

IMPROVING ON-TASK ATTENTION BY ADDING MOVEMENT IN THE  
CLASSROOM

A THESIS

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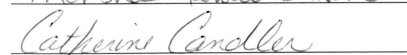
To the Dean of the Graduate School:

I am submitting herewith a thesis written by Lynne Tepolt Harbison entitled "Improving On-Task Attention by Adding Movement in the Classroom." I have examined this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts with a major in Occupational Therapy.



Catherine Candler, PhD, Major Professor

We have read this thesis and recommend its acceptance:

Interim Director

Accepted:



Dean of the Graduate School

## ABSTRACT

LYNNE TEPOLT HARBISON

### IMPROVING ON-TASK ATTENTION BY ADDING MOVEMENT IN THE CLASSROOM

AUGUST 2009

**Purpose:** The purpose of this study was to examine the effects of S'cool Moves<sup>®</sup> on attention in the classroom.

**Methods:** A single subject, A-B-A-B with interrupted time series design was used. All students in a fourth grade classroom participated in a S'cool Moves<sup>®</sup> program. Three students were observed for their on task attention behaviors during a writing task. There are two dependent variables in this study, attention to task and in-seat behavior. Data was graphed for the differences in the phases (Shilling & Schartz, 2003).

**Results:** Three students were observed during the study and the results were widely varied for each student. Participant A showed a clear effect with in seat attention but engaged behaviors were inconclusive. Participant B demonstrated a negative effect with in-seat attention and no effect with engaged behaviors. However, Participant C showed a clear positive effect of the S'cool Moves program with in-seat and engaged behaviors.

**Conclusion:** A classroom based physical activity program may be effective in improving on-task and engaged behaviors in the classroom.

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## CHAPTER I

### INTRODUCTION

Lack of attention to task in the classroom can be a serious hindrance to academic learning (Pellegrini & Bohn, 2005). The prevalence of attention deficit hyperactive disorder (ADHD) is estimated to be as high as 10% of our school age children (Center for Disease Control and Prevention, 2003) and teachers often will have students in their classroom that are unable to pay attention in class, diagnosed or not. The teachers need documented strategies to improve classroom attention with these students. Multiple strategies to remediate poor attention have been developed by educators and occupational therapists with limited results.

One of these intervention techniques is to include movement in the classroom. S'cool Moves<sup>®</sup> (Wilson & Heiniger-White, 2000) was developed to incorporate increased movements throughout the day to provide foundation skills for regulation and focusing skills. There have been no published, standardized studies to document the success of S'cool Moves<sup>®</sup> in the classroom. Therefore, the purpose of this study was to examine S'cool Moves<sup>®</sup> ability to improve attention behaviors in the classroom.

The ability to link attention to task with movement in the classroom could be a cost effective, compelling and creative solution to meet the needs of the administrators, teachers but most importantly the student's needs. Developing documented interventions that can enhance the school performance of children with attention difficulties could help

manage classroom behaviors. Managing classroom behaviors could use a strategy of adapting the environment for the student rather than having the student attempting to adapt to the environment. This research project examined the ability to use movement in the classroom to improve on-task and in-seat attention behaviors with elementary school students.

## CHAPTER II

### REVIEW OF LITERATURE

#### Movement

Kindergarten through grade 12 teachers and administrators are under pressure to increase academic achievement scores and have expressed concern that there is little time to “waste” on recess, which is considered unproductive time (Mahar, 2006). Accordingly, recess, physical education (PE), and breaks are deemphasized in favor of academics. A growing body of scientific evidence, however, suggests that implementing exercise-type activities throughout the school day can help improve academic performance and reduce disruptive classroom and socially problematic behaviors (Barkley, 2004; Majorek, Tachelmann, & Heusser, 2004). Exercise stimulates brain activity related to memory, attention, spatial perception, language and emotion (Olsen, 1994). All students, but especially those with attention-deficit hyperactivity disorder (ADHD) need exercise as it assists them with concentration and provides an outlet for healthy impulse discharge and management of impulsivity (Mulrine, 2008). Thus, restricting frequent movement among students with (ADHD) may contribute to class-related problems (Holtkamp, 2004). The evidence in support of the need for recess, PE and energy breaks among select student populations, especially for students with ADHD, is substantial. However, evidence supporting physical movement throughout the school day among the broader student body is lacking.

## *Attention and ADHD*

Attention is defined as the process of consciously focusing on relevant stimuli while blocking out irrelevant stimuli. Teachers are challenged by the need to utilize available classroom time to meet ever-changing academic standards, while at the same time, capturing and maintaining the student's attention (Pfeiffer, 2008; Schilling, 2004; VandenBerg, 2001). To compound matters, it is highly likely that a teacher will have a student with attention difficulties in their class, with or without a related diagnosis. ADHD is the most frequently diagnosed neurobehavioral disorder in children and the number of students diagnosed with ADHD is increasing in the United States. This increase has intensified the need for educators to be knowledgeable about current concepts of the disorder, ways of managing the behaviors of children with ADHD in the classroom, and strategies to enhance the school performance and academic achievement of these children (Mulligan, 2001).

Various strategies are available to address the attention issues presented by children with neurobehavioral disorders. Brown et al. (2008) has addressed the need for enhancing school performance among these children by recommending treatment plans that include the use of stimulant medications for reducing symptomatic behaviors and improving function. They argue that none of the nonpharmacological interventions tested were more effective than medication in treating the symptoms of ADHD and they stand in favor of multi-modal treatments that include education and counseling for the patient, their family members and school personnel. While medication use has increased, during the past decade the number of mental health visits per child decreased (Hoagwood,

Kelleher, et al., 2000). It is apparent that simply medicating children, without teaching them the life skills they need to improve their behavior and performance, is not likely to improve the children's long-term prognosis (Pelham & Gnagy, 1999). Exercise is an alternative that is likely to be a viable strategy for enhancing student learning, especially among students that have ADHD or other attention disorders (Mulrine, et al., 2008).

Strategies have been developed that allow students the opportunity to engage in physical activity, providing time for movement and recreation and give their minds a needed rest from academics (Wilson & Heiniger-White, 2000). Students with ADHD struggle to maintain focus in class. As a result, teachers often require these students to complete their assignments during nonacademic classes (e.g. PE), or during recess or after school (Mulrine, et al., 2000). Having teachers utilize strategies such as positive reinforcement, rewards and loss of privileges has been shown to be effective in improving classroom behavior of the student with ADHD. However, knowledge about but the influences of these strategies on academic performances is relatively limited (Pelham & Gnagy, 1998).

### *Recess*

Recess has become a place for administrators to fill the time with academics. There are three major arguments that administrators typically use to justify the removal of recess:

1. There is no time for recess because more instructional time is needed to raise test scores.
2. Recess disrupts the work patterns of the children, causing high levels of excitement and subsequent inattentiveness and
3. Recess encourages aggression and antisocial behavior (Jambor & Guddemi, 1992, Pellegrini, Huberty & Jones, 1995).

A contrary argument is that, students have been shown to be more focused on their teachers and school work after recess (Bogden & Vega-Matos, 2000). In question to the claim that recess will disrupt the work pattern of students. Jarett et al. (2001) studied the effects of recess and concluded that there are individual students that have difficulty in settling down after recess, but the majority of students were more productive and fidgeted less when recess was available. Therefore, recess may increase productive instructional time. Finally, to address the claim that recess encourages antisocial behaviors and aggression, Pellegrini (1992) demonstrated that children who participated in recess developed better social competencies. It is interesting to note that although recess may result in better concentration and less fidgeting in the classroom (Pellegrini, Huberty & Jones 1995), no federal law requires states to have recess in schools (Mahar et al, 2006).

#### *PE*

The importance of physical activity for overall physical fitness and health is well known. There are many positive impacts of physical activity, including increasing concentration, mental cognition, and academic performance, reducing distracting self-



stimulatory behaviors, and reducing school related stress (Biddle, 1995; Dwyer, Blizzard & Dean, 1996, Shepard 1997). Children who participate in physical activity through recess or PE are more attentive, behave more appropriately and perform as well or better scholastically (Jensen, 2005). Not only are children more attentive, but children that are engaged in daily PE show superior motor fitness, academic performance, and attitude towards school as compared to their counterparts who do not participate in daily PE (Pollatschek & O'Hagan, 1989).

When students enrolled in a PE class and receiving 55 minutes less classroom instruction are compared to students in similar grades using standardized test scores, the students receiving PE score similarly (Coe, Pivarnik, Womack, Reeves & Malina, 2006). Another study that demonstrated a positive outcome using PE, involved children from British Columbia, who were evaluated to determine if introducing daily classroom physical activity sessions affected their academic performance. Students in the intervention group participated in 10 minutes daily of classroom activity sessions in addition to their regularly scheduled 80 minute PE class. Despite increased in-school physical activity time of approximately 50 minutes per week, students receiving the extra physical activity time had similar standardized test scores for mathematics, reading and language arts as did students in the control group (Ahamed et al., 2007). In fact, doubling or even tripling PE time did not adversely affect students' scores on standardized achievement tests (Sallis et. al, 1999).

Not all studies support that PE can help with classroom attention and behavior. In the study conducted by Tremblay (2000) there was a small negative correlation between

physical activity and behavior, as well as with physical activity and standardized test scores. However in that study, physical activity and self esteem were positively correlated and also demonstrated a positive correlation to academics. A negative correlation between physical activity and academic performance was found by Fisher, Juszczak & Friedman (1996) as well as by Daley & Ryan (2000), which can be interpreted as supporting the removal of PE and recess from the classroom.

### *Physical Breaks*

Breaks are a normal part of an adult's life (e.g. the coffee break) and physical breaks have been studied as a way to increase children's activity levels which are currently limited by pressure for scholastic performance (Mahar et. al, 2006). Classroom-based physical activity programs are a promising new strategy to increase children's physical activity levels without the perceived risk of sacrificing academic performance. McNaughten and Gabhard (1993) demonstrated improved concentration test scores after students completed a classroom activity. When students participated in a systematic running relay for 20-50 minutes and then completed timed mathematical computation tests, they exhibited significant improvements in directly observed on-task behavior.

### *Programs*

Novel means to incorporate movement in the classroom have been designed by S'cool Moves<sup>®</sup>, Braingym<sup>®</sup>, Take 10<sup>®</sup>, and Energizers<sup>®</sup>, with the goal of improving academic achievement in the classroom (McDougall, 1999; VandenBerg, 2001). These interventions claim that routines that utilize activity increase attention and create

opportunities to provide more effective instruction with students (Friend & Bursuck, 2006). Instruction by teachers incorporates physical activity, described as transition exercise, lesson energizers and structured movement games for recess, and with the aim that all students, not just those with identified attention issues, focus better and pay closer attention in class (Mulrine et al., 2008).

Energizers<sup>®</sup> (Mahar et al., 2006) is a classroom-based physical activity program that allows students to stand and move during academic instruction which increases the overall time spent in daily physical activity during the school day. The activities utilized in the Energizers<sup>®</sup> program last approximately 10 minutes and integrate grade-appropriate learning materials into the school day.

Take 10!<sup>®</sup> (Stewart, 2004) addresses the need for increased physical activity among school-aged children. Take 10!<sup>®</sup> involves a classroom-based protocol and integrates physical activity at a vigorous intensity to reinforce academic concepts without requiring additional staff or extensive training. The program content is structured to appeal to multiple learning styles. Take 10!<sup>®</sup> has not been researched for changes in behavior related to increased exercise time and energy expenditure.

S'cool Moves<sup>®</sup> (Wilson & Heiniger-White, 2000) uses a theoretical approach to explain why kids have difficulty focusing. S'cool Moves<sup>®</sup> examines the role of the autonomic nervous system and its relationship to classroom behavior. A student may act out or "zone out" because of frustration. The S'cool Moves<sup>®</sup> program is designed to incorporate increased movements throughout the day to provide foundation skills for regulation and focusing skills.

BrainGym<sup>®</sup> (Dennison & Dennison, 1989) provides results from multiple studies on the effectiveness of their program. This program uses simple movements and activities to teach repatterning of the brain. However, there is no direct research on attention in a classroom.

There are two other programs that have integrated physical activity into the curriculum called Running and Reading Across America<sup>®</sup> and the Move Across America<sup>®</sup> program. Neither of these programs provides data on their effectiveness nor on how physical activity levels impact attention/behavior (Andres, 1997; Shimon, 2001).

Establishing a classroom environment, that encourages directed movement during content lessons throughout the school day, transitions and via specialized games for recess and indoor rainy day activities has potential to improve academic performance for all students (Mulrine, et. al 2008). In particular, for those with ADHD, activity helps reduce impulsivity, problematic classroom behaviors and supports better focus of student's attention on content instruction.

The current body of published literature related to classroom physical activity and academic performance has limitations, including (a) small sample size, (b) mostly conducted on children with a neurobehavioral diagnosis such as ADHD, (c) no longitudinal data, (d) variations in assessment methodology, and (e) variations in study populations making it difficult to accurately identify the effect of physical activity on attention at a specific grade level within the K-12 student population.

## Statement of the Problem

Attention to task in the classroom is a serious hindrance to academic learning for all students. Yet, teachers and administrators continue to ask more of students every school year without addressing the problem of attending to a task. Intervention techniques have been developed to remediate poor attention in the classroom but there has been little research to demonstrate their effectiveness on improving on-task attention.

## Purpose of the Study

The specific purpose of this study was to compare the effect of S'cool Moves versus typical classroom movements on attention with children in the 4<sup>th</sup> grade who have difficulty attending in the classroom.

## Definitions and Terms

On-task attention: the brain's ability to take all the stimuli around and immediately categorize it and organize the information as relevant or irrelevant and focus the mind on one task (Bos & Vaughn, 1994).

## Limitations and Assumptions

Limitations of this study were the sample size and duration of the study. This study focused on a nonclinical population therefore it would be difficult to relate these study results for a clinical population. Although, students did demonstrate the ability to attend to task, these results do not demonstrate if the quality and amount of work improved. In addition, time interval sampling was used. The results reflect periodic observations and did not measure actual duration of the observed behaviors. Finally, another limitation of the study was that the only observer was the primary investigator

and the observer knew that S'cool Moves was being used in the classroom which may have resulted in bias during the rating of classroom behavior.

## CHAPTER III

### METHODOLOGY

#### Participants

All participants in this study were 4<sup>th</sup> grade students who attended a public school in Littleton, Colorado. Three students were observed in this study; however all 26 students in the classroom actively participated in the S'cool Moves exercise program. There were no exclusion criteria for this study. The classroom teacher recommended several students that were having difficulty with on-task attention and who had a score of 70 or higher on the Conner's Teacher Rating Scale-Revised (CTRS-R), (Conners, 1997). The students were between 9 to 10 years of age. Study procedures were approved by the Texas Woman's University, institutional review board, the school district, principal of the school, and teacher. The study took place in the students' regular classroom.

#### Instrument

A behavioral checklist was developed to measure classroom attention (Appendix A). The two behavioral categories that were monitored were in-seat or out-of-seat behaviors and engaged in activities versus non-engaged in classroom activities. For this study, the classroom activity was a writing task. On- task behaviors, while seated in a chair were defined as (a) any portion of buttocks in contact with the seat or cushion and (b) all four legs of chair were in contact with the floor. On-task behaviors were defined as (a) following directions, (b) body oriented to activity, (c) visually attending, (d)

interacting with materials, (e) responding and/or looking at the speaker, and (f) oriented to and/or responding to peers appropriately. The non-engaged behaviors were defined as evidence of any one of the following, (a) not following directions, (b) body not oriented to activity, (c) not visually attending, (d) not interacting with materials, (e) not responding and/or looking at speaker, and (f) not oriented to /or peers appropriately. The student had to demonstrate completing all engaged behaviors to be judged engaged in the task. The off-task and out-of-seat behaviors were defined as: no portion of the buttocks in contact with the seat or cushion or less than four legs of the chair in contact with the floor.

The Conners' Teacher Rating Scale-Revised: Short Version (CTRS-R: S) has excellent reliability ranging from .88 to .95 coefficient reliability (Conners, 1997). The ADHD Index is used to distinguish children with symptoms of ADHD from nonclinical children. A score of 70 or greater on the ADHD index is considered clinically significant.

The S'cool Moves program developed by Debra Wilson (Wilson & Heiniger-White, 2000) is based on the principle that a child's incomplete developmental patterns may contribute to learning challenges throughout the school years. The author of the program proposes that off task behavior is related to stress, sensory difficulties, processing difficulties, weak muscle tone, poor balance, gross and fine motor difficulties. The program addresses these difficulties with integration of movement into academics which enhance the learning for all children.



## Procedure

A single subject, A-B-A-B interrupted time series design was used in the classroom two times a week for an 8 week period. During each 30 minute observation period, the observer assessed on and off task behavior of 3 students per day. The observer monitored behaviors in 5 minute real time intervals for observational measures (Portney & Watkins, 2000). After each 5 minute interval, the observer had 20 seconds to record the student's behavior by tallying the specific behavior box. During phases 2 and 4 extra movements were added by the classroom teacher, per the S'cool Moves program. The students participated in the extra movement, throughout the day, for 1-2 minutes during each of the five subject transitions. These movements could be running up a hill, jumping rope, move to music, fitness ball bouncing, touching elbow to knee (cross crawls) or completing a Minute Moves poster. The Minute Moves posters display a variety of activities that may have the student jump on or over a line while tracking the next move on a poster or completing some rhythmic snaps, claps and pats while following on the poster. The posters are labeled for specific transitions for the needs of the classroom teacher. Such as: Reading, Fine Motor, Yawn Buster, Calming, Fluency and Academic Testing, Writing Posture, Phonic Focus, and Auditory Sequencing. The classroom teacher had the option to choose whichever activity she felt would be helpful for the students.

A Phase one: In all phases, the therapist observed the students during the 2:00 pm writing assignment on Tuesdays and Wednesdays. In phase one the students were

monitored for these 2 sessions for 2 weeks to establish a baseline. There were no extra movements introduced to the classroom.

B Phase two: In this phase, the teacher used the S'cool Moves program for additional movement in the classroom. Observation took place immediately after the student participated in the S'cool Moves program transitioning into the regular writing period.

A Phase three: A withdrawal of S'cool Moves was done for these two weeks in which no extra movements in the classroom took place.

B Phase four: In this phase, the extra movements were reintroduced using the S'cool Moves program.

### Data Analysis

The data were graphed and visually analyzed for differences during each observation session looking at the number out of 6 observations per 30 minutes the children were in seat or engaged. In order to protect confidentiality, each participant's name was replaced with a letter prior to data analysis. There were 16 data points graphed for the 16 observation days. The observation of on-task behaviors is the y axis and the x axis is each observation session. Each of the three students has their own graph showing individual differences. Data for each session were graphed separately for each participant using Microsoft Excel for Windows 95 throughout the four phases of the study.

## CHAPTER IV

### RESULTS

#### Participant A

Participant A was a 10 year old, male that according to his teacher is typically seen moving around in the classroom, talking to other students. Participant A frequently asks to go the library, restroom, drinking fountain. He has great difficulty staying engaged in a task and remaining seated during instruction. Participant A is a general education student that does not have any identified diagnosis. The student is considered below academic proficient.

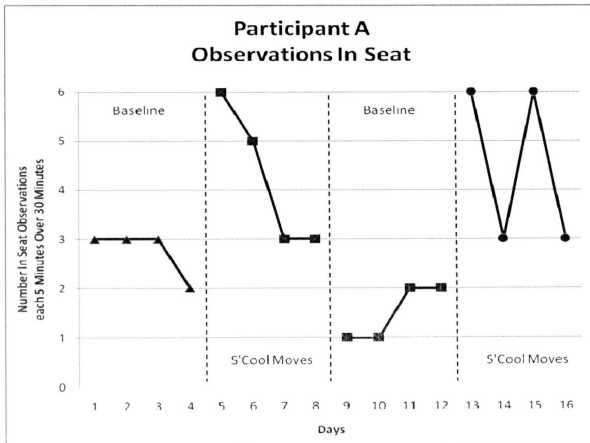
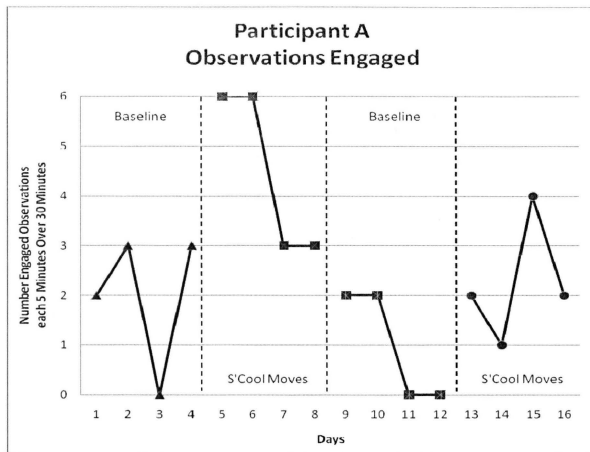


Figure 1. In-seat behaviors of Participant A.



*Figure 2.* Engaged behaviors of Participant A.

In the initial baseline sessions Participant A was observed to be in his seat for three out of the six observation times. He was in his seat for two of the six observation times in the remaining baseline session. After introduction of S'Cool Moves in seat observations increased to six out of six and five out of six times in the next two sessions and then returned to three out of six for the remaining two S'cool Moves sessions. On withdrawal of S'cool Moves Participant A's in seat observations dropped to one out of six for two sessions and two out of six for the remaining withdrawal sessions. When S'cool Moves was reinstated Participant A's inseat observations vacillated between six out of six for two sessions and three out of three for the remaining observations of in seat behavior over the 30 minute sessions.

Over the 16 sessions, Participant A was observed to be in his seat three out of six times for seven, or almost half of the sessions. He was observed to be in his seat less than three times for five of the sessions and these all occurred when S'Cool moves was not present. He was observed to be in his seat more than three times for four of the sessions and these all occurred when S'Cool moves was present. This indicates a distinct change in level between the conditions for in seat behavior.

Observations of engagement for Participant A at baseline were varied and vacillated between three out of six times for two observation sessions, two out of six times and no observation of engagement. After introduction of S'Cool Moves Participant A was observed to be engaged six out of six times for two sessions and then three out of six times for the remaining two S'Cool Moves sessions. When S'Cool Moves was withdrawn observations of engagement for Participant A dropped to two out of six for two sessions and then to no observations of engagement for the last two sessions. Finally, when S'cool Moves was reinstated, Participant A vacillated between two out six for two sessions and one out of six and four out of six for the remaining session.

During the 16 sessions for engagement, Participant A was observed to be engaged none out of six sessions, one session for one out of six, for five sessions Participant A was engaged two out six observations, one observation period of four out of six time and finally for two sessions Participant A was engaged six out of six observations. Engagement observations remained close to baseline and withdrawal levels when S'Cool Moves was reintroduced. This indicates that there was an initial positive pattern for the

introduction of S'cool Moves but then Participant A returned close to baseline therefore it is difficult to determine a clear positive pattern.

### Participant B

Participant B is an 11 year old female that according to her teacher is highly distractible and is often seen talking with her classmates rather than completing assignments. She is in general education classes and is considered to be below academic proficient. Participant B does not have a specific diagnosis.

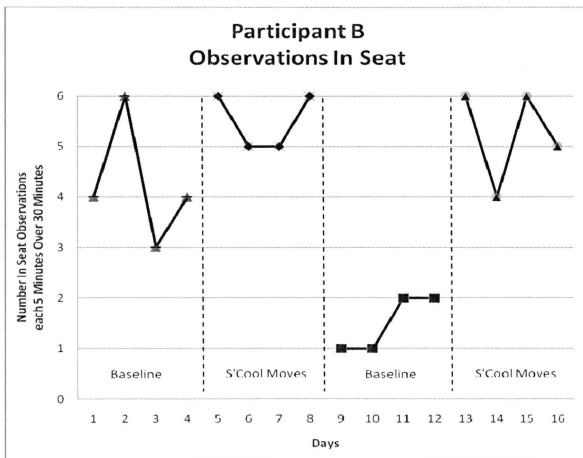
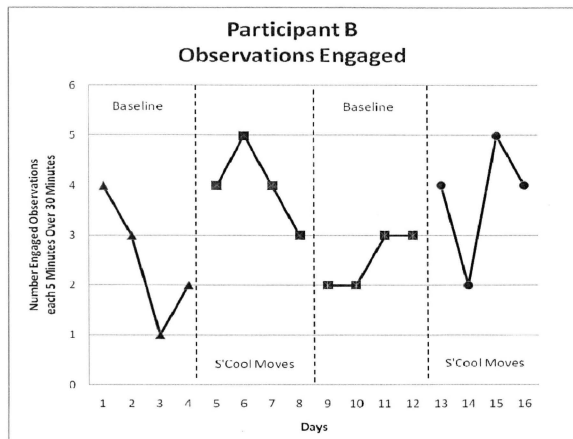


Figure 3. In-seat behavior of Participant B.



*Figure 4. Engaged behaviors of Participant B.*

At baseline, Participant B was in her seat four out of six for two of the sessions, six out of six times, and finally three out of six times during the in seat observations. Then on introduction of S'cool Moves, Participant B was observed to be in her seat six out of six times for two observations and, five out of six times for the remaining sessions. When S'cool Moves was withdrawn, Participant B was observed to be in her seat one out of six times for two observations and two out of six times for two observations of inseat behavior. Again when S'cool Moves were reintroduced, Participant B was observed to be in her seat six out of six times for two sessions, four out of six four one session and the remaining session, she was in her seat for five out of the six observations. Participant B demonstrated a change in level only during S'cool Moves and during the withdrawal phase, observations decreased to one or two out of six.

Over the 16 sessions, Participant B was observed to be in her seat one out of six times two times observation, two out six times for two observations, three out of six for one observation four out of six for two sessions, five out of six for three sessions and six out of six observations for four session. These behaviors occurred if S'cool Moves was present or not. The change in level, therefore cannot be directly attributed to S'cool Moves for in seat behavior. This indicates that removing S'cool Moves had a negative effect for Participant B.

Observations of engagement for Participant B (*Figure 4.*) at baseline were varied and vacillated between four out of six times, three out of six times, two out of six times and one out of six observations of engagement. After introduction of S'Cool Moves Participant B was observed to be engaged four out of six times for two session and then five out of six times for one S'Cool Moves sessions and the remaining session was three out six times. When S'Cool Moves was withdrawn observations of engagement for Participant B dropped to two out of 6 for two sessions and then returned to three out of six observations. With the reinstatement of S'cool Moves Participant B engaged observation vacillated between 4 out of 6 for two sessions, 2 out 6 for one session and the remaining session was 5 out of 6 for engaged behavior.

During the 16 sessions, Participant B was seen engaged for One out of six for one session, two out of six for three sessions, four out of six for 5 sessions, and finally two sessions for five out of six times. Engagement observations remained close to baseline and withdrawal levels when S'Cool Moves was reintroduced. Overall, this indicates there



were no distinct changes in level between the baseline and when Participant B was completing S'cool Moves.

### Participant C

Participant C is an 11 year old male that by teacher report, is often seen fidgeting with small pieces of paper, erasers, pencil shaving etc. He is in general education classes and is considered academic proficient. He does not have any identified diagnosis.

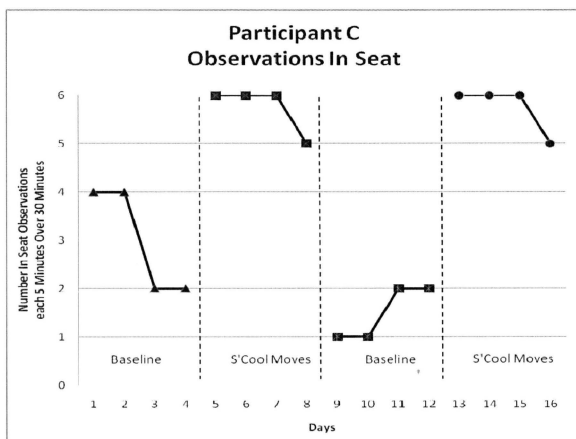


Figure 5. In-seat behaviors of Participant C.

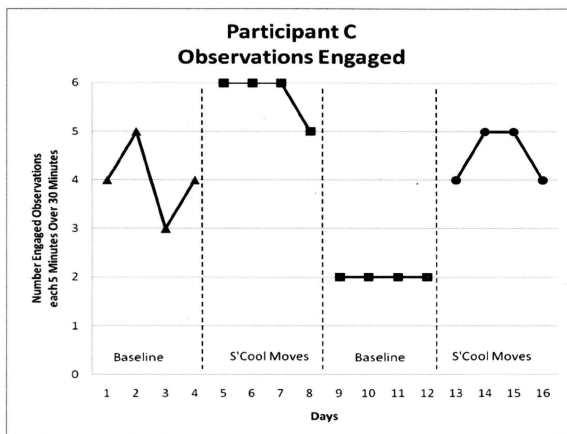


Figure 6. Engaged behaviors of Participant C.

In the initial baseline sessions Participant C (Figure 5) was observed to be in his seat for four out of the six observation times for two sessions. He was in his seat for two of the six observation times in the remaining two baseline sessions. After introduction of S'Cool Moves in seat observations increased to six out of six for three sessions and five out of six times. On withdrawal of S'Cool Moves Participant C's in seat observations dropped to one out of six for two sessions and two out of six for the remaining withdrawal sessions. When S'Cool Moves was reinstated Participant C's inseat observations returned to between six out of six for three sessions and five out of six for one observation of in seat behavior over the 30 minute sessions.

Over the 16 sessions, Participant C was observed to be in his seat one out of six times for two sessions, two out of six observations for four sessions, and to be in his seat

four out of six times for two sessions. For six sessions Participant C was observed to be in his seat five out of six observations and for two sessions he was in his seat four out of the six observations times and these were all during the S'cool Moves phases. This indicates a distinct change in levels between the conditions for in seat behaviors.

Observations of engagement for Participant C (*Figure 6.*) at baseline were varied and vacillated between four out of six times for two sessions, five out of six for one session and three out of six for one session of engagement. After introduction of S'Cool Moves Participant C was observed to be engaged six out of six times for three sessions and then five out of six times for the remaining S'Cool Moves session. When S'Cool Moves was withdrawn observations of engagement for Participant C dropped to two out of six for four sessions. When S'cool Moves was reinstated, Participant C is engaged four out six for two sessions and five out of six for the remaining sessions.

During the 16 observations of engaged behavior, Participant C was observed two out of six times for four sessions, three out of six times for one session, four out of six for three sessions, five out of six for three sessions and six out of six sessions for three sessions. This indicates there is a distinct change in levels between the conditions of the baseline for engagement and S'cool Moves.

## CHAPTER V

### DISCUSSION

The results of this experimental process study were inconsistent and unable to provide inconclusive evidence that extra movement for three children observed in the classroom is an effective way to improve on-task attention and engaged behaviors. Extra movements did produced positive changes in attending behaviors for Participants A and C. Participants A and C showed an increase in engaged behaviors during phases 2 and 4, although the benefit of the extra movements was varied for each student.

The increase in the on-task engaged behavior that occurred during phases 2 and 4 (intervention phase) was not sustained when the extra classroom movements were not used. The participants returned to baseline. Therefore, there is support for the use of extra movement in the classroom to increase engaged behaviors and there is no long-term effects once the extra movements are not used.

When looking at Participant A's data the graphs do not show a consistent pattern during the phases. It would be expected that during Phase 4 that there would be improvement in in-seat behaviors and engaged behaviors however there was significant improvement in in-seat behaviors but only slight improvement for engaged behaviors. Participant A was able to sit in his chair better after the extra movements but he was seen demonstrating behaviors such as staring into space or at his paper rather than completing

work. Participant A and the classroom did benefit from the extra movements as it was typical for this student to disrupt other students when he was off task.

Participant B was able to demonstrate that removing S'cool Moves had a negative effect on her in-seat behavior and that the S'cool Moves had no effect on her engaged behaviors.

Participant C benefited the most from the extra movement breaks in the classroom. This student demonstrated that extra movement breaks changed his in seat and engaged behaviors for a positive finding. Participant C would highly benefit from continued extra movements in the classroom to have improved in-seat and engaged behaviors.

The classroom teacher indicated that since the entire classroom participated in the extra movements in the classroom there was a notable change of improvement in seat and engaged behaviors was evident for the class even though this was not supported by the data. This classroom teacher saw such positive benefits with the students during phases 2 and 4 it was difficult for her not to have the movement breaks during phase 3. It is expected that this teacher will continue to use the multiple extra movement strategies that she learned during this study.

Although, the teacher was very enthusiastic about the extra movements in the classroom, there is difficulty being able to state that there was an improvement in the quality or amount of work that was produced. To support this study, a standardized test that showed improvement in the students learning, would be a better indicator if the program was successful. There also is the bias of the principal investigator rating the

students without a control. In addition, it would be helpful to have additional or different observers taking data.

There was some difficulty with the instrument to measure the behaviors. There was no place to indicate any different changes in the schedule. There was one day during phase 2 that the students were unable to go outside for a recess due to excessive snow. This would be a variance that the instrument does not allow. Another variance would be the state mandated testing that takes place and although this study was able to still incorporate extra movements between the students testing it was an abnormal schedule day that may have skewed results.

Overall, this study suggests that improvements in the on-task behaviors were evident when the students were given extra movements in the classroom during transitions. The results of this study cannot be generalized to a larger population due to a limited number of students observed and the use of one classroom. Additional research is needed to continue to support the evidence base data with a wider age range and populations. Future research is warranted to determine if there is an improvement in the quality of the work task with the extra movements. Therapists in the school system should continue to study the use of extra movement in the classroom for the purpose of improving on-task attention and engaged behaviors that are effective for the student.

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APPENDIX A  
Participant A Data

Appendix A  
Participant A Data

| A # In-Seat |      |    | Engaged    |                 |            |                 |            |                 |            |                 |
|-------------|------|----|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
|             |      |    | Baseline 1 | S'Cool<br>Moves | Baseline 2 | S'Cool<br>Moves | Baseline 1 | S'Cool<br>Moves | Baseline 2 | S'Cool<br>Moves |
| Phase1      | Tues | 1  | 3          |                 |            |                 | 2          |                 |            |                 |
| Normal      | Wed  | 2  | 3          |                 |            |                 | 3          |                 |            |                 |
|             | Tues | 3  | 3          |                 |            |                 | 0          |                 |            |                 |
|             | Wed  | 4  | 2          |                 |            |                 | 3          |                 |            |                 |
| Phase2      | Tues | 5  |            | 6               |            |                 |            | 6               |            |                 |
| Mvmt        | Wed  | 6  |            | 5               |            |                 |            | 6               |            |                 |
|             | Tues | 7  |            | 3               |            |                 |            | 3               |            |                 |
|             | Wed  | 8  |            | 3               |            |                 |            | 3               |            |                 |
| Phase3      | Tues | 9  |            |                 | 1          |                 |            |                 | 2          |                 |
| Normal      | Wed  | 10 |            |                 | 1          |                 |            |                 | 2          |                 |
|             | Tues | 11 |            |                 | 2          |                 |            |                 | 0          |                 |
|             | Wed  | 12 |            |                 | 2          |                 |            |                 | 0          |                 |
| Phase4      | Tues | 13 |            |                 |            | 6               |            |                 |            | 2               |
| Mvmt        | Wed  | 14 |            |                 |            | 3               |            |                 |            | 1               |
|             | Tues | 15 |            |                 |            | 6               |            |                 |            | 4               |
|             | Wed  | 16 |            |                 |            | 3               |            |                 |            | 2               |

APPENDIX B

Participant B Data

Appendix B  
Participant B Data

| B      |      | #  | In-seat    |              |            |              | Engaged    |              |            |              |
|--------|------|----|------------|--------------|------------|--------------|------------|--------------|------------|--------------|
|        |      |    | Baseline 1 | S'Cool Moves | Baseline 2 | S'Cool Moves | Baseline 1 | S'Cool Moves | Baseline 2 | S'Cool Moves |
| Phase1 | Tues | 1  | 4          |              |            |              | 4          |              |            |              |
| Normal | Wed  | 2  | 6          |              |            |              | 3          |              |            |              |
|        | Tues | 3  | 3          |              |            |              | 1          |              |            |              |
|        | Wed  | 4  | 4          |              |            |              | 2          |              |            |              |
| Phase2 | Tues | 5  |            | 6            |            |              |            | 4            |            |              |
| Mvmt   | Wed  | 6  |            | 5            |            |              |            | 5            |            |              |
|        | Tues | 7  |            | 5            |            |              |            | 4            |            |              |
|        | Wed  | 8  |            | 6            |            |              |            | 3            |            |              |
| Phase3 | Tues | 9  |            |              | 1          |              |            |              | 2          |              |
| Normal | Wed  | 10 |            |              | 1          |              |            |              | 2          |              |
|        | Tues | 11 |            |              | 2          |              |            |              | 3          |              |
|        | Wed  | 12 |            |              | 2          |              |            |              | 3          |              |
| Phase4 | Tues | 13 |            |              |            | 6            |            |              |            | 4            |
| Mvmt   | Wed  | 14 |            |              |            | 4            |            |              |            | 2            |
|        | Tues | 15 |            |              |            | 6            |            |              |            | 5            |
|        | Wed  | 16 |            |              |            | 5            |            |              |            | 4            |



APPENDIX C  
Participant C Data

Appendix C  
Participant C Data

| C    | #  | In-seat    |              |            | Engaged      |            |              | Baseline 2 | S'Cool Moves |
|------|----|------------|--------------|------------|--------------|------------|--------------|------------|--------------|
|      |    | Baseline 1 | S'Cool Moves | Baseline 2 | S'Cool Moves | Baseline 1 | S'Cool Moves |            |              |
| Tues | 1  | 4          |              |            |              | 4          |              |            |              |
| Wed  | 2  | 4          |              |            |              | 5          |              |            |              |
| Tues | 3  | 2          |              |            |              | 3          |              |            |              |
| Wed  | 4  | 2          |              |            |              | 4          |              |            |              |
| Tues | 5  |            | 6            |            |              |            | 6            |            |              |
| Wed  | 6  |            | 6            |            |              |            | 6            |            |              |
| Tues | 7  |            | 6            |            |              |            | 6            |            |              |
| Wed  | 8  |            | 5            |            |              |            | 5            |            |              |
| Tues | 9  |            |              | 1          |              |            |              | 2          |              |
| Wed  | 10 |            |              | 1          |              |            |              | 2          |              |
| Tues | 11 |            |              | 2          |              |            |              | 2          |              |
| Wed  | 12 |            |              | 2          |              |            |              | 2          |              |
| Tues | 13 |            |              |            | 6            |            |              |            | 4            |
| Wed  | 14 |            |              |            | 6            |            |              |            | 5            |
| Tues | 15 |            |              |            | 6            |            |              |            | 5            |
| Wed  | 16 |            |              |            | 5            |            |              |            | 4            |

## APPENDIX D

### Observation Form

# Appendix D Observation Form

|  |    |     |     |     |     |     |
|--|----|-----|-----|-----|-----|-----|
| Student A  |    |     |     |     |     |     |
| Activity:  |    |     |     |     |     |     |
| Time:  | 5' | 10' | 15' | 20' | 25' | 30' |
| On-task:   |    |     |     |     |     |     |
| In-seat <ul style="list-style-type: none"> <li>any portion of buttocks in contact with seat/cushion</li> <li>four legs of chair in contact with floor</li> </ul>   |    |     |     |     |     |     |
| Engaged <ul style="list-style-type: none"> <li>following direction</li> <li>body oriented to activity</li> <li>visually attending</li> <li>interacting with materials</li> <li>responding/looking at speaker</li> <li>oriented to/ responding to peers appropriately</li> </ul>                              |    |     |     |     |     |     |
| Off-task:  |    |     |     |     |     |     |
| Out-of-seat <ul style="list-style-type: none"> <li>no portion of buttocks in contact with seat/cushion</li> <li>less than four legs of chair in contact with floor</li> </ul>  |    |     |     |     |     |     |
| Non-engaged <ul style="list-style-type: none"> <li>NOT following direction</li> <li>body NOT oriented to activity</li> <li>NOT visually attending</li> <li>NOT interacting with materials</li> <li>NOT responding/ looking at speaker</li> <li>NOT oriented to/ responding to peers appropriately</li> </ul> |    |     |     |     |     |     |