# Helping Female Juveniles Improve their On-task Behavior and Academic Performance Using a Self-Management Procedure in a Correctional Facility

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The purpose of this study was to teach female juvenile offenders with disabilities a self-management procedure to help improve on-task behavior and academic performance during independent practice of math calculation facts. Students were taught to set goals and were provided with incentives for goal attainment. A reversal single-case design (ABABC) was used to evaluate the effectiveness of the self-management procedure for on-task behavior (time on-task), academic productivity (percentage of problems completed), and academic accuracy (percentage of problems completed correctly). The results indicated that the intervention was effective for increasing participants' on-task behavior. A modest-to-moderate impact was evident on these students' academic accuracy and productivity. Limitations of this study and future directions for research are addressed. In addition, practical suggestions are offered for helping students monitor their on-task behavior, accuracy, and productivity.

*KEYWORDS*: Self-management strategies, female juveniles, serious emotional disturbance, on-task behaviors, and math skills

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 female is more likely to engage in delinquent activity when few protective factors exist and when multiple risk factors are severe, frequent, and occur early in a youth's development. These risk factors 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). Other risk factors 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). Moreover, when comparing female to male juvenile offenders, females juvenile offenders have spent less time in school, have greater academic delays, and are less prepared for job acquisition than male offenders (Timmons-Mitchell et al., 1997).

The prevalence of disabilities as defined by the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) is higher for youth in the juvenile justice system than youth in the general population (Gresham, Lane, & Lambros, 2000). According to Quinn, Rutherford, Leone, Osher, & Poirier (2005), approximately half of the juveniles with disabilities have been identified with emotional disturbance under IDEIA. Students with emotional disturbance have significant difficulty managing their own behaviors such as attending to instruction, completing assigned tasks (Cancio et al., 2004) and using appropriate strategies to resolve interpersonal conflict (Reid, Gonzalez, Nordness, Trout, & Epstein, 2004).

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Howell and Wolford (2002) suggested using behavior modification and self-management strategies to help students with disabilities in juvenile justice settings. 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) with the goal of becoming more productive and improving or eliminating target behaviors that are already within a student's repertoire (Reid, 1993).

Whereas the application of self-management strategies addressing behavior and mental health problems have been suggested within juvenile correctional settings (Houchins, 2001), only one study examined the effects of a self-management intervention in a correctional school setting (i.e., Marshall & Heward, 1979). Specifically, Marshall and Heward (1979) taught self-management strategies to adjudicated boys who were being educated in a juvenile reformatory in order to address their rehabilitation needs. In this study, eight male students were asked to choose a behavior that was personally relevant for meeting the goals of their rehabilitation program (e.g., writing letters to request job applications and interviews). A self-management intervention that included 13 lessons on topics such as defining, measuring, recording, and graphing target behaviors was implemented to help the youth achieve their self-selected behavioral goals. The results indicated that participants, in general, were able to successfully exhibit positive behaviors to meet their goals.

Although studies involving school-based, self-management interventions have not been conducted in juvenile correctional schools in at least the past 30 years, there have been some studies that have examined the effects of self-management strategies for students with emotional and behavioral disorders in typical public school settings (see Mooney, Ryan, Uhing, Reid and Epstein, 2005 for a review). In general, positive findings were reported in those studies. For instance, Levendoski and Cartledge (2000) studied the effects of a self-monitoring procedure on time, on-task and academic performance of one third-, one fifth-, and two fourth-grade boys with emotional and behavioral disorders. They used a reversal design with a fading condition (A-B-A-B-C) to investigate the effects of a self-monitoring procedure on these students' daily practice of math calculation problems following teacher-directed math instruction. The daily math practice consisted of giving the students 20 minutes to complete worksheets containing math problems at their instructional level. They were also asked to use self-monitoring cards at 10-minute intervals while they completed the worksheets. The 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 during the 10-minute intervals. Their findings indicated that all students increased time on-task, and three students increased their accuracy levels on math problems.

There were no studies that explored the use of self-management procedures for improving behaviors and academic performance for girls in a juvenile correctional setting. Therefore, clearly, there is a need to examine the effectiveness of self-management strategies on desired academic and behavioral outcomes for females in juvenile correctional classroom settings.

The purpose of our study was to explore the effects of a self-monitoring procedure on the on-task behaviors and the academic performance of high school females who were placed at a juvenile correctional school and were diagnosed with mental health disabilities (based on Diagnostic and Statistical Manual for Mental Disorders – Fourth Edition – Text Revision (DSM-IV-TR) criteria) and disabilities defined by the Individuals with Disabilities Education Improvement Act (IDEIA 2004). We sought to replicate the work of Levendoski and Cartledge (2000) in several ways. Similar to their study, we also included students with emotional and behavioral disorders. However, in our study, we focused on all females as opposed to males, on high school students rather than elementary students, and on students placed in a juvenile correctional facility rather than those receiving special education services in a public school classroom. We used self-monitoring cards that were similar to those used in Levendoski and Cartledge's (2000) study. However, the students were also encouraged to reflect on and record how they felt each day and whether they were encountering any particular distractions. Our study also used a reversal (A-B-A-B-C) single-case design to study the effects of students' use of self-monitoring cards on their on-task, accuracy, and productivity behaviors while they completed math worksheets. Unlike Levendoski

and Cartledge's (2000) study, we did not focus on newly learned material, and students did not receive assistance while they worked independently. However, we included goal setting, performance feedback, and reinforcement.

The following research questions guided our study:

1. What effects did a self-management intervention have on the participants' percentage of time on-task, math problems completed and math problems completed accurately during independent practice with math facts?
2. What effects did a self-management intervention have on participants' percentage of time on-task, math problems completed and math problems completed accurately during independent practice with math facts after the intervention was faded?

## METHOD

### Setting and Participants

The study took place at a maximum-security juvenile facility in a large metropolitan city in the Midwestern region of the United States. The following are criteria we used to select students for participation in this study: (a) students who had been placed in the correctional facility for at least three months (b) students who had a disability identified through IDEIA or the DSM-IV-TR, (c) students who exhibited frequent off-task behaviors as reported by their teachers, and, (d) students who were performing below the mean or two or more grade levels below their current grade placement in math based on the Woodcock-Johnson-Third Edition (WJ-III) Math Calculation subtest standard score. We were able to obtain permission for three participants who met the selection criteria.

Student A was a 17-year-old Hispanic/Latino American female. According to the DSM–IV-TR she was diagnosed with Conduct Disorder, Bipolar Disorder without psychotic features, ADHD, Cannabis Abuse, and Alcohol Abuse. Student B was an 18-year-old European-American female. According to the DSM-IV-TR, she was diagnosed with Mood Disorder (Not Otherwise Specified), Polysubstance Dependence, and Conduct Disorder. Student C was a 14-year-old African-American/Biracial female. Student C was identified with Emotional Disturbance according to IDEIA (2004) and diagnosed with Major Depressive Disorder (Recurrent), Post-traumatic Stress Disorder, Conduct Disorder, and ADHD according to the DSM-IV-TR. Participants were all taking psychotropic medications at the time of the study. Their performance on the WJ-III indicated that math calculation skills were below the norm sample's mean score (student A standard score = 84; student B standard score = 84; student C standard score = 91). For Student B, experimental procedures were carried out in a treatment group room on her living unit. For Students A and C, the experimental procedures were conducted in a classroom setting where they were seated at a table facing a wall and at other times on their living units in a treatment group room. In the group room, students were seated at a table positioned in the center of the room.

### Dependent Variables

The dependent variables for this study were percentage of time on-task, academic productivity, and academic accuracy during independent math practice. Time on-task was defined as student engagement with the activity, which meant: (a) 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 an audible cue (i.e., a timer with a short bell alarm that signaled students to self-record performance for the 'on-task question') and /or (e) "thinking," that is, looking away from the paper but appeared to be thinking. Any observation of "thinking" was 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. Using an adaptation of the *Behavior Observation of Students in Schools* (*BOSS*; Shapiro, 2004),

students were observed during completion of math worksheets for all sessions across all experimental phases. A momentary time sampling observation method was utilized, whereby the 16-minute time period was divided into a series of 15-second intervals (i.e., total = 64 intervals). Observers recorded whether on-task behavior was occurring at the end of each interval. Specifically, experimenters listened to prerecorded cues and coded behavior on the observation sheet each time an interval number was spoken (e.g. "observe 17"). The percentage of time that a student was on-task was recorded and this was calculated by totaling the number of intervals coded as on-task, dividing that number by the total number of observation intervals (i.e., 64) and multiplying the result by 100.

Academic productivity was defined as the percentage of math problems completed. All items that students attempted, whether accurate or not, were counted in the 'completed' total. Academic accuracy was 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.

**Experimental Design and Procedures**

In this study, a single–case reversal design, A-B-A-B-C (Cooper, Heron, & Heward, 2007) was implemented to examine intervention effects across participants. 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 fading condition involved withdrawal of intervention components such as the self-monitoring card, self-graphing, and goal setting.

**Baseline Phase I: Initial Baseline**

During the initial baseline phase, students were given a packet containing 140 math problems that were distributed across several math worksheets. Students were presented with math problems at their instructional level. The following instructions were provided as students were given the packet of math worksheets: "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 the worksheets were collected. The experimenter and assistants graded the math worksheets and recorded the number of problems completed (i.e., productivity) and the number of correct responses (i.e., accuracy) on the top page of each packet. It should be noted that the experimenter was only given a 16-minute time frame to work with the students. For each student, the decision to move from the first baseline phase to the first intervention phase was based on the percentage of on-task behavior. When a participant showed a stable trend, a declining trend, or persistent variability in the data pattern, she was moved from baseline to intervention.

**Pre-intervention Training**

After the first baseline phase ended, the experimenter, a middle-aged female school psychologist, provided one training session consisting of lessons on how to self-monitor on-task behavior, graph performance for math productivity and accuracy, and set goals. Instructional strategies were adapted from the Self-Regulated Strategy Development (SRSD; Graham, Harris, & Mason, 2005) approach to train students to self-monitor on-task behavior. They involved the following stages: (a) Background Knowledge, (b) Discussion, (c) Modeling, (d) Learning and Memorization, (e) Collaborative Practice, and (f) Independent Practice. In the Learning and Memorization stage, they were asked to memorize the acronym KIT that was placed on a flip chart and consisted of the following self statements: **K**eep working on the assignment, **I**gnore distractions, (the) **T** means "Am I on-task?"

Next, the following procedures for using the self-monitoring card were introduced: (a) The experimenter discussed the first section of the card that dealt with helping students compartmentalize their personal concerns in order to focus on their work. Students were trained to circle a "yes" or a "no" on the card as to whether they wanted to discuss their concerns with the school psychologist at a later time; (b) Students recorded their feelings by circling one of the listed descriptors on the card; (c) On the second section of the card, students listened for a bell tone that was emitted from an electronic device and circled a "yes" if they were on-task or a "no" if they were off-task below the correct tone number (e.g., at tone 1, circle 'yes' or 'no' in the correct box for tone 1); (d) The experimenter demonstrated use of the card while verbalizing the process out loud; (e) Students role-played using the self-monitoring card while the experimenter provided guidance and feedback; and (f) Students practiced the use of the strategy independently. After the 30-minute training session, students were given a modified version of the *Choice Reinforcement Survey* (Northup, George, Jones, Broussard, & Vollmer, 1996), which included items the students were permitted to have within the facility. These were made available during the intervention phases of the study.

**Intervention Phase I: Self-Monitoring**

First, students were shown their math worksheet packets from the last baseline session, and they were provided with feedback on their math performance (e.g., shown errors, the number of problems completed, and the number of problems correct). Next, graph pages were given to the students. Students were asked to graph their performance data (i.e., data on academic productivity and accuracy) from the worksheet packet they just reviewed 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. Self-monitoring cards consisted of 8.5" X 11" pieces of paper divided into two sections (see Figure 1). The first section included a space for students to answer three questions and to indicate whether they made a decision to set aside any personal concerns that 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). A definition of on-task behavior was written at the bottom of the self-monitoring card as an additional cue for students to remain on-task.

Specifically, 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 schoolwork and reach your educational goals. Putting our problems aside in this way is called "compartmentalizing." In the first box, please indicate whether 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."

**Figure 1:** *Self-Monitoring Card*

Student Name

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

| | **Tone 1** | **Tone 2** | **Tone 3** | **Tone 4** |
|---|---|---|---|---|
| **At this exact second, am I on-task?** | **Yes**<br>**No** | **Yes**<br>**No** | **Yes**<br>**No** | **Yes**<br>**No** |

**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**

Next, students were given instructions for completing the second section of the self-monitoring card for on-task behavior. Math worksheets were then 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 were 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. You can start working now".

Students were asked to stop working after 16 minutes, and the worksheets were collected. The experimenter and assistants graded the math worksheets and recorded the number of problems completed (i.e., productivity) and the number of correct responses (i.e., accuracy) on the top page of each packet. If students maintained or improved academic productivity and accuracy during subsequent session(s), they were allowed to choose an incentive of their preference from a set of available options based on the modified survey form. Incentives were provided approximately every other session.

For each student, the decision to move from the first intervention phase to the second baseline phase was based on the student's percentage of on-task behavior. Students were moved to the next phase when the data revealed a median value that was higher than the median point value of the preceding baseline condition.

**Baseline Phase II: Return to Baseline**

This phase consisted of the same procedures as those described in the initial baseline phase.

**Intervention Phase II: Return to Self-Monitoring**

Prior to starting this phase, students were provided with a booster training in use of the self-monitoring card. In this phase, the same procedures described in intervention phase I were implemented.

**Fading Phase**

The fading phase was implemented for six sessions. During sessions 1 and 2, the tone was used in the same manner as in the intervention phases for students to self-monitor their on-task behavior. Students did not use self-monitoring cards, but they were instructed to ask themselves if they were working when the tone occurred. Performance data from the previous session was provided to the students. The following instructions were given as individual graph pages were distributed: "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." Afterwards, graph pages were collected.

The experimenter then provided 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 scratch paper, please let me know. You can start working now." At the end of the 16-minute practice period, the experimenter collected the worksheets and recorded performance data on the graph pages.

During sessions 3 and 4, 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 as individual graph pages were distributed: "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 that were correct. Now, think about your goals for today using the same questions we have discussed before." The graph pages were then collected.

The experimenter provided 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 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. You can start working now." After the practice period, the experimenter collected the worksheets and recorded performance data on the graph pages.

During sessions 5 and 6, the tone was not provided and students were not asked to set aside concerns or report their on-task behavior to the experimenter. The following instructions were provided as individual graph pages were distributed: "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 that were correct. Now, think about your goals for today using the same questions we have discussed before." Afterwards, the graph pages were collected.

Then, the experimenter provided the following instructions, "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. You can start working now." The experimenter collected the worksheets and recorded performance data on the graph pages.

### Interobserver agreement

An undergraduate student in psychology served as the independent observer who graded 100% of the math worksheets using an answer key for scoring productivity and accuracy of math problems across all students and all experimental conditions. Interobserver agreement (IOA) on academic productivity across all students ranged from 97% to 100% for baseline I, ranged from 86% to 100% for intervention I, ranged from 96% to 100% for baseline II, ranged from 91% to 100% for intervention II, and ranged from 89% to 100% for fading. On academic accuracy across all students, IOA ranged from 79% to 100% for baseline I, ranged from 92% to 100% for intervention I, ranged from 96% to 100% for baseline II, ranged from 90% to 100% for intervention II and ranged from 74% to 100% for fading. It should be noted that for 93% of the worksheets, there was 90% or higher agreement for academic accuracy. In some instances 100% agreement between raters' scores was not achieved due to difficulty with distinguishing students' print.

### Procedural Integrity

Using a checklist consisting of all steps required to carry out the intervention, procedural integrity checks of the experimenter's adherence to implementing the intervention procedures were conducted by an independent observer who was an intervention specialist employed at the school. The experimenter was responsible for introducing each session, 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. Percentage of intervention steps were observed for 25% of all the intervention sessions, and procedural integrity ranged from 91% to 100%. As students became very familiar with the procedures, the experimenter eliminated part of the instructions, thus, resulting in less than 100% integrity in some instances.

The experimenter conducted procedural integrity on the students' implementation of the self-monitoring card using a checklist containing a space to place a checkmark as to whether the student completed the following steps: (a) Student reviews the graph page and records a productivity goal and an accuracy goal on the graph page, (b) Student responds 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) Student begins to work on the math calculation worksheet when the experimenter asked student(s) to start, (d) Student responds 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) Student stops working on the math worksheets when the experimenter asked her to stop?

For student A, procedural integrity checks were completed across 72% of all intervention sessions, and adherence ranged from 60% to 100%. For Student B, procedural integrity checks were completed across 66% of all intervention sessions, and adherence ranged from 60% to 100%. For Student C procedural integrity checks were completed across 50% of all intervention sessions, and adherence ranged from 80% to 100%. Adherence was not consistently at 100% because students did not always adhere to some of the steps. For instance, at times, they failed to respond in writing to the on-task question when all four auditory tones were emitted (e.g., they sometimes responded to 3 of 4 cues).

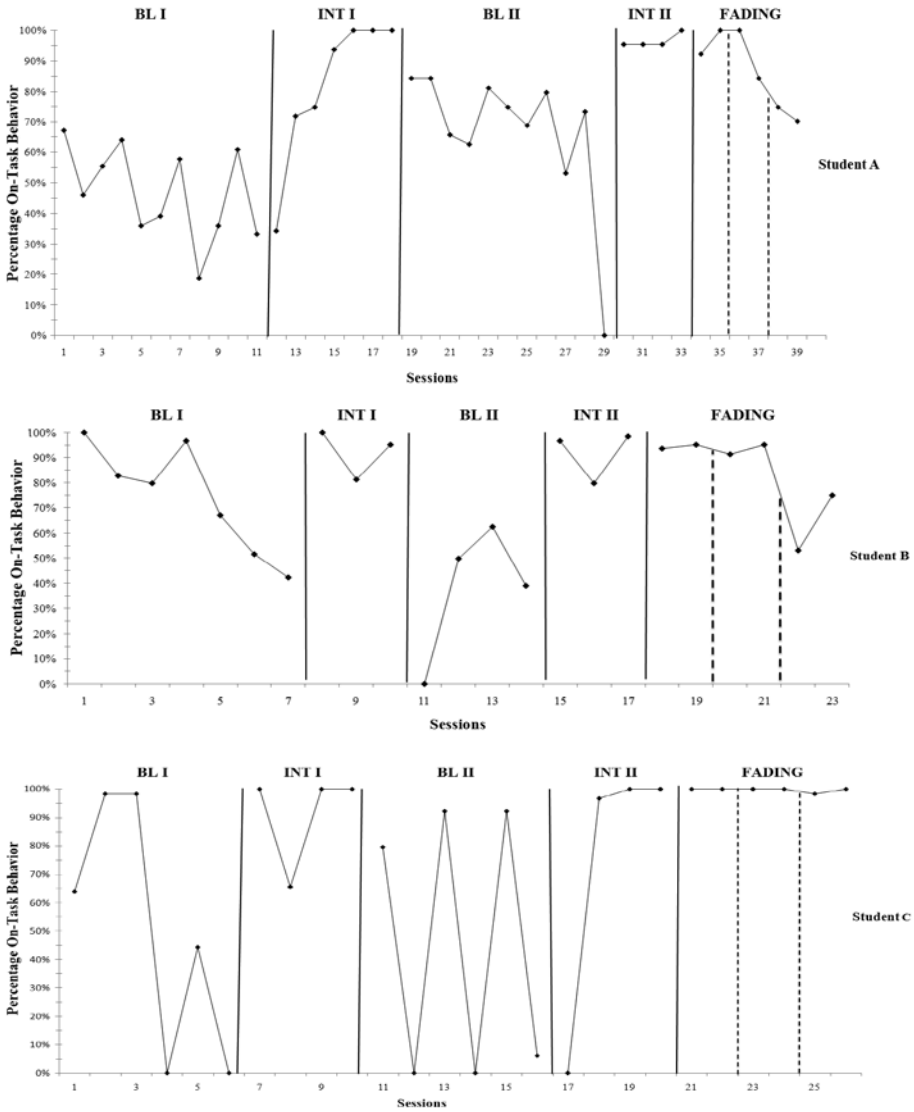
## RESULTS

### On-Task Behavior

Figure 2 presents a graphic display of students' percentage of on-task behavior across all experimental phases. During baseline 1, on-task behavior was highly varied (student A range = 18.75% to 67.18% with a median of 46%; student B range = 42% to 100% with a median of 79%; student C range = 0% to 98.43% with a median of 54%). During the first intervention phase, their on-task behaviors improved (student A range = from 34.37% to 100% with a median of 93%; student B = 81% to 100% with a median

of 95%; student C = 65% to 100% with a median of 100%). During the return to baseline phases, all students exhibited high variability of on-task behaviors (student A range = 0% to 84.37% with a median of 73%, student B range = 0% to 62% with a median of 79%; student C range = 0% to 92% with a median of 43%). During intervention II phase, student A and student B's on-task behavior was stable (student A range = 95.31% to 100% with median of 95% and student B range = 79% to 98% with median of 96%). During intervention II phase, student C's on-task behavior varied initially ranging from 0% to 100% with median of 98%. During the first session of intervention II, she exhibited 0% of on-task behavior, however, by the second session, she exhibited 96% of on-task behavior and this remained stable throughout this condition.

**Figure 2:** *Percentage of On-Task Behavior Across Phases*




During the fading phase, on-task behavior decreased initially for students A and B (student A range = 70.31% to 100% with a median of 92% and student B range = 53% to 95% with a median of 93%). During the fading phase, student C's on-task behavior was maintained (range = 98% to 100% with a median of 100%).

Percentage of nonoverlapping data points (PND) were calculated by totaling the number of data points in the intervention phase that fell above the highest data point in the preceding baseline phase, dividing that total by the number of data points in the intervention phase, and multiplying the outcome by 100 (Scruggs & Mastropieri, 2001). Interventions are considered effective if the PND range is from 70% to 100% (Scruggs & Mastropieri, 2001). PND for on-task-behavior was 85% for student A, 0% for student B, and 75% for student C between the first baseline and first intervention phases. PNDs between the second baseline and second intervention phases were 100% for students A and B and 75% for student C.

PNDs for on-task-behavior were 0% between the first baseline and first intervention phases and 100% between the second baseline and intervention phases for student B. The reason for overlapping data between baseline 1 and intervention 1 was due to her high on-task behavior in the first four sessions of baseline 1. During instances where there was overlap between baseline 1 and intervention1 phases, the on-task behavior of both students B and C may have been influenced by the novelty of the task. However, their motivation seemed to diminish for completing math worksheets as percentages of on-task behavior decreased in the baseline 1 phase.

## Accuracy and Productivity

Ranges and mean percentages of all participants' productivity and accuracy levels are presented in Table 1. Student A's productivity level and accuracy level remained fairly stable during intervention II and fading phases with the exception of one session during intervention II where she completed a high percentage of math problems. Student B and student C's productivity were highest during intervention II and fading phases. As their on-task behavior improved so did their productivity levels, particularly during the fading phase. Although student B and student C completed more math problems during intervention II and fading phases as compared to their productivity levels in the other phases, accuracy levels did not increase as expected. For all students, productivity and accuracy were more stable at the end of intervention II and remained stable during fading phases.

**Table 1:** *Mean Percent of Students' Productivity and Accuracy on Math Problems by Experimental Condition*

| | Student A | | | | Student B | | | | Student C | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Productivity | | Accuracy | | Productivity | | Accuracy | | Productivity | | Accuracy | |
| Condition | Mean | Range | Mean | Range | Mean | Range | Mean | Range | Mean | Range | Mean | Range |
| BL 1 | 58 | 39-88 | 59 | 44-70 | 64 | 53-76 | 50 | 33-86 | 17 | 0-24 | 69 | 0-82 |
| INT 1 | 56 | 47-64 | 59 | 47-74 | 66 | 52-75 | 47 | 42-49 | 38 | 15-61 | 40 | 35-62 |
| BL 2 | 52 | 0-67 | 60 | 0-79 | 55 | 0-61 | 47 | 0-55 | 32 | 0-47 | 37 | 0-42 |
| INT 2 | 75 | 67-93 | 56 | 50-60 | 70 | 59-84 | 53 | 48-56 | 49 | 0-50 | 37 | 0-41 |
| FADE | 64 | 56-67 | 58 | 54-63 | 76 | 66-97 | 48 | 41-50 | 66 | 49-83 | 42 | 37-54 |

*Note:* BL1 = Baseline I; INT1 = Intervention I, BL2 = Baseline II; INT2 = Intervention II, and FADE = fading.

## Social Validity

To assess acceptability of the self-monitoring intervention, social validity surveys were given to all three participants. The surveys consisted of 12 statements and a seven point Likert scale (0 = totally wrong, 1 = a lot wrong, 2 = a little bit wrong, 3 = not right or wrong, 4 = a little bit right, 5 = a lot right, and 6 = totally right). The following are examples of statements that were included on the survey: (a) the

self-monitoring cards were easy to use, (b) the auditory cue helped me focus and reminded me to stay on-task, (c) the self-monitoring strategy was distracting or hard to use, and (d) now I have more confidence in my math calculation skills.Responses varied within and across students on survey items as there were some aspects of the self-monitoring intervention that these students found acceptable and other aspects they found unacceptable. For instance, student A found the audio tone to be distracting, and she did not feel she had more confidence in her math skills.

## DISCUSSION

The female juvenile offenders in this study learned how to use a self-monitoring strategy to manage their on-task behavior. Similar to the Levendoski and Cartledge's (2000) study, the current findings revealed that students' on-task behaviors reflected high variability during the baseline phases, and students' on-task behaviors generally increased during the self-monitoring intervention phases. With regard to productivity and accuracy, the current findings were not consistent with Levendoski and Cartledge's (2000) findings. In their study, the self-monitoring intervention resulted in a substantial increase in the percentage of math problems completed correctly for three of the four participants (the group average was 26% during baseline and 78% for self-monitoring phases); whereas, in the current study, student accuracy levels did not increase from baseline phases to intervention phases. This finding from the current study was also inconsistent with results from other studies that showed students with emotional and behavior disorders improved substantially on their academic accuracy levels (Carr & Punzo, 1993; Lazarus, 1993; Lloyd, Bateman, Landrum, & Hallahan, 1989). Levendoski and Cartledge (2000) directly taught math problems that were new to the students, however, direct instruction on math problems were not provided in the current study. Rather, in the current study, students were given math practice exercises to complete, and some corrective feedback was offered. In addition to the corrective feedback they received, students in this study may have benefitted from direct instruction on how to solve the math problems.

### Limitations

There were several limitations in the current study. First and foremost, the sample size was small and, therefore, findings cannot be generalized to the population of female juvenile delinquents. It was a challenge to recruit more participants due to instances such as release dates from the facility and the reduction in the number and type of youth that would be assigned to the correctional facility. Secondly, the high school setting in this study was in a correctional facility that had a positive behavior support system in place. The results of this study may not generalize to a similar sample of students attending a facility with no positive behavior support system in place.

A third limitation pertained to decisions regarding transition between phases. Perhaps movement from baseline phases to intervention phases could have occurred sooner. We wanted to establish trends in baseline performance after novelty effects wore off.

Another limitation was that the delivery of incentives was provided approximately every other session during intervention phases and not immediately. The students in this study had a very positive regard for incentives and probably needed more immediate incentives in order to maintain interest in the tasks. Incorrect responses on math problems should have been re-taught to the students to ensure they knew how to perform the operations.

## DIRECTIONS FOR FUTURE RESEARCH

Researchers may consider having students complete academic tasks that contain a mixture of mastered items with newly learned items. Participants may be more motivated to complete tasks that mix previously mastered items with new items as they perceived these tasks requiring less effort (Billington & Skinner, 2006). Because there were some inconsistencies in this study between the participants' on-task behavior and performance on math worksheets, researchers may consider having students not

only self-monitor their on-task behavior but also self-monitor their academic performance similar to the way Harris, Friedlander, Saddler, Frizzelle, and Graham (2005) compared self-management of attention (SMA) with self-management of performance (SMP) among students diagnosed with ADHD. Researchers may analyze the components of the intervention to determine which components are the most salient features with regard to student outcomes. For instance, researchers might consider varying the intervention and fading procedures, such as maintaining an auditory tone for more than two days and perhaps increasing the length of time between tones from four to eight minutes and using an auditory tone at random intervals, for example, 3 minutes, 8 minutes, and 6 minutes.

Having students identify academic or behavioral skill targets may be implemented in future studies to determine if self-selection of target behaviors will lead to increases in on-task behavior and academic performance.

## IMPLICATIONS FOR SCHOOL PSYCHOLOGISTS

School psychologists working with students with emotional disturbance in public school settings or alternative educational settings need to keep in mind that any intervention may be challenging to implement given characteristics unique to this population (e.g., long history of behavior problems and detachment from school). The findings of this study and similar studies show that students with challenging behavior problems can be taught to self-monitor their behavior. The materials and training procedures used to carry out this self-monitoring intervention are easy and low cost to develop and implement in practice. The intervention is feasible and can be implemented in practice if school psychologists collaborate with teachers or support staff to share in the design, implementation, and evaluation of the intervention. Collaboration of this nature is especially critical in settings where there is a potential for unexpected highly disruptive behaviors and low base rates of compliance. Some of the challenges associated with educating students with emotional and behavior problems may be mitigated before and during the implementation of interventions if school practitioners establish and maintain positive rapport with students.

In general, participants in the current study were observed to respond favorably to setting goals and receiving incentives or tangible reinforcers while self-managing their behavior. Therefore, practitioners may consider including those components when implementing a self-management intervention in the classroom.

This study showed that components of the intervention could be faded as students maintained appropriate levels of targeted behaviors and/or academic performance. Careful progress monitoring will permit school psychologists and other staff to determine the rate at which intervention components should be faded.

## CONCLUSION

The findings from this study imply that secondary level students with significant behavior concerns may respond favorably to self-management strategy training. Interventions such as this are likely to create opportunities for educational success. Students who experience academic success are likely to develop positive attitudes and maintain motivation for learning.

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