EFFECTIVE AND EFFACIOUS METHODS FOR TEACHING CHILDREN WITH UNDIAGNOSED ADHD IN THE EARLY ELEMENTARY CLASSROOM

by

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Abstract

The purpose of this review of literature was to describe effective and efficacious methods for teaching children with undiagnosed ADHD in early elementary classrooms. This literature review includes studies on the topics of token systems, daily behavior report cards, peer tutoring, social skills training, cognitive behavior therapy, self-regulation, physical activity, and green space. The reviewed research typically used elementary students as the participants, with the majority being male. Results and conclusions from the studies indicated that many of the intervention techniques proved beneficial when working with ADHD children. Recommendations for improving effectiveness of teaching children with undiagnosed ADHD in early elementary classrooms include: class-wide techniques like peer tutoring, group token systems, incorporating physical activity, and utilizing green space, along with individualized approaches like using token systems and daily behavior report cards.
Chapter I-Introduction

It is unknown what percentage of children have undiagnosed attention-deficit/hyperactivity disorder (ADHD). Literature searches using ERIC, PsychINFO, and Google Scholar databases yielded few results on undiagnosed ADHD in children. One result regarded the undiagnosed and under researched African American population and the others related to teenager and adult ADHD. The lack of research on undiagnosed ADHD in children is understandable considering there are still topics in debate about the disorder itself. Literature on ADHD is wide-ranging and dates back at least three decades, yet several issues are still in debate because of the ever changing protocol for diagnosis of the disease (Center for Disease Control). In order to understand more about undiagnosed ADHD, it is imperative to first have knowledge on ADHD.

In the United States the American Psychiatric Association (APA) states in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) that 3%-7% of school-aged children have been diagnosed with ADHD. ADHD is defined by the APA as developmentally inappropriate attention and/or hyperactivity and impulsivity so pervasive and persistent as to significantly interfere with a child’s daily life. Children with ADHD often struggle with academic achievement, social skills, following rules, and issues regarding self-esteem.

There are no qualitative or quantitative tests in a medical laboratory or any x-ray, scan, or physical exam that can be done to diagnose children with ADHD; therefore, diagnosis is not an easy task. The DSM-IV provides recommended criteria for diagnosing ADHD. This criterion can be found located in the appendix. The criteria are presented in modified form in order to make them more accessible to the general public. They are listed for information purposes and should be used only by trained health care providers to diagnose or treat ADHD.
Statement of the Problem

Having criteria to follow has helped with the diagnosing of ADHD in children. The key findings from the National Health Interview Survey found the percentage of children diagnosed with attention deficit hyperactivity disorder increased from 7% to 9% from 1998–2000 through 2007–2009. It appears that ADHD is being diagnosed more; however, this does not make it any easier to diagnosis. It is tricky for parents and educators to distinguish between what is normal behavior and what constitutes a disease or disorder.

Parents may be the first to bring up their concerns about their child to a healthcare provider. In this case, a teacher often feels relief in the sense that the parent had their own concerns regarding their child’s behavior and is taking the lead. However, parents might not think “being hyper or not being able to focus was a reason to take a child to the doctor” and this type of thinking causes more problems for the teacher. This type of parental approach along with many children falling into a gray area between ADHD symptoms and non-ADHD symptoms is what can lead many children to be undiagnosed (Barkley, 2010).

According to the American Academy of Pediatrics (AAP) “school settings can highlight a child’s problems relating to inattention, impulsivity, and hyperactivity because classroom activities demand an increased amount of focus, patience, and self-control from children. These types of demands are not as prevalent at home or in play groups” (Reiff, 2004, p. 21). Parents might not be as concerned about their child because they see the child in a different environment and do not see their child struggle as much. This is why in several situations it can be difficult for teachers to decide if they should approach the topic of ADHD or not. An analysis done by Martinussen, Tannock, and Chaban revealed the majority of general education teachers (76%), and almost half (41%) of the special education teachers, reported having no or brief in-service
training in ADHD (2010). It appears that teachers are undereducated on the disorder and this only exacerbates the problem.

It is difficult for teachers to judge whether ADHD is the issue or not. First off the behaviors associated with ADHD are exhibited by all children from time to time (Reiff, 2004). Secondly all children are individuals that learn and grow differently and it is hard to objectively pinpoint what behaviors fall and do not fall into the normal range. The third issue is it can be difficult to distinguish between whether a child is struggling with ADHD or possibly another diagnosis (learning disability, emotional disorder, etc.) or several different diagnoses. Symptoms must last for at least six months to be considered for diagnosis of ADHD (Barkley, 2010). Often much of the school year is gone before the teacher feels they can accurately judge whether a child falls into the ADHD category. Teachers are more cautious before suggesting that a child be tested for ADHD because ADHD can be a catchall diagnosis for many behavioral problems.

The process for diagnosing ADHD is extremely subjective and the idea of making a diagnosis based on observations is daunting. This is why for several early elementary teachers the topic is avoided. The nervousness that goes along with the topic of ADHD is not a single person’s fault and is largely due to the fact that there is no cure for the disorder. With knowledge being gained in genetics and brain imaging, someday there may be a cure. Then people will be more accepting of the diagnosis, but for now it leaves for undiagnosed ADHD children.

In Barkley’s latest book on ADHD he stated that, “Medications are the most effective treatments currently available for mastering ADHD. Period” (2010, p. 109). Current interventions for ADHD include three evidence-based treatments: behavior therapy, stimulant medication, and the combination of stimulant medication and behavior therapies (American Academy of Pediatrics). Research over the last decade has shown that medication can help with
the neurological imbalances ADHD people possess. This is great news in helping diagnosed ADHD children, but provides little benefit in helping those who remain undiagnosed. It also provides little help to educators that need guidance in managing undiagnosed ADHD students in their general education classroom. Undiagnosed ADHD children in a classroom can stress out a teacher and disrupt an entire class. Undiagnosed ADHD children may talk too much, constantly interrupt the teacher and classmates, put their hands on others, and have trouble following the procedures of the classroom. The organizational flow of teaching often becomes lost because of the time and energy that undiagnosed ADHD children require from the teacher. It is important for a teacher to make their classroom a safe and positive learning environment for everyone. It is important that teachers are educated on ways to help with this struggle they are facing in their classroom.

Research Question

What are effective and efficacious methods for teaching children with undiagnosed ADHD in the early elementary classroom?

Definition of Terms

Behavior therapies as defined by the American Academy of Pediatrics (AAP) are a set of systematic, consistent techniques that parents and teachers can use to help a child better manage his or her behavior.

A token economy is when a child earns rewards and privileges contingent on performing desired behaviors (AAP).

Response cost is withdrawing rewards or privileges contingent on the performance of unwanted or problem behavior (AAP).
A daily behavior report card, also known as school-home notes, involve teachers evaluating students’ behavior daily and parents providing consequences based on the evaluation (Kelley, 1990, 2003 as cited in Jurberg, Palcic, & Kelley, 2010).

A group contingency system is a system whereby delivery of reinforcement to the entire group is contingent upon the group’s behavior (Salend & Lamb, 1986).

Peer tutoring is an instructional strategy in which two students work together on an academic activity, with one student providing assistance, instruction, and feedback to the other (Greenwood, Maheady, & Carta, 1991 as cited in DuPaul et al., 1998).

Cognitive behavioral therapy is a type of therapy that focuses on current thoughts and behaviors that create symptoms (Honos-Webb, 2005). The therapy focuses on first changing what a person thinks and feels, which in turn would then lead to changes in overt behavior (Garber, Garber, & Spizman, 1996).

Self-regulation describes a number of methods used by students to manage, monitor, record, and/or assess their behavior or academic achievements (Reid, Trout, & Schartz, 2005).
Chapter II-Review of Literature

With ADHD prevalence rates between 7-9%, each classroom in America will have two, maybe three kids with ADHD in each class. Providing appropriate education can be a challenge. In a recent review by Schultz, Storer, Watabe, Sadler, and Evans on school-based treatment of ADHD the authors discussed that even when medications are used psychosocial interventions should still be utilized because ADHD impairments often include academic troubles that cannot be corrected by medication alone (2011).

Schultz et al. listed several school based interventions for children with ADHD that are behavioral in nature. “Classroom behavior management strategies include praising positive, ignoring mild negative behavior, providing specific instructions, creating explicit classroom rules and routines, and providing appropriate reprimands and prompts for behavior” (p. 255). In the book *Beyond Ritalin*, authors Stephen Garber, Marianne Garber, and Spizman discuss several mainstream interventions that can make a difference in ADHD children. Some of their ideas include picking a seat for the student in the least distracting location, providing frequent feedback, altering the way assignments are given, and calling a time-out for disruptive behavior (1996). The AAP recommends keeping things simple and doable, keeping thing interesting, and keeping things organized. All of the ideas are seemingly simple interventions that can be easily intertwined in a general education classroom. For the majority of early elementary teachers they are methods that are currently in use.

Often the undiagnosed ADHD child will struggle to conform in the general education classroom with the mainstreamed interventions mentioned and this is when the individualized behavioral interventions are often implemented. Children with attention and behavioral problems do not react to contingencies in the same way as their peers that do not deal with these issues
(Oosterlaan & Sergeant, 2005). They benefit instead from rewards and consequences that are given immediately and regularly (Kaiser & Pfiffner, 2010).

Behavior therapy is considered a proven line of treatment, and these techniques will be a focus for part of this paper. This paper will look at the use of token systems, daily behavior report cards, and response cost techniques. These techniques take ideas based on Skinner’s reinforcement theory, in that positive/negative reinforcement will produce desired behaviors and punishment will decrease the behavior. Beyond behavior therapies this paper will also look into efficacious researched based methods in treating ADHD that include classwide techniques such as peer tutoring and individualized approaches such as social skills training, cognitive therapy, and self-regulation. Last, this paper will look at alternative ideas, like the use of physical activity and green space to decrease ADHD symptoms.

**Token Systems**

To begin we will take a brief look at a classic study conducted by Dr. Teodoro Ayllon and colleagues at Georgia State University in 1975. The year-long study involved three school aged children, one female and two males. Their findings were that token reinforcement given for academic work completed in the classroom can decrease disruptive behavior as significantly as medication. Since this study, other studies have been performed that involve the use of token systems to correct behavioral and learning issues in both ADHD students and other students (Garber, Garber, & Spizman, 1996).

Two studies from the eighties are worth examining. In one study, Robinson, Newby, and Ganzell looked at the use of a token system for a third grade class of 18 boys identified by teachers and psychologists as underachieving and hyperactive children (1981). In this class different color tokens were used as incentives for following the appropriate reading and
vocabulary procedures. These tokens could be placed on bracelets as they were collected. The tokens could be used in exchange for time on a commercial pinball machine or on two electronic "pong" games. The procedure for completing the reading and vocabulary assignments with the token system required peer teaching. The basic program entailed having each student learn seven words of a unit, help teach a second student those words, learn to use the words in sentences, and teach a second student to use the words in sentences. No specialized tutoring system was developed for the students. The teacher simply modeled the procedures.

The token program was instituted for 14 school days, removed for five school days, and then reinstituted for 13 school days. The data collected from the class during the investigation were grouped together and two specific measures were focused upon, the number of assignments completed (for each assignment the student earned one token), and the number of vocabulary level tests mastered by the whole class.

The different conditions experienced by the class produced substantial changes in class achievement in terms of both measures. First, the class completed nine times as many assignments when working under the token system then when the token system was removed. Second, the class completed an average of 34.81 assignments per day during the 14 days of the first experimental stage. With the withdrawal of the tokens and back-up reinforcers the average number of assignments decreased to 3.8 completed per day for the whole class. Reinstating the system brought the assignments completed daily to 39.57.

Robinson, Newby, and Ganzell pointed out valuable information that was gathered from this study. First, it is possible to use a token system to control academic behavior in a large class of hyperactive children with different academic performance levels. Second, the whole class responded to dimensions of the token system and responded quickly. Third, the students
considered the tokens a valuable part of the program as they frequently wore them on their wrists. Mainly they discovered that it is possible to design a token system for a class of hyperactive children that can be effectively controlled by one teacher. They also learned that by using reinforcement contingencies the students cooperated with each other in the learning process.

After the study was completed the teacher began fading toward other reinforcers and reported that her students continued to respond positively to the new reinforcers. Apparently a wide variety of reinforcers can influence academic performance in hyperactive children. Some limitations of the study include that the class was made up of all males that were all working in the same environment. Also it is possible that peer tutoring could have played a vital role in the positive results. Another possible reason for the change of results could have been attributed to the change in the way the material was presented, maybe the children were bored with the method used prior and the change in teaching is what they needed for improvement. Also, it is not clear if they learned to transfer their appropriate behavior to new contexts.

Salend and Lamb (1986) looked at the effectiveness of a group managed interdependent contingency system. Two groups of students serving as subjects and were labeled learning disabled. Group A consisted of three girls and three boys, ages 11-13, while Group B was compromised of one boy and two girls, ages 9-12. For both groups the study was conducted in a resource room. Treatment sessions lasted 30 minutes each and took place during the group’s daily reading period.

The study used a reversal design. Prior to the investigation a baseline frequency count was taken to measure the number of inappropriate verbalizations engaged in by both groups during their daily reading period. The teacher dealt with them in her usual manner. This baseline period lasted five days. Once the intervention was in place, at the beginning of each reading
session the groups received a number of tokens representing the pre-established number of
inappropriate verbalizations the groups could engage in before losing the reinforcement. As the
number of inappropriate verbalizations decreased the number of tokens distributed to the groups
at the beginning of each session was reduced. If any tokens remained at the end of the session,
the groups were awarded 15 minutes of free time. This lasted for nine days, then went back to the
baseline testing for five days, and then returned to the intervention for another nine days.

Interobserver reliability measures were obtained by having two trained observers
independently record the number of inappropriate verbalizations. The intervention resulted in a
substantial decrease in both groups’ inappropriate verbalizations, with major decreases in the
mean scores during the implementation of intervention.

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<th>Baseline 1</th>
<th>Intervention 1</th>
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<th>Intervention 2</th>
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<td>34.8</td>
<td>2.9</td>
</tr>
<tr>
<td>Group B</td>
<td>29</td>
<td>2.7</td>
<td>26.8</td>
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The findings suggest that a group-managed interdependent response cost system
mediated by free tokens can effectively decrease inappropriate behavior in a resource room
setting. The system seemed to be helpful in that it used peer pressure to enhance the effects and
group cooperation by providing a common goal. Also Salend and Lamb noted that it can be
useful in an educational setting because it minimizes the demands of teacher time while
maximizing group cooperation.

Peer pressure was thought of as a positive when explaining this study but, could have
negative effects since there was no discussion about what would happen if the group was not
awarded their 15 minutes of free time. Would one child often be blamed resulting in arguments
in the group or would the group shut down and not complete reading activities if they lost all their tokens early? Plus it seems that in the eighties when this study was conducted there might have been more time to spare in terms of free-play. Now, in 2012, time is precious in today’s classrooms. Federal and state educational standards have flooded the schools with policies about what to teach, how to teach, and the need to raise academic standards in order to prepare for state and national exams. What a child is expected to learn in the early elementary classroom has increased dramatically. Also due to budget cuts there are less resource room teachers in a building, but an increasing amount of students that need services. This means a resource room teacher’s schedule is often extremely busy with servicing a large amount of students in a small amount of time. Spending an extra 5-15 minutes of instruction time with children who need extra help to meet the standards is a priority over free play. Instead, some other alternative reward would need to be put in place.

A limitation of the study is that the interventions took place with small groups in a resource room. It does appear that this study has components that could be utilized in a general education setting, especially from a building a community and working together perspective.

Reitman, Hupp, O’Callaghan, Gulley, and Northup (2001) studied the influence of a token economy and methylphenidate on attentive and disruptive behavior during sports with ADHD diagnosed children. After meeting the criteria three participants (2 girls, 1 boy) were drawn from a small ADHD summer program for children ages 4 to 7 diagnosed with ADHD. The children participated in a 4-week (20-day) summer treatment program. The children participated in an academic program and kickball games occurred daily during a thirty minute recess. Direct observation measures of attentive and disruptive behavior were recorded during
the kickball games and observers also rated each child’s behavior using the ADHD Index of the Conners Teacher Rating Scale–Revised on a daily basis.

Both staff and children were blind to medication status. Children received either medication or a placebo. The researchers analyzed their data by compiling recorded data into percentages. All three of the participants exhibited the lowest rates of attentive behavior when they had received a placebo. Stimulant medication appeared to increase attentive behavior for all three children. In all cases, the token economy appeared to increase attentive behavior to a greater extent than medication and children appeared to attend at the greatest rate when treatments were combined.

For the three participants the token economy appeared to be more effective than medication for increasing attentive behavior during games. The greatest improvements in attentive behavior were observed when medication and the token system were combined. Disruptive and inattentive behaviors associated with ADHD appear to decrease considerably when a token system is in place during a sport. This might also suggest that with a token system in place these unwanted behaviors might be seen less in a classroom setting as well. The one glaring limitation of this study is that there were only three participants.

Hupp, Reitman, Northup, O’Callaghan, and LeBlanc (2002) looked at the effects of delayed rewards, tokens, and stimulant medication on sportsmanlike behavior with ADHD diagnosed children. Five children from a summer program were selected that were diagnosed with attention deficit/hyperactivity disorder. The mixed method study was designed to evaluate behavioral and pharmacological treatments in a recreational setting. Sportsmanlike behaviors were marked during a three week (15-day) daily kickball game as they occurred at any point during an interval. Each half-inning represented a data point. Two to three data points were
obtained each day for each child and this information was gathered through observations and was then configured into percentages.

Results indicate that the delayed reward did not increase sportsmanlike behavior. However, sportsmanlike behavior did increase for all five participants when tokens were delivered each time the participants displayed sportsmanlike behavior during the game. The results also extend previous findings by demonstrating that immediate delivery of tokens and praise had a greater impact on sportsmanlike behavior than a promised delayed reward alone. That is, stating a vague contingency (i.e., “do a good job”) that specified a delayed reward (i.e., “pick a prize after the game”) had little or no effect on sportsmanlike behavior; whereas, the addition of tokens with the delayed reward increased sportsmanlike behavior for all participants. Immediate delivery of tokens and praise appeared to turn delayed rewards into reinforces. Tokens appear as a practical means of increasing the effectiveness of delayed rewards. Hupp et al.’s study provides support for using tokens with delayed rewards in recreational setting, which could be generalized to the educational setting.

Both of the studies dealing with token systems and sports involved a small amount of selected participants and there was no control group which could lead to inaccurate results. Also the results are based off of observations which are subjectively recorded and may also lead to an incorrect outcome. Regardless, the use of token systems appears to decrease ADHD symptoms to some degree. A token system can also be carried out regardless of parental involvement.

**Daily Behavior Report Cards**

Daily Report Cards (DRC) or school-home based notes incorporate parents in the intervention process. DRC are a means of communication between teachers and parents. They allow for parents to know what occurred in the classroom on a daily basis and in most cases to be
involved in the reward or consequence that occurs due to the report. Jurbergs, Palcic and Kelley (2007) carried out a study that looked at how school-home based notes with and without response cost increase attention and academic performance in low-income children with ADHD. Six African American regular education students were the participants. They were from first and second grade, five male and one female. All of the participants were hand picked after meeting criteria; one criterion was being labeled ADHD. The teacher to student ratio in the classrooms was 1:29.

Student behaviors were observed by undergraduate and graduate students that were blind to the study. These observers coded using 15-second intervals. Each interval was coded as either on-task or off-task. Observations were conducted in the morning during independent seatwork activities. Observations were 30 minutes in length. The dependent measure was percentage of intervals in which the student was engaged in on-task behavior.

The school-home note can be located in the appendix. During the without response cost condition, the note was placed on the student’s desk at the beginning of the morning work period. The note included the target behaviors “Completed Classwork Satisfactorily” and “Used Classtime Well.” The teacher rated the student’s performance at the end of the morning work session on each of the two target behaviors. For each, the teacher circled either “Yes,” “So-So,” or “No,” based on her perceptions of appropriate classroom behavior. A rating of “Yes,” worth 2 points, was used to indicate that the student behaved within the normal range; “So-So,” worth 1 point, indicated that the student’s behavior was marginally appropriate; and “No,” worth 0 points, indicated unsatisfactory behavior.

During the with response cost condition, the note was identical with the addition of five smiley faces at the bottom of the note. These were used in conjunction with the target behavior
“Used Classtime Well”. Teachers were instructed to have the student cross off a face for each instance of off-task or disruptive behavior during the morning work period. In addition to earning points for behavior ratings, one point was earned for each remaining smiley face.

The note was taken home at the end of each day. The parent added up the points earned and delivered consequences or reinforcement contingent on the criteria set prior in the parent-student contract. Researchers met with each family individually to determine appropriate contingencies and these contingencies were renegotiated several times through the treatment phase to keep motivation high and increase the amount of points needed to continue to shape children’s performance.

Before treatment the on-task average was 39.8%. With the introduction of treatment on-task behavior went up to 83%. With treatment withdrawal on-task average went down to 44% and with the reintroduction of treatment up to 88.3% for school-home note and 86.5% for response cost note. On-task percentages were equivalent across the two treatment conditions, school-home note and school-home note–response cost.

There was also an interview component to the study that involved interviewing the student, teacher, and mother. Mothers felt like the note helped their child and they were very pleased with their child’s overall behavioral and academic improvements. Teachers felt there were dramatic improvements and they felt the children were more on task during response cost conditions. They also noted that it took little time and effort, but that they would like a note that incorporates the full school day, not just the morning. The children felt the note helped them do much better in school.

The sample was purposeful, though small, and the instruments used were qualitative to provide a percentage based summary of on-task and off-task behavior. Bias could have resulted
from the sample being drawn from the same school and only two classrooms. Also the daily report cards were filled out based off of only two teachers’ perceptions of appropriate behavior. The results could have also been affected by the type of independent work that was given on each observation day.

Jurbergs, Palcic, and Kelley’s study demonstrated that home-based contingencies in the form of school-home notes were effective in increasing disadvantaged students’ on-task rates and accurate classwork completion. Notes with and without response cost were equally effective. However, parents and teachers preferred the note with response cost component. The results suggest that school-home notes produce desired levels of attentiveness and academic productivity in a general education classroom. During the interview component of this study, students, mothers, and teachers alike felt that notes with and without response cost were pleasing because of the ease of implementation.

More recently, Jurbergs, Palcic, and Kelley (2010) examined the effectiveness of a daily behavior report card (DBRC) with a parent delivered consequence and without a parent delivered consequence (2010). Forty-three children were recruited from several public schools. The participants were all low income African American children in the first through third grade. They were randomized into one of three treatment groups, DBRC with parent consequences (PC), DBRC with no parent consequences (NPC), and a no treatment control (CO) condition.

The study lasted five weeks. In addition to the three baseline observations conducted during the assessment phase, participants were observed in their classrooms three times, on three different days, for 30 minutes at the end of the first two weeks of the study, and again at the end of the study. Observers were undergraduate and graduate students blind to the study purpose. Observations were conducted that recorded student behavior during 30-minute sessions of 15-
second intervals using a coding system. Each interval was coded as either on-task or off-task. All observations were conducted in the classroom during morning independent seatwork activities.

At the end of each session, the observer collected and photocopied the child’s class work completed during the morning independent work period. Assignments typically were worksheets that could be objectively graded. Beyond this explicit procedures were given to teachers and parents in how to carry out implementation of the DBRC. See the DBRC used in the appendix. Teachers filled out the DBRC the way they did in the prior study done by Jurbergs, Palcic, and Kelley. Teachers were observed for accuracy and parents’ integrity checked by asking for the signed DBRC sheet to be returned with totals and a signature the next day.

A one way ANOVA was conducted on change scores from pretreatment to post treatment. The analyses revealed a significant change in on-task behavior from pretreatment to post treatment. In addition, increases in on-task rates were significantly higher for PC as compared to NPC participants. There was no significant difference in work completion among groups. The findings showed that both interventions resulted in increased on-task behavior. The results clearly support the superiority of the DBRC plus PC over the NPC intervention with respect to increasing on-task behavior, though both interventions appear to be effective in improving attentiveness in children with ADHD.

At the conclusion of the study, teachers were interviewed with regard to their satisfaction with the interventions using items from the Treatment Evaluation Inventory-Short Form. Anecdotal comments from the teachers suggested both interventions were easy to implement. Several teachers commented that DBRC did not interrupt class to provide consequences to any one student, either positive or negative. Teachers with students in the PC group reported being relieved with not having to provide rewards for good behavior, but pleased to know the child
would receive a reward at home. Of the 19 participating teachers, 4 had students in both
treatment groups in their classrooms. All four teachers noted that they preferred PC over NPC
and indicated that they felt the DBRC was more effective when parents reviewed the form with
their children and provided rewards.

One of this study’s major limitations is that in some cases multiple treatments were being
implemented. Also the population used was not diverse. However, the study has components that
make it a stronger study than Jurbergs, Palcic, and Kelley’s prior 2007 study. There were a larger
number of participants used from several different schools, with 19 different teachers
participating. There was also a control group and the teachers’ were observed for accuracy when
completing ratings on the DBRC.

A DBRC could easily be implemented in an early elementary classroom, especially with
the explicit directions that are provided in this study. The clear cut guidelines can be very helpful
to an often overloaded teacher. A must read for any educator that wants to try a DBRC to help
ease children’s symptoms of ADHD in their classroom.

The use of daily reports cards (DRC) on enhancing the effectiveness of special education
programming for children with ADHD was investigated by Fabiano et al. (2010). Thirty-three
children, all from different classrooms and having different teachers, were randomly assigned to
an intervention condition. In this condition behavior consultants worked with teachers and
parents to construct and implement a DRC based on the child’s individualized education plan
(IEP). Thirty other children were a part of the control group condition where business was
carried out as usual. The study spanned an entire school year.

Observations were conducted before the plan was implemented, during, and after by
graduate level students who were blind to the study. Several tests were done prior to the
implementation of the DRC plan and after the implementation of the plan. The Woodcock-Johnson III tests of Achievement, which provide a view of academic achievement, the DBD rating scale, which rates ADHD, ODD, and CD symptoms, Impairment Rating Scale, Academic Performance Rating Scale, a measure at the end to rate improvement on IEP goals, student-teacher relationship scale, and parent and teacher satisfaction. Observations were used as a primary source and were analyzed using a hierarchical linear modeling approach. Academic achievement measures were analyzed using analysis of covariance.

The DRC was evaluated and completed by the teacher daily, and feedback was provided to the child throughout the day on progress made toward DRC goals. The teacher was asked to implement the other procedures outlined in the IEP (i.e., academic interventions) as planned. At the end of each day, the teacher sent the DRC home with the child so that the parent received feedback on a daily basis regarding the child’s behavior at school. Parents attended three individual parent training meetings with the consultant conducted in parallel with the teacher meetings (generally held in the school library or cafeteria) to introduce them to the DRC. During these meetings, they established home-based rewards contingent on the child’s DRC performance.

Since this study spanned a full school year the analysis of data collected is lengthy and detailed. Participants in the study who received behavioral consultation and DRC interventions were observed and rated as exhibiting improved classroom behavior and as more academically productive and successful. Further, teachers indicated students were more likely to attain IEP goals. There was no observed benefit of the intervention on academic achievement testing, ratings of ADHD symptoms or impairment, or ratings of the student–teacher relationship.
There were limitations regarding this study, the study sample was small and geographically constrained. Also inconsistencies most likely occurred from different teachers and parents carrying out the procedures. Also this study was restricted to special education children and tied into their IEP goals, which made each case individualized. This exact type of intervention would be hard to use with a general education student.

Teachers and parents did weigh in on some concerns they had regarding the implementation. This study required lots of training and meetings to implement the intervention and redefine rewards along the way and this wore on parents and teachers. Daily report cards seem to be a valuable tool if they require little time and effort on the teacher and parents’ part. If too much work is required, the possibilities of benefits drop drastically due to decrease in follow through. Just like with using different interventions, when using a DRC nothing is set in stone and changes will probably need to be made throughout the process with the participants and teachers learning as they become more involved.

Classwide Techniques

Albert Bandura’s social learning theory states that people learn from one another, that learning is done through observation, imitation, and modeling. It would seem that the intervention of peer tutoring would follow aspects of this theory. DuPaul, Ervin, Hook, and McGoe looked at the effects of peer tutoring for children with ADHD on classroom behavior and academic performance (1998). Eighteen children attending grades first though fifth, in two different school districts (one urban, one suburban), labeled ADHD were participants in the study. In addition, ten peer comparison children were included in the study that were from the same classrooms as the labeled ADHD participants and nominated by their teachers as average in
terms of behavior and academic performance. These students did not serve as peer tutors for the students with ADHD during classwide peer tutoring (CWPT).

Teachers determined the peer tutoring pairs for all students. Students picked to tutor the children with ADHD were perceived as displaying a high frequency of appropriate behavior in the classroom and to be on grade level in all academic subjects. Direct observations of classroom behavior were conducted to determine the frequency of on-task, off-task, and “fidgety” behavior exhibited by all of the participants, ADHD and comparison children. A second set of measures examined academic performance. On a weekly basis a classroom teacher administered brief pretests and posttests of academic material covered during the week.

The effects of CWPT were investigated using an ABAB reversal design in 18 classrooms over the course of two school years. Specifically each participant was studied under four conditions: Baseline 1 (typical classroom activities), CWPT 1 (implementation of CWPT in math or spelling), Baseline 2, and CWPT 2. Each experimental condition lasted from one-two weeks. Observations were conducted at least three times per week for at least 15 minutes each.

Teachers conducted at least two training sessions with their classes to familiarize students with CWPT procedures. During CWPT conditions, tutoring pairs worked with each other for 15 to 20 minutes per day, three or four days per week, on a specific academic skill (e.g., learning math facts or spelling words). At the conclusion of each session the teacher recorded the number of points earned by each student. For interobserver agreement sessions, a second observer was present in the classrooms but was located at least three meters away from the primary observer.

Results indicated that across students with ADHD, the mean active on-task behavior was 29% during the initial baseline condition. During the first CWPT phase, active on-task behavior increased for all participants to a mean of 80%. The second baseline condition resulted in a mean
of 21% and the return of the CWPT conditions resulted in improvement again with a mean of 83%. A similar pattern of results emerged for the comparison peers, although the comparison peers exhibited higher rates of active on-task behavior during all four experimental conditions.

DuPaul et al.’s results indicate that CWPT increased active engaged time for students with ADHD and reduced their disruptive behavior. CWPT not only increased task-related attention but also required children to make active responses to academic material which over time might lead to enhanced academic achievement.

In a consumer satisfaction survey the majority of results indicated that CWPT was practical and not overly time consuming. Most teachers also preferred it as a form of treatment for ADHD children, but also found it valuable for the general education classroom as a whole. Students also reported liking the program and that they would like to have a peer tutor again. The fact that this study ran a span of two years increases its validity, considering most studies of this nature only last a couple weeks. CWPT is a great option to implement for not only those students who are suffering with ADHD symptoms, but for the general education classroom as a whole.

In 2005, Plumer and Stoner studied the relative effects of classwide peer tutoring and peer coaching on the social behaviors of children with ADHD. All three participants were from a small school in western Massachusetts, two students (one girl, one boy) were in the same fourth grade classroom (ten years old) and another girl in a third grade classroom (nine years old). All three children were diagnosed ADHD.

The study was conducted in the target students’ general education classrooms as well as recess and lunch periods. CWPT was conducted in spelling for each target child, and peer coaching was conducted throughout the school day. Peer coaches were nominated by their
teachers and demonstrated high frequency of appropriate behaviors and were performing at or above grade level academically.

Once the training sessions were completed, the teacher implemented CWPT for 20 to 25 minutes per day, three days per week during spelling. The teacher divided the class into pairs each week. The target students also participated in the peer coaching aspect of the intervention. Prior to the peer coaching implementation the supervisor met with each peer coach and target to discuss the process. The students participated in peer coaching on a daily basis. At the beginning of each day the peer coach met with the target student to set a social goal for the day. At the end of the week the students received rewards for their performance if they met a certain amount of points for the week. There was also a peer-coaching binder that was used and sent home with the students at the end of each week to inform their families of their weekly performance. CWPT and peer coaching procedures were also informally observed at least one per week by the primary investigator to ensure that the participants were completing all the required steps.

The research design was a multiple-baseline-across-subjects design and included three distinct phases, baseline, CWPT alone, and CWPT combined with peer coaching. The target students’ social behavior was observed during typical spelling instruction, CWPT, recess, and lunch using the Peer Social Behavior Code of the Systematic Screening for Behavior Disorders. Each observation period was ten minutes in length and divided into 10-s intervals. Observations were conducted one to two times per week in the academic environment and two to three times each week in the social setting for the target student. The data was configured into percentages.

The third grade girl showed an immediate change in positive peer social behaviors with an increase in level from 9% baseline to 93% with CWPT. The fourth grade boy’s level changed from 8% to 92% and the fourth grade girl from 10% to 97%. The addition of peer coaching in the
final phase of the study did not seem to produce additional improvements in the amounts of positive social behaviors occurring compared to the CWPT alone. Although it appeared that students were positively engaged with each other during CWPT, generalized effects of CWPT were not found for social setting behaviors. All three students also showed gains in social skills, problem behavior, and academic competence scales from baseline to post intervention as rated by their teachers.

When teachers and students were asked about their satisfaction teachers were highly satisfied with CWPT and peer coaching and believed the interventions benefited all of their students and all the students claimed that they would recommend peer coaching to other students.

This study seemed to implement not only peer tutoring and peer coaching as an intervention technique, but it also had a contingency component and family involvement component during the peer coaching that were not evaluated. These could both play a role in the results discussed. A positive aspect of this study is that it included two females as participants; however, the downside of the study is there were only three participants. This is great considering most studies shared thus far seem to include more males than females. One main finding that can be taken away from this study is that interventions should be designed to take place at the point of performance, and not thought to be carried over from that point to other areas. Peer tutoring shows benefits at the point of performance on a classwide level by promoting positive social skills.

**Individualized Training**

Learning how to interact appropriately with others is an important skill for early elementary children to acquire. Children with ADHD generally struggle with getting along with others more so than their peers without the disorder. Pfiffner and McBurnett looked at treatment
effects of social skills training (SST) with parent generalization for children with ADHD (1997). Twenty-seven children meeting criteria for ADHD were randomly assigned to SST with parent-mediated generalization (SST-PG), child-only SST, or a wait-list control group. SST consisted of eight group sessions in which skill modules were taught sequentially. Parents of children in the SST-PG group simultaneously participated in group generalization training designed to support their children’s transfer of skills.

Treated participants and wait-list control participants completed a pre- and a post-treatment assessment. Mothers, teachers, and children completed measures at each assessment period using various methods which included a social skills rating system, social skills scale, social skills knowledge tests, CLAM test (revision of the Iowa Conners Scale), SNAP-R (rating scale of disruptive behavior), CBCL and Teacher Rating Form, and consumer satisfaction questionnaire. To reduce the number of variables, Pfiffner and McBurnett formed two global constructs (social skills and disruptive behavior) separately for parent-reported and teacher-reported measures. Ratings of social skills did not differ significantly between the two treatment groups by parents or teachers.

SST led to gains in children’s skill knowledge and to significant improvements in parent reports of social interaction and home behavior problems. The SST-PG group, but not the other groups, showed gains in teacher-rated social skills in within-group analyses. Overall brief SST for children with ADHD can have a positive impact on their social skills and problem behavior. This impact can extend to the home setting, and possibly to the school setting, with only minimal parent involvement.

A major limitation of this study was the small sample size. Parent expectancy may have also affected some ratings. Medication was used by 44% of participants, and there were also
contingency methods used and daily report card aspects intertwined in this study and both could easily skew results. This intervention required lots of time outside the classroom. It also required a trained therapist and a licensed psychologist to carry out. Schools are lucky if they have a part-time counselor available to help and this advanced level of social skills training would be extremely difficult for a general education classroom teacher to find time to implement with students or adults.

Cognitive behavior therapy (CBT) shares some of the same characteristics as SST. Levine and Anshel performed a case study of an eight-year-old child with ADHD (2011). The school psychologist evaluated Alex’s difficulties in regard to his academic, social, and home-based functioning. This evaluation involved interviews with his teacher, his mother, and him, as well as the completion of standardized rating scales, classroom observations, and a review of his history. Alex was observed in three settings on separate days for 15 minutes and the observer filled out the Student Observation System of BASC-II.

The classroom observations confirmed that Alex engaged in high levels of motor activity, impulsivity, and inattention. During interviews both Alex’s teacher and his mother reported that Alex exhibited chronic and clinically significant symptoms of inattention and hyperactivity-impulsivity. During Alex’s interview he demonstrated some awareness of his difficulties.

A program was designed to provide both Alex’s teacher and mother with individualized training in behaviorally based interventions for ADHD. They would also be introduced to the CBT framework as a tool to address their negative beliefs about Alex’s behavior. Alex’s teacher and mother were encouraged to provide him with more consistent supervision including frequent and targeted prompting, the use of positive attention, and the use of token systems and reward incentives to increase Alex’s motivation. They were taught to identify automatic self-
statements regarding Alex’s behavior and were introduced to “cognitive restructuring and disputation.” An example is instead of Alex’s teacher thinking, “I don’t have time to do all of this for one child,” she would think, “How much time will this actually take and what are the costs and benefits of trying this approach?”

Alex would participate in eight CBT-based counseling sessions to teach him about his diagnosis of ADHD, to help him identify negative evaluations of himself related to his diagnosis, to help him develop a more positive self-image, and to help him to understand the changes being implemented at home and at school.

During the course of the initial intervention the school psychologist continued to make classroom observations and the teacher and mother were asked to complete updated ADHD rating scales on a weekly basis. After two weeks the symptoms decreased according to their rating scales. In the third week symptoms seemed to increase again, and after fine tuning the behavior modifications symptoms then decreased again. Two months following the evaluation his mother reported feeling some annoyance about needing to continue the behavior program and his teacher also expressed some frustration at the level of sustained effort needed to keep Alex’s symptoms under control in the classroom, however they reported there were substantial improvements in his behavior.

This case demonstrated a place for CBT in the treatment of children with ADHD. It is important to keep a positive attitude and have optimistic views when working with ADHD children. Drawbacks of this case study are that there was only one participant; results could have been due to anticipation of changes, and this method of intervention took a lot of time and energy from the school psychologist, mother, and teacher. Also to what degree can an eight-year-old
comprehend discussions on their diagnosis and the ways their symptoms impact their emotional and interpersonal life. CBT may provide more benefit for older participants.

Reid, Trout, and Schartz reported the results of a meta-analysis of the literature on the use of self-regulation interventions for children with ADHD (2005). Self-regulation theory has long recognized the importance of a feedback cycle in which individuals systematically self-assess and self-evaluate their behavior.

To be included in the review the study must have met certain criteria, one which included participants being 18 or younger who were identified as having ADHD. Studies also had to be peer-reviewed and focused on one of four strategies, including self-monitoring (SM), self-monitoring plus reinforcement (SM+R), self reinforcement (SRF), or self-management (SMGT). Sixteen studies met inclusion criteria and are summarized in the table located in the appendix.

The studies included a total of 51 participants. Participants tended to be elementary students. Of the 51 participants, a total of 48 were described as being age 12 and younger and 48 were male. The following table is a summary of the studies reviewed. Results of this review suggest that SM, SM+R, SMGT, and SRG interventions can be a useful component in an intervention program for children with ADHD. The results suggest that self-regulation interventions can produce meaningful improvements in student on-task behavior, academic productivity and accuracy, and reduction of inappropriate or disruptive behaviors.

The small number of participants limits the extent to which results of this review can be generalized. Also only three of the 51 participants were female and there was no information on the severity of the ADHD symptoms that the participants possessed. Moreover out of the sixteen studies, nine studies reported that some or all of the students were taking medication (47% of total participants). Reid, Trout, and Schartz indicated the results of the study may be positively
biased because studies showing significant results are more likely to be published than those that show less significant results. Nonetheless, self-regulation should be thought of as a technique available when dealing with children that are undiagnosed ADHD, just like using nature is thought of as a possible way to help alleviate ADHD symptoms.

**Alternative Ideas**

In a national study Kuo and Taylor proposed a natural treatment for ADHD (2004). Information on the study was posted on the website of Children and Adults with Attention-Deficit/Hyperactivity Disorder (http://www.chadd.org), the largest national, nonprofit organization in the United States serving individuals with ADHD. Potential participants were invited to take part in “a national study on how different activities affect children’s ADHD symptoms.” Access to the questionnaire itself was restricted to individuals whose responses to screening questions met the sampling criteria. The study used a purposeful sample in that the surveyers had to be a parent of an ADHD child, but used quantitative methods by using a relatively large number of participants, 452, ranging from 5-18 years of age.

Parents rated the after effects of common after-school and weekend activities on their child’s ADHD symptoms. Parents were asked to indicate whether that activity generally resulted in their child’s symptom being “much worse than usual” to “much better than usual,” with ratings in between. Parents rated each of 49 survey items representing a broad range of activities, physical settings, and social contexts. Kuo and Taylor then analyzed rated aftereffects onto a numerical scale, with “same as usual” coded 0, improved scores coded positively (10, 20), and worsened symptoms coded negatively (-10, -20).

Only in green-colored outdoor settings, such as parks that have trees and greenery, did activities reduce ADHD symptoms regardless of social context. Overall, Kuo and Taylor
suggested that exposure to ordinary natural settings in the course of common after-school and weekend activities may be widely effective in reducing attention deficit symptoms in children. The advantage of green outdoor activities was consistent for children across a wide range of individual, residential, and case characteristics.

The findings of the study varied depending on whether the activity was done alone/in pairs or in larger groups and brings up the question if whether social context played a role in the results. Also the type of outdoor activity performed and the parents perceived perceptions could also lead to skewed results. Regardless, it appears that incorporating green outdoor activities could lessen ADHD symptoms.

More recently, Kuo and Taylor discussed how children with attention deficits concentrate better after a walk in the park (2009). They examined different physical environments on attention in children with ADHD. Children 7-12 years old and professionally diagnosed with ADHD were recruited through newspaper advertisements and flyers. The final participants included 17 children, 15 boys, and 2 girls.

Exposure to different settings, either a park, downtown, or neighborhood, were provided via carefully controlled, individual, guided walks. At the day’s assigned setting the guides kept the walk on schedule and discouraged conversation as the participant completed 20 minutes at a relaxed pace. After their walk the children and their guides were driven back to the quiet, indoor facility. During the drive children answered some simple questions about their experience of the walk. Then children went to a testing room were they completed tests of concentration and impulse control. A single test administrator, blind to the children’s walking condition, administered all tests. There was also a test to assess children’s experience of the different walks and parents completed a short survey to gather information about the children.
Children with attention deficits concentrated better after walking in a park than after walking in a neighborhood or downtown. The test scores showed that the children with attention deficits concentrated better after walking the park than walking in the other two settings. There was no significant differences seen between the two other settings. Using an outdoor green space, such as the park, to take a walk could easily be implemented in a general education classroom schedule, just like an exercise program could be easily implemented as well.

Hill, Williams, Aucott, Thomson, and Mon-Williams used a more socio-economically diverse sample than they did in a prior study to investigate if exercise benefits performance on cognitive tests in primary-school pupils (2011). They also investigated whether cognitive benefits of exercise were moderated by symptoms of ADHD. Five hundred fifty-two children were randomly selected. Nine different socio-economic schools were recruited and 1226 children (ages 8-12 years) were asked to participate in the study. Children were allowed to participate as long as they did not receive any additional support. Seven-hundred-sixty children agreed with parental consent, 696 were left after dropout, 552 met the criteria for their analysis.

Hill et al. performed a quantitative study using a sample of 760 participants. Children were randomized by their school into two counterbalanced groups. One group received a classroom based program of physical exercise on week one and then no program on week two, and this order was reversed for the other group. Each week, all participants completed a cognitive test battery (CBT) that was delivered in one part per day at the end of each school day.

The CBT used a selection for psychometric tests that were modified to ensure that each test could be presented orally to the whole class simultaneously and gain written responses within 15 minutes. The tests used were paced serial addition (Mondays), size ordering task (Tuesdays), listening span task (Wednesday), digit span backwards (Thursday), and visual
The exercise intervention lasted 15 minutes and was directed by the teacher within the classroom. Students performed prescribed moderate intensity exercises while standing behind their desks. The inattention and hyperactivity/impulsivity subscales of the Vanderbilt ADHD Diagnostic Parent Rating Scale were scored using the standard protocol. Individuals’ scores were noted based on the DSM-IV-TR criteria.

Having only parents fill out the data used to identify ADHD could possibly produce skewed data. Usually teacher input plays a vital role in this diagnosis. Also the selection of tests could have produced skewed data due to the subjects that were selected and the time limit set to complete them.

Hill et al. analyzed their data by converting the scores on the CTB subtests into percentages of the maximum possible score on each test and then averaged all the tests to give each child an overall performance score. The children classified with zero ADHD symptoms outperformed those with subclinical levels, and the subclinical levels outperformed those with clinical levels. In week one the exercise and baseline groups showed no significant difference between one another. In week two the exercising group significantly outperformed the non-exercising group.

The study found that a classroom-based exercise regime conducted after lunch can improve performance on a CTB at the end of the school day. Hill et al. also found no relationship between participants’ scores on an ADHD questionnaire and the magnitude of cognitive benefit they received from exercise, suggesting that the benefit on attentional abilities due to exercise is independent of the level of ADHD symptoms. This may be relevant if exercise is going to be used in the educational setting. Their findings suggest that any such exercise program may be
useful when applied to the general education classroom as a whole versus selected individuals with recognized attention difficulties.

Physical activity is thought to provide many benefits to people. Verret, Guay, Berthiaume, Gardiner, and Beliveau looked into how physical activity programs improve behavior and cognitive functions in children with ADHD (2012). A total of 21 participants (ages ranging from 7-12) took part in the study. They were recruited from a specialized ADHD clinic and from a local school. All of the participants had previously received an ADHD diagnosis according to the DSM-IV criteria. Children who were diagnosed with the inattentive subtype were not considered in the study, nor were children with multiple diagnosis or those who took medication other than the usual ADHD stimulant treatment. After evaluations two groups were formed. A group of 10 children with ADHD were assigned to the physical activity program and a second group of 11 children with ADHD were assigned to the control group.

Verret et al. had recruitment difficulties and this led to all the participants in the experimental group being recruited from the same school. The control group children were recruited from different areas. Both groups only included one girl. Children with ADHD in the control group were all taking stimulant medication compared to 30% in the trained groups. Due to these circumstances the participant selection method appears to be a major flaw of the study as it is not a good representation of the population and could lead to skewed results.

Parents and teachers completed the Child Behavior Checklist (CBCL) before and after the physical activity program, which resulted in numerical scores. This questionnaire evaluates behavioral problems and social competences of the children. This test has good reliability and has been used extensively in clinical and research setting. The impact of the physical activity program on behavior was assessed using parent and teacher forms for the CBCL. A flaw in this
study is that both parents and teachers were aware of the treatment and probably had
expectations for changes and therefore they could have changed their answers to his questionnaire
to fit these expectations. Verret et al. suggest that in the future studies should use direct
observations or a placebo control group as a good way to eliminate this bias.

The training program took place during 10 consecutive weeks in a school gym. It was
held three times a week for 45-minute periods at lunch time. Fitness and motor performance tests
were carried out within ten days before the training program. The posttests were done within one
week.

Posttest significant differences were observed for total problems score and for three
subscales: social problems, thought problems, and attention problems. Posttest analysis revealed
that with the exception of rule-breaking behaviors, a tendency for improvements was reported by
the teachers in the experimental group for all scales, but all differences did not reach statistical
significance. Significant posttest differences were observed for two neuropsychological variables.
Children in the experimental group showed a higher level of information processing and better
auditory, sustained attention.

According to Verret et al. the physical activity program has a positive impact. Positive,
significant behavioral scores are reported by parents for total problems, social problems, thought
problems, and attention problems, and from teachers, for anxiety-depression and social problems
in the physical activity group. The level of information processing as assessed by visual research
and auditory sustained attention tasks was also better for the experimental group.

This study revealed no significance differences for the inhibition deficit and impaired
characteristics of hyperactivity associated with ADHD. Thus, this program did not affect all the
ADHD core symptoms, but did have an impact on information processing and on other important
functional domains such as social skills and behavior. A main finding of this study is that both parents and teachers observed better behavioral scores in the physical activity group. The scores achieved by the physical activity group on the social scale were significantly higher for both types of respondents, which may suggest that activities that help children to properly use social skills might be beneficial.

Verret et al. suggested that physical activity could be beneficial for children with ADHD and that teachers could use group physical activity opportunities when teaching ADHD children to ease certain symptoms associated with the disorder. Some social benefits may also be gained from group physical activity.

According to the AAP it is important to be educated on various approaches when dealing with children that have ADHD symptoms. Each intervention has effects and limitations and when it comes to ADHD treatment: “nothing is written in stone”. All children are diverse and respond to interventions differently and may need different approaches at different times in their life. It is also important to consider nontraditional methods because the children we are discussing in this paper do not have a definite diagnosis. What works for one, might not work for another. Techniques should be targeted toward the early elementary population in a general education classroom, with one teacher and twenty-some children. It also seems appropriate that some interventions discussed could possess possible benefits for all students in the general education classroom, not just the undiagnosed ADHD students. It was important to review several different effective and efficacious methods for helping children with undiagnosed ADHD.
Chapter III: Results and Analysis Relative to the Problem

Token systems are a valuable tool when working with ADHD children (Hupp et al., 2002; Reitman et al., 2001; Robinson, Newby, & Ganzell, 1981; Salend & Lamb, 1986). Token systems can control academic behavior (Robinson, Newby, & Ganzell, 1981), decrease inappropriate verbalizations in a group (Salend & Lamb, 1986), increase attentive behavior (Reitman et al., 2001), and increase the effectiveness of delayed rewards (Hupp et al., 2002). Some forms of token systems also foster group cooperation (Robinson, Newby, & Ganzell, 1981; Salend & Lamb, 1986). A token economy can be more effective than medication for increasing attentive behavior, but a combination of medication and a token system produce the best results (Reitman et al., 2001).

When using a token system it is important that delivery of tokens be immediate for best results (Hupp et al., 2002). Token systems decrease inappropriate behavior and disruptive behavior and increase attentive behavior. Most token systems minimize demands of a teacher. A possible set back of using token systems is the novelty of most incentives wears off and new incentives need to be given for the positive results to continue.

Token systems usually involve the teacher and child working together to improve classroom behavior, with the teacher providing the reinforcement. Daily Behavior Report Cards (DBRC) often involve the student, teacher, and parent working together to increase appropriate behaviors. DBRC’s increase on-task behavior (Jurbergs, Palcic, & Kelly, 2007; 2010), improve classroom behavior, and make students more academically productive and successful (Fabiano, Vujnovic, et al., 2010). Notes with and without response cost are equally effective, although teachers and parents often prefer the note containing response cost (Jurbergs, Palcic, & Kelley, 2007). Both a DBRC with a parent delivered consequence and a DBRC without a parent
delivered consequence increase attentiveness, but the DBRC with parent consequence is superior in increasing on-task behavior (Jurgergs, Palcic, & Kelley, 2010). Daily report cards are a helpful tool if they require little time and effort on the teachers’ and parents’ parts. If a DBRC requires too much work, the possibilities of its benefits drop drastically due to the decrease in follow through.

Home-based contingency versus school-based contingency is a major difference between a token system and a DBRC. Rewards and consequences can be provided at home with the use of a DBRC (Fabiano et al., 2010; Jurgergs, Palcic, & Kelly, 2007; Jurgergs, Palcic, & Kelly, 2010). Teachers are relieved that they do not have to provide the reward for good behavior, but pleased to know the child will receive a reward at home. It is also an added benefit to have consequences at home because children may respond better to consequences that parents have access to. The downside to using a DBRC is parental involvement is needed for the process to be successful. Also if follow through is not consistent at school and home results could vary. If you cannot rely on consistency and parental involvement, a token system or other intervention type might be a better option, such as peer tutoring.

Token systems and daily behavior report cards are generally set up to improve an individual child’s behavior. Classwide peer tutoring (CWPT) is an intervention technique that involves the entire class and has positive effects on ADHD children and non-ADHD children as well (DuPaul et al., 1998; Plumer & Stoner, 2005). CWPT seems to increase active engaged time for students with ADHD and decreases disruptive behavior. The same positive effects are noted for non-ADHD peers (Dupaul et al., 1998). CWPT often increases positive peer social behaviors and provides gains in social skills, problem behavior, and academic competence (Plumer & Stoner, 2005).
The peer coaching component is an intervention technique that requires time and effort on the part of the teacher and students participating. If done on a small scale it may be feasible, but since it did not seem to produce additional improvements in the amounts of positive social behaviors compared to CWPT alone (Plumer & Stoner, 2005), it might be an additional stress for teachers. It also requires a lot of responsibility by the students involved and for early elementary children it might be too much.

CWPT alone is often beneficial because it requires children to make active responses to academic material. This is an advantage of CWPT that does not necessarily occur in response to other ADHD treatments (Dupaul et al., 1998). Teachers find CWPT practical and not overly time consuming and students like the program. CWPT is especially useful in the context of learning spelling words and math facts because both of these are often a focus in early elementary classrooms. CWPT allows those who are catching on quicker to help those who might need a little extra help and is a great way to involve all children in the process and to help build social skills at the same time.

Many children with ADHD lack in social skills and trainings that are more individualized may help undiagnosed ADHD children with their social skills and other issues as well. Social skills training (SST) is an approach that can be used to produce a positive effect on social skills and problem behavior. With training sessions that require time outside of the classroom with a trained professional, children gain skill knowledge, improve in social interactions and improve their home behavior. These positive effects can then extend to the school setting (Piffner & McBurnett, 1997). Another type of individualized training, cognitive behavior therapy (CBT), also requires training outside of the classroom and shows positive results when dealing with ADHD children (Levine & Anshel, 2011). The approach of self-regulation also produces
meaningful improvements in student on-task behavior, academic productivity and accuracy, and produces decreases of inappropriate and disruptive behavior (Reid, Trout, & Schartz, 2005).

Time outside the classroom might be what is needed for the three individualized approaches discussed. The children who took part in the social skills training and the boy that took part in the CBT training attended eight sessions outside of the general education classroom (Levine & Anshel, 2011; Pfiffner & McBurnett, 1997). These approaches also required people other than the general education classroom teacher to be involved, which poses a problem. Resources are extremely limited at most schools, and finding the time and people to assist with these approaches could be impossible. The idea of this paper is to provide interventions that are easily implemented by the general education teacher that could provide benefits to the undiagnosed ADHD students, but maybe to the other students in the class as well. We do not want to utilize interventions that cause annoyance and more work for teachers and parents.

Components of CBT could be used, such as those that discuss “cognitive restructuring and disputation” because this technique could result in a more positive attitude and optimistic point of view for a teacher. The component that discusses teaching a child about their diagnosis should not be used because we are discussing children that are undiagnosed ADHD; therefore, they have no label and teachers should not approach them as though they do. Self-regulation is a technique that shows hope, but the question remains as to what age children are truly able to begin to self-regulate. In the early elementary years this approach may be more of a stressor than a solution. With older children it may prove to have increased benefits.

Alternative ideas that do not have as much research done yet, are using nature and physical activity to decrease ADHD symptoms. Activities done in green outdoor settings appear to decrease ADHD symptoms (Kuo & Taylor, 2004), and a walk in the park provides better
concentration for those with attention deficits (Kuo & Taylor, 2009). A classroom-based exercise regime can improve performance on a cognitive test battery (Hill et al., 2011) and a physical activity program can have a positive impact on participants (Verret et al., 2012).

The findings related to outdoor green space are consistent with Attention Restoration Theory (ART) which suggests that ADHD children are susceptible to attention fatigue and that contact with everyday nature may improve their attention performance afterward. (Kuo & Taylor, 2009). The advantage of using green outdoor activities was consistent for children across a wide range of individual, residential, and case characteristics (Kuo & Taylor, 2004).

The effectiveness of exercise/physical activity is not clear, though it seems beneficial for educators to mainstream exercise in the general education classroom. Exercise may improve cognition in all students, not necessarily just those struggling with ADHD symptoms (Hill et al, 2011). More research needs to be conducted to determine accurately the effect of exercise on cognition. For now using physical exercise is an additional tool in the tool kit for treating ADHD, along with providing doses of nature. Both have several attractive qualities that do not have any unusual risks or side effects. If physical activity and/or green space can be incorporated into an early elementary classroom then it should be. Getting kids active and outdoors can provide benefits beyond just reducing ADHD symptoms.

Having numerous intervention techniques to try may prove to be beneficial for a teacher. What works for one child might not work for another. Learning what works for each individual requires testing methods, reviewing the outcome, learning from the experience, and then adjusting accordingly.
Chapter IV: Recommendations and Conclusion

Recommendation

Learning how to deal with diagnosed and undiagnosed ADHD students can be a frustrating situation for teachers. Often times teachers are limited in the training and ideas they have regarding an appropriate approach when working with these students. This paper is a way for teachers to feel they have a place to turn to for advice. Not only are there a lot of methods explained, numerous studies provide detailed approaches that once implemented require little time on the teachers part.

When trying to decide what intervention technique might be valuable to implement in your classroom, it is important to ask yourself what your main goal is. Is your main goal to get one child to stay in their seat for a half hour morning work period? To have several unfocused children produce better spelling test scores? To better the social skills of a child that cannot seem to get along with anyone? To stay in communication with parents? I think the hardest part is deciding what intervention to begin with, because teachers have the tendency to want to use them all. If you try too many at once the chances of getting overwhelmed are high, and the interventions may not run as they should, which may produce less positive results. Think on a small level first, fix one small problem, and then begin plugging away gradually at the rest.

It would be impossible for me to strictly recommend what interventions should be used for what situations, because when it comes to treating both ADHD and undiagnosed ADHD, every situation is diverse and treatments work differently for individuals. To start the school year, there are a few things that I would recommend implementing immediately. Utilize green space on a weekly basis and get the kids into naturalistic settings while teaching mandated material. Approach a lesson differently to involve the outdoors. Incorporate a peer tutoring and physical
exercise component into the classroom procedures. The expectations should be taught and modeled early on and these components implemented classwide. However, if some students no longer need the implementation or the novelty wears off as the year progresses, continue the implementation with the portion of students that benefit from it. Peer tutoring can be a fabulous tool for learning spelling words and math facts.

Another classwide technique that would be valuable to use is the group token system, especially if you are trying to mold the entire class’ behavior. A group system is a great way to build community, work towards a common goal, and have fun with the class.

As far as interventions for individual students if a parent is involved and willing to work with you then read the studies in full on DBRC and try this method. DRBC allows rewards and consequences to extend further than just the school day. Examples of daily report cards are included in the appendix and can easily be tweaked to fit the needs of your students. There are also numerous websites that allow you to quickly create daily behavior report cards based off of your individual student needs and websites can be located by performing a Google search on daily behavior report cards.

If parental involvement is a problem then a token system might be a better approach. This may require changes in rewards throughout the intervention, but for some children will be an approach that they buy into. Some children just want attention and by getting positive attention at school there behavior could change for the better with a token system.

If you have a child in your class that you believe could help another student academically, socially, or in another way, a form of peer coaching might be an option. Peer coaching is a tool that can be utilized after you know your students well. Early elementary teachers should avoid complete implementation of social skills training, cognitive behavior therapy, and self-regulation
techniques. There are components that are doable and valuable, but using these techniques in full seem to require outside assistance and time, and general education teachers do not have a lot of of either of these. Some of these techniques would also prove more valuable when working with an older age group.

**Areas for Further Research**

To better understand ways to teach children with undiagnosed ADHD in the early elementary classroom more research is needed. Further research on this topic should involve selection of participants that teachers view as undiagnosed ADHD in the first grade. This would mean the participants are selected subjectively; however, this would fit more with the population we are trying to find out more about. I would use the school that I teach at and ask each first grade teacher to identify a child that they believe to be undiagnosed ADHD. As soon as the individuals were identified and settled into the procedures of the classroom the study would begin and extend the remainder of the school year. The students would be observed for a week during independent reading time using a rating system that calculates their time on-task/ off-task before any interventions are in place. This would be the baseline data that all other data collected would be compared to. There would also be teacher interviews before and after each intervention technique and a satisfactory survey given to teachers and children at the end.

All interventions would be implemented in the same manner in all three classrooms and observers would rotate between classes. There would also be another observer for accuracy and to make sure implementations are carried out in the manner prescribed. Intervention one would implement a token system for two weeks and have observations conducted on the third week measuring on-task/off-task behavior during independent reading time. The token system would
then be carried out for one more week. After this the token system would be discarded and no intervention would be used for two weeks.

Then intervention two and three would follow separately and mimic the same time line as intervention one, but by using a daily behavior report card for intervention two and a peer tutoring/peer coaching technique for intervention three. Both would still be utilized during independent reading time. Once all three interventions were complete the data would be analyzed by putting time on-task/off task into percentages for each week observed under different intervention techniques. The percentages would then reveal under what intervention technique each individual stayed on-task the greatest. If all three students show similar results, this may then provide the teachers with the most effective tool for keeping off-task children on-task during independent reading time.

Summary and Conclusion

Results and conclusions from the studies reviewed in this paper indicated that all of the intervention techniques were beneficial when working with ADHD children. Recommendations for improving effectiveness of teaching children with undiagnosed ADHD in early elementary classrooms include classwide techniques like peer tutoring, group token systems, incorporating physical activity, and utilizing green space, along with individualized approaches like using token systems and daily behavior report cards.
References


Appendix

DSM-IV Criteria for ADHD

I. Either A or B:

A. Six or more of the following symptoms of inattention have been present for at least 6 months to a point that is inappropriate for developmental level:

Inattention

1. Often does not give close attention to details or makes careless mistakes in schoolwork, work, or other activities.
2. Often has trouble keeping attention on tasks or play activities.
3. Often does not seem to listen when spoken to directly.
4. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions).
5. Often has trouble organizing activities.
6. Often avoids, dislikes, or doesn’t want to do things that take a lot of mental effort for a long period of time (such as schoolwork or homework).
7. Often loses things needed for tasks and activities (e.g. toys, school assignments, pencils, books, or tools).
8. Is often easily distracted.
9. Is often forgetful in daily activities.
B. Six or more of the following symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for developmental level:

**Hyperactivity**

1. Often fidgets with hands or feet or squirms in seat when sitting still is expected.

2. Often gets up from seat when remaining in seat is expected.

3. Often excessively runs about or climbs when and where it is not appropriate (adolescents or adults may feel very restless).

4. Often has trouble playing or doing leisure activities quietly.

5. Is often "on the go" or often acts as if "driven by a motor".

6. Often talks excessively.

1. **Impulsivity**

2. Often blurts out answers before questions have been finished.

3. Often has trouble waiting one's turn.

4. Often interrupts or intrudes on others (e.g., butts into conversations or games).

II. Some symptoms that cause impairment were present before age 7 years.

III. Some impairment from the symptoms is present in two or more settings (e.g. at school/work and at home).

IV. There must be clear evidence of clinically significant impairment in social, school, or work functioning.
V. The symptoms do not happen only during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder. The symptoms are not better accounted for by another mental disorder (e.g. Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

**Based on these criteria, three types of ADHD are identified:**

IA. ADHD, *Combined Type*: if both criteria IA and IB are met for the past 6 months

IB. ADHD, *Predominantly Inattentive Type*: if criterion IA is met but criterion IB is not met for the past six months

IC. ADHD, *Predominantly Hyperactive-Impulsive Type*: if Criterion IB is met but Criterion IA is not met for the past six months.

SCHOOL-HOME NOTE 2007

Name: ______________________ Date: ________________

Used Class Time Well
- YES
- SO-SO
- NC

Completed Classwork
- YES
- SO-SO
- NC

Teacher Comments: ____________________________________________

Total Points for Note: ____________________________(YES=2, SO-SO=1, NO=0, 😊 =1)

Good/Bad Note? ____________________________ Reward Earned: ________________

Parent Signature ______________________________
**Daily Behavior Report Card**

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>SO-SO</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paid Attention In Class</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Followed Directions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sat Still In Seat</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Got Along With Classmates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Teacher Comments: ___________________________

Total Points for Note: _____________________ (YES = 2, SO-SO = 1, NO = 0, 😊 = 1)

Good Report Card? (Yes or No)___________    Reward Earned: _____________________

Parent Signature ________________________
<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention Type</th>
<th>Number &amp; Age of Participants</th>
<th>Setting</th>
<th>Dependent Variables</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ajibola &amp; Clement, (1995)</td>
<td>SRF</td>
<td>N = 6</td>
<td>Resource</td>
<td>Inattention, impulsivity, hyperactivity, accurate counter usage, accurate self-reinforcement, academic productivity, and academic accuracy</td>
<td>Increased academic productivity. Combined treatment of medication and self-reinforcement was most effective.</td>
</tr>
<tr>
<td>Barkley, Copeland, &amp; Sivage (1980)</td>
<td>SM+R</td>
<td>N = 6 Ages 7-10</td>
<td>Experimental classroom</td>
<td>Number of misbehaviors in large group activity, number of misbehaviors in individual work, % time on-task during individual work, actometer scores, and misbehaviors during regular school</td>
<td>Number of misbehaviors decreased in individual work, did not change during group work. Mean time on-task increased for 5 of 6 students, actometer measures indicated no change during intervention.</td>
</tr>
<tr>
<td>Chase &amp; Clement (1985)</td>
<td>SRF</td>
<td>N = 6 Ages 9-12</td>
<td>Experimental classroom</td>
<td>Academic productivity and accuracy</td>
<td>Increased academic productivity and accuracy. Combined treatment of medication and self-reinforcement was most effective.</td>
</tr>
<tr>
<td>Christie, Hox, &amp; Lozanoff (1984)</td>
<td>SM</td>
<td>N = 3 Two 4th grade, one 3rd grade</td>
<td>General education</td>
<td>On-task behavior, inattentive behavior, inappropriate behavior</td>
<td>Self-recording increased on-task behavior and decreased both inattentive and inappropriate behavior.</td>
</tr>
<tr>
<td>Davies &amp; Witte (2000)</td>
<td>SM+R</td>
<td>N = 4 Ages 8-10</td>
<td>General education</td>
<td>Inappropriate verbalizations during academic work</td>
<td>Decrease in inappropriate verbalizations during self-management/group contingency intervention program.</td>
</tr>
<tr>
<td>De Haas-Warner (1992)</td>
<td>SM+R</td>
<td>N = 1 Ages 6-8</td>
<td>Integrated preschool</td>
<td>On-task behaviors during readiness tasks</td>
<td>SMP increased on-task performance during readiness task.</td>
</tr>
<tr>
<td>Study</td>
<td>Intervention</td>
<td>Study Sample</td>
<td>Setting/Environment</td>
<td>Behavior Measure</td>
<td>Outcome Measures</td>
</tr>
<tr>
<td>------------------------------------------</td>
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<td>---------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Edwards, Salant, Howard, Braughner, &amp; McLaughlin (1995)</td>
<td>SM+R</td>
<td>N = 3</td>
<td>Ages 7-9</td>
<td>General education</td>
<td>Off-task behavior, % correct for reading comprehension, both on-task behavior and % correct increased during self-recording.</td>
</tr>
<tr>
<td>Ervin, DuPaul, Kern, &amp; Friman (1998)</td>
<td>SMGT</td>
<td>N = 1</td>
<td>Age 14</td>
<td>Residential Treatment Center</td>
<td>Teacher rated on-task behavior during active and passive class work during math, science, and writing, % of on-task behavior increased in all three academic areas during self-evaluation intervention.</td>
</tr>
<tr>
<td>Hoff &amp; DuPaul (1998)</td>
<td>SMGT</td>
<td>N = 3</td>
<td>Age 9</td>
<td>General Education &amp; Recess</td>
<td>Observations of disruptive behavior in math, reading, social studies, and recess, % of disruptive behaviors decreased across all settings.</td>
</tr>
<tr>
<td>Horn, Chatoor, &amp; Connors (1983)</td>
<td>SM+R</td>
<td>N = 1</td>
<td>Age 9</td>
<td>Psychiatric Inpatient Hospital</td>
<td>% off-task behaviors, % gross motor movements, % vocalizations and noise, and total errors, Mean total errors, % off-task behaviors, and % vocalizations and noise decreased during medication and self-monitoring intervention.</td>
</tr>
<tr>
<td>Kern, Ringdahl, Hilt, &amp; Sterling Turner (2001)</td>
<td>SM+R</td>
<td>N = 1</td>
<td>Age 7</td>
<td>Hospital</td>
<td>Number of problem behaviors and rate of appropriate requests per hour, Number of problem behaviors decreased and rate of appropriate requests increased during self-monitoring intervention.</td>
</tr>
<tr>
<td>Mathes &amp; Bender (1997)</td>
<td>SM</td>
<td>N = 3</td>
<td>Ages 8-11</td>
<td>Resource Room</td>
<td>% on-task behaviors during academic tasks, On-task behaviors increased for all students during self-monitoring intervention, Academic accuracy, productivity, and on-task behaviors increased in all three academic areas during self-monitoring intervention.</td>
</tr>
<tr>
<td>Shimahukuura, Prater, Jenkins, &amp; Edelen-Smith (1999)</td>
<td>SM</td>
<td>N = 3</td>
<td>Ages 12-13</td>
<td>Self-contained Private School</td>
<td>Academic accuracy, productivity, and on-task behaviors in reading, math, and written expression.</td>
</tr>
<tr>
<td>Stewart &amp; McLaughlin (1992)</td>
<td>SM+R</td>
<td>N = 1</td>
<td>Age 15</td>
<td>Special Education</td>
<td>Off-task behavior, % of off-task behavior decreased during self-recording intervention.</td>
</tr>
<tr>
<td>Varni &amp; Henker (1979)</td>
<td>SRF</td>
<td>N = 3</td>
<td>Ages 8-10</td>
<td>Clinic and separate school</td>
<td>Number complete and % correct on math and reading tasks, and hyperactivity, Hyperactivity levels decreased, % correct increased, and number attempted increased during the self-reinforcement package intervention.</td>
</tr>
</tbody>
</table>

Note. SM = Self-monitoring, SM+R = Self-monitoring plus reinforcement; SRF = Self-reinforcement; SMGT = Self-management.