th>
<th>Intervention Phases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Check One</td>
<td>YES</td>
</tr>
<tr>
<td>1.</td>
<td><strong>Interventionist reads the following instructions at the start of the class period:</strong> “We would like for you to complete some math problems. Please try to focus on the math worksheet as you complete the problems. You should continue to work on the math worksheet until one of the adults in the classroom asks you to stop working. When we pass out the worksheets, don’t turn them over until we ask you to start working. This is an independent work time, you will not receive assistance, just try your best.”</td>
<td><strong>YES</strong></td>
</tr>
<tr>
<td>2.</td>
<td><strong>Interventionist passes out math worksheets and pencils / scrap paper to students needing them.</strong></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td><strong>Interventionist asks students to:</strong> “please start working?” and sets timer for 16 minutes.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>At end of 16 min. practice period, interventionist asks students: “Please stop?”</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td><strong>Interventionist collects math worksheets.</strong></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td><strong>Interventionist distributes graph pages to students and reads the following instructions:</strong> “Please graph your performance from the last math practice session. The number complete and the number correct are written on the top page of the packet. Now set your goal for today. Do you want to increase the number of problems you complete or complete at least the same number of problems? Do you want to increase the number you get correct or keep this number at least the same? Please write the date and your goal on the chart at the bottom of the page.”</td>
<td><strong>YES</strong></td>
</tr>
<tr>
<td>7.</td>
<td><strong>Interventionist distributes self-monitoring cards, and pencils (if needed)</strong></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td><strong>Interventionist provides the following instructions for completing the first section of the self-monitoring card:</strong> “Sometimes students come to class thinking about problems they have or things that happened before class. When you get to school it is important to push those problems, worries or concerns out of your mind so that you can focus on your school work and reach your educational goals. Putting our problems aside in this way is called “compartmentalizing”. In the first box, please indicating whether or not you have compartmentalized your concerns. Please circle ‘Yes’, ‘No’, or ‘No problems today’. If you circled ‘Yes’ (you have set aside concerns) or ‘No’ (you are having a hard time pushing concerns out of your mind) you can answer the next question in this box to tell whether you would like to meet with the school psychologist later to talk about your problems or concerns. If you say yes, you will be given time to meet with the school psychologist later. Next, I’d like you to tell how you feel today, circle one option from each line.”</td>
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**continued**
Appendix D Continued

4. **Interventionist provides the following instructions for completing the second section of the self-monitoring card:** “While you are working on the math worksheets, you will hear a tone every four minutes. When you hear the tone, ask yourself, ‘At this exact second, am I on-task?’; if you are on-task, circle ‘yes’ and if you are not on-task, circle ‘no’. Be very careful to circle your responses under the correct tone number (e.g. at tone 1, circle ‘yes’ or ‘no’ in the correct box for tone 1). Your card has reminders of what actions count as on-task behavior. Remember, it’s important that you are accurate when you circle ‘yes’ or ‘no’. [Math worksheets will be distributed] Please wait until I say “start”. You will not be able to receive help with the math problems, just do your best. You can have scratch paper to work problems. [Provide scratch paper to any who want it.] You can start working now”.

5. Math worksheets are disturbed.

6. **Interventionist provides the following instructions:** “You will not be able to receive help with the math problems, just do your best. You can have scratch paper to work problems. [Provide scratch paper to any who want it.] You can start working now”.

7. Provide scrap paper to any students who want it.

8. The timer is set for 16 minutes (tone should sound every four minutes)

9. Interventionist and assistants complete observation forms as students work.

10. Students are asked to stop working at the end of 16 minutes.

11. As students finish, collect the self-monitoring cards, worksheets, answer keys, and graph pages.

12. **INSTRUCTIONS FOR THE FIRST, SECOND, & THIRD SESSIONS ONLY:** “During the certain sessions, incentives will be allowed for those of you who maintain or increase your performance – the number of problems completed and number of problems completed correctly.”

13. Interventionist thanks students for participating.

<table>
<thead>
<tr>
<th>Fading Phase</th>
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</thead>
<tbody>
<tr>
<td><strong>YES</strong></td>
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<tr>
<td><strong>NO</strong></td>
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</tbody>
</table>

**FIRST STAGE—Two Days**

1. **Interventionist distributes graph pages to students and reads the following instructions:** “This graph shows your performance from the last practice session. Please look at the number of math problems you completed and the number of problems you got correct. Now, think about your goals for today using the same questions we have discussed before.”

2. **Interventionist collects graph pages then reads the following instructions:** “Today, just as in the other days, please set aside any problems or concerns you may be thinking about in order to focus on the assignment. If you have concerns I can address those with you after the session. You will hear the same tone as you work on the math worksheets. When you hear the tone this time, I want you to ask yourself if you are working but you will not have to circle your response on the Self-monitoring card. If you need scrap paper please let me know.

3. Math worksheets and scratch paper are disturbed.

4. **Interventionist provides the following instructions:** “You can start working now”.

5. **Interventionist completes observation form(s) as students work.**

Continued
Appendix D Continued

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<tbody>
<tr>
<td>6.</td>
<td>Students are asked to stop working at the end of 16 minutes and worksheets are collected.</td>
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</table>

**SECOND STAGE – Two Days**

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<tbody>
<tr>
<td>1.</td>
<td><strong>Interventionist distributes graph pages to students and reads the following instructions:</strong> “This graph shows your performance from the last practice session. Please look at the number of math problems you completed and the number of problems you got correct. Now, think about your goals for today using the same questions we have discussed before.”</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Interventionist collects graph pages then reads the following instructions:</strong> “Today, just as in the other days, please set aside any problems or concerns you may be thinking about in order to focus on the assignment. If you have concerns I can address those with you after the session. You will not hear a tone as you work today. When you finish working I will ask you to tell me if you were on-task or off-task most of the time. If you need scrap paper to help with working the math problems, please let me know.”</td>
</tr>
<tr>
<td>3.</td>
<td>Math worksheets and scrap paper are disturbed.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Interventionist provides the following instructions:</strong> “You can start working now”.</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Interventionist completes observation forms as students work.</strong></td>
</tr>
<tr>
<td>6.</td>
<td>Students are asked to stop working at the end of 16 minutes and worksheets are collected.</td>
</tr>
</tbody>
</table>

**THIRD STAGE – Two Days**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Interventionist distributes graph pages to students and reads the following instructions:</strong> “This graph shows your performance from the last practice session. Please look at the number of math problems you completed and the number of problems you got correct. Now, think about your goals for today using the same questions we have discussed before.”</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Interventionist collects graph pages then reads the following instructions:</strong> “Today, you will complete the math assignment just as you have on other days. You will not need to complete any other steps. When you finish working I will collect the assignment. If you need scratch paper to help with working the math problems, please let me know.”</td>
</tr>
<tr>
<td>3.</td>
<td>Math worksheets and scrap paper are disturbed.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Interventionist provides the following instructions:</strong> “You can start working now”.</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Interventionist and assistants complete observation forms as students work.</strong></td>
</tr>
<tr>
<td>6.</td>
<td>Students are asked to stop working at the end of 16 minutes and worksheets are collected.</td>
</tr>
</tbody>
</table>
Appendix E
Sample Worksheet Page

1a. \[ \frac{7}{12} - \frac{4}{8} = \]
1b. \[ \frac{6}{12} - \frac{4}{9} = \]
1c. \[ \frac{9}{11} - \frac{6}{12} = \]

2a. \[ \frac{5}{6} - \frac{6}{10} = \]
2b. \[ \frac{5}{10} - \frac{4}{10} = \]
2c. \[ \frac{4}{6} - \frac{4}{9} = \]

3a. \[ \frac{7}{11} - \frac{4}{12} = \]
3b. \[ \frac{11}{12} - \frac{7}{11} = \]
3c. \[ \frac{7}{12} - \frac{5}{10} = \]

4a. \[ \frac{8}{10} - \frac{4}{5} = \]
4b. \[ \frac{6}{10} - \frac{6}{12} = \]
4c. \[ \frac{7}{10} - \frac{5}{12} = \]

http://www.homeschoolmath.net/worksheets/fraction.php
Appendix F
Self-Monitoring Card

**Student Name**

<table>
<thead>
<tr>
<th>Did I Compartmentalize My Issues or Concerns?</th>
<th>YES</th>
<th>NO</th>
<th>No problems today</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would you like to talk to the school psychologist about your concerns later?</td>
<td></td>
<td></td>
<td>YES NO</td>
</tr>
<tr>
<td>How I feel today (circle one from each line)</td>
<td>TIRED</td>
<td>ALERT</td>
<td>Good/ Happy / OK/ Sad/Angry/ Don’t Know/ Frustrated/ Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>At this exact second, am I on-task?</th>
<th>Tone 1</th>
<th>Tone 2</th>
<th>Tone 3</th>
<th>Tone 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

On-Task means
- My eyes are on the worksheet, or
- I am working on a math problem, or
- I am circling “yes” or “no” on the self-monitoring card
Appendix G
Graph Page

My Performance - Student Name

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
<th>Day 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>#Completed</td>
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</table>

**MY GOAL FOR TODAY**

<table>
<thead>
<tr>
<th></th>
<th>Date</th>
<th>Complete</th>
<th>Correct</th>
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</thead>
<tbody>
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</tbody>
</table>

204
### BEHAVIOR CODING SHEET

**Student Observed:**

**Observer:**

**Date / Session:**

**Start Time:**

<table>
<thead>
<tr>
<th>Minute</th>
<th>1</th>
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<th>3</th>
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</table>

**Total Intervals Observed:**

**Behaviors Defined:**

- Eyes on Paper - Looking at the assignment
- Self-Monitor - Marking the self-monitoring card at tone
- Appr. Writing - Working a math problem or writing an answer
- "Thinking" - Looking away from papers "appears to be thinking"
- "OFT - Task" - Not engaged in the assignment
- Tone - Check box when tone (cue to mark self-monitoring card) occurs
### Appendix I

**Teacher Intervention Survey**

**Surveys adapted from U.S. Department of Education, 2003**

**Directions:** Please provide your opinion regarding the self-monitoring strategy that was implemented in the math class.

1. I perceived the self-monitoring strategy to be easy to implement. The procedures I observed seemed clear and easy to follow as outlined on the intervention script.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

2. Students’ math skills improved during implementation of self-monitoring strategy.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</tbody>
</table>

3. Students’ ability to focus, on-task behavior and work productivity improved during implementation of self-monitoring strategy.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<tr>
<td>1</td>
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<td>4</td>
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</tr>
</tbody>
</table>

4. The audio taped tones created a distraction in the environment and I think another type of cue would be more appropriate to help students complete the self-monitoring card.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<tbody>
<tr>
<td>1</td>
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<td>3</td>
<td>4</td>
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</tbody>
</table>

5. The self-monitoring cards were simple / clear enough to prompt subjects to accurately monitor time on task.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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Continued
Appendix I Continued

6. The self-monitoring strategy help students gain control over their behavior.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</table>

7. After the intervention, students’ demonstrated high accuracy with math calculations (specify type on lines below).

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</tbody>
</table>

8. If I were to use the self-monitoring strategy in the future, I would change some aspects of the procedure (please specify below).

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree</th>
<th>Slightly Agree</th>
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<th>Strongly Agree</th>
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</table>

9. I plan on using the self-monitoring strategy in the future with other students because I feel it is worthwhile and effective. I think other students would benefit from the strategy.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree</th>
<th>Slightly Agree</th>
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10. I would consider using the self-monitoring strategy with other students that I teach but I do not have enough time to implement the intervention.

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<th>Strongly Disagree</th>
<th>Disagree</th>
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<th>Neither Agree</th>
<th>Slightly Agree</th>
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<th>Strongly Agree</th>
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11. I would not feel comfortable implementing the steps of this intervention without the OSU researcher. I believe I would need additional training with this intervention.

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<tr>
<th>Strongly Disagree</th>
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<th>Neither Agree</th>
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</tr>
</tbody>
</table>

12. I will recommend this self-monitoring strategy to other teachers.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Please write any other comments, suggestions or questions: ____________________________________________

Total Score __________________________
Appendix J

Student Intervention Survey

Directions: We want to know your opinion about the self-monitoring strategy. Please fill in the bubble that best describes how you feel.

1. The self-monitoring card was easy to use.
   - Totally right
   - A lot right
   - A little bit right
   - Not right or wrong
   - A little bit wrong
   - A lot wrong
   - Totally wrong

2. The audio taped tone card helped me focus and reminded me to stay on-task.
   - Totally right
   - A lot right
   - A little bit right
   - Not right or wrong
   - A little bit wrong
   - A lot wrong
   - Totally wrong

3. My math calculation skills improved because of the self-monitoring strategy. I got better at doing different kinds of problems.
   - Totally right
   - A lot right
   - A little bit right
   - Not right or wrong
   - A little bit wrong
   - A lot wrong
   - Totally wrong

4. I was able to complete more and more math problems because of the self-monitoring strategy.
   - Totally right
   - A lot right
   - A little bit right

Continued
Appendix J Continued

5. The self-monitoring strategy was **distracting** or **hard to use** and **I had trouble** completing my work because of the strategy.

   - Totally right
   - A lot right
   - A little bit right
   - Not right or wrong
   - A little bit wrong
   - A lot wrong
   - Totally wrong

6. The self-monitoring strategy was **appropriate for a high school age student**. It did **not** seem like something younger students would use.

   - Totally right
   - A lot right
   - A little bit right
   - Not right or wrong
   - A little bit wrong
   - A lot wrong
   - Totally wrong

7. Now, I focus better in all of my classes.

   - Totally right
   - A lot right
   - A little bit right
   - Not right or wrong
   - A little bit wrong
   - A lot wrong
   - Totally wrong

8. Now, I have more confidence in my math calculation skills.

   - Totally right
   - A lot right
   - A little bit right
   - Not right or wrong
   - A little bit wrong
   - A lot wrong
   - Totally wrong

Continued
Appendix J Continued

9. I would like for other teachers to use the self-monitoring strategy in my other classes.
   o Totally right
   o A lot right
   o A little bit right
   o Not right or wrong
   o A little bit wrong
   o A lot wrong
   o Totally wrong

10. I do not want the teacher to keep using this self-monitoring strategy in this math class.
    o Totally right
    o A lot right
    o A little bit right
    o Not right or wrong
    o A little bit wrong
    o A lot wrong
    o Totally wrong

11. I think the self-monitoring strategy could help other students.
    o Totally right
    o A lot right
    o A little bit right
    o Not right or wrong
    o A little bit wrong
    o A lot wrong
    o Totally wrong

12. I do not feel comfortable using the self-monitoring strategy without the OSU researcher.
    o Totally right
    o A lot right
    o A little bit right
    o Not right or wrong
    o A little bit wrong
    o A lot wrong
    o Totally wrong

Please write any other comments, suggestions or questions:________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
### Objective(s)
For students to identify on-task behaviors and use a self-monitoring card to aid their concentration and monitor their own on-task behaviors.

### Materials Needed
- Student desk
- Blank index cards
- Cards with acronym KIT
- Flip chart or white board
- Sample math worksheets

### SELF-MONITORING LESSON PLAN

<table>
<thead>
<tr>
<th>To Do</th>
<th>To Say</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson Introduction</strong></td>
<td>Explain emphasis of the lesson.</td>
</tr>
<tr>
<td><strong>Active Background Knowledge</strong></td>
<td>Get students to start thinking about classroom behaviors.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Discussion</strong></td>
<td>Lead discussion whereby students define off-task &amp; on-task behavior.</td>
</tr>
<tr>
<td></td>
<td>Discuss how they currently perform the skill.</td>
</tr>
<tr>
<td></td>
<td>If, I were to come into your classroom to check to see if you were on-task, what kinds of things might I see students doing?</td>
</tr>
</tbody>
</table>

Continued
| **Modeling** | Sit in a student desk at the center of the group in order to act out behaviors. | Now, I want you to watch me as I sit at this desk and act like I am off-task. *(Demonstrate)*

**What was I doing that caused me to be off-task?**

Now, I want you to watch me as I sit at this desk and act like I am on-task and trying to keep myself on-task. *(Demonstrate while talking out loud and using self-instructions (e.g. “I need to keep working even though people beside me are talking”, “I need to work on another problem while I’m waiting for the teacher to help me”, etc)).

**What on-task behaviors did you see?**

**What did I do to help keep myself on-task?**

Talking to myself in that way is called using self-instructions or self-statements? |
| **Learning & Memorization** | Distribute index cards to each student. | Just like I used self-instructions, I want you to use the index cards to write your own self-instructions. Please write self-instructions starting with the words “keep” and “ignore”. For example, you could write “keep doing math problems” or “ignore others talking”. Just write down phrases that will encourage or help you to stay focused when you start to get distracted or off-task in the classroom. *(Allow ample time for students to come up with cues. Students may assist one another.)*

**Ask, “Can someone share some of their self-instructions?”**

Hold onto these index cards because you will need them when I ask you to act out and practice on-task behavior. |
|  | Show the acronym KIT on the board or flip chart and read each line. | An acronym is a group of letters that can help us remember information. In an acronym, each letter stands for something. Now, I’d like for you to memorize the acronym, KIT to help you remember what to do when working on your math assignment. The K stands for “keep working on the assignment”. The I stands for “ignore distractions”. The T means “am I on-task”.

212 | Continued |
### Learning & Memorization

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribute cards with the acronym</td>
<td>You will have five minutes to memorize this acronym and then I will quiz you. You can help each other. You may use this card with the acronym to help you learn. (Pass out the cards). (Allow five minutes to elapse. Cover the acronym.)</td>
</tr>
<tr>
<td>Turn your cards over.</td>
<td>(Call on students, one at a time to tell what the acronym stands for.)</td>
</tr>
<tr>
<td>OK (student name), please tell me what K.I.T. stands for.</td>
<td></td>
</tr>
</tbody>
</table>

### Collaborative Practice

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduce students to the role playing activity</td>
<td>Now I want you to take turns role playing how to stay on-task in the classroom. Each person will sit at the desk in the center. The rest of us will act as other students in the classroom.</td>
</tr>
<tr>
<td>First, you will show on-task behavior, using self-instructions from the KIT acronym and your other self-instructions.</td>
<td>(Allow each student to practice role playing)</td>
</tr>
</tbody>
</table>

### Discussion

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduce self-monitoring card and discuss why it might be helpful.</td>
<td>Now, I’d like to show you another tool that can help you stay on-task. It’s called a self-monitoring card. When we start the new assignment in your math class, you will be using this card to help you stay focused on your work.</td>
</tr>
<tr>
<td>Show the self-monitoring card and point out the first box.</td>
<td>Look at the first box with the question, “Did I compartmentalize my problems or worries?” Sometimes students come to school thinking about or worrying about things that happened the day before, or outside of school, or on the living unit, or with their families. When these other things are on your mind you cannot concentrate on your work. Compartmentalize means being able to put these things in the back of your mind so you can focus on your work. It might mean telling yourself that you can think about or talk about this issue later like at lunch time. Before starting on an assignment you will be asked to answer the questions in this first box.</td>
</tr>
<tr>
<td><strong>Discussion</strong></td>
<td>Show the self-monitoring card and point out the second box.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>and tell me if you were able to set aside worries /concerns, not able to do this or simply don’t have any concerns on that day. The second question asks whether you would like to talk to the school psychologist later about your concerns. If you have any concerns this helps you to know that you will have a chance to talk about them later. You will also be asked to answer the third question about how you feel on that day. You can just circle one response on each line.</td>
</tr>
<tr>
<td></td>
<td>Now, Look at the four boxes with the words “tone”, “yes”, and “no”.</td>
</tr>
<tr>
<td></td>
<td>Tone means that a tone or bell will go off four times while you are working on a math assignment.</td>
</tr>
<tr>
<td></td>
<td>Now look at the box with the question “At this exact second, am I on-task”. Each time the tone / bell goes off, you should ask yourself this question “__” and then circle the answer, ‘yes’ or ‘no’. After you circle your answer you should immediately return to working on your math assignment.</td>
</tr>
<tr>
<td></td>
<td>Do you have any questions about how to use the self-monitoring card? (Answer any questions)</td>
</tr>
<tr>
<td></td>
<td>How do you think this card can help you stay on task? (Provide additional examples as necessary, e.g., helps you remember to keep working on the assignment.)</td>
</tr>
<tr>
<td><strong>Modeling</strong></td>
<td>Model use of the card. Set the timer to ring twice – just 45 seconds apart – for the purpose of demonstration</td>
</tr>
<tr>
<td></td>
<td>Now, I want you to watch me as I sit at this desk and act like I am using the self-monitoring card to keep myself on-task. (Sit in the student desk and demonstrate while talking out loud and using self-instructions (e.g. “The bell rang, I was not on-task, I was looking at another student, I will circle no”, and “The bell rang, I was on task, I was working on a math problem, I will circle yes this time”) etc).</td>
</tr>
</tbody>
</table>

Continued
### Collaborative Practice

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set the timer to ring four times, just 20 seconds apart for the purpose of demonstration.</td>
<td>Now we will practice using the self-monitoring card together. I want you to take turns role playing how to use the self-monitoring card. Each person will sit at the desk in the center. The rest of us will act as other students in the classroom. (Allow each student time to practice / role play)</td>
</tr>
<tr>
<td>Guide students as they role play.</td>
<td></td>
</tr>
</tbody>
</table>

### Independent Practice

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give students a sample math worksheet and self-monitoring card.</td>
<td>Now you all will practice using the self-monitoring card while working on a math worksheet. (Distribute math worksheets and a self-monitoring cards).</td>
</tr>
<tr>
<td>Set timer bell at three intervals of 1 minute apart</td>
<td>Look at the first box and answer the question. Do you have any problems or worries that you need to set aside or compartmentalize before starting the math assignment?</td>
</tr>
<tr>
<td></td>
<td>If you do have concerns, tell whether you want to talk with the school psychologist later, circle yes or no.</td>
</tr>
<tr>
<td></td>
<td>When I say begin, start working on the math worksheet and listen for the tone/bell. Each time you hear the bell, ask yourself. “At this exact second, am I on-task” and then circle the answer, ‘yes’ or ‘no’. After you circle your answer you should immediately return to working on your math assignment.</td>
</tr>
<tr>
<td></td>
<td>OK, begin.</td>
</tr>
<tr>
<td></td>
<td>(Allow students three opportunities to self-monitor. Allow additional opportunities for any students having difficulty)</td>
</tr>
</tbody>
</table>

Appendix K Continued

Objective(s)
For students to receive feedback on their math worksheets and record the number of problems completed and number completed accurately on a graph.

Materials Needed
Sample math worksheet with completed problems
Sample graph page
Pencils

DATA COLLECTION
LESSON PLAN

<table>
<thead>
<tr>
<th>To Do</th>
<th>To Say</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduce the Lesson</strong></td>
<td>Hold up a sample math worksheet with completed problems and answer key</td>
</tr>
<tr>
<td></td>
<td>Hold up a sample graph page</td>
</tr>
<tr>
<td><strong>Model Feedback</strong></td>
<td>Distribute the sample worksheets, and graph pages.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued
### Explain How Data is Recorded on the Graph Page

- Hold up the graph page and then distribute sample graph pages.

- Hold up graph page and point to each area.

- Hold up graph page and point to the date and bars to be discussed.

- Hold up graph page and point to the date and bars to be discussed.

This page has a bar graph showing how this student has performed on her math worksheet assignments.

At the bottom on the horizontal line is the date. The vertical line on the left side shows numbers.

Look at the first date “2/19”. The blue bar shows that she finished 5 math problems and the green bar shows that she got 3 problems right and those numbers are written over the bars.

Look at the next date “2/20”. The blue bar shows that she finished 8 math problems this time and the green bar shows that she got 5 problems right. Those numbers are written over the bars.

### Guided Practice

- Hold up graph page and point to the horizontal line.

- Now you will record information from the worksheet you just reviewed on the graph page.

- First write the date at the bottom along the horizontal line, “2/23”. Next, follow the line up to the number (along the vertical) that shows the number of problems she completed on this worksheet, the number is 12. Write “12” on the line across from the 12 on the vertical axis. Now draw a bar.

Continued
Guided Practice

Next, follow the line up to the number (along the vertical) that shows the number of problems she got right on this worksheet, the number is 8. Write “8” on the line across from the 8 on the vertical axis. Now draw a bar.

So, this is how we record information from the worksheet onto a graph.

Are the any questions?
(Respond to questions)
Objective(s) | Enable students to set personal productivity and accuracy goals for performance on math activity.
---|---
Materials Needed | Graph page from previous data recording lesson
| Math worksheet from previous data recording lesson
| Pencils

| Introduce the Activity | We’re going to learn how to set goals to improve our performance on the math assignments we will be doing.
|---|---
| Explain the Goal Setting Process | Look at the box labeled “My Goal for Today” on this graph page. This is where you will write your goals.
| | Look at the bar graph for the date “9/23”. This student finished 5 math problems and she got 3 problems right on that day. So the next day on “9/24” she set a goal to complete 8 problems and to get at least 5 problems right.
| | Now look at the next date on the graph “9/24”. Here you can see that this student finished 8 math problems this time and she got 5 problems right. So she reached her goal.
### Explain the Goal Setting Process

<table>
<thead>
<tr>
<th>Point to “9/25” date on graph.</th>
<th>Explain the Goal Setting Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Look at the bar graph for the next day “9/25”. On the next day, she increased her goal. She wanted to complete at least 16 problems and get 11 right on this day. But when you look at her actual performance on “9/25”, you can see that she only finished 12 math problems and she got 8 problems right on that day. So she did not reach her goal for the day. This means she may have set her goal too high.</td>
<td></td>
</tr>
<tr>
<td>So when she sets her goal on the next day “9/26” she might want to increase her goal for the number of problems she completes only by a little, to 14 and she might want to increase her goal for the number she gets correct by a little (not too much), like 9. Or she could decide to try to maintain her goal which means to keep her performance the same. She might want to keep it the same if she feels like it was very hard for her to even complete 12 problems and very hard to get 8 problems correct.</td>
<td></td>
</tr>
</tbody>
</table>

So there are two different types of goals you could set. You could decide to either maintain or increase— the number of problems you complete and the number you get right.

When we start the new math assignment, you will be able to earn incentives for reaching the goals you set.

So when you set goals ask yourself: “Do I think I can increase the number of problems I will complete?” “Was is a struggle to complete the amount I got correct the last time, so should I try to
Appendix K Continued

<table>
<thead>
<tr>
<th>Test Knowledge of Goal-Setting</th>
<th>keep this amount at least the same?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have any questions?</td>
<td><em>(Respond to any questions)</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write example on the board:</th>
<th>Now you will take a short quiz on what you just learned about goal setting.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX: Let’s say a student got these scores:</td>
<td></td>
</tr>
<tr>
<td>Day 1</td>
<td></td>
</tr>
<tr>
<td>Number completed – 7</td>
<td></td>
</tr>
<tr>
<td>Number correct – 3</td>
<td></td>
</tr>
<tr>
<td>Day 2</td>
<td></td>
</tr>
<tr>
<td>Number completed – 5</td>
<td></td>
</tr>
<tr>
<td>Number correct – 1</td>
<td></td>
</tr>
<tr>
<td>What should the goals be for Day 3?</td>
<td></td>
</tr>
<tr>
<td>For Number Completed?</td>
<td></td>
</tr>
<tr>
<td>For Number Correct?</td>
<td></td>
</tr>
</tbody>
</table>
Appendix L

Participant # ___________________________ Date: __________

**Choice Reinforcement Survey**
(Categories adapted from Northup, et al., 1996)

**Instructions to student:** This is a list of incentives that students like to receive. I want to know how much you like each of these things. After I name each item, tell me if you like it a little, a lot, or not at all. For example, if I say ‘getting stationary’, you might say you like it ‘a little’, but if I say ‘going for a walk with your social worker’, you might say ‘a lot’.

**Instructions for administration:** For items in each category, place the response rank on the line: a lot (1), a little (2), or not at all (0).

<table>
<thead>
<tr>
<th>Edibles</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juice Drinks</td>
<td>Craft project, (e.g. photo album)</td>
</tr>
<tr>
<td>Pretzels, chips</td>
<td>Free time in Library</td>
</tr>
<tr>
<td>Cookies</td>
<td>Taking a walk with favorite staff person</td>
</tr>
<tr>
<td>Popcorn</td>
<td>Playing a board game or card game</td>
</tr>
<tr>
<td>Candy</td>
<td>Other:</td>
</tr>
<tr>
<td>Crackers</td>
<td></td>
</tr>
<tr>
<td>Trail Mix</td>
<td></td>
</tr>
<tr>
<td>Ice Cream</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tangibles</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificates, awards</td>
<td>Tell class you are a hard worker</td>
</tr>
<tr>
<td>Stationary, special writing paper</td>
<td>Say, “I’m going to let your parents know you are doing a good job”</td>
</tr>
<tr>
<td>Books</td>
<td>Other:</td>
</tr>
<tr>
<td>Magazines</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

**Follow-up questions:**

1. Would you rather get things to eat like chips and popcorn or would you rather get things to do like crafts projects, or go to the library for free time?

2. Would you rather get things to keep like lotion and special writing paper or would you rather have your teachers make positive comments like “Good Job”, “You’re improving”?  

Continued
Appendix L Continued

3. Would you rather get things to eat like candy, chips and popcorn or get things to keep like special writing paper or a book?