

THE EFFECTS OF CURRICULUM BASED YOGA ON CHILDREN WITH ATTENTION

DEFICIT/ HYERACTIVITY DISORDER

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### Abstract

Yoga is a means of using specified techniques to increase attention, concentration, flexibility, and stress. There is a body of research that supports the use of complimentary treatments, treatment in addition to any medications, for children with Attention Deficit/ Hyperactivity Disorder (ADHD), but there is a lack of research demonstrating the effects of a yoga intervention in the classroom for children with ADHD. This study involves nine, sixth grade students with ADHD, for which a ten week yoga intervention was used prior to language arts and mathematics instruction, and prior to an examination. Participants were evaluated using the Vanderbilt ADHD Diagnostic Teacher Rating Scale on the following subscales: hyperactivity, inattention, ODD/CD, anxiety/depression, reading, writing, math, and behavioral performance. The data appear to reveal mixed results for each participant. The overall summed subgroups showed significant changes in each category of the Vanderbilt ADHD Diagnostic Teacher Rating Scale except for peer to peer relationships.

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Today there are more than four million children diagnosed with a disability known as Attention Deficit Hyperactivity Disorder (ADHD). These children struggle with the basic cognitive functions that many of us take for granted. The inability to focus, stay on-task, maintain attention, and reduce hyperactivity are just a few of the dilemmas that face these children. Parents, peers and teachers are the ones who have to assist these children with their behavior challenges.

According to Pag and Ruiz (2001), attention deficit hyperactivity disorder is one of the most commonly diagnosed behavioral impairments of childhood. They argue that ADHD currently affects between 3 to 9 percent of the school-age population. While most of those who are diagnosed with ADHD are males, there are also females that have been diagnosed. It has been proposed that the reason for such a difference in the prevalence of ADHD across genders is due in part because of the biological components that naturally make males more outgoing than females (Wicks-Nelson & Israel, 2000). This is particularly true of children who are of a younger age. Pag and Ruiz (2001) explain that as these children grow into adults, only two percent will continue to express symptoms of ADHD.

ADHD has caused a number of academic problems for children and teachers. Some researchers have shown that as many as 80% of children with attention problems also display some type of academic performance problem (Putnam, 2004). Further, children with ADHD also display poor social skills, aggression, and failure to adhere to rules. One result of behavioral problems is diminished academic performance. Grades are lower, and IQ appears to be lower, resulting in many different disability diagnoses including learning disabilities, obsessive compulsive disorder, oppositional defiant disorder and conduct disorders (American Psychiatric Association, 2004; Raggi & Chronis, 2006).

### *ADHD Diagnosis*

ADHD as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) is a condition of certain behaviors that manifest themselves in at least two different settings. These behaviors have two main features that include a pervasive pattern of inattention and hyperactivity/impulsivity more severe and frequent than other children at a similar level of development. The impulsive and inattentive symptoms must appear in more than one setting before the age of seven. Further, the symptoms must cause interference in social, academic, or occupational functioning.

In addition to the above-mentioned criteria there are additional sub-types of ADHD that may be diagnosed. The sub- types are: Attention deficit hyperactivity disorder- predominately inattentive, Attention deficit hyperactivity disorder- predominantly hyperactive-impulsive, and attention deficit hyperactivity disorder- a combined type. Each sub-type also specifies its own criteria that are specific to age of onset, settings in which each must occur, as well as symptoms for proper diagnosis.

Diagnosis for ADHD is fairly common however; treatment for ADHD has become accepted and controversial. Lingenfelter (2001) explains that in order for treatment to be accurate, diagnosis must be accurate. Current literature suggests there is a fine line between the division of ADHD being diagnosed as inattentive and impulsive/hyperactive which makes treatment difficult. Currently, there are several psychotropic medications that have shown to provide reduction of symptoms in ADHD (Putnam, 2004; Wicks-Nelson & Israel, 2000).

### *Treatments for Children with ADHD*

Stimulant medications have been used in the treatment of ADHD since the early 1900s. Charles Bradley used the first medication in the treatment of ADHD in 1937. He used the

amphetamine known as Benzedrine for children who displayed inappropriate behaviors (Pag & Ruiz, 2002). This was the first of many stimulant medications With Ritalin, Cylert, and Adderall quick to follow. In 1996, it was estimated that roughly 78% of children diagnosed with ADHD were taking medications and that number continues to grow (Pag & Ruiz).

Although drug treatment has shown to be effective in some individuals, it has not helped everyone, and has shown negative side effects in others. The first difficulty with drug treatment alone is that there are few long-term gains. The drugs often help to alleviate attention problems while it is still in the child's system, which is only for about six to eight hours. As soon as the drug diminishes, the symptoms return with no long-lasting effects. A second difficulty is that ADHD is most frequently diagnosed in children. As a result, children are the ones who are using stimulants for long periods of time. Potential long-term consequences of constant usage of drug medications include: delay of puberty, drug dependency, and the ability of the child to learn proper behaviors (Benedelto-nash & Tannock, 1999; Lingenfelter, 2001; Pag & Ruiz, 2002).

There are other difficulties associated with the use of stimulant medications. The use of these medications has also shown to cause insomnia and poor eating. Facial tics and cardiovascular problems are also associated with stimulant medications. Further, high dosages have also shown to have significant cognitive impairments. For instance, parents of children who use stimulant medication argue that their child concentrates better on academics, but once on the medications, lose part of their creative and imaginative abilities (Wicks-Nelson & Israel, 2000). Last, Putnam (2004) proposed that in some cases, Ritalin and other stimulant medications may stunt growth, increase blood pressure, and cause extreme weight loss and that long term use of drugs might also have long-term toxic effects on the brain.

There have also been potential problems regarding medication compliancy. It has been

revealed that because of the effects of stimulant medication, some children forget or even refuse to take medication. Some doctors even prescribe “drug cocktails” to aid in alleviating some of the side effects of the stimulant medication (Putnam, 2004). As a result, some parents are searching for alternative treatment options.

### *Complimentary and Alternative Medicine for Treatment of ADHD*

Other treatments of ADHD that have shown to be effective include Applied Behavior Analysis or behavior modification (Alberto & Troutman, 2004). This has been one of the most frequently used therapies next to stimulant drugs used to treat ADHD. The strength of this type of therapy is that it is a method of shaping a child’s behavior through the collaborative efforts of parents, teachers, and paraprofessionals (Alberto & Troutman, 2004; Jensen, & Kenny, 2004; Peck, Kehle, Bray & Theodore, 2005). Applied Behavior Analysis includes the use of positive reinforcement, negative reinforcement, punishment, extinction, and overcorrection in order to manage students’ behavior. It is unobtrusive and inexpensive and has shown to be effective. One limitation of using this approach is that the behaviors learned are often difficult to generalize and maintain. Further, a lack of training on the part of the parent or teacher using ABA will negatively affect how well the treatment works (Boeshansz, 2004).

Now, researchers have shown a new way of helping students with ADHD to alleviate hyperactivity and increase concentration. This new method requires no stimulant drugs and has no known side effects. This new method of intervention is using Yoga. Yoga is the process of using physical exercises and mental imagery that originated in the Indian cultures more than three thousand years ago. It is the name given to a practice that helps create a union between the mind, body, and spirit (Khalsa, 2001). Yoga first made its debut in the Western world in the mid 1800s. Hatha yoga, the form of yoga practiced most in the United States was first introduced to

to America by Yogendra Mastamani in New York in 1919.

Hatha Yoga begins by working with the body on a structural level, helping to align the vertebrae, increasing flexibility, and strengthening muscles and tendons (Khalsa, 2001). At the same time, internal organs are toned and rejuvenated, the epidermal, digestive and cardiovascular systems are purified of toxins and waste matter; the nervous system and endocrine systems are balanced and toned; and brain cells are nourished (Khalsa, 2001). The end result is increased mental clarity, emotional stability, and a greater sense of self (Sumar, 1998).

Hatha Yoga involves using the body to change the internal state of mind and consciousness. The method of practicing hatha yoga is broken down into five steps: asana, or body postures, dranyama or breathing exercises; cleansing practices; music therapy, and deep relaxation (Khalsa, 2001).

According to Brown (2003) an asana is “a particular posture of the body, which is both steady and comfortable.” Each posture is distinct and is dictated by stretching. The major focus of asana is alignment of the muscular and skeletal systems. By adding breathing to the postures it circulates energy and blood, which adds balance to the body (Brown, 2003).

Pranayama is the science of proper breathing. According to Khalsa (2001), most people breathe using only the top portion of the lungs. Proper breathing includes deep breaths that contract the diaphragm. By learning how to increase breathing capacity, one can increase the flow of oxygen to various organs in the body. Further, by regulating breathing and increasing oxygen intake, brain cells are strengthened. Thus, pranayama helps to stabilize the body and the mind.

The third step is the practice of cleansing. Somaria (1998) describes cleansing as a second step of pranayama. She maintains that the cleansing step is a pranayama practice for

eliminating excess phlegm and mucus from the respiratory system. It also includes a “rolling” of the abdomen muscle, which results in improved digestion.

The next step is music in combination with hand movements that will develop concentration, breath coordination, communication, and motor skills. This is possible because the repetition of certain sound patterns can produce a calming effect on the nervous system.

Finally, is deep relaxation. Relaxation is the culminating experience of yoga that allows the body to absorb all the benefits of the previous steps. During deep relaxation, visualization and meditation techniques are used to have people focus their tension to one place. It works to relax the muscles and mind by tightening and loosening various parts of the body while also maintaining control over the breath and body.

Yoga works on many different levels and has great potential as an effective therapy for chronic diseases (Sumar, 1998). As a result, children with disabilities who practice the breathing and postures of yoga often show remarkable benefits. However, only a handful of studies have specifically examined the effects of yoga on students with ADHD. The effects of the treatment is clear, but the limitations relate to the number of participants eligible for participation in the research studies as well as the number of researchers who want to find out how yoga will help students with disabilities.

The purpose of this research is to determine an effective way to help students maintain control and focus in the classroom. This research aims to answer the following questions: Can yoga be an effective intervention for students with ADHD? Will yoga provide a way for students to reduce anxiety, maintain focus and control in the classroom? Can yoga be used as a way to increase student participation in class thus increasing overall academic success? Will yoga be an effective way to maintain behavior in the classroom? It is hypothesized that using yoga will

demonstrate an increase in academic and behavioral performance and reduce the symptoms of ADHD in each participant.

## Review of the Literature

### *Postures and Meditation*

Manien (2000) tested the effects of Buddhist psychology in terms of what answers it might offer relative to intervention that special educators could apply to students who displayed challenging behaviors. During which the author attempted to conclude that the principles of the Tibetan Buddhists had manifested itself as American Psychology. Maninen (2000) describes that Buddhist psychology is in fact, comparable to the psychology of William James. Thus, the research set out to show that the philosophies of Buddhist psychology and William James is that social skill training in students with challenging behaviors is doomed to failure, instead, students should be taught relaxation and visualization in order to create a fresh, new outlook for life.

The procedures for conducting the study were qualitative in nature. Participants were selected on the basis of the type of challenging behavior displayed. Students who showed behavioral problems such as oppositional defiant disorder, ADHD, or autism were placed in groups of ten or more to participate in specific meditation/ relaxation techniques. The meditation technique was chosen for each group based upon which “Buddhist- realm” - hell, hungry-ghost, or animal- their Western behavior most qualified them.

The meditations used were called loving kindness, visualizations, and mantra or chanting meditations. Each meditation was paired with a breathing technique. Each meditation was performed for thirty sessions. The results showed a significant improvement in the behavior of the students ( $p = .01$ ) in pre and post measures as compared to the control group.

Although the research showed a significant improvement of behavior as a result of the meditation techniques, the methodologies are questionable. They are extremely vague in describing the procedures which would make it very difficult to reproduce the study. Further, the rationale for comparing Eastern and Western Philosophies of interventions was not clear. Even the title of the study made no clear indication that Eastern and Western Philosophies of interventions would be addressed.

### *Effects of Meditation on the Brain*

One key aspect of using yoga is that it not only involves postures, but also requires breathing techniques that stimulates concentration in the brain. There are several studies that have used specific meditation techniques for children and families with and without disabilities.

Werntz, Bickford, Bloom and Shannahoff- Khalsa (1983) performed a qualitative research study that examined hemispheric functions after implementing selective nostril breathing. The concept was to see if controlling the breathing of one nostril would impact the cognitive functioning in the brain.

The methodology for conducting the experiment was first to measure the airflow of the nostrils through a unit called a thermistor. Airflow was measured in conjunction with an EEG for brain activity to see where the brain activity was occurring. A baseline of activity from the nostrils was measured in order to normalize the current airflow for each individual. Further, it was noted which nostril produced the majority of the airflow, so a more accurate airflow could be determined for the dominant nostril. The baseline would then be compared to altering nostril breathing and cerebral hemispheric activity.

Subjects were found by publishing an advertisement in a university newspaper. The subjects were paid an hourly wage for their participation in the study. The length of the

recording was determined by the subject's ability to stay awake and remain immobile.

The results indicate that hemispheric activity is correlated with airflow in the opposite nostril. The significance of this work is that students with ADHD are believed to have specific hemispheric activity on one side of the brain that constantly keeps them active. Thus, depending on which side of the brain is more active, students can be taught to decrease their breathing activity on the controlateral nostril and increase their breathing using the other nostril. This would create more of a balance in the two brain hemispheres. As a result of the study, cognitive processes and behavior may be influenced by regulation in breathing patterns depending on the location of activity in the brain.

In a follow up study conducted by Werntz, Bickford and Shannahoff- Khalsa (1987) the authors confirmed that cognitive performance was correlated with forced breathing through the controlateral nostril. Using the same methodology, they determined that by having a subject breathe through one nostril, it generated more activity on the opposite side of the brain. Thus, verbal skills were enhanced while the subjects were breathing primarily out of their right nostril and spatial skills were enhanced during left nostril dominance. Breathing techniques have been shown to be effective in conducting more activity in the brain, thus increasing concentration and academic performance.

Similarly, in a review of the literature by Zipkin (2001) it was shown that relaxation techniques have been extremely effective for children with disabilities. Research indicated that progressive muscle relaxation, isometrics, yoga, movement exercises, massage, guided fantasy, meditation, concentration, music, breathing control, and biofeedback training have all been successful at decreasing hyperactivity and impulsivity. At the same time, academic achievement, interpersonal relationship, and increased attention span have resulted from these techniques. The

yoga research as described in Zipkin's (2001) review suggested that yoga positively effects mental states. It promotes self-control, attention, and concentration through breath control, and deep relaxation.

Additional research has shown that with deep breathing, the body's overall circulation is improved resulting in the release of tension as well as increasing levels of blood and oxygen through the entire body, which then affects the central and autonomic nervous systems. Both systems control heartbeat, respiration, and conserve energy. Through breath and meditation, yoga works to produce calming effects, emotional balance, and increases concentration (Harrison, Manocha, & Rubia, 2004; Pag & Ruiz, 2001; Peck, Kehle, Bray & Theodore, 2005; Shannahoff-Khalsa, 2004; Zipkin, 1985)

Harrison, Manocha and Rubin (2004) used Sahaja Meditation for families of children with ADHD and showed positive results with both children with ADHD and their parents. In this research, families participated in a Sahaja meditation program for a duration of 6 weeks, for two days each week in a clinic session. The sessions each lasted 90 minutes. Children and parents contributed to the data collection, which consisted of several questionnaires, examiner testing and interviews, medication checks, and self-esteem measures. Data were collected throughout the treatment in weeks 1, 3 and 6. Results indicated significant improvements in children's self-esteem, academic achievement, parent-child relationships, and a reduction in several symptoms of ADHD. Based on the results, anxiety, poor confidence, hyperactivity, and impulsivity were significantly reduced over the course of the meditation treatment. At some points, children either quit or reduced the use of stimulant medication because they felt more in control of their bodies. The research indicated children who either quit taking or reduced medication showed more improvement in ADHD-related behaviors than those who continued to

take their medication.

Finally, a study introduced by Shannahoff-Khalsa, (2004), showed that Kundalini Yoga meditation can and does aid in the treatment of specific psychiatric disorders. Although specific to obsessive- compulsive disorder, the research showed some specific meditations are beneficial for children who have symptoms of ADHD including symptoms of co-morbid disorders such as oppositional defiant disorder/conduct disorder (ODD/CD), and depression/anxiety. The study included eight participants, five of whom completed the twelve-month trial. Three of the five were completely without the use of medication. Results indicated an improvement of 55.6% going from a mean score of 19.8 to 8.8. Shannahoff-khalsa (2004) recommended a Kundalini meditation protocol for specific disabilities and psychiatric disorders based on the results and previous years of research.

#### *Yoga-Based Interventions for Children with Disabilities*

Hopkins and Hopkins (1979) performed one of the earliest studies conducted using yoga with children to determine if yoga increased concentration. Participants were 34 children ranging in age from six to eleven years of age. The students were not in a regular public school rather, they were from impact centers or centers for children with severe disabilities. The children were not categorized and grouped by disability and each child acted as his/her own control. A baseline was conducted as a reference point for the treatment. Each group was given fifteen minutes of yoga instruction or fifteen minutes of psychomotor activities. Concentration was measured by a code message game. The results indicate that both the yoga and psychomotor activities significantly improved concentration of the students ( $p = .001$ ), but there was no significant difference between yoga and psychomotor interventions.

This particular study was easy to read and would be easy to reproduce. However,

because it is one of the first yoga based interventions, the authors point out a major flaw, which may have made the difference between the yoga training and psychomotor training. There was no attempt to control extraneous variables. The research method was a single subject design used for multiple persons where the focus on just one person may have been better. The students were compared against themselves as a control under a 2 x 2 x 2 design where an AB design might have been better for a first study.

Another study was performed by Uma, Nagendra, Nagarathna, Vaidehi, Seethalakshmi, (1989), dedicated to determining the effects of yoga on children with mental retardation. They performed a quantitative study with over ninety children from four different schools. The children all had mental retardation of varying degrees. Forty-five children underwent yoga training for one academic year. The yoga group and the control group were selected and matched from the same school so that the two groups were subjected to the same environmental background for a direct comparison of the results. All the children in the yoga group were taught the five key steps to hatha yoga. The children were engaged in yoga for one hour, five days a week, for one year. During this hour, the control group participated in their regular school functions.

The results indicated the yoga group showed significant improvements in I.Q., psychomotor skills and in social training compared to the control group who showed no changes. Although the research was well designed, the subjects were not randomly assigned to the control or intervention groups.

Kenny (2002) discussed the need for a yoga-based movement therapy for children with autism. Kenny's findings confirmed the relationship between learning and movement, which was

supported by Putman (2004). Kenny argued that because of the deficits in frontal lobe function in children with autism, yoga should be used. Research was previously demonstrated how yoga does affect brain functioning. As Kenny pointed out, yoga affects the frontal lobes which, increases physical and cognitive functioning and speculated that yoga could be a positive intervention for children with autism because of its ability to integrate physical stimulation, social interaction, and self-esteem building postures. Because yoga is holistic, it is presumed this type of therapy would allow for direct development in all areas of deficit found in children with autism and show promising effects. Further research needs to be completed in order to have data to support the effects of yoga for children with autism.

Kenny & Jensen (2004) performed the known first research using yoga as an intervention with boys with Attention-Deficit Hyperactivity Disorder. Participants were ages 8-13 and all were Caucasian. Of the fourteen participants, five had a co-morbid diagnosis. Two were diagnosed with ODD and two were diagnosed with learning disabilities (LD). One participant was diagnosed with both LD and ODD. A yoga group and a control group were established. The yoga group received 20 weekly 1-hour yoga sessions that took place in a hospital in Australia. The control group engaged in cooperative games and activities. The control group met for 1-hour sessions once a month.

Yoga training involved breathing, postural training, relaxation training, and concentration training. The Conner's Teacher Rating Scale- Long Version and Conner's Parent Rating Scales were used as a way to determine the effects of yoga on the yoga group. A Test of Variables of Attention (TOVA) was also used to measure any confounding variables. Finally, a Motional logger actigraph was also used to determine the participants' amount of movement in settings such as school, home, and on the weekends. According to the Conner's' Parent Rating Scales,

the yoga group showed significant improvements from pre and post-test on eight of the subscales. The control group also showed significant improvement on six of the subscales, however, the pattern of changes were different. The Conner's Parent Rating Scale showed significant changes for the yoga group in ADHD-related behaviors including ODD, Anxious/shy, perfectionism, ADHD index, Global index for restlessness/ impulsivity, Global index for emotional liability, Global index total, and ADHD index total. The control group showed significant changes in anxious/shy, hyperactivity, perfectionism, ADHD index, hyperactive/impulsive, and the DSM index.

According to the authors, the TOVA data was thrown out because it did not prove to be a reliable instrument. The actigraphs were also thrown out because they became complicated with technical problems. The authors also point out problems with the Conner's Teacher and Parent Rating Scales and that rating the participants during medicated and unmediated times could have been the reason for mixed results. However, based on the research, the yoga implementation did produce some positive results during evening hours. Parents indicated that children had improved in various areas.

Peck, Kehle, Bray and Theodore (2005) used yoga as an intervention for children with "attention problems." The researchers used a multiple baseline design to investigate the effects of yoga for improving time on task with elementary school children. The participants had to show signs of attention problems in school but did not have to be diagnosed with Attention Deficit Hyperactivity Disorder. Ten elementary school students participated in the study ranging in grade level (1-3) and age (6-10 years).

Students were observed in class and a behavioral observation form was used to determine time on task. Time on task was determined by eye contact with teacher, eye contact on assigned

task and, performed classroom assignments. Observations took place in 10 minute segments using 10 second intervals. Yoga was implemented in the school in small groups. The researchers used the “yoga fitness for kids” video for 30 minutes twice a week for a period of three weeks. Students were observed again for the same amount of time immediately following the yoga intervention. Results indicate the participants improved their time on task during the yoga implementation. Research indicates that yoga could be a promising intervention for students with attention problems and that yoga could be used in conjunction with the curriculum.

### *Summary*

Yoga has been shown to be an effective treatment for students who need treatment in psychomotor training, social development, and cognitive development. Research has shown that the effects of yoga have made remarkable progress for students ranging in IQ from 50- 70. According to Hopkins and Hopkins (1979), yoga gives students enough exercise during the day to assist them in the level of concentration they will need to get through the day while not tiring them out as physical education classes might. The breathing patterns and postures of yoga help to create a calming and repetitiveness that students with ADHD need in order to function.

As mentioned previously, traditional treatments of students with ADHD have included stimulant drugs that have produced some concerns for some parents and students. Yoga alleviates the need for medication and the worry of children having to be on medication for the rest of their lives. It helps to promote social growth and inner well being without the use of stimulants. Although the present research did not require participants to reduce or discontinue medication, it is important to note that through rigorous yoga and meditation training it can be done.

Yoga can be successful for students with ADHD. The limited available research has

confirmed that yoga can be successful. What is needed now is a much larger data base regarding the effects of yoga on students with ADHD. The goal of this research was to use a curriculum-based yoga intervention for students with ADHD. It was hypothesized that yoga would decrease symptoms of ADHD including hyperactivity- impulsivity, inattention, ODD/CD, anxiety, and depression while increasing academic achievement.

## Methodology

### *Overview*

The following section provides details regarding the methodology used for this study in order to answer the proposed research questions. This study was designed to discover if yoga was beneficial for children with attention deficits, hyperactivity, or a co-morbidity of both conditions. The setting, selection, data collection tools and design of yoga implementation is explained in the following sections

### *Setting*

This study involved sixth grade students at a middle school in Ohio. The study took place over a period of three months during early winter. It was the middle of the school year immediately following Christmas break, when students and teachers had already gotten to know one another. Attitudes had been formed and relationships between the teachers and students had been established. This element was important because surveys were completed prior to yoga implementation, which called for an evaluation of already existing classroom behavior and relationships.

### *Role of the Researcher*

The researcher was pursuing a professional internship lasting for a period of time from January to March. The researcher implemented the yoga intervention in classroom time during this period of time. It is important to note that the researcher is not an expert in yoga and is not a certified yoga instructor. However, the researcher has had several years of yoga experience. All participants and parents were aware of this information prior to implementation.

### *Participants*

All parents of students in a special education resource classroom were asked to complete a survey (see Appendix A for complete questionnaire) to determine which students were diagnosed with ADD/ADHD. All parents who had children in the special education resources room were asked for consent for his/her child to participate in the yoga study. Students who were diagnosed with ADD/ADHD or co-morbidity were included as research participants. No student was rejected from the participation of yoga during class. As long as the parent consented and student assented to participate in the yoga implementation they were permitted to participate in yoga breathing and exercises. If a no consent or assent form was returned or permission was not granted, the student was not permitted to participate in the yoga implementation. The student then had to continue working on classroom assignments or read silently. Consent forms were coded in order to ensure confidentiality. Yoga implementation only took place in the special education resource room.

The students were mostly from low socioeconomic background and poverty is an issue in the school community. All students received some instruction in the general education classroom (science and social studies), and all received special education services in reading, mathematics and language arts. During testing for science and social studies, all students received accommodations including taking the test in the special education resource room

during the corresponding class period.

A total of nine students participated in the research study. Participants were seven boys and two girls aged 11-12 years. The mean age for boys in the yoga group was 12 and 11.5 for the girls. All participants were Caucasian. Students ranged in average to low intelligence. Table 1 represents participant information including subtypes of ADHD, if the student was taking medication, and/or diagnosed with co- morbid conditions.

Participant 1 was a sixth grade male, twelve years of age. This participant failed to give attention to details, and made frequent mistakes in schoolwork. Participant 1 often had frequent outbursts and appeared to be angry and resentful in class toward other students. Participant 1 was formally diagnosed with ADHD and scored high in several areas of the Vanderbilt ADHD Diagnostic Teacher Rating Scale (i.e. hyperactive, inattention, ODD/CD and anxiety and depression). The student receives no additional academic services.

Participant 2 was a 12-year-old male, in sixth grade. Diagnosed formally with ADHD-combined type, the participant was currently taking medication but the type was not specified on the parent teacher survey. According to the Vanderbilt ADHD Diagnostic Teacher Rating Scale the participant scored high in the subcategories of hyperactivity, inattention, and anxiety/depression. Participant 2 was easily distracted by extraneous stimuli. This participant blurted out answers to problems in class, interrupted others and was frequently “on the go.” Often times, this participant ran around the classroom during situations where staying seated was expected. Organization seemed difficult for this student and working without teacher in close proximity, the student would not complete work on time.

Participant 3 was a male, sixth grader who was 12 years old. The formal diagnosis for participant 3 was ADHD. This participant also had a co-morbid diagnosis of bipolar disorder

and ODD/CD. Currently, this participant was taking vyvance for diagnosed disorders. This participant also suffered from extreme reading and writing difficulties. Aside from the academic difficulties, this participant also had difficulty functioning in the classroom due to distractibility, inability to follow directions from adults, and was frequently angry or resentful. This participant also had difficulty developing strong relationships with peers.

Participant 4 was a 12 year old male in sixth grade. Participant 4 was formally diagnosed with ADD. On the Vanderbilt ADHD Diagnostic Teacher Rating Scale, participant 4 scored high in inattention and ODD/CD. Participant 4 frequently did not follow through with directions and did not finish schoolwork most often because of an inability to maintain attention to spoken directions. Further, participant 4 also failed to give attention to tasks, which resulted in mistakes in schoolwork. This participant also frequently fell asleep in class.

Participant 5 was a sixth grade male who was 12 years old. He was formally diagnosed with ADD and was also seeking additional academic services for speech. According to the Vanderbilt scale, he scored high in hyperactivity, inattention, (combined type), and anxiety/depression. Participant 5 failed to give attention to schoolwork and often “dazed off” during class. He was easily distracted and had difficulty staying organized.

Participant 6 was a sixth grade male who was 12 years old. He was formally diagnosed with ADD and scored high on the Vanderbilt scale in ADHD and anxiety/depression. Participant 6 did not work on assignments alone due to necessity to talk in class to peers. He was unable to sustain attention for long periods of time. Frequently, participant 6 would day dream in class or preferred to read. Participant 6 currently sought additional academic intervention for speech.

Participant 7 was a sixth grade, 11 year old, female. Formally, she was diagnosed with ADHD. She was also diagnosed with bipolar disorder and OCD. She was prescribed several medications such as vyvance, adderall, and cymbalta. Participant 7 currently received additional to aid in the development of social skills. The Vanderbilt ADHD Diagnostic Teacher Rating Scale revealed high scores in hyperactivity, inattention, ODD/CD and anxiety/depression. Participant 7 faced several challenges in the classroom including an ability to get along with peers, extreme highs and lows, frequent crying outbursts, and poor organization skills. In addition, participant 7 continuously fidgeted with her hands, squirmed in her seat or was out of her seat.

Participant 8 was a 12 year old female in sixth grade. Participant 8 was formally diagnosed with ADHD- combined type. She scored high on the Vanderbilt ADHD Diagnostic Teacher Rating Scale in hyperactivity, inattention, ODD/CD, and anxiety/depression. She was taking the medication, concerta, for ADHD. Participant 8 frequently was disruptive during class talking to peers. She was easily distracted in class and avoided tasks that required sustained mental effort.

Participant 9 was a twelve year old male in sixth grade. He was formally diagnosed with ADHD- Predominately inattentive and scored high on the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroups: hyperactivity, inattention, ODD/CD, and anxiety/depression. He frequently spoke out during class, talked excessively, and defied requests by adults.

*Table 1*

*Participant Information based on survey data collected by parents and teachers*

Name/ Info	Age	Gender	Nationality	Medication	Add. Academic	Other Physical	ADHD medical	Co- morbid	Vanderbilt Subscale
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					Services	Activity	diagnosis	Diagnosis	Diagnosis
P-1	12	M	Caucasian	N/A	No	No	ADHD- Hyper.	LD	ADHD ODD/CD Anx/dep
P-2	12	M	Caucasian	Yes- not specified	No	Baseball Football	ADHD- combined	LD	ADHD Anx/dep
P-3	12	M	Caucasian	Yes- Vyvance	No	No	ADHD- Combined	Bipolar ODD /CD	ADHD ODD/CD Anx/dep
P-4	12	M	Caucasian	N/A	No	Golf	ADD- Inattentive	SLD	ADHD ODD/CD
P-5	12	M	Caucasian	No	Speech	Softball	ADD- Inattentive	LD/CD	ADHD Anx/dep
P-6	12	M	Caucasian	Yes- not specified	Speech	No	ADD- Inattentive	LD	ADHD Anx/dep
P-7	11	F	Caucasian	Yes- Vyvance Adderall Cymbalta	Social skills	Volleyball Karate	ADHD- Combined	Bipolar OCD	ADHD ODD/CD Anx/dep
P-8	12	F	Caucasian	Concerta	No	Volleyball	ADHD- Combined	LD	ADHD ODD/CD Anx/dep
P-9	12	M	Caucasian	No	No	No	ADD- Inattentive	LD	ADHD ODD/CD Anx/dep

### *Instrument*

The Vanderbilt Diagnostic Teacher Rating Scales (Appendix B) was used as a survey for the researcher to collect baseline data. The Vanderbilt Diagnostic Teacher Rating Scales is a rating scale completed by a teacher/ observer to determine the specific ADHD/ADD subcategory of the participant. These subcategories include: Inattention, hyperactivity, combined type, ODD/CD, and Anxiety/ Depression. The Vanderbilt scale also requires the teacher/observer to report a student's levels of academic performance in Reading, Writing, and Math. Finally, the scale asks the teacher to evaluate the participant's performance in: peer-to-peer relationships, following directions, disruptiveness, completing assignments and organization. The rating scale was a non-invasive way to determine present levels of performance in the classroom. During the initial data collection, the classroom teacher was asked to give input on each question. The final data collection was completed by the researcher.

### *Procedures*

The yoga intervention described below was developed from Marsha Wenig's (2004) *YogaKids*. The program was specifically designed for use in a classroom environment. Inspired by Howard Gardner's Theory of Multiple intelligences, the *YogaKids* program treats yoga as a medium for learning, using different poses designed to stimulate children's minds and bodies. The program consists of a selection of 50 different poses that promote breathing, posture training, relaxation, and concentration. The book is designed to cover a multitude of common situations such as calming down, getting ready for a test, or waking up. There are several sequences of poses to be used during specific events occurring during the school day. Finally, *YogaKids* provides tips and techniques for using yoga with children who have a multitude of

special needs including: Autism, Attention Deficit Disorder and Attention Deficit Hyperactivity Disorder, Cerebral Palsy, and Down Syndrome.

The implemented classroom poses included:

1. Breathing Techniques – Used to reduce anxiety and stress and increase awareness of breath (Jensen & Kenny, 2004). Each day, yoga training began with a Take 5 breathing technique.
  - a. Students were asked to sit at their desks or on the floor and breath calmly in and out through both nostrils for a total of 2-3 minutes. Students were asked to close his/her eyes and think of a thought that made them happy or relaxed. This breathing technique was known as “Take 5.”
  - b. Prior to testing, participants used dragon’s breath. Dragon’s breath is a much deeper breathing technique that brings a deeper awareness to breathing and produces a calming effect.
2. Postures –Used to focus attention and bodily awareness. Postures were used in conjunction with breathing techniques in order to bring awareness to breath and how it relates to relaxation during tense exercises in static and dynamic positions (Wenig, 2003; Jensen & Kenny, 2004). Postures were used in order to bring about brain balance and strength. At any point the following yoga postures were used during the yoga implementation. Postures were implemented for roughly 5-7 min. a day during the intervention.
  - a. Child’s pose
  - b. Lizard
  - c. Eagle

- d. Mountain
- e. Volcano
- f. Warrior series
- g. Tree
- h. Flamingo
- i. Stork
- j. Owl
- k. Dolphin
- l. Boat
- m. Triangle

3. Relaxation – a process of tensing and relaxing muscles in order to be fully relaxed.

Participants were asked to stand bent over their chairs. They were asked to think of a time in their life that made them happy. During this thought process, students were asked to tense specific muscles. Next, students were asked to sit at the desk and follow through with breathing techniques in order to relax and rest the body. The relaxation technique was implemented as the last part of the yoga session. Relaxation was implemented for 2-3 min. per day.

Yoga was implemented prior to Language Arts class and Math class every day for a minimum of ten minutes and a maximum of twenty minutes over the period of ten weeks. If participants were in a testing situation, they were asked to fulfill breathing techniques prior to taking the test. Each participant had a test on Friday in the afternoon. This process continued for ten weeks.

### *Data Collection*

Baseline data collection using the Vanderbilt Diagnostic Teacher Rating Scale began one week prior to implementing the yoga intervention. Following ten weeks of yoga implementation, the survey was used again to determine the present levels of performance in the same category.

### *Data Analysis*

In order to determine if a relationship existed between the yoga intervention and behaviors associated with ADHD, a two tailed t-test design was used to determine the impact of the intervention. Behavioral improvement post-intervention was indicated by lower scores on the Vanderbilt Diagnostic Teacher Rating Scale. The t-test was run on each participant for each subcategory (i.e., inattention, hyperactivity, combined type, ODD/CD, and anxiety, depression). Finally, a t-test was run for the summed participants' scores for each of the subcategories to determine overall pre and post differences by subcategory.

The methods being used were selected based on ease of use with sixth grade students in a middle school special education classroom. Teacher ratings of student behavior were done without distractions from the students or cooperating teacher. A positive change in behavior would result in implications for future research in yoga intervention being implemented in a general education and moderate-severe classroom setting. The data collected and results follow.

## Results

The yoga intervention took place during the winter term from January through March over the course of ten weeks. There were some mild interruptions during the regular school day such as late starts due to weather or school being cancelled altogether for snow days. These

disruptions were not specific to certain participants, but to all. No student had an unusual number of absences that would disrupt the implementation of the yoga intervention.

The following section presents the results of the t-tests for each of the sub-categories of hyperactivity, inattentive, combined type, ODD/CD, anxiety and depression, reading, writing, math, and behavioral interventions.

Table 2 reveals that of the nine participants, four showed significant improvement in ratings of hyperactivity. Participant 1 ( $P = .005$ ); participant 2 ( $P = .004$ ); participant 8 ( $P = .023$ ) and participant 9 ( $P = .003$ ) showed significant improvements in hyperactivity. Participant 3 ( $P = .225$ ), participant 4 ( $P = .169$ ); participant 5 ( $P = .169$ ); participant 6 ( $P = .169$ ) and participant 8 ( $P = .347$ ) did not show significant improvement in the measure of hyperactivity. The data reveals that less than half the participants made significant improvements in the measure of hyperactivity.

*Table 2*

*Participant Data on the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup:*

*Hyperactivity*

Participant	Mean	Std. Deviation	t	df	Sig (2-tailed)
P-1	1.22	.97183	3.773	8	.005
P-2	1.33	1.00000	4.000	8	.004
P-3	.444	1.01379	1.315	8	.225
P-4	.222	.44096	1.512	8	.169
P-5	.444	.88192	1.512	8	.169
P-6	.444	.88192	1.512	8	.169

P-7	.444	1.3333	1.000	8	.347
P-8	.7778	.83333	2.800	8	.023
P-9	1.111	.78174	4.264	8	.003

Table 3 shows the results of the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup Inattention. The data reveals that all participants achieved significant improvements in a measure of inattention.

*Table 3*

*Participant Data on the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup:*

*Inattention*

Participant	Mean	Std. Deviation	t	df	Sig. (2-tailed)
P-1	1.1111	1.26930	2.626	8	.030
P-2	1.7778	1.39443	3.825	8	.005
P-3	1.6667	.70711	7.071	8	.000
P-4	1.2222	.66667	5.500	8	.001
P-5	1.4444	.72648	5.965	8	.000
P-6	1.5556	.52705	8.854	8	.000
P-7	1.0000	.87703	3.464	8	.009
P-8	1.4444	1.13039	3.833	8	.005
P-9	1.2222	1.09291	3.355	8	.010

Table 4 reveals the results of pre and post-test data collected for the Vanderbilt ADHD subgroup: combined type. Based on the results, all participants showed significant changes in combined ADHD behavior.

*Table 4*

*Participant Data on the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup:*

*Combined Type*

Participant	Mean	Std. Deviation	t	df	Sig. (2-tailed)
P-1	1.16667	1.09813	4.507	17	.000
P-2	1.55556	1.19913	5.504	17	.000
P-3	1.05556	1.05564	4.242	17	.001
P-4	.72222	.75190	4.075	17	.001
P-5	.94444	.93760	4.274	17	.001
P-6	1.00000	.90749	4.675	17	.000
P-7	.72222	1.12749	2.718	17	.015
P-8	1.11111	1.02262	4.610	17	.000
P-9	1.16667	.92355	5.359	17	.000

Of the participants that had a co-morbid diagnosis according to the Vanderbilt ADHD Teacher Rating Scale of ODD/CD with ADHD, table 5 presents data indicating that more than 50% of the participants showed a significant change in ratings of ODD/CD behaviors. Participant 1 ( $P = .006$ ), participant 2 ( $P = .002$ ), participant 7 ( $P = .010$ ), and participant 9 ( $P = .022$ ) showed significant changes in ratings of ODD/CD. Participants 4 ( $P = .343$ ) and 8 ( $P = .343$ ) did

not show significant changes in ODD/CD as measured by the Vanderbilt ADHD Diagnostic Teacher Rating Scale.

*Table 5*

*Participant Data on the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup:*

*ODD/CD*

Participant	Mean	Std. Deviation	t	df	Sig. (2-tailed)
P-1	1.3000	1.15950	3.545	9	.006
P-3	1.6000	1.17379	4.311	9	.002
P-4	.10000	.31623	1.000	9	.343
P-7	.90000	.87560	3.250	9	.010
P-8	.10000	.31623	1.000	9	.343
P-9	.80000	.91894	2.753	9	.022

As seen in Table 6, eight of the participants scored high on the Vanderbilt subscale for anxiety/depression. However, of the eight participants, only two showed significant changes: participant 2 ( $P = .038$ ) and participant 8 ( $P = .038$ ). Participant 1 ( $P = .423$ ), participant 3 ( $P = .184$ ), participant 5 ( $P = .184$ ), participant 6 ( $P = .225$ ), participant 7 ( $P = .057$ ) and participant 9 ( $P = .225$ ) did not show a significant change on the Vanderbilt anxiety/ depression subscale.

*Table 6*

*Participant Data on the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup: Anxiety/ Depression*

Participant	Mean	Std.	t	df	Sig. (2-tailed)
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		Deviation			
P-1	-.66667	1.15470	-1.000	2	.423
P-2	-1.6667	.57735	-5.000	2	.038
P-3	-1.0000	.86603	-2.000	2	.184
P-5	-1.3333	1.15470	-2.000	2	.184
P-6	-1.6667	1.0000	-1.732	2	.225
P-7	-1.3333	.57735	-4.000	2	.057
P-8	-1.6667	.57735	-5.000	2	.038
P-9	-1.0000	1.00000	-1.732	2	.225

Table 7 outlines the academic performance for the participants on the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup, Academic Performance. Participant 1 ( $P = .04$ ) and participant 7 ( $P = .001$ ) showed significant changes in pre and post-measures of academic performance. Participant 2 and Participant 5 showed no change in academic performance. Participant 3 ( $P = .111$ ), participant 4 ( $P = .356$ ), participant 6 ( $P = .172$ ), participant 8 ( $P = .356$ ) and participant 9 ( $P = .172$ ) did not show significant changes in academic performance as measured by the Vanderbilt ADHD Diagnostic Teacher Rating Scale.

*Table 7*

*Participant Data on the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup:*

*Academic Performance*

Participant	Mean	Std. Deviation	t	df	Sig (2-tailed)
P-1	.71429	.75593	2.500	6	.047

P-2	-	-	-	6	-
P-3	.85714	1.21499	1.867	6	.111
P-4	.14286	.37796	1.000	6	.356
P-5	-	-	-	6	-
P-6	.57143	.97590	1.549	6	.172
P-7	1.71429	.75593	6.000	6	.001
P-8	.14286	.37796	1.000	6	.356
P-9	.57143	.97590	1.549	6	.172

- Participant showed no change in this subgroup

Table 8 shows pre and post test results for the Vanderbilt ADHD Diagnostic Teacher Rating Scale ratings of behavioral performance. Participant 3 is the only participant that did not show any change in pre and post-test results. Participant 1 ( $P = .033$ ), 4 ( $P = .004$ ), 7 ( $P = .029$ ) and 8 ( $P = .033$ ) each showed significant changes in pre and post-test results in behavioral performance. Participant 2 ( $P = .305$ ), 5 ( $P = .089$ ), 6 ( $P = .099$ ), and 9 ( $P = .099$ ) did not show significant pre and post-test results on behavioral performance.

*Table 8*

*Participant Data on the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup:*

*Behavioral Performance*

Participant	Mean	Std. Deviation	t	df	Sig. (2-tailed)
P-1	-1.200000	.83666	-3.207	4	.033
P-2	-.600000	1.14018	-1.177	4	.305

P-3	-	-	-	-	-
P-4	-1.20000	.44721	-6.000	4	.004
P-5	-1.00000	1.00000	-2.236	4	.089
P-6	-.80000	.83666	-2.138	4	.099
P-7	-1.10000	.74162	-3.317	4	.029
P-8	-1.20000	.83666	-3.207	4	.033
P-9	-.80000	.83666	-2.138	4	.099

- Participant showed no change in pre and post results

Table 9 presents the summed participants’ scores for each of the subcategories to determine overall pre and post-differences by subcategory. The ADHD subcategories: inattention (P = .000), hyperactivity (P = .002), combined type 9 (P = .000), ODD/CD (P = .048), and anxiety/ depression (P = .019) showed significant changes for each subgroup. Based on the data, academic performance in Reading (P = .00), Math (P = .002), and Writing (P = .000), also showed significant changes in pre and post-scores. Finally, behavior performance had mixed results. Peer to peer relationships (P = .282) did not show a significant change. However, the following subcategories: follows directions (P = .000), disruption (P = .003), finishes assignments (P = .000), and organization (P = .035) all showed significant changes at the p = .05 significance level.

*Table 9*

*Summed data per each subgroup on the Vanderbilt ADHD Diagnostic Teacher Rating Scale*

Subgroup	Mean	Std. Deviation	t	df	Sig. (2-tailed)
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Inattention	6.00000	1.22474	14.697	8	.000
Hyperactivity	3.11111	2.02759	4.603	8	.002
Combined type	9.11111	2.42097	11.290	8	.000
ODD/CD	2.22222	2.86259	2.329	8	.048
Anxiety/ Depression	1.55556	1.58990	2.935	8	.019
Reading	-8.33333	.70711	-3.536	8	.008
Math	-1.27778	.83333	-4.600	8	.002
Writing	-1.44444	.72648	-5.965	8	.000
Peer-to –Peer Relationship	-.333333	.86603	-1.155	8	.282
Follows Directions	-1.33333	.50000	-8.000	8	.000
Disruptions	-1.00000	.70711	-4.243	8	.003
Finishes Assignments	-1.83333	.35355	-15.556	8	.000
Organization	-.44444	.52705	-2.530	8	.035

Table 10 shows the changes for each participant in each Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroup. The first column represents the specific AD/HD 'diagnosis' area where each participant received high scores. Following the Vanderbilt diagnosis, are each of the subgroups and significance levels for each participant.

*Participant 1*

The Vanderbilt ADHD Diagnostic Teacher Rating Scale scored participant 1 with symptoms of hyperactivity, inattention, combined type, ODD/CD and anxiety/ depression. Based on the data, participant 1 showed significant changes in each of the following ADHD subgroups: hyperactivity ( $P = .005$ ), inattention ( $P = .030$ ), and ODD/CD ( $P = .006$ ). Participant 1 did not show a significant change in anxiety/ depression ( $P = .432$ ). Participant 1 did show significant changes in pre and post-scores in summed academic performance ( $P = .047$ ) and summed behavioral performance ( $P = .033$ ).

*Participant 2*

Table 10 reveals that participant 2 scored high on the Vanderbilt ADHD Diagnostic Teacher Rating Scale in hyperactivity, inattention and anxiety/ depression. Based on the results, significant changes in pre and post-test data were found in hyperactivity ( $P = .004$ ), inattention ( $P = .005$ ), and anxiety/depression ( $.038$ ). There was no change in summed academic performance and no significant change in the subgroup summed behavioral performance ( $P = .305$ ).

*Participant 3*

Participant 3 scored high in the subgroups hyperactivity, inattention, ODD/CD, and anxiety/depression. Participant 3 showed no change in academic performance and showed no significant changes in hyperactivity ( $P = .225$ ), anxiety/depression ( $P = .184$ ) and summed academic performance ( $P = .111$ ). There were significant changes in pre and post-test results for inattention ( $P = .000$ ) and ODD/CD ( $P = .002$ ).

*Participant 4*

According to the Vanderbilt ADHD Diagnostic Scale, Participant 4 scored high in the inattention, hyperactivity, and ODD/CD subgroups. Participant 4 showed significant changes in only one subgroup: inattentiveness ( $P = .001$ ). Participant 4 did not improve in hyperactivity ( $P = .169$ ), ODD/CD ( $P = .343$ ) and summed academic performance ( $P = .356$ ). However, the overall summed behavioral performance did show a significant change ( $P = .004$ ).

*Participant 5*

Table 11 shows Participant 5 scored high in the Vanderbilt subgroups: hyperactivity, inattention, and anxiety/depression. Participant 5 showed significant changes in one Vanderbilt subgroup: inattention ( $P = .000$ ). The data also shows this participant had no significant changes in the following subgroups: hyperactivity ( $P = .169$ ), anxiety/ depression ( $P = .184$ ) and no change in summed behavior performance ( $P = .089$ ). Additionally, participant 5 showed no change in academic performance.

*Participant 6*

Based on the results of the Vanderbilt ADHD Diagnostic Teacher Rating Scales, participant 6 scored high in the subgroups hyperactivity, inattention, and anxiety/depression. Table 10 reveals that participant 6 did not show significant changes in the subgroups of hyperactivity ( $P = .169$ ) and anxiety/depression ( $P = .225$ ). However, participant 6 showed significant pre and post-changes in inattention ( $P = .000$ ). The academic performance ( $P = .172$ ) and behavioral performance ( $P = .099$ ) of participant 6 did not show significant pre and post-test differences.



P-1	Inattention Hyperactivity ODD/CD Anx/dep	.005	.030	.006	.432	.047	.033
P-2	Inattention Hyperactivity Anx/dep	.004	.005	N/A	.038	-	.305
P-3	Inattention Hyperactivity ODD/CD Anx/dep	.225	.000	.002	.184	.111	-
P-4	Inattention Hyperactivity ODD/CD	.169	.001	.343	N/A	.356	.004
P-5	Inattention Hyperactivity Anx/dep	.169	.000	N/A	.184	-	.089
P-6	Inattention Hyperactivity Anx/dep	.169	.000	N/A	.225	.172	.099
P-7	Inattention Hyperactivity ODD/CD	.347	.009	.010	.057	.001	.029

	Anx/dep						
P-8	Inattention	.023	.005	.343	.038	.356	.033
	Hyperactivity						
	ODD/CD						
	Anx/dep						
P-9	Inattention	.003	.010	.022	.225	.172	.099
	Hyperactivity						
	ODD/CD						
	Anx/dep						

- Participant showed no change in pre and post test results

The results shown above provide information about the pre and post-results from the intervention. In order to derive meaning, they need to be analyzed more carefully. In the following sections, the results are analyzed and compared to the original aim of the yoga intervention. Implications for classroom use and future research opportunities are provided.

#### Discussion and Conclusion

This research sought to discover if the principles of yoga are an effective means to decrease symptoms of Attention Deficit/Hyperactivity Disorder (ADHD), including-inattentiveness, hyperactivity, ODD/CD, anxiety, or depression. It has differed from much of the research that exists due to the fact that this research was conducted in a classroom setting as part of the curriculum, not just as a therapy outside of the classroom. Only one other study was found that specifically addressed the use of yoga with children with attention deficit hyperactivity disorder. This research, however, was specific to boys with attention deficit hyperactivity disorder and was performed after school (Jensen & Kenny, 2004). Additional research supports

the use of yoga with children with various disabilities including cerebral palsy, obsessive-compulsive disorder and autism spectrum disorders. Each participant was diagnosed with ADHD, but had other diagnoses such as specific learning disabilities, cognitive disabilities, obsessive compulsive disorder, bipolar, oppositional defiant disorder, and additional academic services for speech and social skills.

This study sought to determine if yoga could be beneficial in a classroom to improve focus and concentration as well as reduce stress and anxiety in children with attention deficit/hyperactivity disorder. It was hypothesized that all students who participated in the research study would demonstrate the benefits of yoga through their academic achievement, symptoms of ADHD, and behavioral performance. This would be indicated by a decrease in scores on the Vanderbilt ADHD Diagnostic Teacher Rating Scale. In order to determine if a relationship existed between the yoga intervention and a change in symptoms of ADHD, data needed to show significance differences in pre and post-test results, indicating a decrease in specific behaviors related to ADHD resulting in increased academic achievement and decrease in behavioral problems.

### *Discussion*

*Participant 1.* The hypothesis was confirmed with participant. He was medically diagnosed with ADHD – Hyperactive type. Based on the data, he showed a significant decrease in symptoms of hyperactivity. In addition, based on the Vanderbilt ADHD Diagnostic Teacher Rating Scale, participant 1 showed improvements in academic and behavioral performance. Participant 1 has a specific learning disability in reading, language arts, and mathematics. In all areas of academic achievement he showed improvements. This participant had a difficult time paying attention and staying focused in class. As a result, he seldom started or finished projects

on time. Immediately following yoga intervention, this student was able to write short stories. Formerly, this participant would only write one or two lines during language arts. Participant 1 also became very team-work oriented. He worked well with his classmates by taking an interest in helping them learn mathematics or reading aloud as a partner. The Vanderbilt ADHD Scale also identified this participant as scoring high in several additional areas such as inattention, ODD/CD, and anxiety/ depression. Immediately following the yoga intervention, the data showed significant changes in each of these subgroups except anxiety and depression. During the yoga intervention, the participant was having some personal problems with family members. Although the yoga intervention should have helped alleviate anxiety and depressive symptoms it was possible that the student was unable to generalize the yoga lesson from the classroom to the home.

*Participant 2.* Participant 2 was medically diagnosed with ADHD combined type and specific learning disabilities. The Vanderbilt ADHD Scale scored participant 2 high in combined type as well as anxiety/depression. Although there was no significant change in academic performance or behavioral performance, observations made of this student participating in the yoga intervention indicated this student began paying more attention to details and became more academically aware of finishing assignments. Because this student was given extra time to complete tasks by his Individualized Education Plan (IEP) there was no change in grades. However, this student was able to complete all academic assignments with good handwriting, organization and in the time allotted. Finally, during the course of the yoga intervention, this participant chose to discontinue taking medication. As a result, he became very defiant at times and even refused to complete schoolwork. It was discovered through parent discussions that the medication was making the participant feel extremely ill, resulting in the non-compliance. After

two weeks, the participant began taking a new medication and did not show any stomach discomfort. During the period of time where medication was not being taken, yoga became a natural calming regimen throughout the day. Immediately following the yoga intervention, the student was extremely calm and showed appropriate behavior during class such as complying with teacher requests, sitting calmly in the seat, and working on assignments independently. This participant did meet the hypothesis in terms of alleviating symptoms of ADHD, by decreasing hyperactivity and inattention during class.

*Participant 3.* Participant 3 was medically diagnosed with ADHD –combined type and with a series of co-morbid disorders including bipolar disorder and ODD/CD. It was not specified if the ADHD was a result of the bipolar disorder or in-addition- to. Participant 3 showed significant improvements in ratings of inattention and ODD/CD. Although no academic change was specified, observations revealed that the student’s confidence level increased and increases in academic achievement. Prior to the yoga intervention, it was noted he seldom read aloud or participated during mathematics classes. Over the course of the yoga intervention, the participant began to read aloud during science and social studies classes. He answered questions in class and made efforts to complete homework assignments independently. As the professional intern at the time, the researcher observed him working and developing better relationships with peers. He became more participatory during group assignments. It is difficult to say for sure that the growing confidence was due to yoga implementation or if it was due to general adolescents. This participant did not show a significant change in anxiety/depression ratings. During the course of the yoga intervention, the student appeared to have significant troubles at home causing him to occasionally do unexplainable things. At one point he ate a steel screw and was dismissed from school for several days. At another point, he became very angry and started a

fight with another student and was dismissed from school for the day. Finally, one week he became extremely withdrawn and did not want to speak with anyone. It is presumed that his medication was being changed during this time and as a result these behaviors occurred. This may also have been a reason anxiety and depression scores did not show an improvement.

*Participant 4.* Participant 4 was medically diagnosed with ADHD- predominately inattentive and has specific learning disabilities in reading, language arts, and mathematics. The Vanderbilt ADHD Scales scored participant 4 high several subgroups including hyperactivity, inattention, ODD/CD, and anxiety/depression. According to the data, participant 4 showed significant positive changes in inattention. . Although the participant only showed significant changes in inattention with respect to post-intervention ratings, anecdotal evidence supports that the yoga intervention aided in reducing symptoms of his ADHD. Although this participant did not show a change in academic performance, observations reveal that his ability to concentrate and decode spelling words significantly improved in language arts class. Participant 4 stopped sleeping during class and began to develop better peer relationships. He began assisting others in class projects and volunteering to read in class.

*Participant 5.* Participant 5 was medically diagnosed with ADHD predominately inattentive. According to the Vanderbilt Scale, participant 5 scored high in hyperactivity, inattention, and anxiety/depression. Based on the aims of the project, the hypothesis could not be confirmed in participant 5's case. He showed significant improvements in inattention. According to the parent survey, participant 5's parents stated they never intend to put their child on medication. They were looking for other ways to help him stay focused in class. Participant 5 did not show any change in academic achievement. However, during language arts he began completing assignments independently and assisting others with completing their assignments. In

mathematics class, his participation increased both independently and during group activities. Although he continued to doze off in class, he did show improvements. However, the lack of improvement could be why he did not show a significant change in behavioral performance.

*Participant 6.* Participant 6 was medically diagnosed with ADHD- predominately inattentive. As a result, the hypothesis was confirmed for participant 6 as there was a significant change in inattentive behaviors. The Vanderbilt ADHD Scale scored participant 6 high in several additional categories including hyperactivity and anxiety/depression. Participant 6 did not show a significant change in academic or behavioral performance. This is surprising given the remarkable progress made during class. During the yoga intervention, participant 6 went from not being able to sustain attention to tasks, to being able to participate in class by reading aloud and answering questions. He was able to focus on completing tasks, however prior to the intervention, he did not comply well with detailed instructions. If a task required more than two or three steps to complete, he would be unable to complete the task. However, this could be due to a processing or memory deficit rather than lack of concentration. Immediately following the yoga intervention, the participant was able to remember details for specific tasks, which was shown by his ability to assist others in completing tasks.

*Participant 7.* Participant 7 was only one of two females in the yoga intervention. She was medically diagnosed with ADHD – combined type and had several co-morbid disorders such as bipolar and obsessive compulsive disorder. She scored high on the Vanderbilt Diagnostic Scale in hyperactivity, inattention, anxiety/depression, and ODD/CD. Participant 7 received counseling at least once per month. In addition to these services, she was taking several medications that were changed multiple times during the course of the yoga intervention. As a result of the different medication changes several different behavior issues occurred during class.

Several outbursts and crying fits occurred multiple times per day. It is unclear if these events were a result of the bipolar disorder, medication changes, or maturation. Participant 7 did not show significant improvements in the Vanderbilt ADHD subcategory hyperactivity or anxiety/depression. During a meeting, her parents discussed that they were not changing her medication for her ADHD until they were able to help her emotionally. Her parents were extremely excited about the yoga intervention and were pleased to know that it would be used as a method for reducing anxiety, as this was something she was working on during counseling sessions. It is unclear if the parents had her practice yoga at home, however, meditation was part of her after school karate class.

In each additional category, inattentiveness and ODD/CD, she showed significant improvements. During this time, participant 7 also showed improvements in academic achievement and behavioral performance. It is unclear if the changes can be attributed to the yoga intervention due to the significant changes in medication or counseling efforts on the part of the parents and psychiatrists. What can be noted however, is that prior to the yoga intervention the participant lacked confidence in her academic abilities and ability to get along with others. The researcher observed a dramatic change in her ability to work collaboratively in a group setting. In fact, she even began tutoring others and assisting many students in mathematics. As a result, the hypothesis was confirmed for the majority of ADHD subcategories but not in others.

*Participant 8.* Participant 8 was the second girl who participated in the intervention. Formally, she was medically diagnosed with ADHD- combined type and learning disabilities in reading, language arts, and mathematics. Participant 8 scored high on the Vanderbilt ADHD Scale in inattention, hyperactivity, anxiety/depression and ODD/CD. The hypothesis was confirmed in some areas but not in all. Participant 8 showed significant changes in hyperactivity

and inattention, but did not show significant improvement in academic performance.

Observations indicate she was working hard to improve her academic performance, specifically during mathematics. She consistently took notes and completed independently class work. She was also able to perform better in written tasks. Prior to yoga intervention, she would only write two or three sentences for writing assignments. After the yoga implementation, she was able to write multiple pages. Her grammar was not completely accurate, but she was still able to produce written expression. The Vanderbilt ADHD Scale revealed high scores in ODD/CD due to constant lying in class. Although this did not continue on a regular basis, it was an occasional problem, which could be the reason why there were no significant changes in ratings of ODD/CD.

*Participant 9.* Participant 9 was formally diagnosed with ADHD- predominately inattentive. He scored high in the subcategories of anxiety/depression, hyperactivity, and inattention. Based on the data, participant 9 confirmed the hypothesis because he showed significant changes in the subcategory of inattention. During the yoga intervention, this participant was having significant troubles at home. Because this participant may not have used the yoga intervention at home, his anxiety may not have decreased as much as it would have if he had used the yoga intervention at home. Further, there was also no significant change in his academic or behavioral performance, which is interesting given the observations made during the yoga intervention. According to his Individualized Education Plan (IEP), he was to have a scribe and as a result did not usually perform well with written assignments. Remarkably during a poetry segment, he began using the thesaurus, dictionary, and his own imagination to come up with creative poetry. He also improved greatly in his team work skills. During mathematics class, group competitive activities were used for reinforcement and reinforcement of skills. He

became the cheerleader for his team. He would not let his team give up and if someone did not understand how to perform a particular math problem, and would take the time to go up to the board and show them how to complete the problem. Based on the data, the participant confirmed the hypothesis through improvements in hyperactivity and inattention, but did not display significant changes in anxiety/depression, and academic and behavioral performance.

### *Conclusions*

Overall, this study revealed positive significant changes in overall (summed) participant scores in all but one of the Vanderbilt ADHD Diagnostic Teacher Rating Scale subgroups. The only score that did not show a significant change was peer to peer relationships. It is difficult to say with any certainty that changes in ADHD symptoms were due to the yoga intervention. The weakness of an AB design is that it does not allow for the results to be replicated. However, the significance of this type of design is that it could be done in the school setting with consistency and little intrusion.

Further, yoga allows for simple exercises to be used in class as part of the curriculum. It is difficult to say if allowing the students to perform push-ups, jumping jacks, or other aerobic activities would have produced similar results to that of the yoga implementation. Some research studies show that implementing simple exercise regimens in class helps students with ADHD to release excess energy (Putnam, 2001). This same research suggests that even short 10 minute non-aerobic exercises have shown promising effects in concentration and reducing classroom disruptions. However, the benefits of yoga are that it not only uses exercise as a way to release excess energy, but it also teaches participants how to focus their energy and concentration via deep breathing and relaxation techniques. Further, research has shown that meditative deep breathing exercises have a calming and focusing effect and relaxation exercises have shown

positive effects on hyperactivity, impulsivity, and inattentiveness (Harrison, Manocha, & Rubia, 2004; Peck, Kehle, Bray, & Theodore, 2005; Ruiz, 2001; Shannahoff-Khalsa, 2004; Throll, 1982; Zipkin, 1985). Thus, yoga may have contributed to the dramatic positive results.

### *Limitations*

Despite the overall positive results of using yoga in the classroom, there are other issues to consider including methodological issues. The sample size was extremely small and was more homogenous with respect to age and gender. The participants themselves were extremely different with respect to medication needs, I.Q., co-morbid disorders, and learning disabilities. Ratings of subtypes of the disorder were also mixed. Some participants were rated as predominately inattentive, others exhibited the combined type and a few were rated as hyperactive as described by the DSM-IV. There was also variability in the number of yoga sessions attended and the amount of time each participant received. Yoga intervention was only performed in the special education resource room. Some students spent most of the day in the resource room while others only spent one or two periods in the resource room. Yoga intervention could have lasted anywhere from 5 to 20 minutes given the participant's class schedule.

The use of the Vanderbilt ADHD Diagnostic Teacher Rating Scale in this study is a subjective scale. Given that both the cooperating teacher and student teacher knew the questions guiding the study, it may have been difficult to be as objective as possible when completing the survey. Further, because different teachers gave input for the pre- and post-rating scale, different teachers have different standards regarding the behavior and severity of behavior. As a result, the scores could have been effected by teacher inter rater reliability. In the future, interval data could be collected on each participant based on a specific set of criteria for a specific amount of time

by an observer. The tallies could be used to determine if specific ADHD behaviors decrease for each participant. This would be a more controlled study and more consistent with regard to data collection methodologies.

Another variable was the parent survey. It was discovered that most of the parents did not have significant knowledge of the participant's reason for being in a special education classroom. Thus, the cooperating teacher and student teacher used academic information to complete missing pieces of the survey. As a result of laws protecting medical information (HIPAA), some medical information was not included in school records – as medication, or changes in medication were not mentioned in school records. It was also clear that some parents used the survey as a way to express their frustration with medical professionals and the diagnosis of their child rather than answering questions specifically. In one instance, a parent did not have the ability to answer specific questions because of their own lack of academic knowledge. Because of the variability of information gathered from many sources, miscommunications could occur between several professionals including parents, teachers, administrators, and medical professionals resulting in incomplete student records.

Finally, it is difficult to say if the yoga intervention generalized across settings. Did the participants show decreased levels of anxiety and stress while at home? Were the participants able to control erratic behaviors or inattentiveness at home? These questions would be interesting to have answers to and future research could involve a parent/guardian survey to record behavior outside of the classroom.

The use of yoga as a complementary, as opposed to alternative, treatment for students with ADHD appears to have some merit in the classroom. In order to have the opportunity to discover more about yoga intervention in the classroom, there are several opportunities for future

exploration and study. First and foremost, ideally it would be beneficial for the research to be continued for a longer time and collect data using the Vanderbilt ADHD Diagnostic Teacher Rating Scale periodically in order to determine any progressive benefits of the yoga intervention.

This study needs to be replicated with larger numbers and more reliable measures need to be employed before it can be recommended as a reliable intervention for children with ADHD. Because of the success of the summed participant data, the yoga intervention should be replicated in a classroom for students in a general education setting as well as those students with moderate to severe disabilities.

Implications for future research include:

- Continued use of the research methodology for an extended time period
- More controlled time intervals for yoga intervention
- Use of more reliable measures such as an outside observer with an interval recording data sheet to record targeted behaviors
- Expanded research to include typically developing students as well as students with more severe disabilities
- Change the methodology so a yoga group is compared against an intervention group who perform general exercises with no emphasis on breathing techniques.
- Use a certified 'yoga kids' instructor to conduct in-class yoga sessions
- Gather parental input regarding the effects of the yoga intervention after school to determine generalization effects.

This area of research is extremely promising and could result in an effective way to help all students increase their concentration in school. Many people have tried to explain the benefits of yoga, but few actually have data to back up anecdotal evidence. There is a lack of

non-eastern studies that have examined the use of yoga as a classroom intervention for students with ADHD or any disability. With future research, this could become an extremely beneficial classroom management tool benefiting entire groups of students and school districts.

### Implications- Bringing Yoga Into Schools

Yoga seems to be a modern way of healing and relieving stress. Today more than 16.5 million Americans are taking classes in hatha yoga (Gillen & Gillen, 2007). Before the 1920s, typical yoga training was practiced by adults in studios. Few gyms or studios offered yoga for children. At the turn of the decade, new age medications began to surface and parents became increasingly aware of the effects of stimulant medications. As such, alternative treatment programs began to surface with yoga being one such treatment.

Today, more than ever before, teachers are being forced to show increased academic performance in all students and they are challenged by low academic achievement, increasing prevalence of disability, unfunded schools that require increased scores on standardized tests in regular and special education, loss of unified arts programs that promote balanced education, and other moral and ethical issues such as teen pregnancy, suicide, and drug and alcohol abuse amongst minors (D.Cherry, personal communication, February, 2009; Gillen & Gillen, 2007).

Not to mention, from discussions with teachers they argue that they spend a significant amount of time pursuing ways to manage classroom behavior in an effort to improve academic achievements. As a result of the added stress and pressures for educators and students, yoga surfaced as a way to help address the challenges of educating children today. In 2007 Purdue University conducted a study using the Yoga Kids Tools for School Program in a K-5 education setting (as cited in Gillen & Gillen, 2007). The research team found significant improvements in

academic achievement, personal attributes, relationships, and general health. Yoga Calm for Kids also created a program specifically to be used in schools. Their program differed from yoga kids as it addressed not only the physical aspects of yoga but also the emotional components of yoga. Both programs foster an integrated learning approach using breathing, postures, and meditation that enhance the child's emotional needs, mental needs and physical needs. Both programs can be easily implemented into the already designed curriculum and with astounding testimonials and background research to reveal the effects of using yoga in the classroom it seems almost a miracle treatment to aid in stillness, listening, and strength.

Putnam (2004) argued that in as little as 10 minutes of exercise a day disruptions would be minimized. With yoga, in ten minutes you can have a child who not only disrupts class less often, but also demonstrates less hyperactivity, impulsivity, and increased ability to focus on tasks, reduction of anxiety/ stress, increased physical health, and increased team work skills. These fundamental improvements are especially beneficial for students who have ADHD or ADHD with co-morbid disorders. Yoga provides a therapeutic alternative way for students in a classroom to release excess energy that can benefit their overall academic and behavioral performance. The use of yoga could be a potentially beneficial intervention for more educators to try. An intervention of this type could provide increased academic achievement for students, schools and entire districts. When teachers consider the amount of time per day lost as a result of behavioral problems, a ten minute a day yoga intervention could be a way to maintain classroom behavior and provide many benefits to students, parents, and educators.

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APPENDIX A

PARENT SURVEY

Please complete this survey and return it with the signed consent forms. Please remember this information will be kept confidential and in a secure location.

Name of Student participating in research study: \_\_\_\_\_

Age of student: \_\_\_\_\_

Weight of student : \_\_\_\_\_

Grade level: \_\_\_\_\_

Gender: \_\_\_\_\_

Nationality: \_\_\_\_\_

Country of birth \_\_\_\_\_

1.) Reason for Special Education Resource (Diagnosis)? :

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2.) How many days a week does your child receive special education and for which classes?:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3.) Is your child currently taking medications? (This question is being asked for research purposes only. Students who are taking specific medication could have a better reaction to the yoga exercises. This information will help to explain results only) Please specify type:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4.) Does your child currently receive additional academic interventions (i.e. Social skills, ABA therapy, other behavior modification programs) please specify which type and how many hours per week.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5.) What type of organized physical activity does your child currently participate (i.e. Karate, Softball, gymnastics)? Please specify how many days a week your child attends the activity.

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6.) What type of other extra curricular activities is your child involved (i.e. choir, church, musical instruments, boy scouts, art/ theatre)? Please specify how many days a week your child attends the activity.

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APPENDIX B

# Vanderbilt ADHD Diagnostic Teacher Rating Scale

## INSTRUCTIONS AND SCORING

Behaviors are counted if they are scored 2 (often) or 3 (very often).

<b>Inattention</b>	Requires six or more counted behaviors from questions 1–9 for indication of the predominantly inattentive subtype.
<b>Hyperactivity/ impulsivity</b>	Requires six or more counted behaviors from questions 10–18 for indication of the predominantly hyperactive/impulsive subtype.
<b>Combined subtype</b>	Requires six or more counted behaviors each on both the inattention and hyperactivity/impulsivity dimensions.
<b>Oppositional defiant and conduct disorders</b>	Requires three or more counted behaviors from questions 19–28.
<b>Anxiety or depression symptoms</b>	Requires three or more counted behaviors from questions 29–35.

The performance section is scored as indicating some impairment if a child scores 1 or 2 on at least one item.

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The scale is available at [http://peds.mc.vanderbilt.edu/VCHWEB\\_1/rating~1.html](http://peds.mc.vanderbilt.edu/VCHWEB_1/rating~1.html).

### REFERENCE FOR THE SCALE'S PSYCHOMETRIC PROPERTIES

Wolraich ML, Feurer ID, Hannah JN, et al. 1998.  
Obtaining systematic teacher reports of disruptive  
behavior disorders utilizing DSM-IV. *Journal of  
Abnormal Child Psychology* 26(2):141–152.

# Vanderbilt ADHD Diagnostic Teacher Rating Scale

Name: \_\_\_\_\_ Grade: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ Teacher: \_\_\_\_\_ School: \_\_\_\_\_

Each rating should be considered in the context of what is appropriate for the age of the children you are rating.

**Frequency Code: 0 = Never; 1 = Occasionally; 2 = Often; 3 = Very Often**

1. Fails to give attention to details or makes careless mistakes in schoolwork	0	1	2	3
2. Has difficulty sustaining attention to tasks or activities	0	1	2	3
3. Does not seem to listen when spoken to directly	0	1	2	3
4. Does not follow through on instruction and fails to finish schoolwork (not due to oppositional behavior or failure to understand)	0	1	2	3
5. Has difficulty organizing tasks and activities	0	1	2	3
6. Avoids, dislikes, or is reluctant to engage in tasks that require sustaining mental effort	0	1	2	3
7. Loses things necessary for tasks or activities (school assignments, pencils, or books)	0	1	2	3
8. Is easily distracted by extraneous stimuli	0	1	2	3
9. Is forgetful in daily activities	0	1	2	3
10. Fidgets with hands or feet or squirms in seat	0	1	2	3
11. Leaves seat in classroom or in other situations in which remaining seated is expected	0	1	2	3
12. Runs about or climbs excessively in situations in which remaining seated is expected	0	1	2	3
13. Has difficulty playing or engaging in leisure activities quietly	0	1	2	3
14. Is "on the go" or often acts as if "driven by a motor"	0	1	2	3
15. Talks excessively	0	1	2	3
16. Blurts out answers before questions have been completed	0	1	2	3
17. Has difficulty waiting in line	0	1	2	3
18. Interrupts or intrudes on others (e.g., butts into conversations or games)	0	1	2	3
19. Loses temper	0	1	2	3

*(continued on next page)*

Vanderbilt ADHD Diagnostic Teacher Rating Scale (continued)

Frequency Code: 0 = Never; 1 = Occasionally; 2 = Often; 3 = Very Often

20. Actively defies or refuses to comply with adults' requests or rules	0	1	2	3
21. Is angry or resentful	0	1	2	3
22. Is spiteful and vindictive	0	1	2	3
23. Bullies, threatens, or intimidates others	0	1	2	3
24. Initiates physical fights	0	1	2	3
25. Lies to obtain goods for favors or to avoid obligations (i.e., "cons" others)	0	1	2	3
26. Is physically cruel to people	0	1	2	3
27. Has stolen items of nontrivial value	0	1	2	3
28. Deliberately destroys others' property	0	1	2	3
29. Is fearful, anxious, or worried	0	1	2	3
30. Is self-conscious or easily embarrassed	0	1	2	3
31. Is afraid to try new things for fear of making mistakes	0	1	2	3
32. Feels worthless or inferior	0	1	2	3
33. Blames self for problems, feels guilty	0	1	2	3
34. Feels lonely, unwanted, or unloved; complains that "no one loves him/her"	0	1	2	3
35. Is sad, unhappy, or depressed	0	1	2	3

**PERFORMANCE**

	Problematic		Average	Above Average	
<b>Academic Performance</b>					
1. Reading	1	2	3	4	5
2. Mathematics	1	2	3	4	5
3. Written expression	1	2	3	4	5
<b>Classroom Behavioral Performance</b>					
1. Relationships with peers	1	2	3	4	5
2. Following directions/rules	1	2	3	4	5
3. Disrupting class	1	2	3	4	5
4. Assignment completion	1	2	3	4	5
5. Organizational skills	1	2	3	4	5