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The Use of Self-Management Procedures to Increase on Task Behavior of Three Children with Autism Spectrum Disorder

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The Use of Self-Management Procedures to Increase on Task Behavior

of Three Children with Autism Spectrum Disorder

by

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Abstract

Autism Spectrum Disorder (ASD) is a complex neurological disorder that affects 1 in 68 individuals (Centre for Disease Control and Prevention, 2014). Autism is characterized as deficits in social skills, verbal and non-verbal communication, and challenging behaviors. The number of participants with autism in a general education classroom has increased. Self-Management is an easy way to increase on-task behavior in classrooms. The purpose of this study was to increase the on-task behavior of three participants in Transition Support Services (TSS) using a self-management package and to generalize the skill to at least one other setting (i.e., inclusion classroom, IBI classroom or community). Data were collected using 10 sec momentary time sampling for 5 min. A multiple baseline design across participants was used to evaluate the effectiveness of the self-management treatment package. The intervention was conducted during homework time in the participant's home. The results of the study showed increase in on-task behaviour for all three participants.

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Chapter I

INTRODUCTION

Autism Spectrum Disorder (ASD) is a developmental disability that affects an individual's social skills, verbal and nonverbal communication, and behavior (Centers for Disease Control and Prevention, 2014). According to the Centre for Disease Control and Prevention (2014), approximately 1 in 68 children are diagnosed with ASD, an increase from 1 in 110 children in 2009. There is no cure for ASD. However, research shows that Applied Behavior Analysis (ABA) based treatments like Intensive Behavior Intervention (IBI) can be very effective in improving a child's development (Eldevik, Hastings, Hughes, Jahr, & Eikeseth, 2009; Makrygianni & Reed, 2010).

The Ministry of Child and Youth Services in Ontario funds IBI. IBI consists of one-on-one, small group or a combination approach to teaching. IBI is very rigorous requiring 20-40 hours of direct service a week. Goals are based on assessments and programming is individualized (Ministry of Child and Youth Services, 2013). However, this intensive method is not necessarily feasible or realistic to implement in a classroom type setting where the typical participant-to-teacher ratio is 23:1 (Ministry of Education, 2013).

IBI settings have low participant-to-teacher ratios, and high levels of reinforcement and attention. Participants with ASD may have difficulty transitioning to a classroom with high participant-to-teacher ratios, and low levels of reinforcement and attention. Materials such as token boards, timers and clickers may be difficult for inclusion classroom teachers to use and can draw unnecessary attention to the participant with ASD. In most cases, inclusion classroom teachers have limited skills and education about ASD and ABA.

To support these teachers and school staff in providing effective teaching for participants with ASD, Ontario's Ministry of Education has implemented policy and procedures such as Policy/Program Memorandum No. 140 (PPM-140). This policy requires schools to use the principles of ABA in their classrooms to ease the transition from IBI to school. A challenge arises, however, as individuals with ASD are often unable to continue to use learned skills once professional support fades and independent use of skills is expected (Hume, Loftin, & Lantz, 2009).

Chapter II

LITERATURE REVIEW

Methods such as self-management can be an effective tool for participants with ASD. Self-management allows teachers to attend to the whole class and the participant to become independent; thus, self-management is an optimal procedure for schools (Amato-Zech, Hoff, & Doepke, 2006; Callahan & Rademacher, 1999; Vanderbilt, 2005). Self-management has effectively decreased inappropriate behaviors in the classroom (Ardoin & Martens, 2004; Newman, Tuntigian, Ryan, & Reinecke, 1997; Vanderbilt, 2005) as well as increased appropriate behaviors (Amato-Zech et al., 2006; Brooks, Todd, Tofflemoyer, & Horner, 2003; Holifield, Goodman, Hazelkorn & Heflin, 2010; Wilkinson, 2008). Self-Management also facilitates skill generalization (Vanderbilt, 2005). Not only is self-management an easy tool to implement in the classroom, it is inexpensive, easy to teach and can be implemented with participants with different ability levels (Vanderbilt, 2005).

The procedure requires teaching two elements: (a) the target behavior, if the individual does not have the skill yet and (b) the specific self-management procedure. A self-management procedure involves a combination of two or more of the following strategies: self-monitoring (including self-assessment and self-recording), self-evaluation (including decision-making and goal setting) and self-reinforcement for goal attainment (Brooks et al., 2003).

Teaching self-management will allow teachers to spend more time teaching and less time dealing with problem behaviors (Fox & Garrison, 2003). The purpose of this research review is to discuss the effects of self-management on decreasing inappropriate behaviors such (e.g., self-

injurious, stereotypical behaviors, and off task,) and increasing appropriate behaviors (e.g.,

attending to teacher, attending to task materials, and staying in one's seat).

Decreasing Inappropriate Behaviors

Inappropriate behaviors that have been treated with self-management techniques include

(a) disruptive behaviors such as being out of seat (Newman et al., 1997) chatting with peers

(Ardoin & Martens, 2004) and talking out of turn, (b) stereotypical behaviors such as nail

flicking (Newman et al., 1997) and non-contextual vocalization (Newman et al., 1997; Mancina,

Tankersley, Kamps Kravits, & Parrett, 2000 & Stahr, Cushing, Lane, & Fox, 2006), and (c)

severe behaviors such as aggression and property destruction (Gerdtz, 2000). These behaviors

interfere with the target participant's learning as well as the learning and well being of other

participants in the class. They interfere with peer relationships and decrease teaching time for the

teacher. Using a self-management procedure can increase learning time for the target participant,

improve relations with peers and increase teaching time for the teacher as he or she is not

focused on providing one-on-one support. Therefore, teaching participants with inappropriate

behaviors to self-manage is beneficial for the participant, his or her peers, and school staff.

Newman et al. (1997) taught three participants with autism to self manage their own

behavior and to decrease disruptive behavior in the classroom. All three participants, Bart, 12;

Rocco, 4; and Laura, 6 were diagnosed with autism and mild to moderate mental retardation.

Target behaviors for Laura and Bart were out of seat behaviors and inappropriate nail flicking for

Rocco.

Data were collected using partial-interval recording (PIR) using 1-min intervals. All

sessions were 10 min in duration. During baseline, participants were given noncontingent tokens

every 10 min. Bart and Rocco traded in their tokens for edibles and Laura traded in her tokens for a break. A timer was set to indicate the end of an interval and was reset if the participant engaged in target problem behavior during intervention.

The first phase of treatment was the external reinforcement phase. The experimenter gave the participant a token at the end of each interval if they did not engage in inappropriate behavior. Tokens were traded in for reinforcers similar to baseline. At the beginning of each session the participant was told what behaviors would earn reinforcement and what behaviors would result in the timer being reset. If the participant engaged in appropriate behaviors he or she was praised and a token was delivered. If the participant engaged in inappropriate behaviors the timer was reset and the reason was provided. During the second phase of treatment, prompted self-reinforcement, the participant received verbal prompts to take a token each time an interval was completed. No additional phrase or prompts were given. During the third phase, unprompted self-reinforcement, the participant was not reminded to take a token and data were taken on accuracy of token taking. The last phase, follow-up, was identical to the unprompted self-reinforcement phase. Data were only collected on Bart and Laura, as Rocco was unavailable. All three participant's target problem behavior decreased following external reinforcement for appropriate behavior.

Newman et al. (1997) showed a decrease in inappropriate behavior of three participants by using a self-reinforcement procedure. The decrease in inappropriate behavior was maintained during prompted and unprompted self-reinforcement as well as during the follow-up phases. Inappropriate behavior remained low even though token taking accuracy was variable (as low as 50% for Bart, and with cheating by Laura).

Mancina et al. (2000) used self-management procedures which encompassed self-reinforcement, self-assessment and self-recording component to decrease the noncontextual vocalization of a 12-year-old girl. Keri, an African American girl diagnosed with autism and moderate mental retardation, exhibited three target self-stimulatory behaviors (vocalization, facial movement and body movements). The self-management sessions lasted about 5 min and were conducted during leisure, prevocational and reading tasks to test for generalization effects.

The observers collected data on the occurrence and nonoccurrence of three categories of behavior using 10 sec intervals. Data on self-injurious behavior were also recorded. Vocalization (i.e., humming, whistling, tongue clucking, and repeated echolalia or words or phrases) was the target behavior and all other behaviors were collateral behaviors. Data were only collected during the target activities.

Baseline data were collected during when Kerri engaged in leisure (e.g., coloring and sticker books, drawing boards, memory match games, photograph albums, and puzzles), prevocational (e.g., sorting, stamping and collating items) and reading tasks (e.g., flash cards, worksheets, and the participants Edmark ® reading book). These tasks were presented to her by her classroom teacher. The treatment procedure was the same as baseline, but incorporated self-management procedures. Keri was first taught to identify her target behavior by labeling quiet and noisy. Secondly, Keri was asked to model the behavior. Thirdly, she was taught to use the self-recording sheet. Finally, she was taught to self-reinforce.

The results of this study showed a decrease in vocalization after implementing the self-management program. However, there was minimal to no decrease in the collateral behaviors or in vocalization across target settings. The instructors were unable to fade out the verbal and

gestural prompts. This shows that self-management can be effective when implemented directly which was supported by Newman et al. (1997). However, using a "train and hope" method for generalization is not effective since the skills learned did not generalize across settings or behaviors.

Mancina et al., 2000 tried to take their study one step further by introducing the teacher as the treatment provider. The results of study two showed a decrease in vocalization and some generalization across behavior (body movement), but the decrease was not significant.

Even though the teaching procedures used by Mancina et al., (2000) was more thorough than to Newman et al., (1997) there were limitations as noted by the authors. First, Keri did not learn to complete tasks independently nor were the experimenters able to be faded. Secondly, larger changes may have been obtained with the use of behavioral programming to address behaviors such as non-compliance, an augmented communication system, and programs to increase social competencies. Thirdly, longer programs may also be needed for participants with lower cognitive ability, high rates of problem behaviors, and a long history of behaviors with insufficient interventions.

Newman et al. (1997) and Mancina et al. (2000) showed that self-management procedures were effective in decreasing inappropriate behavior in children with ASD. However, both studies focused on decreasing inappropriate behaviors with no effort to teach the target participants replacement behaviors, that is, the participants were not taught what to do. It is important for teachers and other professionals to teach positive and adaptive skills as well as decreasing undesired behaviors (Newman et al., 1997)

Increasing Appropriate Behavior

Appropriate behaviors can be treated with self-management techniques. Behaviors such as attending to a teacher (Stahr et al., 2006), attending to task materials (Holifield et al., 2010), and staying in one's seat (Amato-Zech et al., 2006) have been targeted to increase classroom readiness skills for participants with autism. Self-management teaches participants to attend to important components in the classroom like the speaker, task material, or whiteboard while allowing participants to take ownership of their behaviors and less on the classroom teacher or educational assistant. Increasing on-task behavior can improve grades and relationships with peers and staff.

Holifield et al. (2010) examined the effectiveness of self-monitoring on increasing attending to task and the effects of attending on academic accuracy of two elementary participants with ASD. Two male participants with ASD were selected by school staff due to the participants' chronic long-term deficits in attending to task, which interfered with learning and social functioning. The participants' academic performance was variable and they frequently did not complete assignments without verbal prompts. Both participants were in a self contained classroom with four other participants. Participants included Tony, 10 and Graham, 9. They had high levels of off task behaviors and low levels of task completion, mostly during language and math

Attending to task during language was described as reading aloud, writing on language arts work sheets, erasing a language arts answer, following a teacher's directive, or asking or answering a task-related question. Attending to task during math was described as reading or writing on math worksheet, counting manipulatives, erasing a mathematics answer, following a

teacher's directive, or asking or answering a task related questions. Attending to task and academic accuracy were recorded by the staff and only attending to task was self-monitored.

Holifield et al. (2010) used a multiple baseline across participants design across two academic subjects (language arts and mathematics) to determine the effectiveness of the self-monitoring procedure. During baseline, trained observers collected data on attention-to-task. Data were collected for the first 20 min during each lesson using momentary time sampling.

Participants were to self-monitor using sheets provided by their teacher using 5-min intervals during 20-min sessions. The teacher prompted the participants every 5 with a verbal prompt (e.g., "attending to task—one") where the participant would mark "yes" if he was attending to task and "no" if he was not. Trained observers simultaneously recorded whether or not the participant was attending. The data were compared for 20% of the sessions and observer participant agreement ranged from 80% to 100%. Holifield et al (2000) used a multiple baseline across participants design to evaluate the effects of the intervention.

Tony and Graham circled "yes" or "no" when the teacher pointed to attending to task. They were praised if they circled "yes" correctly. If they were not attending, the teacher instructed them to circle no and praise was not delivered.

The results of the study showed an increase in attending to task and academic accuracy for both participants. The authors noted that the participants even retrieved self-monitoring sheets independently a few days into the intervention. Self management requires that the participant manages his or her own behavior, Holifield et al. (2010) did not program to fade out the teacher's verbal and gestural prompts or to collect data on what happened after the participants retrieved self-monitoring sheets independently. It would have been beneficial for the

authors to fade out the verbal and gestural prompts and replace it with an auditory or tactile prompt. Another limitation was that the study was conducted in a self contained classroom with a total of 6 participants, where Tony and Graham were able to get the attention and support needed from the teacher and aid. It would have been beneficial to determine if the skill would generalize to a general education classroom.

Callahan and Rademacher (1999) used self-management strategies to increase the on-task behaviors and school performance of a participant who was fully integrated in a general education setting. Seth was an 8-year-old boy with ASD, with average to above average IQ and tested strongly in mathematics. The classroom teacher indicated he was off- task and out of seat frequently, engaged in little to no social interaction with peers, and exhibited inappropriate vocalization during class instructions.

Seth's aids were instructed to collect baseline data on his behavior during instructional time after they had attended an eight-hour workshop and follow-up training addressing general principles of ABA. Using anecdotal data and data from the first author's observation, the function of the behavior was hypothesized. Data were also collected on topography, frequency and duration. It was determined that Seth was out of his seat and off task at a level which significantly interfered with his learning and interfered with the class. Seth's off task behavior included gazing around the classroom and being out of seat. On-task behavior was defined as attending appropriately to the instructional task (e.g., look at the teacher or relevant task materials). This definition was summarized and posted on his desk and systematically faded.

A multiple baseline across reading and math was conducted. The observations were 30 min with a variable interval of 1 minute. The observation period was then increased to 60 min with a variable interval of 2 min when Seth met the necessary success criteria.

During an after school training session, the classroom teacher taught Seth how to use self-management. Discrimination training consisted of Seth observing his aids demonstrating on task and off task behavior and for Seth to indicate if they were on task or off task. Seth then was required to role play on task and off task situations using the self-recording sheet. During the intervention, Seth self-recorded his behavior by circling a smiley face when he was on task and a sad face if he was off-task when he heard the auditory cue. The success criterion was increased as Seth met his goal. After each session, Seth compared his results with the aids to determine if he earned the reinforcement.

Callahan and Rademacher (1999) showed that Seth's on-task behavior increased from 57% of intervals at baseline to 85% of intervals after intervention. However, it was noted that Seth's grades in math and reading decreased. The aides indicated this may have been because he began to work more independently during independent work and tests, so it was a better reflection of his own skills. The researchers noted that the number of verbal and physical prompts provided to Seth decreased from approximately 17.5 prompts per 30 min to 7.3 during the 60-minute observation period. In conclusion, self-monitoring was an effective tool in decreasing off-task behavior and increasing on-task behavior for Seth. It is also important to note that Seth's classmates seemed unaware of the procedure, therefore reducing any possible stigmatization effects.

Seth's strength and like for mathematics made self-recording, graphing, and analysis of data easy for him. This may not be the case for all participants with ASD. Therefore, an easier self-recording method maybe needed for other participants. Also, even though the participants in Seth's class were unaware of an auditory cue, it is possible other peers may be disturbed by the auditory sound that was heard every few minutes.

Legge, DeBar and Alber-Morgan (2010) used the MotivAider® and a self-recording form to train three boys to self-monitor their own behavior and stay on task. Adam was 13-years-old; Joshua and Mathew were both 11 years. Adam and Joshua were diagnosed with ASD and Mathew was diagnosed with cerebral palsy. Adam was in a self-contained classroom and integrated with his typical peers for physical education, art and music. Joshua attended a regular classroom for most of the day and was pulled out for supplemental instruction in language arts and math. Data were collected during independent math assignments using 10-minute momentary time sampling over four days.

All participants were trained on how to use a MotivAider® and self-recording form. A MotivAider ® is a pager-like item that can be clipped on to your waistband or belt and will vibrate at the programmed time. It does not need to be reset every time like most timers and provides a tactile prompt which cannot be seen or heard by others, making it appropriate for self-monitoring in inclusion classrooms. Participants were then trained on how to use the self-recording sheet independently. They were taught to circle (+) or (-) to indicate they were on-task or off-task. On-task meant sitting in seat, looking at the assignment and manipulating materials related to the assignment. A fading condition was introduced for all three participants at the same time when they showed high and stable rates of on-task behavior. During fading, the time on the

motivator was increased by a variable time schedule of 2 min. A multiple baseline across participants was used. Data were collected during math class for both participants after 10-15 min of instruction by the teacher. Data were collected during math. Each participant was given assignments after teacher led instruction and asked to complete their work. The experimenters recorded on-task and off-task behavior using two-minute momentary time sampling.

The results of the study showed an immediate and considerable increase in on-task behavior for all participants. Joshua's on-task behavior increased from 26% of intervals during baseline to 91% of intervals after training, Mathew's on-task behavior increased from 53% intervals during baseline to 98% intervals after training and Adam's on-task behavior increased from 77% of intervals during baseline to 97% of intervals after training. The authors indicated the quick increase could have been due to the unpredictable recording schedule and, according to Cooper, Heron, and Heward (2007a, 2007b), unpredictable or intermittent schedules are more robust and resistance to extinction.

Some limitations to the study included a lack of preference assessment. It is possible that more robust results could have been seen if participants were working for preferred items. The authors also recommended using partial interval time sampling as it is more conservative when compared to momentary time sampling. Other limitations included the lack of maintenance and generalization of the learned skill. It was noted by the experimenters that other individuals (e.g., teachers and educational assistance) and video recording could have been used to train as well as collect data for generalization purposes. Also, maintenance was only recorded once a week for three weeks, it may have been beneficial to have the maintenance checks further apart, such as

once a month. With respect to generalization, the skill was not assessed in any other setting, individuals (e.g., teacher) or other subjects (e.g., language arts).

All three studies focused on increasing appropriate on-task behavior for participants during math or language arts and were successful in teaching self-monitoring to increase on-task behavior. Self-monitoring was implemented during independent seat work after teacher led instructions. Unfortunately, none of the studies programmed for generalization. Holifield et al., (2010) implemented self-monitoring procedures only in a self-contained classroom. Callahan and Rademacher (1999) implemented self-monitoring only in Seth's second-grade classroom, and lastly, Legge et al. (2010) implemented self-monitoring only in the participant's special education classroom. Independent seat work is an important skill may generalize to other areas of the participant's lives. Holifield et al. and Leggie et al. could have attempted to program for generalization to the inclusion classroom or to the participant's home where participants are expected to do home work.

Lee, Simpson, and Shogren (2007) reviewed 11 self-management articles published between 1992 and 2001 with a focus on increasing positive behavior. A total of 34 participants with autism were included, 31 boys and 3 girls. Four boys were excluded from the mean calculations as the exact ages were unknown. Articles were included based on (a) whether participants were provided self-management training and/or discrimination training, (b) the type of intervention, (c) the type of self-management material, (d) whether the intervention also focused on decreasing problem behaviors, (e) whether the intervention was implemented with co-participants as well as participants with autism, (f) whether the study included follow-up

information, (g) whether the study included generalization data, and (h) the type of experimental research single case design.

Overall Percentage of Overlapping Data (PND), a method designed to analyze intervention effects in single case designs, was used. PND reliability was 91% and overall inter-rater agreement for the intervention and participant characteristics was 94%. The overall PND score was 81.5%, showing that the treatments used in the research were effective. These findings provide generic support for the efficacy of self-management interventions in increasing appropriate behaviors among individuals with ASD. However, self-management is not universally effective or suitable for all participants.

Intervention Characteristics—Lee et al. (2007) found that self-management pre-training and discrimination training were insignificant. It is possible that learners who did not have pre-training and/or discrimination training learned from the teacher demonstrating monitoring and feedback. When self-monitoring, self-reinforcement, and self-management packages where compared, all showed skill acquisition and the differences were not statistically significant. Interventions that included co-participants as well as participant self-monitoring resulted in higher PND scores, indicating the involvement of other people in monitoring target participant behavior may result in better outcomes.

Participation Characteristics—Girls' average scores were higher than for boys. This may have been due to the low number of female participants. There were no statistical differences between school age children and preschoolers. It was noted that improving social behavior was more difficult than daily living skills. No studies implemented self-management programs in

general education classrooms. Self-management in homes showed high scores, showing that parents and family members were able to implement the strategies in the home setting.

Results showed that using self-management to improve behavior such as following schedules, independently and daily living skills were very effective. None of the studies used self-management methods to increase academic performance in general education classrooms and only a few attempted to assess generalization.

Statement of Purpose

The purpose of this study was to increase the on-task behavior of participants with ASD using self-management in the home setting through the Connections for Students (CFS) and Transition Support Services (TSS) and determine if the skills maintained across time and generalized into the school setting. The purpose for implementing the self-management procedure in the home was a result of both York Region Catholic School Board and York Region District School Board's inability to allow external staff videotaping for inter-observer agreement and various work to rule actions by both school board staff.

Chapter III

METHOD

Participants

Two children participating in Autism Services' Connections for Participants and one

child in Transition Support Services participated in this study. Leo was a 10-year-old boy who

was enrolled in a community classroom at a public school and was integrated with his typically

developing peers during parts of the day. Leo had been discharged from IBI for six months when

he began the study. Amanda was an 8-year-old girl who attended IBI part-time and a public

school part-time. Amanda also had opportunities to integrate with her typically developing peers

for parts of the day. Lastly, Donny was a 6-year-old boy who was in a community classroom

and had never attended IBI. Donny was not integrated with his typically developing peers due to

high rates of challenging behaviors. An intervention to increase on-task behavior was deemed

necessary and beneficial for all three participants by their parent(s). Criteria to participate in the

study included: (a) ability to communicate verbally or non-verbally (e.g., GoTalkNow) assessed

by using the VB-MAPP score with a score minimum of 9 of 11 possible points, (b) success in

using token economies, (c) success using a timer, (d) able to sit in a chair for a minimum of 5

min and (e) a deficit in on task behavior during independent seat work.

Setting

All participants were expected to complete academic tasks at the family's dinning room

table. The dinning room was near the kitchen with four to six chairs. Each participant had a

preferred place to sit and a corner where they kept all their material. The researcher worked one-

on-one with the participant at the dinning room table and trained the participants in the family

room. The family room consisted of a coffee table and sofas. The participant and the researcher sat on the floor around the coffee table.

Preference Assessment

The preferred items were identified for each participant before the beginning of the experiment and updated as required throughout the study. Preference assessments were conducted by the researcher using a multiple stimulus without replacement (MSWO) preference assessment (DeLeon & Iwata, 1996). Caregiver feedback was used to determine items for use in the MSWO. All participants communicated what they wanted to work for at the beginning of each session. Examples of backup reinforcers included edibles (e.g., goldfish crackers, tim bits, and sour keys) activities (e.g., iPad, computer).

Materials

Materials for each participant included preferred tangibles or activities for reinforcement, independent activities (e.g., book, coloring sheets, portfolio activity, puzzles, or activity/assignment sheets), recording materials (i.e., eraser, marker or pencil) required for self-recording, a digital auditory or vibrating timer (MotivAider®) and an individualized self-recording sheet. Each participant had his or her own bin of independent activities with books appropriate for his or her reading level, coloring sheets, portfolios activities or worksheets/assignments selected by the clinical team. All materials used in this study were at an academic level appropriate for the participant.

The self-recording sheets included: (a) the on-task behavior definition, broken down into individual components at the top of the page, (b) the backup reinforcer that the participant would earn at the end of the session, (c) the minimum number of checkmarks he or she was required to

earn to gain access to the specific backup reinforcer and (d) boxes to record on-task or off task

behavior (Appendix D)

A video camera was used to record sessions. A second digital timer was used to signal

the end of each interval for observers. The observers recorded data using a pencil and sheet

(Appendix B).

Response Measurement

On-task behavior was defined as any time the participant is seated and actively engaged

in the independent activity, self-recording, or seeking assistance from an adult supervisor or peer,

examples included: (a) reading words in a book or worksheet, (b) coloring, (c) completing the

activity or assignment, (d) seeking and gathering materials required to complete the task, and (e)

seeking assistance by raising hand and asking or answering questions related to the task. This

excluded seeking materials for task completion when materials were already present.

The experimenter and another Kinark staff (Clinical Supervisor and ASD Consultant)

collected data on the provided data sheet (Appendix A) on the occurrence (+) or nonoccurrence

(-) of the target behavior using momentary time-sampling (MTS) recording every 10 sec. The

dependent variable was the percentage of intervals on-task and was calculated by dividing the

number of intervals scored as an occurrence by the total number of intervals in the session and

then multiplied by 100.

Interobserver Agreement

The experimenter and another Kinark staff (Clinical Supervisor) served as observers. The

experimenter served as the primary lead observer and trained the secondary observer by

reviewing MTS and by explaining the datasheet. The observers simultaneously, but

independently, practiced scoring videotaped sessions of the participant's behaviors. The experimenter compared data sheets and provided feedback. The observer was considered trained after obtaining agreement scores of 90% or higher across three consecutive training sessions with the experimenter.

Reliability was calculated for 73% of sessions for all participants. Two observers simultaneously and independently scored the participant's behavior by reviewing video taped sessions. An agreement was scored if both observers recorded either occurrence or nonoccurrence of the target behaivours in the same interval. Reliability was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100.

Social Validity

At the end of the study, the experimenter administered an opinion questionnaire (Appendix E) in which the instructional therapists ranked aspects of the intervention from strongly disagree to strongly agree to the following statements: (a) the procedure helped the participant (b) I would recommend this procedure for others with ASD.

Accuracy of Self-Monitoring

Accuracy of self-monitoring was assessed by comparing the observer's MTS data sheet and the participant's self-recording sheet during the treatment phase. Session start times were calibrated between the observer and the participant. A self-recorded checkmark was considered accurate if three intervals were recorded as on-task via MTS within the same 30-sec self recording interval, where as a self recording x (off-task) was considered correct if one or no intervals were recorded as off-task via MTS within the 30-sec interval. Accuracy was calculated

by dividing the number of accurate self-recording by the total number or self-recording in that session and multiplying by 100.

Experimental Design

A multiple baseline across participants was used to evaluate the effectiveness of the self-management treatment package in increasing on task behavior during independent seat work in the respective settings. Follow-up and generalization were also assessed for all participants in their respective activities.

Procedure

In order to reduce potential reactivity effects of being videotaped, a video camera was set up in the respective settings on the dinning table for three days prior to the study. The camera was positioned so the participant wasn't easily distracted.

Sessions were 5 min in duration and scheduled to occur two to three times a day, with sessions being separated by at least 10 min. However, this was not always possible due to planned and unplanned changes in schedule (e.g., trips, sick/vacation days and other after school programs). Sessions were conducted at various times of the day. Independent activity included reading books, coloring sheets, portfolio activities, puzzles, or activity/assignment sheets. The experimenter trained the participants during discrimination training and self-management training.

Baseline

During baseline, an individualized bin of materials was placed next to the participant on the dinning table, after which the experimenter provided the following instruction "It's time to work on your independent activity" or a variation, depending on the activity targeted during the

session for the participant. Additional reminders for task engagement and feedback for appropriate or inappropriate behaviors were not provided. After 5 min, the instructional therapist asked the participant to end the activity and return materials to their bin.

Discrimination Training

Training was conducted by the experimenter in the living room for participants. Discrimination training was conducted in two steps using behavioral skills training. During the first step, Adult Model Step, the experimenter explained what it meant to be off-task and on task. The observer then modeled five examples of on-task and five examples of off-task behaviors at random for the participant, and labeled them as "on-task" and "off-task." Next, the adult engaged in a mock independent activity where a timer was set at 10-s intervals. The participant was prompted to score the adult's behavior on the self-recording sheet (Appendix A) when the timer sounded. That is, the participant asked the question "was Ms._____ on-task until the timer rang?" At the end of each interval the participant scored an x for "no" and a checkmark for "yes." The participant was praised after each interval if they were accurate in their discrimination and provided with corrective feedback if incorrect. The participant was required to attain 100% accuracy for one session before they were able to move onto the second step, Child Role Play Step.

During the Child Role Play Step, the participants were asked to model being on task and off-task using their academic materials. The experimenter said "show me/pretend to be [off task/on task]" and the participant demonstrated it appropriately. Participants were asked to show five on-task and five off-task behaviors in random order. The experimenter set a timer to go off

at 10-s intervals. Praise and corrective feedback were provided. The participant was required to attain 100% for one session.

Self-Management Training

Self-management training was conducted in the family room. The experimenter taught the participants how to use the self-recording sheet. The experimenter showed the self-recording sheet and said "When the timer rings and if I was following my rules, I can give myself a checkmark" and modeled the behavior of making a checkmark on the self-recording form. Next, the experimenter said "When the timer rings and I was not following my rules, I give myself an X" and modeled the behavior of making an X on the form. Lastly, the experimenter said, "After I give myself a checkmark or an x, I continue to work on my independent work and continue to follow my rules until I have filled out all my boxes." The experimenter showed how to count the number of self-recorded checkmarks earned throughout that session and recorded the number at the bottom of the self-recording sheet.

The participants immediately practiced self-recording during a 5 min session. The experimenter gave the instruction "Get your materials" or a variation. Once the participant had their materials, the MotivAider ® or digital timer was set at 30-sec intervals and given to the participant to place on their waist band or on the table.

The participant practiced by: (a) pressing start on the MotivAider ® or time (b) asking the question "Was I being on-task until the timer vibrated or rang?" to themselves, and (c) recording a checkmark or an X on the self-recording sheet for the answer "yes" or "no." Verbal prompts and verbal praise were used during the session if needed. Praise for filling out the sheet accurately and corrective feedback was provided after each session until the participant

independently (no prompts) filled out the self-recording sheet with 100% accuracy across three consecutive sessions.

Self-Management

During the next phase, the intervention was conducted during homework time in the home at the dining table. The participant self-monitored during a 5-min session. The experimenter gave the instruction "Get your materials" or a variation. Once the participant had their materials, the MotivAider ® or digital timer was set for 30-s intervals and given to the participant to place on their waist band or on the table.

The participant: (a) pressed start on the MotivAtor ® or timer (b) asked the question "Was I being on-task until the timer vibrated or rang?" to themselves, and(c) recorded a checkmark or an X on the self-recording sheet for the answer "yes" or "no." No prompts or feedback for self-recording was delivered. Participants continued to self-monitor without prompts or feedback until criterion was reached (see below).

In addition to self-monitoring, a token economy was used to reinforce self-recording of on-task behavior. At the end of the targeted independent activity, the participants counted the number of self-recorded checkmarks earned throughout that session and recorded the number at the bottom of the self-recording sheet. The backup reinforcer was provided upon completion of the session when the participant earned the target number of checkmarks. Staff provided praise for meeting the goal (not accuracy). If the participant did not meet the criterion, the staff told the participant he or she could try again next time.

The target checkmarks were determined by calculating the mean of the participant's baseline data and increasing it by initially 100% than 50%. That is, if the participant was on task

on average of two times out of 10 intervals during baseline, their initial checkmark requirement was 4 out of 10 until they reached criterion of 4 of 10 intervals for three consecutive sessions. It was then increased to 6 of 10 intervals, etc. until the participant reached criterion of 9 of 10 intervals across three consecutive sessions.

Generalization Across Settings

Sessions were conducted in the community classroom and general education classroom. Generalization probes were conducted once during baseline conditions and near the end of intervention in each location for all participants.

Follow-up

After the participant reached criterion at home, follow-up sessions were conducted at one week, two weeks, and one month. They were conducted in the home setting using the same procedures as intervention.

Chapter IV

RESULTS

Figure 1 (Appendix F) shows the percentage of on-task intervals during independent seat work for all three participants during baseline, treatment, generalization, and follow-up. The arrows with numbers indicate the minimum checkmark criteria within the token economy for each participant. All participants exhibited an increase in the mean on-task behavior after self-management training. These results maintained during follow-up and generalization for all two participants and follow-up for one participant.

During baseline, Leo's on-task behavior was low, with a mean of 29% of intervals (range: 23% to 33%). Implementation of the self-monitoring and the token economy resulted in a gradual increase of intervals on-task with mastery reached after 9 sessions. Leo's on-task behavior averaged 79% of intervals (range: 46% to 100%). Leo's learned skills generalized to his community classroom and general education classroom. Leo's on task behaviour increased from 39% and 41% of intervals during baseline to 100% following intervention in the Community Classroom and General Education Classroom, respectively. Leo was able to maintain his learned skills at one week, two week and one month follow up.

During baseline, Amanda's on-task behavior averaged, 40% of intervals (range 0% to 66%). Amanda's on-task behavior was at a mean of 82.4% (range: 70-97%) and she required 14 sessions to meet criteria. Amanda's slow pace to achieve mastery was attributed to her poor sleeping patterns. Amanda's mother indicated Amanda woke up early, before 5 a.m., and could not go back to sleep the nights before Sessions 11 and 15. Amanda learned skills generalized to her community classroom, general education classroom, and IBI. Her mean on-task behaviour

increased from 0% in all settings to 97% of intervals in the community classroom and general education classroom and 100% of intervals in her IBI setting. Amanda was able to maintain her learned skills at one week, two weeks, and one month follow-up.

During baseline, Donny's on-task behavior was low, with a mean of 19% of intervals (range 3% to 30%). Implementation of the self-monitoring and the token economy resulted in an increase of intervals on-task with mastery reached after nine sessions, (mean of 79%, range: of 43% to 100%). Generalization was not available for Donny as he was discharged from the transition services program on August 30, a few weeks before school started. One week follow-up was completed with Donny where he was able to maintain his learned skills.

Chapter V

DISCUSSION

The results of the self-monitoring and token economy program showed an increase in on-task behaviors for all participants. The results were consistent with other studies that were designed to increase the on-task behavior of participants with ASD (e.g., Amato-Zech et al., 2006; Holifield et al., 2010; Wilkinson 2008). The levels of on-task behavior attained during treatment conditions in the home were maintained in the school setting and during follow-ups for both Leo and Amanda. Unfortunately, generalization data were not collected for Donny as he was discharged from transition support services.

This study did not reinforce accuracy of self-recording of the target behavior like many other studies (e.g., Newman, Reinecke, & Meinberg, 2000; Wilkinson, 2005); however, data were collected by the primary researcher throughout the study on participants' accuracy. Accuracy probes showed that all participants in the study were accurate in their self-recording. Leo was known to stop working as soon as he reached his target number of checkmarks and request for his reinforcer and marked himself as off-task. It would be beneficial to further research if accuracy of self-recording directly influenced on-task behavior by comparing accuracy of self-recording data during baseline and treatment for participants.

The high accuracy of all the participants in this study may be attributed to various components of the intervention. Participants were taught to reliably identify and label on-task and off-task behavior during individual discrimination training similar to Mancina et al., 2000. However, other studies did not implement discrimination training program (e.g., Callahan & Rademacher, 1999; Newman et al., 2000) or teach operational definitions of on-task off task

behaviors (e.g., Coyle & Cole, 2004). Secondly, the researcher also role- played on-task and off-task behaviors, and participants received reinforcement and feedback on role play performance. Further research should compare the effects of discrimination training and it's components to determine which component(s) are key.

All three participants completed discrimination training within a few sessions with no challenges. Donny's participation required more sessions than Leo or Amanda, who only required one. Donny's slow rate to complete discrimination training was due to escape maintained problem behaviour. A reinforcer was used to bring Donny to the table. An advantage was that this training procedure took relatively little time to implement.

The reinforcement procedures for this study required that the participant achieve a target number of tokens before receiving reinforcement. The number of tokens required to achieve reinforcement was increased gradually. It can be seen graphically that as the number of tokens required to achieve a reinforcer increased the participants' on-task behavior also increased. Further research may examine if the gradual increase was necessary.

The self-management procedure used in this study was effective in improving on-task behavior for all three participants. The self-recording sheet included on-task goals which were different for each participant. Leo's on task goals were: (a) stay in my seat, (b) look at my work, (c) talk on topic, (d) keep my body safe, and (e) be a good brother. Amanda's goals were: (a) read the instructions before I start my work, (b) look at my work, (c) talk on-topic, and (d) go onto the next activity when I am done. Donny's goals were: (a) stay at my seat, (b) look at my work (c) go onto the next task when I am done, and (d) reset my timer when it beeps. The self-recording data sheet allowed for participant specific goals to be set. Checkmarks and cross out

marks were used as they were symbols regularly used by most teachers in a school setting and were understood by all three participants.

Donny was able to understand what on-task an off-task was in a few trials; however, he required extensive training on using a timer. When at the table, Donny was able to stay on-task and follow the rules. However, Donny ignored the MotivAider when it vibrated and continued to work. Even though Donny was on-task, he did not mark his self-recording data sheet. Therefore, a timer was introduced requiring Donny to stop and reset the timer. Initially Donny engaged in verbal protests (e.g., "why is it ringing again?"); however, he quickly learned to reset the timer which resulted in more accurate data recording. Future research may want to compare and contrast the benefits of using a timer vs. MotivAider.

The initial MCC for all participants was based on baseline data. All three participants were able to move through the self-monitoring data sheet and return to work within an acceptable period of time with little to no interruption in on-task behavior. However, this may not be true for others. It is possible that participants may take longer durations to stop, start, and mark their self-recording data sheets and further research may be required.

Upon completion of this study, feedback regarding the application of self-management procedures in the home setting was obtained from participant's parents (mother). The parents indicated they were satisfied with the self-management procedures and noted that the ability to remain on-task during homework time was a very important skill for their child. Leo's mother was happy the skill generalized to the school (community classroom and general education classroom). Leo's classroom teacher adopted the program to be implemented as a goals system throughout the day to increase desired behaviors and decrease inappropriate behaviors.

Amanda's mom was happy Amanda was able to generalize the learned skill to her IBI centre,

general education classroom and community classroom.

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Appendices

Appendix A

Momentary Time Sampling Data Sheet
On-Task Behavior

Date:_____   Primary/Secondary   Date:_____   Primary/Secondary

Minute	:10	:20	:30	:40	:50	:00
1						
2						
3						
4						
5						
6						

% intervals On-Task: _____

Minute	:10	:20	:30	:40	:50	:00
1						
2						
3						
4						
5						
6						

% intervals On-Task: _____

Date:_____   Primary/Secondary   Date:_____   Primary/Secondary

Minute	:10	:20	:30	:40	:50	:00
1						
2						
3						
4						
5						
6						

% intervals On-Task: _____

Minute	:10	:20	:30	:40	:50	:00
1						
2						
3						
4						
5						
6						

% intervals On-Task: _____

Date:_____   Primary/Secondary   Date:_____   Primary/Secondary

Minute	:10	:20	:30	:40	:50	:00
1						
2						
3						
4						
5						
6						

% intervals On-Task: _____

Minute	:10	:20	:30	:40	:50	:00
1						
2						
3						
4						
5						
6						

% intervals On-Task: _____

Appendix B

Script for Obtaining Participating Assent

Initial Assent
Researcher to participant:
1. Make direct eye contact with participants with participant and smile
2. Say "Its time to do your _____ worksheet. You can choose something to work for and fill out the on-task boxes when the timer goes off. You can always tell me you want to stop."
3. Say "Would you like to fill out the on-task boxes?"
4. Note potential indicators of assent. If the response is unclear, immediately contact the guardian/caregiver. If the guardian/caregiver is not available, then discontinue the assent process until the guardian/caregiver can be consulted.
(Note: Once indicators of assent are established by the caregiver, no further contact with caregiver is necessary concerning this issue.)

Indicators:
1. Say " yes," "yah," "ok" or a phrase or sound that the guardian/caregiver indicates means "yes"
2. Reaching for or filling out the self-recording sheet
3. Smiling, nodding, or other physical actions that indicate interest in the task.
Subsequent Assent Procedures:
Note: Prior to starting each session, the participants must be asked of they would if they would like to fill out the on-task boxes.
1. Make direct eye contact with participants and smile
2. Say "It's time to do your _____worksheet. Do you want fill out the on-task boxes again today"
3. Note potential indicators of assent.

Appendix C

Consent

The Use of Self-Management Procedure to Increase on Task Behavior of Children with Autism Spectrum Disorder in a Transition Classroom

Your child has been invited to participate in a thesis research study examining the use of self-management and token economy to increase on task behavior. Your child has been selected as a potential participant because of his/her need to increase on-task behavior during independent seat work. The research will be conducted by Narmatha Sabanathan to satisfy her requirements for a Master's Degree in Applied Behavior Analysis from St. Cloud State University.

Purpose
Narmatha is a consultant to schools in York Region she assists in transitioning children with ASD from an IBI setting into schools. During her experience as a consultant she has come across various teachers who have requested support in teaching participants to stay on-task during independent work. Self-management procedures have shown to increase on-task behavior for children while potentially improving relations with peers and increasing teaching time for the teacher.

The purpose of this research study is to teach children with ASD in an IBI setting to increase their on-task behavior by using self-management and token-economy and to promote generalization of these skills to novel settings such as a classroom or home.

Procedure
Narmatha would like to design and implement a self-management program for your child. The program will consist of teaching your child to self-manage their own behavior during independent seat work. Self-management will be taught using discrimination training. Narmatha will teach your child what on-task and off-task means and how to record their behavior. During the study your child will be given an independent activity appropriate to their skill set. Your child will be asked to sit at a desk and monitor their behavior for a short period of time by giving themselves a checkmark or cross out mark to indicate if they were on task or off task. After your child has reached this learning objective Narmatha will promote generalization of the skill to novel settings. During the study Narmatha will analyze the data to examine your child's progress. She will also conduct follow-up session at one-week, two-weeks and one-month to determine if your child has maintained the skill. The expected duration of this study is 10-14 weeks.

Confidentiality
Any reports, presentations, and/or publications from this study will require basic demographic information including age, gender, diagnosis, and skill level of the participant. It will also require details about the specific program, the data collected, and a pseudonym in place of your child's name. The participant's name will be coded and saved in a secure password-protected

document on Kinark's secure network. No other personal or identifying information will be collected. The information collected will be disclosed with relevant Kinark staff (e.g., IBI team, senior clinical management) and Narmatha's St. Cloud thesis advisor, Dr. Kim Schulze, and Thesis committee, Dr. Julie Ackerlund Brandt and Dr. Eric Rudrud. Raw, paper data collected during the study will be stored in a secure cabinet in the participant's IBI setting and destroyed within three years of completing the study.

Benefit
The main benefit of participating in this study is that your child may learn to stay on-task for a longer duration of time, which can help with learning and integration. Another benefit is that self-management can be used in other places like at home during homework time. Your child's participation will give us information to add to other findings regarding effective ways to increase on-task behavior for other children with autism.

Potential Risks
All videotapes and raw data will be destroyed within 3 years of the completion of this study. Because all the information Narmatha collects about your child will remain completely confidential, there are no known risks to participating in this study beyond the normal risks related to your child's participation in the IBI program.

Voluntary Participation/Withdrawal
Please be advised that refusal to consent to participate will not result in any service disruption and will not cause any negative impact to your existing IBI services. If you choose to participate you may withdraw at any time with no penalty.

Research Results
Narmatha would be happy to provide the results of the final project if you are interested. Please let her know and she will send a copy of the finished project upon its completion. Additionally, her thesis will be placed on file at the St. Cloud State University Learning Resource Center upon completion of the study.

Contact Information
If you have any questions or concerns please feel free to contact Narmatha at any time. Her phone number is (905)-479.0158 ext 625 or you can email her at narmatha.sabanatha@kinark.on.ca. You may also contact her advisor at St. Cloud State University, Dr. Kim Schulze, at kaschulze@stcloudstate.edu or Sara Dunkel-Jackson, the Associate Clinical Director of Transition Services at Kinark Child and Family Services at (905)-479.0158 ext 332

Acknowledgement of Informed Parental Consent

- I grant permission to have my child participate in this thesis research study conducted by Narmatha Sabanathan.
- I grand permission to have my child be video taped for the purpose of this study by Narmatha Sabanathan.
- I understand that I may withdraw my child from participation at any point during this study with no penalty.
- I understand that my child's information will be kept confidential and secure throughout the study. A pseudonym will be used in place of my child's name and all data collection forms will be destroyed 3 years after the study is completed.

_____   _____
Child's Name   Parent Signature

_____
Date

Appendix D

Discrimination Training Recording Sheet

Being on-task means:

    1. _____
    2. _____
    3. _____

If I am on task when the timer vibrates, I put a checkmark in the box. If I am not on-task when the timer vibrates, I put an x on the box.

If I get _____checkmarks, I get _____

Appendix E

Social Validity Questionnaire

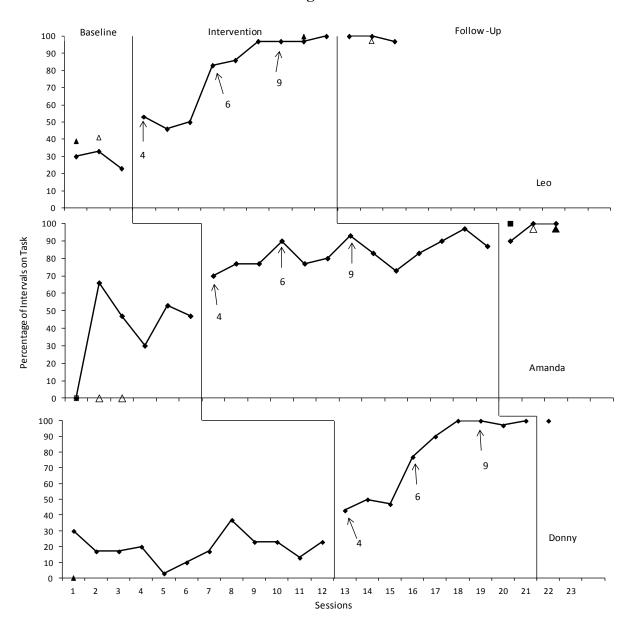|	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree
the procedure helped the participant					
I would use this procedure with other participants with ASD in the future					

Appendix F

Figure 1

Figure 1: Percentage of on-task intervals for Leo, Amanda and Donny during independent work, graphed session by session. Open square indicated IBI sessions, open triangles indicate general education classroom and closed triangles are community classroom.