JAG

Project Number: 51-JAG-021

AD/HD AND LIFE

An Interactive Qualifying Project Report
submitted to the Faculty of
WORCESTER POLYTECHNIC INSTITUTE
in partial fulfillment of the requirements for the
Degree of Bachelor of Science
by

Melissa Barter | Eric Harvey | Monica Zuray

Date: February 27th, 2003

Approved:

Advisor: John Goulet

Co-Advisor: Dale Snyder

Abstract

Worcester Polytechnic Institute's (WPI) Disability Services Office felt the need for a website which could make the transition from high school to college easier for incoming students with Attention Deficit/Hyperactivity Disorder (AD/HD). After researching pertinent information on the disorder, the project team designed a website which was aimed toward providing specific information for coping with WPI's fast-paced environment. The website, located as a link off of the disability services homepage (http://www.wpi.edu/Admin/Disabilities), included topics such as coping strategies, personal stories from current WPI students with AD/HD and general information on the disorder. The project team created an online survey and found that most people found our website useful, informative and, most importantly, aimed toward assisting high school students entering college.

Table of Contents

1 Introduction

Although many students with Attention Deficit/Hyperactivity Disorder (AD/HD) feel as though no one else experiences the difficulties they face, many people have the disorder. In most cases, a child or teenager with AD/HD must learn to cope with his disorder effectively in order to be successful, especially in the world of academia. Worcester Polytechnic Institute's short seven week terms can make it especially difficult for a student with AD/HD to achieve success. The goal of this Interactive Qualifying Project (IQP) is to find coping strategies which could specifically help an incoming WPI student with AD/HD. However, the coping strategies and tips for making transitions that are provided can be helpful to everyone, even those without the disorder.

2 Literature Review

2.1 History

The symptoms characterizing AD/HD have existed throughout much of history; however it wasn't until recently that these symptoms were categorized into the disorder that we now call AD/HD. In fact, accounts of AD/HD symptoms such as hyperactivity and inattentiveness date back to the 19th century (Millichap, 1998). The first written account was in 1845, when a German poet by the name of Hoffman published a story about a child named Fidgety Phil. Even though they were recognized much earlier, the first attempts to view these neurological symptoms in a systematic and scientific way weren't until the early 1900s. At the time, the English doctor G.R. Still termed the disorder "abnormal defects in motor control" (Flick, 1998, p. 19). He was the first to find the prevalence of AD/HD symptoms in males over females and to investigate the effects of the child's environment on his behavior and actions. In 1908, Tredgold related AD/HD to brain injury; he believed that brain trauma early in life could result in difficulties in school and the onset of AD/HD symptoms later in life (Flick, 1998). Tredgold's theory that AD/HD was the result of brain damage would later be the reasoning behind the first name given to the disorder: minimal brain damage. In 1923, during the outbreak of encephalitis, many doctors found that the disease could result in symptoms of impulsivity, inattention, and

hyperactivity. Thus, the disorder then came to be known as postencephalitic behavior disorder. At this time, the general consensus among medical professionals was that an underlying neurological disorder could result in behavioral problems (Millichap, 1998). The next major advance in the area of AD/HD was by Childers, who presented children with symptoms of hyperactivity and differentiated them from children with brain damage. By doing this, he found that only a small number of hyperactive children have brain damage (Flick, 1998).

By 1937, some of the first experimental medications for AD/HD were available. Bradley used the amphetamine Benzedrine to help reduce headaches and found that it improved behavior, attention and school performance (Flick, 1998). Ritalin (brand name methylphenidate) became commercially available in 1957. However, the use of this drug was widely questioned because many did not believe that stimulant medications could help a hyperactive child. In fact, medical professionals had no idea exactly how or why it worked to treat AD/HD symptoms but they found that it did work for most people. Since then, there has been much research done on methylphenidate and it has become the number one most researched psychotropic drug used in the treatment of children (Jones, 2000).

By the 1950's, the idea that AD/HD symptoms were treatable was more widely accepted. The disorder was later named hyperkinetic-impulsive disorder in North America and hyperkinetic syndrome by the World Health Organization (WHO). As time progressed, the symptoms and mechanisms of the disorder were better understood. In 1972 when Virginia Douglas and Susan Campbell reported research to the American Psychological Association (APA) showing that children could experience problems with sustained attention even in the absence of distraction, the disorder evolved into its modern form: AD/HD (Flick, 1998).

2.2 Differences between ADD and ADHD

ADD and ADHD are commonly lumped together into one disorder but in many ways the symptoms of someone with ADD can be drastically different than someone with ADHD. The typical ADHD child exhibits symptoms that include hyperactivity, resulting in a much different disorder. They typically have little appreciation for societal, ethical, social, moral or even legal

consequences of their actions (Hunsucker, 1988). They have almost no concept of right and wrong so it is common for them to have little respect for other people's feelings or property. The child can be disruptive in class because they are restless and tend to yawn or consistently repeat physical movements such as tapping (Gross, 1997). Hyperactivity makes it difficult for them to remain calm, resulting in symptoms such as excessive talking or other symptoms of over-activity (Hunsucker, 1988). The child may have difficulty falling asleep at night and thus may exhibit signs of mental fatigue during the day (Alexander-Roberts, 1995).

The ADD child exhibits symptoms that are much different and, at first glance, may not even seem related to ADHD. The ADD child is seldom oppositional, aggressive or noncompliant. They are generally unaware of what is going on around them because they are inwardly focused (Alexander-Roberts, 1995). These children may seem shy and withdrawn because they generally sit in the far back corner of the classroom and avoid social situations (Hunsucker, 1998). They are almost never disruptive because they do not wish to bring any unneeded attention to themselves, much unlike the ADHD child who seeks attention (Alexander-Roberts, 1995). They may want to avoid social situations so badly that they don't defend themselves and will let other children tease or otherwise pick on them. The ADD child may have academic difficulties similar to the ADHD child, but many times they will put forth much more effort to accomplish things that are difficult for them (Hunsucker, 1998). When the very different symptoms of ADD and ADHD are lumped together into one disorder it creates many misconceptions about what behavior an ADD child should or should not exhibit. It is common for the teacher or parent to believe that a certain child cannot have ADD because they try hard at school and are not disruptive to others around them; however, this is not always the case. It is important to understand that the symptoms of ADD and ADHD are very different and that the way they manifest themselves can vary from person to person.

2.3 Causes of AD/HD

Despite the large advances in understanding AD/HD, there is still much that is not understood about the disorder. There is no single cause for AD/HD but rather a variety of neurobiological, physiological and psychological theories that have been developed (Alexander-Roberts, 1995).

Each of these theories tries to explain what is different in the brain of an AD/HD child or adult and what may be causing these differences. The neurobiological theory has become the most respected in the medical field.

2.3.1 Neurobiological Theories

Even though there are a few different neurobiological theories regarding the onset of AD/HD, they all share the common idea that the disorder is hereditary (Alexander-Roberts, 1995). The transition method of this genetic trait is autosomal dominate, meaning that only one parent has to have the trait for the child to exhibit AD/HD neurology. If one parent has the gene then there is a 50% chance that the child will have the disorder; if both parents have the trait then there is a 75% to 100% chance. A genetic trait with an autosomal dominate transition method does not skip generations, which means that if the child has AD/HD then one of the parents must have it as well. It is commonly believed that boys are more likely to develop AD/HD than girls, however there is an equal genetic probability for both girls and boys to develop the disorder. Females generally have more subtle symptoms of AD/HD than do males which may cause them to go undiagnosed and thus males seem to have a higher incidence of the disorder. More proof for the genetic approach to AD/HD stems from the fact that medications for AD/HD can have an effect on the patient within days of the first dosage, which proves that the disorder is not environmentally-induced but rather is based in one's genes (Gross, 1997).

2.3.1.1 The Limbic System

The first major, and most widely accepted, of these neurobiological theories is that of a neurotransmitter deficiency, specifically that of the neurotransmitter dopamine. Neurotransmitters are located in the brain and are part of the central nervous system (CNS). The CNS is the command center of the brain and contains millions of nerve cells. Each of these cells has the ability to transmit electrical impulses, which form the foundation for thought processes. These impulses transmit from one nerve cell to another through a synapse, which is a gap between nerve cells (Kelly & Ramundo, 1993). The synapse is filled with neurotransmitters whose concentration and composition determine how well the nerve cells communicate with one

another. The exact location of the proposed dopamine deficiency in the brain of a person with AD/HD is not known but many suspect that it is in the limbic system, commonly called the "primitive part of the brain" (Gross, 1997, p. 11). The limbic system is responsible for many problems such as impulsivity, rage, stress, negative social behaviors and memory and sexuality problems. The symptoms of AD/HD are consistent with symptoms resulting from abnormalities in the limbic system (Gross, 1997). Support for this theory comes from the fact that Ritalin, a drug commonly used to relieve AD/HD symptoms, contains dopamine and is used to regulate dopamine levels in the brain.

2.3.1.2 The Frontal Lobe and the RAS

Some medical experts believe that AD/HD is a result of reduced blood flow to the brain, especially the frontal lobe (Kelly & Ramundo, 1993). This reduction in blood flow leads to a disruption in many of the brain's functions. The frontal lobe regulates activity, emotion and attention levels. When the frontal lobe is not operating correctly, symptoms similar to those associated with AD/HD are apparent. However, symptoms caused by a disruption in the frontal lobe are many times more severe than those observed in AD/HD patients; thus many medical professionals do not support this theory (Alexander-Roberts, 1995). Another proposed theory claims that a disruption in the normal functioning of the reticular activating system (RAS) is the cause of AD/HD. This system is located in the brain stem and regulates alertness and other functions similar to those regulated in the frontal lobe. The frontal lobe and the RAS form an interconnected loop in the brain. Some believe that AD/HD symptoms are caused by a break or disruption in this loop, similar to a short in an electrical circuit (Kelly & Ramundo, 1993).

2.3.1.3 The Inner Ear

Some experts claim that 90% of AD/HD patients have an inner ear problem (Levinson, 1990). The part of the brain that is affected by the inner ear is called the cerebral vestibular system (CVS). The CVS receives and processes all sensory data in the brain and is responsible for regulating all motor functions, including balance. An abnormality in this part of the brain can cause difficulties with coordination, energy control and the ability to focus. Many of these

difficulties are apparent in AD/HD patients, which has led medical professionals to believe that AD/HD symptoms may be related to a disruption in the inner ear. According to this theory, AD/HD symptoms can be caused by a physical injury to the brain or inner ear later in life (Levinson, 1990).

2.3.1.4 The Farmer and the Hunter

Lastly, some view AD/HD symptoms as a natural evolutionary genetic trait, not as a disorder. Thousands of years ago, hunting was essential for survival. Hunters must be able to take risks, take in all of their surrounding at once and have good visual spatial skills. These are all common AD/HD characteristics that many people living at this time had to possess in order to survive. As time progressed however, the need for these characteristics lessened because people no longer had to hunt for their food. Thus those people without AD/HD symptoms, called the farmers by this theory, became more predominant in society. The farmer tends to be very slow and careful while the hunter tends to be very impulsive (Hartmann, 1993). Today most people are a blend of both the hunter and farmer characteristics although the extremes do still exist.

2.3.2 Physiological Theories

Symptoms of AD/HD or, in some cases, even the onset of the disorder, may be caused by one's environment. It is believed by some medical professionals that overexposure to environmental toxins, such as lead and cigarette smoke, can cause children to display symptoms similar to AD/HD even if the child does not have the disorder. However, it is proven that environmental toxins can affect, and may even damage, certain parts of the brain. Damage to the brain can result in the onset of AD/HD symptoms, as explained in the Neurobiological sections above. Pregnancy and child birth complications are also believed to increase the probability of the child having AD/HD because these complications can result in damage to the CNS. Another theory is that AD/HD symptoms may be displayed in children with sleep disorders; in fact, AD/HD is believed to be a form of a sleeping disorder by some medical professionals. It is believed that people with AD/HD are never fully awake because they do not get enough sleep and thus their behavior is a coping method to try to keep themselves from falling asleep. Another common

theory is that food additives, dyes and sugars can cause AD/HD symptoms or make them more severe. However, a change in one's diet only relieves AD/HD symptoms for approximately 5% of those who try it (Kelly & Ramundo, 1993). The last of these physiological theories is that florescent lights can make certain AD/HD symptoms, especially hyperactivity, more severe (Hunsucker, 1998).

2.3.3 Psychological Theories

The last, and least respected, of the theories for the onset of AD/HD are the psychological theories, which claim that AD/HD is a disorder of the mind, not the brain. It is not widely accepted that the onset of AD/HD can be caused by psychological factors; however, it is believed by some that symptoms may worsen under certain conditions. It has been shown that parenting methods and other environmental factors can predict the behavior of a child. Corrupt parenting methods are not viewed as a cause for the onset of AD/HD by most professionals, however children who already have AD/HD may experience more severe symptoms if they are raised in this type of situation. The worst of these situations for an AD/HD child, especially an AD/HD teenager, is a controlling parent who inflicts excessively harsh punishment or a parent that is negligent (Alexander-Roberts, 1995). The information explosion theory is the last of the psychological theories for AD/HD. This theory proposes that AD/HD is a result of the increasing complexity of the knowledge possessed by society due to major advances in all areas of education (Kelly & Ramundo, 1993). A child in the modern school system is expected to learn so much by such a young age that the vast amount of information can become overwhelming. Due to the increase in society's knowledge base, children are also required to sit through longer classes and more years of schooling, which can lead to boredom and AD/HD symptoms in some people.

2.4 Symptoms

Even though there is not much solid evidence for the cause of the disorder, the symptoms resulting from AD/HD are well understood. These symptoms have both negative and positive aspects that can vary according to sex, age and the individual person. Clinical symptoms of

AD/HD can surface as early as three years of age, although more subtle signs may be noticeable during infancy, and, due to the neurobiological origins of the disorder, will continue throughout the person's life. Although the symptoms are continuous, they manifest themselves in different degrees and at different points in one's life and thus are always evolving. AD/HD can be interpreted as a personality type that is defined by a wide range of physical, behavioral and emotional characteristics rather than a disorder although it is considered a disorder by the medical community. Also, AD/HD symptoms are independent of IQ, meaning that a child can be as smart, or possibly even smarter, than any given child but still exhibit AD/HD characteristics (Alexander-Roberts, 1995).

2.4.1 Primary Symptoms

Primary symptoms are those symptoms which are a direct result of the neurobiological differences in the brain of a person with AD/HD as opposed to those without the disorder.

2.4.1.1 Physical

Although AD/HD is a disorder of brain function, children and adults with the disorder can still exhibit certain physical symptoms. Children with AD/HD typically have a slow physical maturity and so may be thinner and smaller than others their age (Hunsucker, 1998). They may also have sleeping problems, including difficulties with both falling asleep and waking up (Gross, 1997). In general, people with AD/HD need less sleep because they have a higher energy level than a person without the disorder, allowing them to stay awake for longer periods of time.

People with AD/HD exhibit a high tolerance for pain (Hunsucker, 1998). Therefore, they are generally not as afraid of doing things that may cause them injury and thus it is common for AD/HD children to have a lot of cuts and bruises. This high tolerance for pain may also cause a higher incidence of bed wetting after the age of five (Gross, 1997). Children with AD/HD are less aware of the pain which signals that their bladder is full and thus tend to delay going to the bathroom. Also, physical punishment, such as hitting, may not be as effective as it should be.

Despite their high tolerance for pain, children with AD/HD tend to experience more physical ailments such as colds, allergies and ear infections (Hunsucker, 1998).

Poor coordination is another physical symptom of AD/HD. In many cases, children and adults with AD/HD have an impairment of balance and fine and gross motor skills and thus are generally viewed as clumsy. Poor coordination can lead to problems with focusing of the eye, as well as hand writing difficulties (Levinson, 1990). However, as with most of the symptoms, not everyone with AD/HD is uncoordinated; in fact, many good athletes have AD/HD. The fact that people with AD/HD commonly have coordination problems is the basis for the inner ear theory for the cause of AD/HD symptoms because the inner ear controls balance as well as motor skills.

Due to the slow hemispheric development and other abnormalities in the brain of a person with AD/HD, auditory and verbal processing tends to be difficult. The AD/HD person may have a difficult time creating mental pictures from words and so may quickly forget auditory information such as directions (Hartmann, 1993). It may also be difficult for a person with AD/HD to read text because the brain interprets the written word as auditory information. Problems with processing auditory information can also result in poor speech development as well; it is common for the AD/HD person to mispronounce words or say one word when they mean another (Levinson, 1990). Another effect that is commonly seen as a result of difficulty with the processing of auditory information is an addiction to television (Hartmann, 1993). Television presents information in a visual manner, which makes it easier for a person with AD/HD to understand and focus. The person with AD/HD may even understand and perceive visual images better than a person without the disorder.

2.4.1.2 Behavioral

Since AD/HD is a neurological disorder, one's behavior is heavily impacted and thus most of the primary symptoms, such as impulsivity, inattention and hyperactivity, are related to one's behavior (Alexander-Roberts, 1995). There are several other behavioral symptoms that commonly stem from the primary behavioral symptoms such as a poor concept of time, the need for excessive stimulation, a lack of proper social skills, procrastination and substance abuse as

well as a variety of additional behavioral symptoms. Each of these symptoms can drastically affect the life of the person with the disorder as well as the lives of those around them.

As stated, one of the major behavioral symptoms is impulsivity, which includes acting without thinking of the possible consequences first and lacking self control (Alexander-Roberts, 1995). It is also common for someone with AD/HD to seem very blunt and straight forward because they may talk without thinking about the consequences of their words (Hartmann, 1993). Impulsivity leads to a need for instant reward or action which is generally manifested in the form of a temper tantrum in children and impulsive spending in adults. People with AD/HD also tend to get bored very quickly of items which they just purchased, which results in the acquisition of an extreme amount of superfluous ~~–s~~tuff" (Alexander-Roberts, 1995). However, impulsive decision making can have more serious effects then simply careless spending and temper tantrums; impulsivity can make teens more prone to peer pressure, dangerous behavior and quick and severe mood swings (Levinson, 1990). Succumbing to peer pressure, which is common with AD/HD children and teenagers, can lead to substance abuse. In general, those with AD/HD are ten times more likely to abuse drugs and alcohol than those without the disorder. In fact, as much as 35% of those with the disorder will abuse alcohol or drugs at some point in their life; the percentage is even higher for those who have a comorbid conduct disorder (Alexander-Roberts, 1995).

In general, a person with AD/HD experiences inconsistencies in their attention and distractibility levels. They may have problems focusing on only one event and instead attempt to absorb everything in their surroundings (Hartmann, 1993). Therefore, people with AD/HD may become easily overwhelmed and distracted when there is a large number of stimuli around them. An AD/HD student, for example, may focus more on what is happening around them than what the teacher is saying and thus may miss an entire lecture even though they were present (Gross, 1997). On the other hand, a person with AD/HD may attend very intensely to something which interests them. However, this extreme concentration generally only lasts for a short period of time (Alexander-Roberts, 1995). It is common for a person with AD/HD to have difficulties reading due to their inconsistent attention levels. He may forget the beginning of a paragraph before he reaches the end or he may have to read a paragraph many times before he fully

understands the given information (Gross, 1997). As a person with AD/HD gets older, they may tend to never finish what they start or to have difficulty keeping a job for a prolonged period of time (Alexander-Roberts, 1995).

People with ADHD, more so than people with ADD, generally have very poor self-monitoring skills and thus find it difficult to regulate their own behavior (Alexander-Roberts, 1995). There are several symptoms which are associated with poor self-monitoring skills such as a hot temper, being easily irritable and frustrated, quick and frequent mood shifts and explosive behavior (Gross, 1997). Even though someone with ADHD may show genuine remorse for a previous misbehavior, they may continue to misbehave in identical or similar ways because they do not think before they act. Due to their impulsivity and hyperactivity, someone with ADHD may have difficulty performing activities which are extremely frustrating, such as waiting in traffic. A school age child with these symptoms may experience extreme inconsistencies in their grades and test taking abilities (Hunsucker, 1998).

People with AD/HD also tend to have a poor concept of time. Their elastic perception of time can make some activities seem as though they took only a few minutes when they actually took a couple of hours and vice versa. Thus, activities such as a class lecture may seem to last an eternity (Hartmann, 1993). Since people with AD/HD have difficulty predicting how long tasks will take, it is common for them to be constantly running late (Alexander-Roberts, 1995). Their sense of time is affected by their emotional highs and lows as well. Someone with AD/HD may perceive times which they are enjoying to go very quickly while those times in which they are mad or sad seem to last forever (Hartmann, 1993).

People with ADHD, more so than those with ADD, are generally bored with life's daily routines and will seek out unique and stimulating activities. These activities are generally more dangerous than average because people with ADHD, especially teenagers, seek out the most intense stimuli. If a teen cannot find stimuli which fill his needs he may begin to start arguments with authority, such as his parents. A teenager with ADHD may argue excessively, never take no for an answer, start fights for no logical reason and constantly test the limits of his parents (Alexander-Roberts, 1995).

People with AD/HD interact and interpret social situations much differently than do others and thus they may not even notice that they are fighting with their parents simply to fight. A study found that up to 80% of AD/HD teenagers have significant social problems (Alexander-Roberts, 1995). The majority of people with AD/HD have to try hard to interact well with others and have difficulty knowing how to react in specific social situations. They may not know how to respond when asked certain questions and may become nervous or uncomfortable because they are worried they will say something wrong. It is also difficult for the AD/HD person to understand subtle aspects of conversations, such as insinuated jokes, and remember people's names. Their social ineptness may lead to a fear of social interaction which is manifested in reduced eye contact during conversation. Since they are avoiding eye contact, people with AD/HD commonly have difficulty interpreting subtle and non-verbal cues as to how others are reacting to their words and actions. Due to their difficulties interacting with others, people with AD/HD oftentimes become frustrated and choose to isolate themselves rather than be in situations which make them uncomfortable (Alexander-Roberts, 1995). Their antisocial behavior can lead to poor peer relationships, especially in teenagers, and thus they may have difficulty making and keeping friends. Feelings of isolation can be psychologically detrimental to any teenager, especially those with AD/HD (Hunsucker, 1998).

Most AD/HD children and teenagers with social problems exhibit antisocial behavior but the other extreme exists as well. It is possible for people with ADHD, more so than those with ADD, to be overly outgoing and talkative and frequently interrupt others, which may cause them to seem very domineering to their peers. Also, they may occasionally take what others say out of context and treat what they said as an insult, when it wasn't meant to be insulting (Alexander-Roberts, 1995).

Due to his behavioral symptoms, a person with AD/HD is commonly a chronic procrastinator. A student with AD/HD, more so than normal high school and college students, tends to avoid doing things that he does not enjoy until the last minute due to his skewed perception of time as well as his tendency to be easily distracted. He also tends to be more afraid of failure than others and so

he tends to delay tasks which he thinks he cannot accomplish or will have difficulty accomplishing (Alexander-Roberts, 1995).

2.4.2 Secondary Symptoms

Secondary symptoms are a result of the primary symptoms of AD/HD and are not directly related to the neurobiological differences in the brain of a person with AD/HD.

2.4.2.1 Emotional

Emotional symptoms are a person's emotional response to the other symptoms of AD/HD and do not directly relate to the neurobiological differences in the brain of a person with the disorder. Although the emotional symptoms are secondary symptoms, they can oftentimes have a greater effect on someone's everyday life than the primary symptoms because one's emotional state determines how they perceive the world around them. Emotional problems are historically very difficult to treat but, in the case of a person with AD/HD, treating the primary symptoms should have a very positive effect on the emotional symptoms as well.

Emotional symptoms of AD/HD can be displayed in many different ways such as anger, depression, guilt and a variety of other negative emotional states. Children and teenagers with AD/HD are usually very aware that they differ from others around them but they are not always sure how or why. When they are in group situations, such as after school activities and recess, they may feel like outcasts because they never seem to fit in with the other children. Children with AD/HD, especially those with ADHD, are generally not invited to birthday parties nor have a boyfriend or girlfriend due to their raucous behavior, which can be damaging to both their psychological and emotional development. After dealing with these social barriers, those with AD/HD many times blame themselves for the difficulties they experience with all kinds of relationships (Alexander-Roberts, 1995). Some people with AD/HD believe that they simply have a bad nature or a major character flaw, which can lead to a low self esteem and thus a negative self image (Levinson, 1990). Through their pessimistic view of themselves, they

convince themselves that they are stupid, lazy and sometimes even worthless (Alexander-Roberts, 1995).

The most common result of a negative self-image is depression and, in extremely severe cases, suicide. A person with AD/HD, especially a teenager, may view the world he lives in and his situation with peers or at home as miserable and may see no way out except death. A recent study found that 20% of AD/HD teenagers are very depressed and thus may be suicidal (Alexander-Roberts, 1995). The fact that impulsivity is a common primary symptom of AD/HD only increases the probability of suicidal tendencies. If an extremely impulsive person becomes very depressed, he may not consider all of his options and may decide to take the "easy" way out before considering alternate solutions. For someone with AD/HD, even something which seems trivial to others, such as a bad grade on an exam, may lead them to think about, or even attempt, suicide (Alexander-Roberts, 1995).

People with AD/HD, especially those with emotional symptoms, generally have problems with personal relationships. Most people with AD/HD, especially those who are impulsive, tend to move quickly from one person to another in their love life and thus they tend to have multiple marriages (Hartmann, 1993). These relationships are typically very short and intense, similar to the way that someone with AD/HD attends to interesting stimuli in his surroundings. As a result of his impulsive behavior and tendency for quick and intense relationships, there is a high rate of unwanted pregnancies in AD/HD teens, which leads to a large amount of children given up for adoption from AD/HD parents. A recent study found that up to 40% of adopted children display symptoms of AD/HD; since AD/HD is primarily transmitted through the genes as explained in the Neurobiological sections above, this statistic is not extremely surprising (Alexander-Roberts, 1995).

2.4.2.2 Academic Effects

The most difficult activity for someone with AD/HD is usually attending school because it requires a multitude of tasks to be undertaken successfully that are historically difficult for those with the disorder, such as test taking, sustained attention, listening, taking notes, organizing

projects, defining career goals and many more. These difficulties in the academic environment put those children and teenagers with AD/HD at a higher risk of academic failure. Statistics show that a person with AD/HD is likely to receive a lower grade on a standardized test than someone without the disorder, approximately half of AD/HD students will fail at least one grade level by the time they are an adolescent and approximately 1/3 of AD/HD students will drop out of high school. That is, an AD/HD teenager is three times more likely to drop out than a teenager without the disorder (Alexander-Roberts, 1995).

One reason for the high rate of academic failure in children and teenagers with AD/HD is the fluctuation in grades and test taking abilities due to their variable attention and distractibility levels. Also, people with AD/HD generally have to put in more time and effort to perform the same task at a quality level consistent with their peers. People with AD/HD tend to have little to no organization skills, which can have grave effects on their performance in school and at work. Poor organization can result in cluttered work environments, misplaced paperwork, lost or missed homework assignments, messy notes and many more effects which put the person with AD/HD at a disadvantage (Hartmann, 1993).

Academic difficulties for those with ADD and for those with ADHD are very different. Those with ADD tend to spend excessive time studying or at work to produce the same quality as a person without the disorder. They are constantly checking and rechecking their work for mistakes because they are desperately afraid of failure. Due to the work overload, they tend to get very frustrated. A person with ADHD has difficulty staying on task, talking too much in class and prefers the social life to academia (Hunsucker, 1998). Regardless of which form of the disorder one has, they must learn to cope and live with their disorder so that they can overcome it and succeed both at school and at work.

2.4.3 Family dynamics

The symptoms of AD/HD have a dramatic effect not only on the person with the disorder but also on his family. If the child's AD/HD symptoms are severe, the child may create stress and conflict between family members because he is constantly not living up to everyone's

expectations, or feels as though he isn't, especially during his teenage years. AD/HD teenagers have a tendency to forget about or simply not do their chores due to their AD/HD symptoms of inattention and distractibility. AD/HD children and teenagers seek extremely stimulating activities, which are usually dangerous and thus can cause harm to both the person with AD/HD and those around them, such as their siblings and friends. Activities such as these cause the parents to become very worried and nervous and thus come into conflict with their AD/HD child. If the stress in the family ever becomes too severe or if the two parents disagree with how to handle their disruptive child, the family may fall apart (Alexander-Roberts, 1995).

Traditionally, a father works all day to support the family while the mother stays at home to watch the children. In this type of family structure, the mother has to deal with the child's behavior more often than the father and will probably be more affected by having an AD/HD child. Also, the child is around his mother more often than his father and will probably be more comfortable being disobedient with her. As a result, the mother may begin to feel as though she cannot control her child or as though her child's disorder is a result of her parenting techniques. Parents in this type of family structure, or one in which the mother works while the father stays at home, must be sure to communicate with each other and help each other to control their child. However, in most modern families both the mother and the father work, which means the child is at school and an after-school care program for most of the day. It is usually easier for the parents to deal with an AD/HD child in this situation because they are not around their child all day. However, they must make sure that they are in constant communication with their child's caretaker and with each other so that their child's behavior is monitored and controlled properly throughout the day (Alexander-Roberts, 1995).

Parents cope with the stress that their AD/HD child causes in many different ways, depending on their own general attitude and demeanor. At least one of the biological parents of an AD/HD child must also have AD/HD, which can affect how they handle certain situations. Some parents may become so aggravated with their child's behavior that they begin to think irrationally, which can lead to a multitude of different scenarios, including a violent act by a parent. Parents may also begin to ignore their child's misbehavior when they are tired of the stress that an argument will cause. However, the child's bad behavior will not be corrected and the child may feel that

his behavior is appropriate and continue to misbehave. Parents may even give up on their child altogether and completely ignore his misbehavior because they feel as though there is nothing they can do (Hunsucker, 1998). When parents give up on their own child, it becomes increasingly difficult, if not impossible, for the child to see any good in himself, which can lead to depression.

Siblings of children with AD/HD can also be put under a lot of stress due to the seemingly constant arguments between their parents and their AD/HD sibling as well as their own conflicts with him. Factors such as the age and sex of the person with AD/HD, as well as the age and sex of his siblings, can change the family dynamics. It is common for an older sibling with AD/HD to be aggressive towards his younger sibling, which is especially a problem if the older AD/HD sibling is a male and his younger sibling is a female because he will tend to inflict harm on her when he gets upset (Hunsucker, 1998). Through it all, the family should try to find effective ways to control the behavior of the child with AD/HD.

2.4.4 Age Progression of Symptoms

AD/HD manifests itself in different ways throughout a person's life so infants, children, adolescents and adults all experience AD/HD symptoms in slightly different ways. The age progression of AD/HD symptoms plays a large role in diagnosing the disorder. For example, a young child who has symptoms of hyperactivity may not necessarily have ADHD; the increased activity levels may simply be a natural effect of the growing process in young children. However, if a teenager or older child exhibits excessive hyperactivity, it is highly probable that they have ADHD. Each of the primary symptoms of AD/HD exists at all ages, the difficulty lies in determining whether the child's behavior is normal, the result of some disorder other than AD/HD or the result of AD/HD itself.

Although AD/HD cannot be diagnosed with any certainty in infants, there are many behaviors that indicate the possibility of AD/HD symptoms later in life. During infancy, the primary symptom of AD/HD is irregular sleeping patterns or an infant who doesn't sleep as long as normal. It has also been observed that infants with AD/HD dislike being cuddled and, when they

are being held, like to have their arms and legs free. As the child approaches two years of age, the behavioral symptoms of AD/HD usually become more apparent and the child may begin to misbehave more than other children. The child may also be more adventurous than the other children and perform dangerous activities, potentially hurting himself and those around him. As the child enters pre-school, teachers may begin to recognize AD/HD symptoms in the child. Children with AD/HD may show aggression in school by destroying toys, hurting other children and throwing temper tantrums. Some teachers may feel that the child is immature or they may have a sense that there is something different about the child. This is also the age at which comorbid conditions, such as various learning disabilities common in children with AD/HD, begin to surface. As time progresses, the material taught at school becomes more difficult and the child may begin to severely dislike school because he is constantly failing and not living up to everyone's expectations (Hunsucker, 1998).

As the child becomes an adolescent, several symptoms such as impulsivity, hyperactivity and exuberance all become less severe but the teenager does tend to become more destructive, restless and aggressive (AD-IN, 1991). The AD/HD teenager may develop into a loner, become very depressed and have a plummeting self esteem as the emotional impact of the disorder develops. Adolescence is generally the time that a person with AD/HD begins to realize how he is different from his peers, which can lead to the emotional aspects of the disorder. As the AD/HD teenager get older, the likelihood of proper diagnosis and thus treatment becomes much less likely (Hunsucker, 1998).

After a person with AD/HD struggles through their teenage years and advances into adulthood, they generally find life much easier and more manageable. Adulthood is generally considered to be the time when the child leaves the school system, whether it is high school or college, and becomes a member of the work force (Alexander-Roberts, 1995). An adult can usually find a job that suits his or her personality and behavioral tendencies. He can avoid the boring activities that inhibit his attention and he has learned to control his impulsive behavior and thus he has better social skills (Gross, 1997). Since adults with AD/HD have learned many ways to cope with the negative aspects of their symptoms, the positive aspects of the disorder are generally apparent and thus they are typically viewed as creative, high energy and enthusiastic people (Alexander-

Roberts, 1995). However, several problems and negative aspects of AD/HD still exist in adulthood. Adults with AD/HD are less likely to go to college and they are more prone to alcohol and drug abuse problems than a person without the disorder. Adults with AD/HD tend to find themselves in relationships which are abusive and thus they typically have a high divorce rate (Hunsucker, 1998). However, all of these negative aspects can be avoided and a person with AD/HD can lead a very normal and happy life.

2.4.5 Positive Aspects

So far every aspect of AD/HD that has been presented negatively impacts the lives of the person with the disorder. In the hunter-farmer theory for the cause of AD/HD, which was presented in The Farmer and the Hunter subsection above, it is proven that AD/HD used to be a positive trait when human beings had to hunt for their survival. However, we now live in a farmer's world, where those with AD/HD have the disadvantage. Thus AD/HD can be a weakness or strength, depending on the environment the person is in. Having AD/HD is a disadvantage at school only because school requires a set of behavioral characteristics that an AD/HD person lacks (Hartmann, 1993). On the other hand, there are many situations in which those with AD/HD have the upper hand and it is in these situations that people with AD/HD need to work in order to succeed in life because it allows them to take advantage of their inherent personality traits.

One of these positive aspects is the AD/HD person's willingness to engage in risk taking and try something that no one has tried before (Alexander-Roberts, 1995). People who are willing to overcome obstacles and turn new corners are the ones that spark change in society. Another positive quality of AD/HD is one's intrinsic motivation towards subjects which interest them (Hartmann, 1993). People with AD/HD are willing to do work for their own interest and not just for a letter grade, monetary reimbursement or to please others. Therefore, they can be very tenacious and their willpower and stubbornness can result in a brilliant piece of work or research (Levinson, 1990). In fact, those with AD/HD have a very different way of thinking than people without the disorder. People who do not have AD/HD typically have a very linear thought process and a logical systematic approach to arrive at a solution and thus approach problems from only one direction. On the other hand, those with the disorder analyze problems

nonlinearly and thus have the unique ability to think –outside the box" and arrive at original solutions that could never have been derived from a linear and systematic approach to the problem. As a result of their unique thought processes, people with AD/HD tend to be very insightful and thus have the ability to relate two seemingly unrelated events or ideas (Hartmann, 1993). With their insightfulness and inherent creativity, they are able to derive a solution much quicker because they can see the whole picture (Alexander-Roberts, 1995). People with AD/HD also tend to have very good visual spatial skills and thus are able to visualize and conceptualize very abstract ideas in their minds. These visual spatial skills may make the person good at taking things apart and putting them together and being able to tell how something works simply by examining it. The last major positive aspect of the disorder is an AD/HD person's ability to absorb everything in their surroundings at once. People with AD/HD are usually inherently curious and are aware of the small events or objects in their environment that other people miss or dismiss. Since people with AD/HD are always aware of their environment, they generally adapt quickly to any change in their surroundings (Hartmann, 1993).

Even though there are many positive aspects to the disorder, most children with AD/HD fail to recognize them. They typically magnify their shortcomings and are unaware of their skills and good qualities (Alexander-Roberts, 1995). The structured educational system in the United States forces children to learn a certain way and does not generally allow them to explore the method of learning which is best for them. It is typically not until after a person with AD/HD gets out of the educational system that he is aware of the strengths that his disorder provides to him.

2.4.6 Common Comorbidities

There are a good number of mood, anxiety and behavioral disorders as well as learning disabilities that commonly exist alongside AD/HD which are called comorbidities. With such a huge and complex array of symptoms, it is very difficult to correctly diagnose AD/HD and any other existing comorbidities (Alexander-Roberts, 1995). Medical professionals must be careful not to mistake symptoms of one disorder for another. For example, depression can cause a person to display an abnormally high level of distractibility, which is a primary symptom of

AD/HD, however the person may not have AD/HD (Hartmann, 1993). Comorbid conditions are believed to exist in 85% of teenagers diagnosed with AD/HD (Alexander-Roberts, 1995).

Mood disorders that are commonly seen with AD/HD include chronic depression and bipolar disorders such as manic depression. In fact, approximately 1/3 of AD/HD teenagers will exhibit at least one major episode of depression during their adolescence. Common symptoms of depression are feelings of sadness, loneliness and, in severe cases, the thought of death. Bipolar disorders are characterized by quick and extreme mood swings and symptoms similar to depression (Alexander-Roberts, 1995).

Another type of comorbid condition that is commonly seen in people with AD/HD is anxiety disorders. It is believed that 25% of those with AD/HD also display symptoms of some form of anxiety disorder. One common type of anxiety disorder, called panic disorder, is characterized by episodes of paralyzing terror, chronic fear and phobias. People who are excessively anxious may also exhibit physical symptoms such as stuttering when they speak and constantly trembling hands and clammy skin. Another anxiety disorder which is commonly comorbid with AD/HD is obsessive compulsive disorder (OCD). People with OCD tend to focus all of their attention on a single idea or task, no matter how trivial. They need to have everything done in a specific way and they never vary from their routine (Alexander-Roberts, 1995).

Comorbid behavioral disorders, such as oppositional defiant disorder (ODD) and conduct disorder (CD) are commonly seen as comorbid conditions in boys who have ADHD and are rarely seen in those with ADD or girls with either ADHD or ADD. ODD is characterized by non-compliant behavior and opposition to authority. A person with CD exhibits symptoms of ODD and has a tendency to be violent. The last major area of comorbid conditions is learning disabilities. Studies have shown that up to 1/4 of all people who have AD/HD also have some sort of learning disability (Alexander-Roberts, 1995). These learning disabilities are characterized by underachievement in writing, reading, mathematics and/or spelling. Someone with AD/HD may also have a handwriting disability or have extreme difficulty with communication and language (Alexander-Roberts, 1995).

2.5 Diagnosis

AD/HD is a difficult disorder to diagnose because it is often accompanied by one or more comorbidities. In order to obtain a complete diagnosis and thus a comprehensive treatment program, a multilevel analysis is needed because the child' symptoms and behavior will be different according to the situation he is in and the task he is given. A full assessment demands participation from the child's teachers, coaches, parents and clinicians as well as the child himself. Usually, the evaluation will include a description of the child's abilities, achievements, executive control (frontal lobe) skills and socioemotional functions as well as his specific visual, motor, attention, memory and auditory skills (Flick, 1998).

To begin the evaluation, the clinician should gather information on the child's specific medical history as well as that of his family and the child's developmental milestones and academic history. Then the clinician should obtain as much information as possible from all of the most important people in the child's life including his parents, teachers and coaches through the use of interviews and rating scales. After the initial information gathering, the clinician should then gather results from a variety of different test procedures for AD/HD. Once all necessary tests have been performed and the clinician can make an informed and professional decision, an individualized multi-disciplinary program is formulated which takes into account all of the child's specific strengths and weaknesses. The treatment plan usually includes a program of behavior modification, a medication regimen and many mechanisms to evaluate the child's progress (Flick, 1998).

2.5.1 The History of the DSM

Since the 1950s, the symptoms of AD/HD have been collected and are constantly refined in a catalog of neurological disorders called the Diagnostic and Statistical Manual of Mental Disorders (DSM) by the APA. The DSM assists doctors in diagnosing many different types of disorders, including AD/HD. It is important to note that the DSM is used in North America only. A standard created by the WHO, called the ICD-10, is the standard which is used to diagnose AD/HD in countries outside of North America (Anastopoulos & Shelton, 2001).

The first of these standards, the DSM-I, was written in 1952 and was a very primitive understanding and organization of neurological disorders. In it, AD/HD was not examined because, at the time, it was not a defined disorder. This is not to say that AD/HD or similar symptoms did not exist but rather that the framework of the first DSM did not take these symptoms into account. It was believed that neurological disorders in general could not exist in children or adolescents because their brains were not mature enough (Anastopoulos & Shelton, 2001).

The DSM-II was written in 1968. From 1952 to 1968 there was a shift in the way that psychological disorders were viewed. The scientific and medical society in North America began to recognize that children and adolescents could, in fact, have neurological disorders. The DSM-II introduced for the first time a category termed ~~"b~~behavioral disorders of children and adolescents." Under this category, there were six sub-categories, one of which was ~~"h~~yperkinetic reaction of childhood (or adolescence)". The key symptoms of this disorder were over-activity, restlessness, hyperactivity, and a short attention span; impulsivity was not included in the list. The DSM-II explained that symptoms of the hyperkinetic reaction diminish as the child moves into adolescence. The DSM-II classified disorders based on their symptoms unlike the DSM-I, which classified disorders by hypothesized causes, such as physical brain damage. Despite all of its fallbacks, the DSM-II was the first to introduce AD/HD-type symptoms into publication, increasing the probability of a successful diagnosis (Anastopoulos & Shelton, 2001).

The next major advance occurred with the publication of the DSM-III in 1980. This new version of the DSM introduced a much different perspective on what we now call AD/HD. The first major change that the DSM-III made was to rename the disorder ADHD, attention deficit hyperactivity disorder. It also included the key symptoms of inattention and impulsivity, which were not included in any previous manual. However, the DSM-III did not include hyperactivity as a core symptom but rather as a sub-symptom caused by the presence of core symptoms of the disorder. The APA divided the symptoms into categories and set a minimum number of symptoms from each category that someone must have in order for the disorder to be considered a mental impairment. The DSM-III also introduced some exclusionary conditions for ADHD. It

specified that the symptoms must be noticeable at an age of seven years or under and be apparent for a period of at least six consecutive months. It also states that the ADHD-like symptoms cannot be a result of ~~–s~~chizophrenia, affective disorder, or severe or profound mental retardation". The DSM-III also created a separate disorder called ADD, simply attention deficit disorder. For diagnosis, the patient must display symptoms of impulsivity and inattention but not hyperactivity. It is important to recognize that this disorder is not just the symptoms of inattention, as the name attention deficit disorder implies, but rather both inattention and impulsivity. The last major change that occurred in the DSM-III was the introduction of attention deficit disorder residual type (ADD-RT), which defined the disorder in adolescents and adults. However, it only mentions that adults may experience symptoms of ADD and was very vague about the specifics of the disorder (Anastopoulos & Shelton, 2001).

In 1987, the DSM-III-R was introduced as a revision of DSM-III. In this revision, three disorders were identified: ADHD, ADD and undifferentiated attention deficit disorder (UADD). The symptoms of ADHD were no longer separated into categories but rather all combined into one list of fourteen symptoms. For a child to be diagnosed with ADHD, they had to experience eight out of the fourteen symptoms. The DSM-III-R also required that the symptoms be displayed to a degree such that they are developmentally destructive to the child. This new system of diagnosis lessened the chance of erroneous or accidental diagnosis of ADHD. However, having all of the symptoms in one list makes it difficult for different types and manifestations of the disorder to be identified, which may affect the reliability as well as the usefulness of the diagnostic criteria. The exclusionary conditions also changed in that patients exhibiting ADHD symptoms resulting from affective disorder or mental retardation could now be considered to have ADHD and those with symptoms resulting from pervasive developmental disorder (PDD) could no longer be considered to have ADHD. The revision also included a list of disorders that could mimic the symptoms of both ADD and ADHD. The other major category, UADD, differed from the ADD that was described in DSM-III in that it did not require the presence of impulsivity. In other words, UADD is a disorder of inattention alone, which makes it apparent that ADD is more than a disorder of simply inattention. One of the negative aspects of the DSM-III-R is that many of the symptoms for UADD were vague, which made the disorder appear similar to anxiety

disorder. UADD was not presented with ADHD in the manual and was instead in a section entitled: Other Disorders of Infancy, Childhood or Adolescence (Anastopoulos & Shelton, 2001).

The most current explanation of the diagnostic criteria is outlined in the DSM-IV which was published in 1994. In this version of the DSM, a new classification is introduced: attention deficit/hyperactivity disorder (AD/HD). The DSM-IV has two primary groupings for symptoms: inattention, which contains nine symptoms, and hyperactivity-impulsivity, which has nine symptoms. The hyperactivity-impulsivity symptoms were combined because it is now believed that the two categories are intertwined. Since the symptoms are split into two different categories, separate subtypes of the disorder can be identified depending on which category or categories the patient's symptoms are from. The new manual also states that the symptoms must be present in more than one environment, such as school and home. If the child's symptoms only manifest themselves in a certain environment then it is more likely that the environment is the cause of the symptoms. On top of this constraint, the symptoms must also interfere with social, academic or occupational function to be considered a disability under the DSM-IV. The DSM-IV also provides a list of common comorbidities and introduces two new subcategories of AD/HD: partial remission and not otherwise specified. The ~~"in~~ partial remission" subcategory is for adults and adolescents that were previously diagnosed with AD/HD as a child but, as an adult, do not manifest enough symptoms to be diagnosed with it. The other category, ~~"n~~ot otherwise specified," is used when the patient's symptoms do not become apparent or are not diagnosed at the normal age (before approximately seven years of age). This classification is primarily used for adults but can also be used for children who live in a bad environment or had a chaotic childhood. Even though there are many positive aspects to DSM-IV, there are still some negative aspects. It is believed to be too strict in the diagnosis of AD/HD in adults and in children. In general, the symptoms of AD/HD are less apparent at older and very young ages. Therefore, it is believed that less diagnostic criteria should be used to diagnose the disorder in these two age groups (Anastopoulos & Shelton, 2001).

2.5.2 Background and Developmental History

In order to use the criteria stated in the DSM as a guide in diagnosing AD/HD, the clinician must first make a thorough examination of the child's medical history and that of his family. A family's medical history should include evidence of AD/HD, instances of any cumulative lead poisoning, learning disabilities, seizures and any neurological or endocrine disorders (Sangare, 2000). When interviewing the parents, it is also important to assess how the AD/HD child is treated in the home (Flick, 1998). Many times, a family's response to their AD/HD child has a large impact on the child's emotional well-being. It is important to discuss the family's normal disciplinary measures and how the child responds to limits imposed on them and tasks requested of them, which can help to determine the child's impulse control. Sometimes, family support and therapy are suggested as treatment for the child's behavioral problems. Traumatic experiences such as exposure to violence, abuse or addiction in the home, turbulent parent unemployment problems, marital problems and multiple recent deaths in the family are important factors in identifying comorbid disorders (Sangare, 2000). The AD/HD child's birth history is important as well because AD/HD is closely related to birth defects and problems during pregnancy and birth. A birth history includes problems such as neonatal distress, whether or not the child was premature, loss of oxygen during pregnancy or birth, trauma during birth, pre- or post-partum infection and maternal smoking or substance abuse. Two applications which are helpful in obtaining a complete historical background are: "Childhood history form for Attention Disorders" by Drs. Sam and Michael Goldstein and "Conners-March developmental questionnaire" Dr. C. Keith Conners and Dr. John March (Flick, 1998).

A complete physical exam of the child can detect any neurological, vision or hearing problems. The clinician also looks for any signs of abuse, which can be difficult to assess because a child with AD/HD is more prone to injury and accidents anyway. Therefore, the doctor looks for discrepancies between the child's and parent's stories and the nature of the specific injury. The doctor also documents the child's nutritional history and any previous or current medications. In order to rule in or out other medical problems, lab tests are performed to detect lead toxicity, substance abuse, anemia, seizures and thyroid problems. The information obtained in the physical exam may reveal medical problems which are historically comorbid with AD/HD, however they provide no basis for diagnosis of the disorder itself (Sangare, 2000).

2.5.3 Observations of Behavior

The next step in obtaining a diagnosis for AD/HD is an observation of the child's behavior, which is provided by the parents, teachers and psychological examiner. Formal rating scales provide comparisons relative to the child's age group as well as other important comparisons are available for use. The most popular of these rating scales are the ACTeRS, Conners and ADHD tests as well as the BASC scale. Since AD/HD is a developmental disorder, these tests and scales are usually repeated many times throughout the child's life. The ADHD test evaluates the child's background according to criteria stated in the DSM IV. This test is unique because it does not include information on specific task performance. There is a standard set of observations that should be made as the child grows which parallel the increasingly complexity of education and which determine the progress of the child relative to other children in his age bracket (Flick, 1998).

The psychological examiner applies several tests and gives assigned tasks to the child. He or she then provides a description of the test results as well as how the child approached each task, the child's feelings about his performance and what strategies were or could have been useful for accomplishing the task. Some of the tasks given should mimic the cognitive activities needed in school so that the assessment of the child's response to the task can be related to real-world situations. The one-to-one testing environment in the clinic creates an ideal "micro-classroom" for the child and provides an environment for maximum academic performance and an accurate assessment of the child's abilities and natural tendencies (Flick, 1998, page 40). Sometimes, accurate results are not obtainable if the child is not on medication because their disorder makes it almost impossible for them to finish the assigned task. However, some tests and tasks should be performed without medication as well to assess differences in the results from when the child was medicated (Flick, 1998).

2.5.4 Assessment

2.5.4.1 Psychological/ Neuropsychological

The clinical examiner's evaluation should be combined with a psychological and neuropsychological assessment in order to achieve a complete description of the child's symptoms and each individual symptom's severity. Having this complete record is extremely important because it helps to identify comorbidities, which are very common in children with AD/HD. The psychological/neuropsychological evaluation measures verbal, non-verbal, memory, executive control and attention capacity as well as visual, fine and gross motor skills. It also provides an assessment of behavioral response inhibition which includes an evaluation of the child's impulsivity, activity levels, organization skills, cognitive flexibility, socioemotional development, visual motor skills, and his general capacity to adapt to changes in his environment. A medical examination should also be performed to discover any organic dysfunctions of the child's brain, such as encephalitis, epilepsy, head injury, disruption in the functioning of the frontal lobe and structural brain lesions (Flick, 1998).

There are twelve psychological/neuropsychological assessments that document the child's specific strengths and weaknesses and reveal a person's adaptive tendencies. These twelve components include ability, achievement, executive control, visual motor skills, memory, attention skills, self-concept/self-esteem, social skills, visual spatial skills, language skills and behavioral-emotional assessment (Flick, 1998).

2.5.4.1.1 Abilities

Assessing ability is primarily accomplished by using the Wechsler Intelligence Scale for Children III (WISC III), which is most useful for children aged 6-16. This assessment provides a measure of the child's verbal, non-verbal and visual-spatial abilities as well as a full scale IQ score. In order to determine verbal abilities, the child is given tasks which test their vocabulary, comprehension of both written and spoken language and digit span. The child may also be given two different stories and he will be asked to determine the similarities between the two. As an expansion of the reading comprehension task, the clinician may give the child a mathematical word problem to observe how the child uses the given information. Evaluations of the child's non-verbal and visual-spatial abilities include picture completion, picture arrangement, block design, object assembly, coding, mazes and symbol search. The WISC II can also be used to

score the child's perceptual organization, freedom from distractibility and processing speed. The second assessment for ability is the Kaufman Brief Intelligence Test (KBIT), which is a faster method of measuring abilities. This assessment provides a fairly accurate prediction of the child's WISC III scores (Flick, 1998).

2.5.4.1.2 Achievement

A child's achievement, especially discrepancies in their achievements, is primarily measured by using the Wechsler Individual Achievement Test (WIAT). This test includes methods for assessing a child's basic reading, math reasoning, spelling, reading comprehension, numerical operation, listening comprehension, oral expression and written expression skills. Four other comprehensive achievement tests are: the Woodcock-Johnson Psycho Educational Battery Revised (WJ-R); the Wide Range Achievement Test 3 (WRAT-R); the Peabody Individual Achievement Test Revised (PIAT-R); and the Boder Test of Reading/Spelling Patterns (Flick, 1998).

2.5.4.1.3 Executive Control

There are three tests for assessing a child's control over the frontal lobe of his brain, which is commonly called executive control. These tests include the Trail Making Test, the Stroop Color Word Test and the Wisconsin Card Sorting Test. The Trail Making Test measures motor speed, working memory and mental flexibility in two parts. In part A, the child is asked to connected a series of numbered circles while in part B they must connect alternating numbers and letters in sequence. Part B of the Trail Making Test is far more complex than part A because the child must keep track of two sequences at once. The Stroop Color Word Test tests a child's impulsivity by determining whether he can control conflicting information in his brain and respond correctly. This test includes presenting a child with names of colors in which the text and the print of the word represent different colors; the child is asked to read the color represented by the text and ignore the color of the print. The Wisconsin Card Sorting Test measures mental flexibility and conceptual problem solving skills. The child's mental flexibility is tested by giving him cards which have circles of one color which contain text representing

another color. They are asked to read the color represented by the text and ignore the color of the circle. To test the child's conceptual problem solving skills, the clinician may give the child a number of cards which are not in order but which can be placed in a certain sequence based on the picture on the card (Flick, 1998).

Two tests that have recently been developed are the Six Elements Task (SET) and the Hayling Sentence Completion Test (HSCT). The SET identifies problems with attention control, self-regulation of behavior and utilization of feedback. The test is known for detecting abnormal functioning of the frontal lobe. The HSCT demands that the child fulfill a task by generating a strategy first, which forces the child to organize and plan a response (Clark, 2000).

2.5.4.1.4 Visual Motor Skills

A child's visual motor skills are measured by at least one of three tests. The first test is the Bender-Gestalt Test which is only accurate for children younger than 8 years old because older children can pass the test very easily. The Development Test of Visual-Motor Integration IV measures a child's development and uses visual motor standard scores and percentile ranks. This test is for children aged 3-18 and includes twenty four drawing tasks of increasing complexity. The last test, the Minnesota Perception Diagnostic Test, measures visual perception and visual-motor skills for children aged 5 and older (Flick, 1998).

2.5.4.1.5 Motor Skills

There are several tests that can assess a child's motor skills. The Finger Tapping Test, also known as the Finger Oscillation Test, measures motor speed. The Hand Movement Test, which is a subtest of the Kaufman Assessment Battery for Children, assesses frontal lobe functions and motor skills. The Strength of Grip Test evaluates whether the child has a natural response to stimulation. The lack of a natural response may signify a more serious condition such as autism or a nerve problem. However, it may also signify a possible weakness of the child due to his AD/HD symptoms because the symptoms manifest themselves differently from person to person. In either situation, the Strength of Grip Test can help to guide a treatment plan because it can

help to identify possible comorbidities and the specific AD/HD symptoms of the child. The SOMPA Physical Dexterity Tasks are for children aged 5-12 and the Comprehensive Movement Assessment Battery for Children is for children aged 4-12. A quick test for motor skills is the Movement ABC checklist, which can be done by a teacher or parent and is for children above the age of six. The child is spun around or moved and the administrator observes how long it takes his eyes to adjust to the still environment. He may also be asked to follow a moving object while he is still (Flick, 1998).

2.5.4.1.6 Memory

The Wide Range Assessment of Memory and Learning (WRAML) is used for children aged 5-17 and tests both visual and verbal memory. However, parts of this assessment are particularly sensitive to attention problems. A more intricate test for memory is the Test of Memory and Learning (TOMAL) for children 5-19 years of age. This test provides verbal and non-verbal memory scores as well as composite scores for attention, concentration and learning. The most recent memory assessment, the Children's Memory Scale, has not yet produced results that can be evaluated (Flick, 1998).

2.5.4.1.7 Attention

The most in depth psychological/nueropsychological assessments for AD/HD are for attention skills. The most developed of these tests is the Continuous Performance Test (CPT), which was designed in the 1950s. The test evaluates inconsistencies in one's attention levels. Another test, the Gordon Diagnostic System of 1987 (GDS), is applicable to those children in preschool through the age of 16. The test is entirely computerized and is separated into three categories: self control, vigilance and distractibility. The self control task demands a delayed response from the child. The test consists of a large button which can be pressed as often as desired, however points will only be awarded for an appropriate delay in the child's response time. The child is totally in control of the task so it provides a measure of how well the child can pace himself. The second part of the GDS is the vigilance task. A sequence of two numbers will be repeated periodically and the child has to react when he sees the last number in the sequence. The test

measures the child's attention and impulsivity levels through an evaluation of the number of errors he makes; an impulsive child has a tendency to react when he sees the first number in the sequence and thus does not wait for the whole sequence to appear as requested. Recently, the task has been performed through auditory means in which case the child uses a pair of earphones and is asked to detect certain sound patterns. The distractibility element of the GDS is simply the vigilance task but also includes irrelevant number sequences flashing across the screen simultaneously (Flick, 1998).

Another assessment for attention is the Test of Variables of Attention (TOVA) for people 4-80 years of age. The test subject has a fake pistol and is asked to shoot at a certain target when it is presented. Results from this test are not affected by any comorbid learning disabilities because it is not based on language and changes in performance due to practice are negligible. However, the accuracy of this method varies with age and it tends to exaggerate the person's AD/HD symptoms. Another test which can be administered with a computer is the Intermediate Visual and Auditory Continuous Performance Test (IVA) for ages five and up. This test, which was developed by Dr. Joseph Sandford and his colleagues, determines a child's attention, impulsivity and hyperactivity levels in only thirteen minutes (Flick, 1998).

The last attention assessment is the Conners Continuous Performance Test which was developed by Dr. C. Keith Conners in the mid 1970s and is applicable for people ages six and up. The test is fourteen minutes long and it primarily determines the patient's behavioral inhibition and visual attention skills. For any letter except X, a corresponding key must be pressed. The computer then computes the results, such as reaction time, error frequency and percentage of correct hits, and compares them to a set of average results to determine whether the patient has difficulties or inconsistencies in attention and impulsivity. Perceptual sensitivity is measured by the patient's ability to discriminate non-targets from targets. It is likely that a person has AD/HD if their test score is greater than or equal to sixty or is in the 90^{th} percentile or higher (Flick, 1998).

2.5.4.1.8 Self-Concept and Self-Esteem

The self-concept and self-esteem assessment is accomplished partly by clinical observation. Oftentimes, the child is asked to draw a picture of his family or other people and situations and then the clinician evaluates the drawings and talks to the child about them. The child may also be asked to complete sentences which are started by the clinician, which can help the clinician to observe the child's positive or negative views toward someone or something. One assessment is the Multidimensional Self Concept Scale (MSCS), which is appropriate for children 9-19 years of age. This scale is separated into four areas of psychosocial functioning: self competence, academia, family and physical activity. The other test for self-perception and self-value is the Self Esteem Index (SEI) for those aged 7-18. This test has four areas: academic competence, family acceptance, peer popularity and personal security (Flick, 1998).

2.5.4.1.9 Social Skills

A person's social skills can be assessed by observation of the child at home, at school and in the clinic as well as through the use of the Walker-McConnel Scale of Social Competence and School Adjustment. A social skills rating scale, which is useful for documentation of observation, can be used by parents, teachers and the child himself and is appropriate for children aged 3-18. This rating scale documents the child's cooperation, assertion, responsibility, empathy and self-control. Results derived from the rating scales can provide insight into the teacher-student relationship, peer acceptance, academic performance, shyness and difficulty initiating conversation. Two other similar scales, the problem behaviors scale and the academic competence scale, are available for use. The problem behavior scale measures both internal and external problems and hyperactivity. The academic competence scale measures the child's academic functioning, motivation and parental support. An Assessment Intervention Record (AIR) is provided so that the clinician can plan the most productive intervention program. The Walker-McConnell Scale of Social Competence and School Adjustment is separated into two tests depending on the child's age. One test is for those children in kindergarten through the 6^{th} grade and is called the elementary version and the other is called the adolescent version and is for those teenagers in grades 7 through 12. The elementary version includes sections regarding teacher preferred behavior, peer preferred behavior and school adjustment behavior. The adolescent version includes the sections of self-control, peer relations,

school adjustment and empathy. This test helps in providing a description of adaptive classroom behavior and interpersonal social competence as well as determining any social skills that need to be refined (Flick, 1998).

2.5.4.1.10 Visual-Spatial Skills

Three different tests are used to assess visual-spatial skills. The Minnesota Perception Diagnostic Test is appropriate for children aged 5-14 and is used to measure visual perception and visual motor skills. The test is very short so it lacks the accuracy of the longer tests but, unlike the other tests for visual perception, this test is very sensitive to the child's age, IQ and development. The second test, the Motor-Free Visual Perception Test-Revised (MVPT-R), is applicable to children aged 4-11. This test measures the child's spatial relationship, visual discrimination and visual memory skills. The last test for visual-spatial assessment is the Jordan Left-Right Reversal Test, which was revised in 1990. This test, which is applicable to children 5-12 years of age, helps to identify whether the patient has the comorbid condition of dyslexia alongside AD/HD (Flick, 1998).

2.5.4.1.11 Language Skills

The primary test for assessing language skills, the Test of Language Development (TOLD), is divided into two tests depending on the child's age. The primary version (TOLD-P:3) is for children aged 4-8 while the intermediate version (TOLD-I:3) is for those aged 8-12. The TOLD-P:3 measures both expressive and receptive modes of oral communication as well as the child's linguistic abilities to organize both expressive and receptive information. There are nine subtests which include word articulation, phonemic analysis, word discrimination, grammatical understanding, sentence imitation, grammatical completion, picture vocabulary, relational vocabulary and oral vocabulary. The TOLD-I:3 evaluates oral language skills including both listening and speaking by testing whether the child understands both syntax and semantic aspects of language. Five subtests include general oral language including testing the child's ability to understand abstract relationships, giving the child ridiculous sentences to correct, picture vocabulary, sentence combining, word ordering and grammatical comprehension. Another test

for language skills is the Peabody Picture Vocabulary Test III (PPVT-III) of 1997, which is applicable for ages 2.5 to 85. This assessment tests the person's receptive and expressive vocabulary analysis as well as their word retrieval skills (Flick, 1998).

2.5.4.1.12 Behavioral and Emotional Assessment

There are two assessment procedures for evaluating behavioral and emotional problems. The first is the Child Behavior Checklist (CBCL) for children aged 4-18. There are three different forms available, depending on who is performing the evaluation. A parent, who must have at least a fifth grade reading level, can complete the form in approximately twenty minutes. There is also a form for teachers evaluating school age children and a youth self report form for children aged 11-18. Each form is divided into eight scales that are answered with one of the following three choices: internalized behaviors; externalized behaviors; or neither. The scale for teachers evaluates the child's popularity, attentiveness, nervousness, overactivity, anxiousness, social withdrawal, distractability, obsessive-compulsivity and aggressiveness. The youth self report is divided into two scales which include competence and behavioral problems. The second assessment test is the Personality Inventory for Children (PIC) which is completed by the child's parents and is appropriate for children aged 6-16. The evaluation originally contained 600 items but it was later reduced to 280 items. The evaluation includes neurological/psychological scales and a general adjustment scale as well as an assessment of self-control, internalization of somatic symptoms, social competence and cognitive development. This test is known for distinguishing between a learning disability and a behavioral disorder (Flick, 1998).

2.5.4.2 Other Assessments

If a reading disability is evident and the patient is 6-21 years of age, the Dyslexia Screening Instrument is appropriate. The test consists of thirty-three scales regarding the child's characteristics and is to be completed by the child's teacher. There are three answers available for each question: pass, fail and inconclusive classification. An answer of "fail" means that the child exhibits a dyslexic characteristic related to the question at hand. For serious disabilities,

the Scale for Predicting Successful Inclusion should be completed by the child's teachers and parents to determine the likelihood of the child's success in general education. For children aged 5-18, factors determining ability to adjust to a normal school setting include work habits, coping skills, peer relationships and emotional maturity. NEPSY is a neuropsychological test for children 3-12 years of age, which consists of an evaluation of five main functions: attention/executive, language, sensory motor, visual motor and memory. The test assesses self-regulation, self-monitoring, inhibition, vigilance, selective and sustained attention, planning, thinking flexibility, linguistic fluency and maintenance of response set. The test specializes in identifying learning disabilities, AD/HD, traumatic brain injury, autism and speech and language impairments. A complete assessment of the child's AD/HD characteristics can be made using NEPSY, rating scales, CPT and personality and behavioral assessments (Flick, 1998).

2.5.5 Rating Scales

There are no diagnostic procedures that can unquestionably report that someone has AD/HD because diagnosis heavily relies on observations from those familiar with the child's everyday behavior and lifestyle. However, rating scales, which can help to make all observations more specific and accurate, are available for parents, teachers and the child himself. Scales are also available for many different settings, such as at school or at home, and some can even differentiate between disorders other than AD/HD and AD/HD and any possible comorbidities. These rating scales have been through extensive testing to assure their reliability and a minimization of bias as well as to identify a standard which represents an average outcome for those who do not have the disorder (Sangare, 2000). However, rating scales do not produce consistent and accurate results in all cases. In fact, the parent rating scale, the teacher rating scale and the child's performance on the CPT agree only about a quarter of the time. Despite their inconsistency, rating scales provide a general view of the child's behavior and thus are usually very useful for obtaining a broad picture of the child's symptoms. Rating scales are available for just the parents, teachers and the self or as a combination of the three (Flick, 1998).

2.5.5.1 For Parents

The main rating scale for parents is the Conners' Parent Rating Scales-Revised (CPRS-R) for those parents with children 3-17 years of age. This scale has been through thirty years of testing and is known to produce fairly reliable results. The test is made up of eight subscales: oppositional behavior characteristics, cognitive problems, hyperactivity/impulsivity, anxiousness/shyness, perfectionism, social problems, psychosomatic problems and evidence of symptoms outlined in the DSM IV. The results from the CPRS-R are divided into two different indexes: the ADD index determines whether ADD is present and the global index determines whether hyperactivity is present. The global index is also useful for determining whether or not medication is improving the child's hyperactivity. The test contains a total of eighty items and takes a substantial amount of time to complete, however it has been proven to be a more thorough evaluation of the child than other scales available for parents. Although the longer version is more thorough, if time is a concern there is an abbreviated version of the CPRS-R called the CPRS-RS which includes only four subscales: oppositional behavior characteristics, cognitive problems, hyperactivity/impulsivity and anxiousness/shyness. This abbreviated version only includes the ADD index. There is also an even shorter test, which is made up of only fourteen items involving simply the primary symptoms of concentration and attention, called the Home Situations Questionnaire Revised (HSQ-R). This test focuses on the child's behavior at home and in public and is applicable for parents with children aged 6-12 (Flick, 1998).

2.5.5.2 For Teachers

There are many different ratings scales available for teachers including the Conners and the Spadafore teacher ratings scales, the Behavior Scale, the ADHD Comprehensive Teacher Rating Scale (ACTeRS) and the Student Observation System. The Conners' Teacher Rating Scale-Revised (CTRS-R) parallels the CPRS-R except that it does not include the psychosomatic subscale. The CTRS-R is available for those children aged 3-17, like the CPRS-R, and has 59 questions. A less extensive version of this test, the CTRS-RS, has only 28 questions and includes only the oppositional behavior characteristics, cognitive problems and hyperactivity/impulsivity subscales and it does not include the ADD index. The shortest Conners evaluation available for teachers is the Conners' Abbreviated Teacher Questionnaire,

which is especially useful for determining hyperactivity and comorbid conduct disorders. Another available scale is the Spadafore ADHD Rating Scale, which rates the child's impulsivity, hyperactivity, attention and social adjustment. The test is applicable for those children aged 5-19 and is fairly accurate at determining the severity of the child's behavioral problems and detecting ADHD. The Spadafore rating scale consists of fifty questions, including a nine item ADD index. The Behavior Scale is often used because it offers a very thorough evaluation of the child. A popular rating scale is the ACTeRS, which is applicable for children 5-13 years of age. This test consists of 24 questions and 4 subscales: attention, hyperactivity, social skills and oppositional behavior characteristics. Different versions of the ACTeRS scale are available depending on whether the child is male or female and additional sections are available for parents and for evaluation of early childhood behavior. The last rating scale is the Student Observation System, which helps teachers to record positive and negative behavior in the classroom (Flick, 1998).

2.5.5.3 Self-Report

The most widely used self report scale is the Conners Adolescent Self Report Scale (CASRS). This scale has no specific applicable age range, however it does prove to be more accurate as the child gets older because the child is able to give a more detailed description of his symptoms and behaviors. Also, symptoms related to comorbidities tend to consistently develop with time and thus are more easily identified if the child is older. The CASRS includes an analysis of the child's anger control problems, family problems, symptoms as outlined in the DSM IV, emotional problems, behavioral problems, cognitive problems, hyperactivity and impulsivity (Flick, 1998).

2.5.5.4 Combined Rating Scales

The most popular combined rating scale is the Behavioral Assessment for Children (BASC), which includes scales for parents, teachers and children. The scale generally measures behavioral, cognitive and emotional problems and the child's self-perception. The assessment follows criteria outlined in the DSM IV and the Individuals with Disabilities Act (IDEA). The

BASC teacher rating scale is separated into three age groups: preschool child, for ages 4-5; child, for ages 6-11; and adolescent, for ages 12-18. The test includes four components: externalizing problems, internalizing problems, school problems and adaptive skills. Sometimes a child exaggerates his symptoms for one reason or another so the BASC scale includes a section, called the F-index, which takes this possibility into account. The BASC parent rating scales are comprised of the following four subscales: externalizing problems, internalizing problems, learning problems and study skills problems. This version of the test is divided into the same three age groups and includes the F-Index. The BASC Self Report of Personality is separated into two age groups: child, for ages 8-11; and adolescent, for ages 12-18. This test consists of three sections which evaluate the child's adjustment to school, the clinic and to his own developing self as well as an emotional symptoms index. An additional assessment can also be used, called the Structural Development History Assessment, which is completed by both the clinician and the parents (Flick, 1998).

2.6 Coping

Coping with AD/HD involves analyzing one's life in school and at home as well as one's interactions with others. The person with AD/HD is very unique in the way he approaches and interprets life and, as a result, he tends to be singled out both at home and at school. His differences become more obvious to him as he grows older and his disorder can become a very painful fact of life. The impact of being different than other children is enormous, so much so that it can have a major influence on the AD/HD child's personality (Levine, 1990).

Even if a child is diagnosed and treated at a young age, he will still grow up not fully understanding how and why he is different from everyone else. A child with AD/HD grows up feeling like a constant disappointment to everyone around him because he has trouble performing and succeeding in almost all areas of life. He may develop a negative self-perception of himself at an early age, which results in a negative impact on his self-esteem. However, the greatest impact is suffered by those who live to adulthood never knowing that they have AD/HD and never realizing that other people share and suffer similar experiences. A lifetime of feeling like a disappointment, being rejected and feeling inadequate, demands that a person master the

art of coping in order to survive in today's farmer society (see section 2.1.4 The Farmer and the Hunter).

2.6.1 Attitude

2.6.1.1 Denial

A common method of coping is to deny a problem exists in an attempt to shield oneself from psychological and emotional harm. By coping in this manner, the child essentially insulates himself from thoughts of his differences from others and the effect his disorder has on his life. Denial has many forms and it affects everyone differently; however it is, in general, very psychologically and emotionally detrimental to the child.

2.6.1.2 It will get Better

An advanced form of denial is apparent in the person with AD/HD who believes that his problems are only temporary and that life will someday be normal for him. He rationalizes that life isn't this hard for everyone else and that everyone else leads a normal life, so eventually he will have his turn and things will be normal for him. This method of coping is even more emotionally, psychologically and socially damaging to the child than simple denial. If he is having problems in some area of life, he will not make any attempt to correct it but instead will wait for the problem to fix itself (Silver, 1999).

2.6.1.3 Being Bad is Better than being Stupid

Sometimes the child or teenager with AD/HD does recognize that he is different from everyone else. This type of child will find other ways to adjust and fit in with his peers. His disorder naturally makes him a risk taker so he may see rebellion as his golden ticket to acceptance. Many things the child with a ~~"b~~being bad is better than being stupid" attitude may do are dangerous and may scare even the child or teenager with AD/HD himself. However, he will see

it as a chance to be admired by his peers and thus may feel as though the danger is a small price to pay for being accepted and having friends (Silver, 1999).

2.6.1.4 Chip off his Shoulder

A person with AD/HD usually has to work twice as hard as a person without the disorder to accomplish the same end result and so oftentimes feels as though people's expectations of him are too high. Due to the stress this causes, the person with AD/HD may develop a so-called "chip off his shoulder" personality. Thus, he may constantly attack those whom he feels are working him too hard with their constant demands and thus others may begin to view him as a disagreeable and bitter person. Other people may begin to fear asking him to do anything for fear of being attacked, which may provide temporary relief to the person with the disorder. However, this attitude may become detrimental to the person's already inept social skills and may prevent the person from engaging in social activities because others would prefer to leave him out than deal with his attitude (Silver, 1999).

2.6.1.5 Manipulative

A person with AD/HD is also prone to manipulating others due to the burden he feels. Making others carry the overwhelming burden that a person with AD/HD has to carry is a useful short-term way to survive mentally however it usually doesn't work long-term and is not an effective way to deal with problems. By conning others into doing his work, the person with AD/HD doesn't look inadequate and he may even be able to get better grades in school due to others. The person with AD/HD may reason that it is easier for others to perform the same work to the same quality as it would be for him and thus he uses this to convince himself that others should take his responsibilities both at school and at home. However, other people will eventually become tired of doing all the work for the person with AD/HD, which may end their friendship. Thus the AD/HD child is constantly switching friends and lifestyles until there is no one left to manipulate, or even be friends with (Silver, 1999).

2.6.1.6 Learned Helplessness

Another version of manipulation is learned helplessness. A person with this type of attitude towards their disorder doesn't con others into doing their work for them but instead is constantly asking to be rescued. He believes that his inadequacies are unavoidable and too large to fix and that by playing dumb he can escape the constant feeling of incompetence. He tends to boost the ego of those helping him and therefore doesn't constantly change friends and lifestyles like those who manipulate others. He never excels or succeeds but instead learns to accept that life is easier to manage when he performs at his lowest potential (Silver, 1999).

2.6.1.7 Giving Up

Instead of using others to accomplish his work and responsibilities, some people with AD/HD give up altogether. The individual with AD/HD tends to get disappointed easily when he doesn't see immediate results from his hard work. He finds himself buying all the books, gathering all of the available information, attending all of the meetings or lectures and buying new planners. However, his enthusiasm and organization usually only last for a short period of time because he sees the results he obtains from all of his work as minimal and inconsequential, at best. He tends to abandon all of his effort, blame others for his lack of results and continue to feel depressed and anxious about his differences (Beckley & Fisher, 1999). He constantly feels as though he is being buried alive in his problems and he begins to live a life of seclusion in order to protect himself from other's disapproving eyes. In seclusion, he begins to feel lonely, bored and depressed and will constantly try to run away from his life and his problems. In severe cases, he will abandon even his worries because just trying has become too difficult and stressful for him (Silver, 1999).

2.6.1.8 Who Cares?

Many people with AD/HD internalize their problems so that they create less conflict in their external world, which can make them feel even more alone and secluded. One method of accomplishing an internalization of all of their problems is to have a "who cares?" approach to life. An individual with this attitude is generally very easy going and laidback because he never

lets himself externally express his problems or emotions. His inadequacies tend to go unnoticed for a while and his peers begin to accept him but, as time goes on, they may begin to think he is lazy or incompetent. Also, the person with AD/HD may even be putting themselves at risk because it is psychologically, emotionally and physically unhealthy to internalize all of life's problems. Therefore, a person with AD/HD who has this "who cares?" attitude may experience constant mental, emotional or physical fatigue in addition to their already existing problems (Silver, 1999).

2.6.1.9 Take Me or Leave Me

The person with AD/HD finds himself constantly giving up on situations when they become too difficult to handle with ease. This can easily develop into a "take me or leave me" attitude in which the individual is afraid of commitment and/or relationships. An individual with this attitude is quick to find the negative side of any situation or person and is often the first to admit his own faults and inadequacies. By being the first to admit his imperfections, he doesn't allow others to judge him and thus they may begin to accept his faults even though they still view him as undependable and incompetent (Silver, 1999).

2.6.2 Personality Tendencies

2.6.2.1 Peter Pan Syndrome

Due to his impulsivity and constant need for stimulation, a person with AD/HD has problems committing to anything and he tends to seek the newest and most thrilling opportunities available (Alexander-Roberts, 1995). When one situation, person, subject or object is no longer providing the necessary stimulation, he moves on without a second thought. However, if he were to stay and commit past the point where the situation, person, subject or object ceased to fill his necessary stimulation level, he would not function as well and may even take dangerous risks in order to feel stimulated. By running away from commitment, he learns to escape his constant feeling of incompetence, which preserves his self-esteem and emotional well-being. He develops a need for constant change, which is a difficult chain to break and hard for others to

deal with (Silver, 1999). Even feelings of intimacy have a limited potential; the individual with AD/HD often ends up hurting his partner because he tends to show strong interest for a short time and then simply drops everything when he begins to feel bored. This need for excessive stimulation and constant change materializes into the Peter Pan Syndrome, which implies that the individual is only comfortable living in the moment instead of also thinking about the future (Alexander-Roberts, 1995).

2.6.2.2 Party Animal

There are ways for an individual with AD/HD to stay committed to a certain situation, person, subject or object while still fulfilling his stimulation levels but they generally lead to dangerous behavior. Throughout the child's life, risky behavior becomes even riskier as well as increasingly more influential. A person with AD/HD often grows up feeling estranged from everyone else, which makes risky behavior even more appealing because it involves acceptance from a different group of peers. Sex, drugs and alcohol not only offer acceptance but also a plethora of new experiences and opportunities. The average individual can easily stop themselves and think about which activities they wish to be associated with and the consequences of their actions. However, the person with AD/HD lets their impulsivity take over and does not go through this thought process before engaging in risky behavior (Flick, 1998). The individual with AD/HD usually goes through a stage of experimentation and often ends up with the greatest range of experiences because he is more willing to place himself at risk. When this stage ends, the AD/HD teenager begins to attend parties regularly because they always offer new ways to achieve both social and physical stimulation. They begin to depend on the stimulation they receive from their party animal lifestyle, however this way of life is only socially acceptable through one's teenage years. When his peers naturally begin to desert this lifestyle, the individual with AD/HD is often left behind with a set of younger friends (Silver, 1999).

2.6.2.3 The Space Cadet

Even though an AD/HD person needs more stimulation than the average person, an excess of stressful stimuli, which is common for AD/HD children in social environments, can be overwhelming. The human body has its own method of dealing with an overload of stimuli, it naturally slows down. This coping method often results in a person who cannot process directions or conversations completely and thus has trouble retaining any information. A blank face, possibly filled with confusion or concern, is often the only response that others can observe. The individual with AD/HD stops noticing the people and events around him and he begins to neglect all of his responsibilities, which leads others to believe that he is incompetent and irresponsible (Silver, 1999).

2.6.2.4 Blamers

Other people with AD/HD find another way to deal with their inadequacies, by blaming other people for their actions and faults. A person with AD/HD is constantly making mistakes due to his rash decision making and is forever forgetting his daily responsibilities due to his distractibility and impulsivity. He may try to hide these faults and make himself equal to his peers by blaming others for his problems. Therefore, he is oftentimes blatantly disliked by others (Silver, 1999).

2.6.2.5 The Emotional Incontinent

Another reason why an individual with AD/HD usually ends up being disliked and avoided by others is that he isn't able to learn or understand socially correct behavior. He has trouble seeing the whole picture, especially in conversation, because he is constantly trying to think about what he is saying. However, thinking about what he is saying and how to say it without upsetting others does not come naturally to him. Constantly having to monitor himself is extremely difficult and makes it almost impossible to simultaneously observe the responses, both verbal and non-verbal, of others. Thus, conversation is exhausting and very difficult to follow for most people with AD/HD and coping with it is never easy and sometimes may even be impossible (Silver, 1999). Some people with AD/HD find that simply concentrating on themselves and finding the right words is easier than even trying to listen and talk simultaneously. However, if

he doesn't observe the reactions of others, he will never learn what is socially acceptable and others may begin to perceive him as an insensitive person. This personality trait is a coping method used to counteract the feeling of exhaustion produced by the enormous amount of energy that is necessary for an individual with AD/HD to socialize like everyone else. Unfortunately, this method involves bulldozing over other people's feelings, without first considering the consequences (Flick, 1998). Many times, this act of bulldozing happens at the end of a long day or a day that demands a continuous span of social communication. To add to the difficulty, people with AD/HD also suffer from extremely variable levels of emotion and concentration, among other symptoms. Failure in conversation is likely, especially at a moment of low concentration, which makes conversation with an individual with AD/HD a task even for those without the disorder. Therefore, other children tend to isolate the child with AD/HD, which only adds to the child's already existing problems (Silver, 1999).

2.6.2.6 The Blabber

Many times people with AD/HD do not get exhausted by attempting conversation but instead they want to know every piece of information possible, whether secret or not, and then share it with others. People with AD/HD are oftentimes easy to confide in and talk to because they can be very interested in the conversation, especially if it sparks their attention. Many times, the information they are told is so intriguing to them that they want to further their excitement by sharing it with others, even if they were sworn to secrecy. This is another example of the AD/HD person's inability to see the whole picture and foresee the consequences of their actions. The excitement of sharing secret information with others may blind the AD/HD person's conscience so they may not even realize that they are revealing information which they had sworn to keep secret (Silver, 1999).

2.6.2.7 The Perfectionist

On the other end of the spectrum from the bulldozer and the like, there is the perfectionist, who everyone loves and adores. An individual who expresses this personality trait is involved in a multitude of extra-curricular activities, gets good grades and seems to be doing everything right;

that is, they seem to be AD/HD-free. However, the enormous amount of energy involved in being this person is completely exhausting. A person with AD/HD already has to try many times harder than others in order to deliver the same performance but the perfectionist exceeds an average level of success and effort. However, the perfectionist lives in constant fear of disappointing others and never risks saying no to anyone for fear he will lose their admiration and acceptance. He eventually becomes mentally exhausted from being the regular people pleaser and thus he too will sacrifice mental well-being for acceptance in society (Silver, 1999).

2.6.2.8 The Obsessive-Compulsive (OCD) Individual

Like the perfectionist, a person with AD/HD who is coping with their disorder by developing symptoms of OCD may begin to spend an excessive amount of time on one particular thing to reach a certain level of perfection. This individual will subconsciously reason that they are better at doing things that they are good at and thus will not attempt to do anything which they fear they will fail doing. This can have an enormous impact on the individual's already ailing conversation skills. Instead of taking the risk of saying something wrong or saying something he didn't mean to say, he will refuse to say anything unless he knows it will come out exactly the way he wants it to. This method of coping rescues him from feeling incompetent, so he begins to depend upon it. He becomes so obsessed with his opportunity to do something better than other people, that he will do or think of nothing else until that certain thing reaches perfection. If anyone attempts to stop him from achieving this perfection, he will become very irritable and moody, which will put a damper on relationships with both his family and friends (Beckley & Fisher, 1999).

2.6.2.9 Control Freaks

An individual with AD/HD may develop a controlling attitude toward those around him, which can also damage many of his relationships. This type of individual measures his success with financial gain and power over others and becomes very dominant. One of the most damaging symptoms of AD/HD is that life always seems out of control; however, some people with AD/HD become overly controlling of everything around them. Eventually, this type of person

will find that he can control what other people think of him and find ways to make sure that people only see his non-AD/HD side. As his controlling side develops, he will begin to view it as necessary because he can only produce coherent and organized ideas when he follows his own train of thought and appears incompetent if he is forced to do otherwise. By hiding his inadequacies through control of his environment, he appears productive and successful. However, due to his controlling behavior and inherent inability to interpret social situations, this AD/HD individual tends to make many enemies (Silver, 1999).

2.6.3 Balance

People with AD/HD are always trying to compensate for their differences but they don't usually know how to balance themselves and lead a normal life. They tend to suffer in almost all areas of life including emotional wellbeing, social status, relationships and academia. In some way, they will always carry the burden of their disorder, however there are many ways to cope with it which can minimize the effect it has on their life. In order to learn to cope with having AD/HD, the individual must balance their life, first by understanding the importance of balance and then actually achieving it. However, balance is particularly difficult for people with AD/HD because they have erratic and poorly regulated nervous systems. They tend to allow an excessive amount of input, which tends to tire and stress their mind and thus prevent substantial productive output. They seem to have little balance between structure and freedom and, as a result, tend to apply one or the other to the extreme depending on their environment at the moment. Balance is needed so that the individual does not go to the extremes in any type of environment but people with AD/HD don't usually have the ability to learn balance themselves. Once they learn to balance themselves and apply it in their everyday life, they do not need to depend on others to achieve their personal equilibrium (Silver, 1999).

2.6.3.1 Energy levels

Balancing one's time must include an evaluation of all areas of life. It is clearly necessary to continue activities that maintain health, such as eating, sleeping and maintaining hygiene, as well as all required responsibilities. Making a chart of all one's daily activities can help to organize

and evenly distribute one's time and energy. When making the chart, the AD/HD individual must heavily consider his own daily work capacity because those with AD/HD have a tendency to work beyond their own energy potential, which tires and stresses them very early in the week. In order to avoid tiring himself, an individual with AD/HD should also include a sufficient amount of rest, which includes both relaxing and sleeping, in his daily schedule (Levine, 1990). Another important activity to consider when creating a schedule is how often breaks are needed throughout the day and how long they should be (Silver, 1999). Everything must be included in the evaluation, including even the seemingly most insignificant activities because they do demand a certain amount of energy, no matter how minute. By carefully considering even the most trivial activities, a complete schedule can be made, which makes it easier to eliminate activities that aren't necessary and thus helps to achieve a less stressful and healthier lifestyle (Beckley & Fisher, 1999).

After making a schedule, many people, especially those with AD/HD, find that there is simply not enough time or energy in the day. Not having enough time in one's day means that too much energy and time is spent on certain activities or that the individual has taken on too many responsibilities. It is important to evaluate which obligations are critical and which can be eliminated or reduced, which requires that the individual have self-monitoring skills. Self-monitoring is a difficult task, especially for individuals with AD/HD, but it is needed to balance life (Levine, 1990). However, if an individual is having problems creating a schedule of all of his activities, he may find it useful to make a daily log of all of the activities he was involved in during the day and the difficulty of each task or event. When making this log, it is important to look for activities which created the most stress in the day and the different times in the day in which the individual felt the most and least energized (Beckley & Fisher, 1999). It is also important to consider how many times in the day the individual was distracted and how much time and energy was devoted to each distraction. Many logs and schedules may need to be made before one can effectively manage his time and energy but in the end the schedule will be worth the time it took to make it because it helps to achieve balance in one's daily activities (Silver, 1999).

2.6.3.2 Difficulties with Balance

One of the most difficult activities to evaluate is how much time should be spent with family and friends. Socializing tends to wear those with AD/HD down, which may be difficult to admit because spending time with friends and family is supposed to be fun and relaxing. Thus, the energy needed for social activities tends to be underestimated in one's schedule. Those with AD/HD should allot more time for exercise and recreational sports than those without the disorder because it is critical to one's wellbeing and it helps to promote a healthier lifestyle, to create a calmer state of mind and to improve one's energy capacity (Silver, 1999).

People with AD/HD, especially children, usually love to play games which have no structure and authority because they tend to excel in this type of environment. However, playing games with other children tends to expend a lot of the AD/HD child's energy and he doesn't leave enough energy to complete his responsibilities. Older children and teenagers should have the ability to estimate how long their responsibilities will take and how long they have to relax but a person with AD/HD tends to completely overestimate his time and energy capacity (Silver, 1999).

2.6.3.2.1 College and Balancing

College can be an especially difficult time for an individual with AD/HD because he is away from his parents for the first time and he is constantly around other college people who can spend much less time on their schoolwork than him and they both still get the same grades. It is important for the individual with AD/HD to resist the pressure of trying to keep up with others and learn to pace himself effectively. Sometimes taking fewer classes, especially at first, may help to alleviate a lot of the pressure. A person with AD/HD should take advantage of the resources which are available to him at almost any college such as getting help with difficult schoolwork and getting a counselor to help receive accommodations from professors. The large amount of schoolwork and the ever present social life at college can be very demanding, especially for a freshman with AD/HD, so working during college can be very risky; however, it is necessary in many cases. An individual with AD/HD also tends to spend money impulsively so it is not advised that he get any credit cards, especially at college, because it is also the first time he is away from his parents. Also, credit cards and bills only present one more thing for a

person to think and worry about. Life at college should be kept as simple as possible for everyone, especially the individual with AD/HD. It should be viewed as a way to get away from one's failures and start a new life with new friends (Silver, 1999).

2.6.3.3 Methods of Balancing

The most effective way to cope with the many obstacles that are encountered throughout life is to accept that it is impossible to participate in everything and still maintain any sense of sanity and that more can be accomplished if they accept the help of others. The golden rule of balance is demonstrated in the following serenity prayer:

> God grant me the serenity
> To accept the things I cannot change,
> To change the things I can,
> and the wisdom to know the difference (Silver, 1999, p. 129).

The best way to cope with having AD/HD is to acknowledge that no one is perfect and to accept that the disorder can be treated so that it does not ruin their life, however it cannot be cured. Making a list of all of one's disabilities and how their disorder affects them in their everyday life can help the individual to acknowledge his personal disadvantages and begin to cope with them.

2.6.4 Communication

Communication is the key to survival for an individual with AD/HD, especially in college, although it is oftentimes very difficult to do. Communication with friends and other students is very important, especially when working on a group project. The most important people to communicate with during college are disability services and one's professors. Advocating for his disability, so that he can receive more time on tests for example, can be very intimidating because the individual's disability is probably already a sensitive topic but disability services can help.

Working in groups is very difficult for an individual with AD/HD because he has problems listening to everyone and effectively evaluating their contribution. An individual with AD/HD has a slow reaction time and an inability to hold ideas in short term memory for a normal amount of time due to neurobiological differences imposed on him by his disorder. He also tends to become frustrated very early in the meeting because he is having problems following the conversation, which makes him bored and tired very quickly. When he gets frustrated, he is inclined to get distracted, make irrelevant comments and be irritable and offensive. Thus, his AD/HD symptoms of impulsivity and lack of inhibition take control of him when he is mentally fatigued. The individual with AD/HD must work to prevent the mental fatigue from taking over or rescue himself when it does to avoid confrontation (Silver, 1999).

If confrontation does occur, there are some basic rules of communication that are useful and productive for everyone, especially the individual with AD/HD. In an intense situation, it is necessary for the individual with AD/HD to prevent his impulsive nature from taking over and to think about the consequences of his words before voicing them. It is always best if he has time to think about the problem at hand before confronting the other person because he generally needs more time than most people to think of an appropriate and effective solution. After he has had time to collect his thoughts, he should calmly confront anyone else involved in person as opposed to on the internet or phone. In conversation, the person with AD/HD tends to go off in tangents, which will prevent a full discussion of the problem at hand, and thus he needs to be careful to avoid this situation by making sure that everything he says somehow pertains to the point he is trying to make. In order to make the conversation a success, he also needs to make sure that he is allowing others to participate in the conversation as well. When the other person involved in the conversation does get his or her chance to talk, the individual with AD/HD should make sure to listen carefully and not cut him or her off. In order to slow himself down and make the conversation more balanced, it is helpful to focus on individual feelings instead of individual actions. Focusing on feelings can help the individual with AD/HD develop a more sensitive attitude toward the situation and can help to avoid lecturing, criticizing and blaming the other person. There are certain phrases to avoid, such as "you always/never," because they are more offensive than constructive in almost all situations. The conversation is most likely to succeed if all parties are negotiating and making compromises (Silver, 1999).

2.6.4.1 Conversation

Maintaining eye contact during conversation is very important, especially during a confrontation, because it tells the person who is talking how their listener is reacting to what they are saying. Eye contact can also help an individual with AD/HD focus on the conversation instead of their surroundings. However, a person with AD/HD usually has a very difficult time performing more than one task at a time, which makes maintaining eye contact while talking to someone very demanding on his concentration and energy. Also, a human face is intriguing and visually stimulating because people express many emotions through facial expressions, which can make eye contact even more distracting (Beckley & Fisher, 1999). Although it is important to maintain eye contact and look for visual cues as to how the listener is reacting, if his energy and concentration are running low, an individual with AD/HD should concentrate more on the auditory content of the conversation. If he finds that looking away for a certain period of time helps him to communicate better with other people, then he should train himself to do so. The most effective way of training himself is for him to monitor himself and take note of when and why he is losing his focus during conversation. Concentrating becomes a much easier task if the individual with AD/HD knows what his personal obstacles are and what situations to avoid.

A conversation obstacle which is very common in people with AD/HD is the tendency to have a one-sided conversation. An individual with AD/HD usually has a hard time maintaining eye contact and watching for non-verbal cues as to how his listener is reacting so he does not generally notice when his listener is not very interested in the conversation, does not understand the subject or is overwhelmed by his intense interest in the subject at hand. If the listener is overwhelmed, does not understand the conversation or is simply not interested, the conversation will become one-sided. To prevent this, the individual with AD/HD must train himself to look for these non-verbal cues if he feels as though a lot of his conversations are one-sided. It may be helpful for him to mentally visualize a clock in his head to keep a balance between the amount of time he has talked versus how much other people in the conversation have contributed information. Once he has successfully trained himself to notice the cues, he must then train himself to respond to the cues when he receives them. If the listener seems bored, the individual

with AD/HD should take a breath or a small break to allow the other person to talk and maybe change the subject. An individual with AD/HD must be careful not to get too intense during the conversation, especially if his listener is not as interested as he is about the subject. If he doesn't know whether or not his listener will be interested in a certain subject, it is useful to give the listener a small sample of the subject to see if it catches his or her attention. However, if the individual with AD/HD does get too intense and his listener loses interest, he should try to initiate a topic which he or she may enjoy. Sometimes the best method is to sit back, relax and simply listen. It is important for the person with AD/HD to remember that he doesn't need to be talking all of the time to appear as though he is socially competent; the other person or people involved in the conversation are also responsible for making the conversation worthwhile and interesting (Silver, 1999).

The environment has a major influence on a person with AD/HD, especially when they are trying to hold a conversation with someone who is not affected by their surroundings. Most people can effectively monitor which information is more or less important in a conversation. However, an individual with AD/HD does not usually have this ability and when he gets overwhelmed due to the vast intake of unsorted information and the excess stimuli in his environment, he cannot even process the words he is saying correctly. If the environment is too distracting for the individual with AD/HD, he may find himself zoning out and not paying attention to what others are saying. If other people notice that he is not paying attention, they may be offended and feel as though the person is incapable of normal communication. Therefore, it may be necessary to postpone a certain conversation if possible so that the individual with AD/HD can rest or find a less distracting environment in order to have the conversation effectively. Most people will be able to respect that he is too tired or overwhelmed to have the conversation at the moment and will have no problems postponing it. If delaying the conversation is not an option, he should explain to the other person that he is having a difficult time focusing because he is tired or stressed and that he may need important points of the conversation repeated. By communicating his difficulties with concentration and focus, although not necessarily explaining that he has AD/HD, others may change their style of conversation to fit his needs (Beckley & Fisher, 1999).

If possible, a person with AD/HD should prepare any important future conversations, such as talking to a professor or going for a job interview, so that he can be prepared and focused. Before the conversation takes place, he should think about what he wants to say during the conversation and take notes, either mentally or on paper. Also, he should attempt to prepare himself for questions which other people in the future conversation may potentially ask him. It may be helpful to have a friend or family member represent the other person in the conversation so that the individual with AD/HD can practice and so that the friend or family member can provide feedback and help to think of questions that may be asked (Silver, 1999). Any conversation, especially an important and stressful one, can be nearly impossible to handle effectively when the individual with AD/HD is tired. If he is becoming excessively fatigued during the conversation, it may be necessary for the individual to compose himself by taking a small break. Using the restroom and getting a drink are commonly used as a way to get the small break without looking out of the ordinary.

2.6.5 Social Life

2.6.5.1 Social Gatherings

Fatigue can be caused by anxiety, especially for individuals with AD/HD who fear social gatherings because they feel as though they are socially incompetent. The best way to overcome, or even avoid, social anxiety is to be comfortable both physically and mentally during social gatherings. An individual with AD/HD may have problems easing his mind, especially if the event is formal, if he does not know anyone present or if the event is very important to him. Before attending any sort of gathering, he should call and ask about the dress code so that he can be assured that he is in the right style of dress. It is also important for him to arrive on time so that other people feel as though he is respecting their time and so that he is not made uncomfortable when he walks in late. Arriving early will also allow the individual with AD/HD to watch how others are interacting with each other and what conversations they are having; following other people's conduct and tone of voice is a helpful guide for learning how to fit in. It may also be useful for him to watch the news for a few minutes or read a newspaper before going to an event in which he knows no one so that he can prepare conversation starters about

current events, which will make conversations with new people easier and smoother. The best way to leave a good impression on someone is to be polite, look professional and always have something intelligent to contribute by preparing conversation starters ahead of time (Silver, 1999).

2.6.5.2 Intimate relationships

Making a good first impression is not only important at large social gatherings, but also in a one-on-one situation, such as a first date. Intimate relationships are usually easiest to get into during college because there are so many students who are all around the same age and who are away from their parents for the first time. An individual with AD/HD has a tendency to be very intense at first, especially if he is very interested in the girl he is dating. In fact, the intensity demonstrated by the individual with AD/HD may even be the cause for the girl's initial attraction to him, however it is usually ultimately suffocating to her. Even if a first date goes horribly wrong, the individual with AD/HD must remember that there will be more opportunities in the future, learn from the mistakes he made and move on (Alexander-Roberts, 1995).

Dealing with intimate relationships demands energy and time because the best way to accomplish a healthy relationship is to take everything slow and/ have a high self-esteem and good communication skills, all of which those with AD/HD tend to lack. The individual with AD/HD must be careful to watch for clues of progress in the relationship because he is prone to thinking that the relationship is more than what it actually is. Being impulsive, especially sexually, can be very detrimental to a relationship, especially if one of the people involved in the relationship wasn't ready for what happened. Communication is necessary in order to preserve the relationship if this type of scenario occurs. A high self-esteem is necessary because an individual with AD/HD tends to become very dependent on intimate relationships because they offer companionship; however, if he has a high self-esteem, he will not become dependent and if the relationship doesn't work, he won't be severely depressed. Making the relationship last demands continuous work and maintenance to keep things balanced. Fantasizing about a relationship's potential does nothing but hinder its progress; it is very important to live in the moment and not daydream about the possibility of a future, especially in the beginning of the

relationship. It is important to keep all options available so that the individual with AD/HD may find someone who is just right for him (Silver, 1999).

2.6.5.3 Effective Relationship Problem Solving

When a problem arises in any type of relationship, those with AD/HD tend to immediately resort to anger and frustration without considering how to peacefully fix the problem at hand. An individual with AD/HD tends to be very impulsive, which makes it difficult for him to stop and make himself assess the situation before making any rash decisions. A person with an impulsive nature should wait one day before they make a final decision as to how to fix a certain relationship problem because it takes approximately that long for an impulsive person to begin to truly consider other solutions. In the process of devising a solution to the problem, it is important to consider the consequences of the decision both in the short and long term as well as how the decision will affect others. Once the seemingly most desirable solution is established, it is then necessary to think of a way to achieve the solution and what obstacles may be encountered in the process (Hartmann, 1993).

2.6.6 Organization

Organization is one of the most difficult problems that an individual with AD/HD has to deal with in his everyday life, whether it be organizing time or organizing one's thoughts to prepare a solution to a problem (Alexander-Roberts, 1995). He tends to experience short-lived impulses to organize himself and thus ends up creating new systems of organization monthly. Keys, pencils, papers and everything else in his possession always get misplaced because he didn't focus on where he put the object originally. He tends to forget about routine responsibilities such as opening his mail and doing his laundry and so his room is constantly cluttered with piles of unopened mail and dirty laundry scattering the floor. His "I forgot" list grows continuously and others begin to not trust that he will accomplish anything they ask him to do. He is constantly running late for everything because he tends to forget about it or get distracted by the intensity of the present moment. Getting a watch doesn't even help because he tends to lose it quickly or simply never wear it (Flick, 1998).

All of these everyday problems with organization represent the AD/HD individual's innate difficulty with time, space and selective focus. However, a lack of organization is a major disadvantage because it has a direct effect on one's ability to complete their responsibilities (Flick, 1998). There is no perfect system that can help an individual with AD/HD to organize himself because each individual must learn which unique system works best for him. However, the system of organization should be simple because ones which are complex will be time-consuming and distracting (Silver, 1999).

2.6.6.1 Reorganizing Living Space

The first step to getting organized for a person with AD/HD is to get his room organized. He should make a list of all of the spaces in his room, or even his home, and how he uses each space. From the list, it should be easy to distinguish which parts of his room can be utilized better for him. Then the individual with AD/HD should make a list of all of the objects in his room or house and how he uses each object and how often. From this list, it should be easy to decide which objects serve no purpose and which objects are most distracting to the individual. Once the analysis of his room or house is complete, a checklist should be created of all of the spaces that need organizing and cleaning and how often and how long each space should be cleaned. It is easy to overestimate how much certain spaces need to be cleaned and how much organization needs to be done, especially if the person with AD/HD has OCD tendencies. Therefore, each activity should have a time limit and the checklist should be organized according to priority (Silver, 1999).

2.6.6.2 Creating a Productive Work Environment

When the AD/HD individual's room is organized to the best of his abilities, the next step is to create a work environment in which to accomplish tasks, such as homework. It is helpful for the individual to designate a certain place in his room, preferably a desk, in which he always does his homework. The most desirable homework spot, especially for an individual with AD/HD, is one which is free of distractions, such as a television or a window. The homework spot should

be comfortable, however too much comfort can result in a lack of productivity and possibly even unintentional naps (Levine, 1990). Separate all items needed to do homework, such as rulers, pens, pencils, etc., into two categories: items used constantly and items used rarely. Make sure that all items which are constantly used are within reaching distance and that those items which are rarely used are close to the designated homework spot. All items, whether used constantly or rarely, should have a designated spot so that they can be found easily (Silver, 1999).

2.6.6.3 Making To-Do Lists

A to-do list is useful for an individual with AD/HD, however he oftentimes misplaces it and thus defeats its purpose. Therefore, it is useful for the to-do list to have its own designated place, preferably in his backpack or at least within reaching distance of his homework spot. It is also helpful for the individual with AD/HD to set aside time every day to rewrite, reorganize and prioritize his to-do list. The to-do list should include a description of each task to be accomplished, how much time the task should take to finish and the date it was both started and finished (Beckley & Fisher, 1999). Each item in the to-do list should be categorized as a short or long term accomplishment, a responsibility, an appointment or homework. After each item has been fully completed, it should be crossed off of the to-do list. Even the most insignificant tasks should be included in the to-do list so that it is thorough and complete and so that the individual with AD/HD can feel as though he accomplished something when he crosses it off of the list, which increases his self-esteem and self-confidence (Silver, 1999). A calendar, and possibly even a planner, should be attached to the to-do list because most people with AD/HD have problems organizing times and dates effectively.

2.6.7 Coping with Academia

School can be very challenging for an individual with AD/HD because it requires a large amount of organized attention, and both organization and attention are difficult for an individual with the disorder. He has a very unique learning style which most schools, especially public schools, either cannot or do not accommodate. To perform to the best of his abilities, the individual with AD/HD must learn to cope with his disorder. He tends to have short bursts of focused energy

during which he can produce high-quality work. Therefore, he needs to learn to work with his impulsive behavior and organize his time according to it. The best way to accomplish this is to break up all of his work into small components. When he experiences one of these short bursts of focused energy and attention, he can accomplish at least one of the small components of work he has set aside (Hartmann, 1993).

However, sometimes the individual with AD/HD simply does not get enough short bursts of focus and attention to accomplish all of his work or he simply cannot pay attention during school so he begins to fall behind. The environment at school and the child's own ailing self-confidence eventually have the greatest effect on his learning difficulties. At school, the child with AD/HD is around others his own age so he wants to impress everyone and be everyone's friend. Thus, he is constantly getting in trouble because that is the only way he knows how to achieve popularity and he is constantly distracted from his schoolwork by the ever present longing to fit in with his peers. Eventually, the individual with AD/HD actually expects himself to fail because it has happened so many times in the past. He tends to delay performing a certain difficult school task because he is scared of failing again. When he does finally try to accomplish the task, he usually misinterprets the assignment or simply doesn't understand it and doesn't have time to ask the teacher because he waited until the last minute. Thus, he ends up failing yet again, which only adds to his already diminished self image. Gradually, the failure accumulates and even others begin to expect him to fail. At this point, learning has usually become such a sensitive issue for the individual with AD/HD that he is tempted to give it up altogether.

2.6.7.1 Attention and Memory

Even though the individual with AD/HD is statistically more likely to fail at school than someone without the disorder, he must realize that it is not because he isn't smart or that he doesn't try hard. An individual with AD/HD has a difficult time in school because his attention levels and memory are extremely variable and he may not remember what was covered in a class he just attended. However, he doesn't have a terrible memory but rather he doesn't initially acquire the information because he was distracted during the time it was presented to him so it is

impossible for him to store the information in memory (Flick, 1998). The medical profession generally refers to this common symptom of AD/HD as input or information processing difficulties (Beckley & Fisher, 1999).

There are many helpful tips and hints to overcome information processing difficulties and sustain attention. In school, the main goal is to gather all of the required information and learn it, preferably before it is required to be known to pass a test. In order to sustain attention during a class period, it is helpful for an individual with AD/HD to sit either in the first few rows or in the center row, so that he can clearly see the professor. He should always look at the professor and use his or her face as a focal point for his concentration. It is also helpful for him to sit next to a friend who will not be distracting or a person who takes good notes so that he can ask a quick question if he absolutely needs to during class in order to understand the material. Sometimes, however, the material is difficult for him to understand or concentrate on so he may need extra help from the professor (Beckley & Fisher, 1999). If he realizes that his concentration and attention levels were extremely low during one particular lecture, it is advised that he see the professor for a quick review of what was covered or ask to see his or her notes from that particular lecture. It is essential that he takes notes during the small review because the professor will cover what he or she considers to be the most important material. Textbooks are a good source of information as well because the individual with AD/HD can pace himself. Once all of the information has been gathered, it is critical that he review it many times on his own and attempt to shorten it to a couple of pages at most; in a reduced form, the information does not seem so overwhelming. An individual with AD/HD may find that rewriting his notes a few times or reading aloud when reviewing material helps him to remember the information.

2.6.7.2 Test strategies

There are also several strategies for taking tests which makes it an easier task for a student with AD/HD to accomplish. As soon as the student with AD/HD receives the exam, he should quickly scan the test and write down notes or clues that will help to remind him of the answer when he arrives at that particular question later. Therefore, he does not need to worry that he will not be able to maintain the information in his head until he gets to a certain question; simply

the fear of not being able to succeed and knowing that they have tried and failed in the past can often prevent the individual with AD/HD from succeeding. He should skip any questions which completely confuse him and finish ones which he is sure that he can get right first. He should also be sure to read every question at least twice to make sure that he understands what the question is asking (Beckley & Fisher, 1999).

2.6.7.3 Advisors

The best way to accommodate an individual with AD/HD is to provide him with someone that he can trust and who will help to guide him, such as a school counselor, a therapist or a tutor. Parents usually fulfill this type of role for their children, however a child with AD/HD usually does not have a great relationship with his parents because he feels as though they treat him differently than everyone else. Thus, an adult who can provide support, recognition and direction for the child with AD/HD can greatly change that child's life. Most colleges have a disability services office which can provide a mentor for those who are having problems in school or who simply need guidance (AD-IN, 1993).

2.6.7.4 Choosing Careers and Colleges

Advisors can help an individual with AD/HD to identify his strengths, weaknesses, abilities, inadequacies and hobbies. It is often difficult for him to do this type of self-assessment on his own because he is so focused on all his mistakes due to his lack of self-confidence. An examination of his personal qualities can help the individual with AD/HD to choose a career path which ignites his interest and suits his personality. People, in general, prefer to choose a line of work which they are good at and which is reasonably easy for them. An individual with AD/HD must be careful not to choose an occupation which leaves him emotionally, mentally or physically drained at the end of each work day. Those with AD/HD tend to prefer hands-on activities and prefer not to sit at a desk all day, which must be considered when looking for a suitable occupation. Thus, it is important to understand exactly what each occupation entails (AD-IN, 1993). The best way to fully understand an occupation is to interview someone who is currently working in the field or get an internship in the field. Touring a workplace can also help

the individual with AD/HD to understand the type of environment so that he can determine whether he would be comfortable and perform well in the surroundings at the workplace.

Deciding on a career path can usually help to narrow down potential colleges for the AD/HD individual. Just as the environment in the workplace is important, so is the environment at school. It is important for all students, especially the student with AD/HD, to visit all potential colleges to understand the atmosphere at each one. An interview with a counselor in the disability services department or admissions may help to answer all of the questions that an individual with AD/HD may have about any accommodations that he may be able to receive as well as have all of his questions about the school. If possible, it is also helpful to sit in on a few typical classes at the college or talk to some of the professors. This can help the individual with AD/HD to understand what would be expected of him and what style teachers tend to teach in at that particular school. It is usually better for the individual with AD/HD to go to a small college so that he can receive some individual attention (AD-IN, 1993).

2.7 Treatments

Finding an appropriate treatment for a person with AD/HD can become very frustrating because there is no ~~"m~~iracle cure" or any one particular ~~"m~~iracle doctor" for the disorder. Therefore, the best approach to treatment is one which is both multidisciplinary and multimodal. This means that everyone involved, including parents, teachers and the child himself, must be open to a variety of different modes of treatment including medication, behavior modification, dietary interventions and holistic approaches on top of simply learning to cope with the disorder (Bilton & Cooper, 1999). Several factors, including the age of the child, the cooperation of the parents and child to certain treatments, whether the child still lives at home and the health insurance coverage for certain treatments have to be considered before choosing the appropriate treatment plan (Barkley & Mash, 1998). For example, age is an especially important factor when trying to decide whether to include medication in the treatment plan for a child. Stimulant medications, the most common type of medication given to children with AD/HD, have at least a thirty percent chance of bad side effects such as clinging, insomnia, irritability and loss of appetite in children under the age of five. Therefore, medication is not an option at this age (Jones, 2000).

The most important method of treatment at this stage is behavior modification and control over the child's behavior both at home and at preschool. Once the child reaches the elementary age, they may be successfully medicated and should probably start some form of social skills training. Peers are especially important in this stage of the child's life and children with AD/HD generally have problems making and maintaining friends so it is usually beneficial to start this type of training. When the AD/HD child reaches the teenage years, it becomes especially important that he is able to control himself without the constant supervision of adults (Barkley & Mash, 1998). This is especially true when the young adult with AD/HD goes to college because he will experience many new freedoms and responsibilities.

Even though a multidisciplinary and multimodal treatment plan is generally the best choice, when two treatments are attempted simultaneously, they may interact positively, negatively or they may simply cancel each other out. Care must be taken to ensure that each treatment is beneficial to the child so that time and money is not wasted and so that the child is not harmed in any way by the prescribed treatment. The subject of AD/HD treatment is by no means clear-cut but most people experience an alleviation of symptoms through the use of one or more of the treatment plans available (Greenhill & Osman, 2000).

2.7.1 Medications

Medications are usually part of a multidisciplinary treatment plan for AD/HD because when a child has a severe case of the disorder he needs medication just as much as a person with a serious physical disorder, such as diabetes, does. Medication calms the child down and brings him to the same levels as his peers in all aspects of daily life such as at school, playing games and at home. However, positive results from medication only last as long as the drug is in his system so other non-physiological treatments, such as behavior modification, should be used to help the child learn long-term ways to cope with, and eventually control, his disorder. Most clinics report a success rate of 80-95% when treating an AD/HD child with both medication and other treatments such as behavior modification, dietary interventions and holistic approaches (Bilton & Cooper, 1999). The role that teaching the child to control himself plays in the multi-modal treatment plan is obvious. If the child is on medication alone, he may start to believe that

he has no control over his own actions and that he never will (Grimley & Kirby, 1986). If this attitude is not recognized or is simply ignored, by the time the child moves out of his home and/or goes to college he will still not have the ability to control his behavior. Inappropriate behavior can lead to trouble with his peers, with authorities at his college and with the law. The child is a first-hand source as to how the medication is working and his own attitude toward his treatment plan so he should be involved in the medication process when appropriate. It is important to keep educators and parents thoroughly involved because they interact with the child on a daily basis. The physician only sees the child in an office setting, which makes it difficult for him or her to determine possible comorbidities and the correct medication and its optimal dosage without help (Goldstein, 1997). The physician should see the child every six to twelve months even after the initial medication period to ensure that the medication is still working effectively and to make sure that the child is not changing weight or blood pressure or experiencing any other serious symptoms (Bilton & Cooper, 1999). It is also important to keep the same physician for as long as possible, especially if he or she is well liked by both the child and parents because trust is an important factor. However, if the child goes away to college it may be necessary to find a doctor who is close to his college. In this case, it is advantageous to speak with the counseling center at the school for recommendations for physicians in the area.

The optimal dosage and type of medication best suited for an individual is not likely to change over the years (Goldstein, 1997). Thus, if the child needs to change doctors, there is no need to go through the trial period for medication again. The optimal dosage for anyone taking any sort of drug for any disorder is the lowest possible dosage which produces the desired effects. This is very important to keep in mind during the medication trial period because this phase of treatment can be very frustrating for everyone involved. However, since everyone metabolizes drugs at a different rate, there is no way to know what the optimal dosage will be for a specific person based on his or her height, weight, age, etc. Therefore, the AD/HD patient should be started on the lowest dosage, 5mg of Ritalin or 2.5mg of Dexedrine, and, if needed, the medication should be increased every 2 or 3 days until the child's symptoms are eliminated. A dosage which is too high for a specific child can cause bad side effects and, in some cases, actually make the child's symptoms worse than before (Jones, 2000).

The most commonly prescribed class of drugs to treat children with AD/HD is stimulant medications, such as Ritalin and Dexedrine. Studies done in the 1980s and 1990s show that 52% to 71% of children with AD/HD are taking stimulant medications and, of those taking stimulant medications, approximately 83% take methylphenidate (Ritalin), 9% take dextroamphetamine (Dexedrine) and 8% take pemoline (Cylert). Methylphenidate use has increased dramatically from the 1970s to the 1990s while dextroamphetamine and pemoline use has decreased (Greenhill & Osman, 2000). The most commonly prescribed class of drugs to treat adults with AD/HD is antidepressants, especially those adults with a past history of substance abuse. Methylphenidate is a Schedule II controlled substance which means that it is closely watched by the DEA and physicians because it is addictive and thus frequently abused by adults although addiction does not appear to be a risk for children (Goldstein, 1997). There is also a demand for stimulant medications as a recreational drug, especially among high school and college students. Many students who do not have AD/HD take the drug to help them concentrate on homework or to get "high." Since AD/HD teenagers generally have a comorbid social disorder, they may sell their medication to their peers as an attempt to make people like them. The risk of addiction and the demand for stimulant medications among recreational users are the main reasons why antidepressants are prescribed more than stimulant medications for teenagers and adults with AD/HD. Anti-hypertensives and anti-psychotic drugs are also used as treatment for both adults and children but much less frequently (Jones, 2000).

When physicians first discovered that stimulants, anti-depressants and anti-hypertensives can alleviate symptoms of AD/HD they had no idea why. Researchers today have a few ideas as to why these medications work but there is still no conclusive evidence for any one theory. Some medical professionals believe that the core AD/HD symptom is poor behavioral inhibition due to excessively high or low levels of certain neurotransmitters in the brain such as dopamine, norepinephrine, epinephrine and serotonin. Stimulants, anti-depressants and anti-hypertensives may work to normalize the level of these chemicals in the brain (Barkley & Mash, 1998).

2.7.1.1 Stimulant Medications

There are also several theories as to how stimulant medications in particular work. Some people believe that stimulant medications work by stimulating certain parts of the brain which are functioning under normal levels (Jones, 2000). Others believe that children with AD/HD have levels of arousal which are below normal and that stimulant medications raise arousal levels or that people with AD/HD are aroused too much and that stimulant medications lower arousal levels (Bloomingdale, 1985). Still others believe that everyone has a unique optimal stimulation level, however, the stimulation level of AD/HD children is much higher than average so these children need to receive excessive stimulation from somewhere. Stimulant medications, as well as video games and playing in a structure-free environment, provide the child with his personal optimal stimulation level. When performing these types of activities, the child has no need for excessive outside stimulation and so he will seem more like his peers (DeGrandpre, 1999).

Although medical professionals cannot agree on how stimulant medications work, they can agree that they do generally work. Stimulants, when used correctly, improve AD/HD symptoms in approximately 75% of people who take them (Goldstein & Ingersoll, 1993). They directly affect a child's overactivity, inattention, impulsivity and aggression. There are also some indirect improvements from stimulant medication including improved academic achievement in both quantity and quality, increased compliance with commands and increased positive social interactions (DeGrandpre, 1999). Stimulant medications can also help the child with several aspects of language such as maintaining a suitable talking pace, staying on a certain topic during conversation, being polite, decreasing the amount of off-task speech, listening to the person they are talking with and using more complex sentences (Greenhill & Osman, 1993). Children with severe inattentiveness, of a younger age (6-13 years), with fewer comorbidities and with higher intellectual abilities usually benefit the most from stimulant medications (Goldstein, 1997).

Although stimulant medications are very effective for treatment of AD/HD symptoms when used correctly, they have a bad reputation. AD/HD is commonly mis- or under-diagnosed and stimulant medications will more than likely not work as intended for these patients. Patients who are mis-diagnosed with AD/HD will probably see no marked change in their symptoms from stimulant medication. Those who are under-diagnosed actually have AD/HD but also have other disorders such as conduct or social anxiety disorder, which may cause the stimulant medication

to actually worsen their symptoms. People with AD/HD and some common comorbidities should avoid certain medications and/or take multiple medications to take care of all of their symptoms (Goldstein & Ingersoll, 1993).

Serious or long-term side effects from stimulant medications are rare when the correct dosage is being taken. However, temporary side effects may occur during the first couple of weeks the patient is on the medication. Temporary side effects only last as long as the drug is in the patient's body, which is only about four hours for most stimulant medications such as methylphenidate and dextroamphetamine. The most common side effects are abdominal pains, nausea, dry mouth, sleeplessness, loss of appetite, temporary personality change, itching, depression and the ~~"re~~bound effect" (Bilton & Cooper, 1999, p. 66-75). The ~~"re~~bound effect" is when the child's AD/HD symptoms become worse while the medication is wearing off. Most physicians suggest that a child experiencing rebound effects should take his medication approximately every three hours instead of the normal four hours (Bilton & Cooper, 1999). There are also some serious symptoms such as panic, confusion, increased aggression, difficulty urinating, change in blood pressure, rapid heart beating, constipation, trembling, chest pains, diarrhea, heightened emotions, excessive crying and excessive irritability. If any of these serious symptoms occur, use of that drug should be discontinued and alternatives should be found (Jones, 2000). Some patients have claimed to experience a height loss of approximately half an inch to an inch. Some medical professionals believe that the loss in height may be due to the loss of appetite commonly caused by stimulant medication. Caretakers of AD/HD children should make sure that their child is eating healthy and consistently (Barkley & Mash, 1998). There is also a controversy as to whether stimulant medication can cause Tourette's syndrome. A person suffering from Tourette's experiences involuntary body movements and vocal outbursts, usually consisting of obscenities. Approximately half of Tourette's sufferers also suffer from AD/HD. AD/HD symptoms are usually apparent very early in the child's life while the onset of Tourette's takes approximately five to ten years. Therefore, the child is probably already taking stimulant medication to treat his AD/HD symptoms before he knows he has Tourette's. Therefore, there is controversy as to whether stimulant medication can cause Tourette's or whether the Tourette's syndrome was latent in every case. In fact, stimulant

medication works to alleviate tics caused by Tourette's in about half of the cases; in the rest of the cases, stimulant medication makes the tics worse (Goldstein & Ingersoll, 1993).

While the dosage of the drug is very important when considering potential side effects, how many times the drug is taken per day is also a very large factor. Many parents try to give their child no more than two or three doses per day because any more than that is known to increase side effects. The two doses should be taken at breakfast and at lunch so that the child is attentive and behaves properly at school. If the child has severe AD/HD, this can make life at home difficult because the child will not be medicated during the evening. In this case, other treatment methods such as behavior modification and parent training should be considered. Many parents give their child a "drug holiday" on school vacations to lessen the possibility, if any, of long-term side effects and to determine the difference between the drug-free and drug-induced behaviors of their child to see exactly what behaviors the medication is improving (Greenhill & Osman, 2000).

Studies have been done to show that the more severe the symptoms are for an AD/HD child in a drug-free state, the higher the degree of change will be when the child is on the correct dosage of stimulant medication. If the child has severe AD/HD symptoms, they have more to improve upon and thus medication has more positive effects on them than on children with mild to moderate AD/HD symptoms. However, if the dosage is too high the child will usually display personality traits which are the exact opposite of those which they display in their drug-free state. For example, if a child is particularly impulsive, they will be significantly hesitant on a dosage which is too high for their needs (Bloomingdale, 1985). Thus, parents and physicians must be very careful not to prescribe a dosage which is too high for the child so that the does not turn into a completely different person under the influence of the stimulant medication.

2.7.1.1.1 Ritalin (Methylphenidate)

At the moment, 95% of children taking medication for AD/HD are taking Ritalin, name brand methylphenidate, because most children respond positively to it (Jones, 2000). However, Ritalin is not recommended for people with excessive anxiety, motor tics or a family history of

Tourette's syndrome. Methylphenidate has the same positive and negative side effects as described in the Stimulant Medications section above (Goldstein, 1997).

Generic methylphenidate is much cheaper than brand-name Ritalin. There is not supposed to be a difference between the two types because they both have the same active ingredients, however, some children taking Ritalin do not respond to generic methylphenidate and, in some cases, different dosages may be required to produce the same effects. In most cases, the cheaper cost of generic methylphenidate outweighs the disadvantages, such as higher doses, it may cause. Scientists have also devised a sustained-release methylphenidate pill which lasts for eight hours instead of the regular four hours. However, it has repeatedly caused more adverse effects, takes longer to work after the dosage is taken and doesn't suppress the symptoms as well as regular methylphenidate does so it is not widely accepted in the medical community (Goldstein, 1997).

Many parents are very skeptical about giving their child Ritalin because it has a rather bad reputation among the general public. One reason for the skepticism surrounding Ritalin is the sudden rise in Ritalin prescriptions throughout the United States. Even in the small time period from the mid-1990s to 2002, Ritalin use has increased dramatically. As of 2000, 1.5 million children in North America take Ritalin. 80% of the world's Ritalin is used in the United States which raises the question of why children in the United States seem to "need" Ritalin more than children in other countries (DeGrandpre, 1999). Lastly, some parents fear giving their child methylphenidate because it is a very strong psychotropic drug with biochemical effects similar to cocaine and amphetamines in large doses (Greenhill & Osman, 2000).

In fact, animals in laboratory environments cannot tell the difference between cocaine, amphetamines and large doses of methylphenidate when all three drugs are taken intravenously. At extremely high doses, side effects from methylphenidate are similar to side effects from cocaine and amphetamines such as euphoria, agitation, tremors, increased heart rate (over 100 beats per minute), hypertension, trembling and psychotic episodes (Greenhill & Osman, 2000). However, children taking Ritalin do not feel "high" or experience the same effects as a person taking cocaine or amphetamine would. The way a drug is taken, either intravenously, orally or intranasally, can greatly change the effects that the drug will have on the person. Children take

Ritalin orally while recreational users of cocaine, amphetamines and stimulant medications such as Ritalin usually snort or inject the drug. Also, what the user expects when he or she is taking any sort of drug greatly affects what the person will feel from that drug. Since children taking Ritalin do not expect to get "high" from the drug, they do not but a recreational user of methylphenidate would be expecting to feel "high," so he or she would (DeGrandpre, 1999).

Due to the fact that methylphenidate can have effects similar to cocaine and amphetamines and since Ritalin can improve most people's attention span and work productivity even if they don't have AD/HD, Ritalin is a commonly abused drug. Ritalin is most commonly abused by teenagers in high school and college because most people know at least one person who is prescribed Ritalin at this age and there is an increased need for academic productivity and accuracy at school. The Drug Enforcement Agency (DEA) claims that Ritalin abuse among high school seniors increased from 3% to 16% from 1992 to 1995. Methylphenidate was so highly abused as a street drug in Sweden that it was officially banned by the Swedish government in the 1960s (DeGrandpre, 1999). The United States government has known about the potential for abuse of methylphenidate since its discovery. It is a Schedule II prescription drug which means that is placed in the same class as cocaine, amphetamines and valium in the eyes of the DEA. In order to be placed in this class, a drug must have a high potential for abuse, be a commonly prescribed medication in the United States and have the potential for psychological or physical dependence (Greenhill & Osman, 2000). However, even though Ritalin has a bad reputation, it can have very positive effects on a child with AD/HD and can help them to lead a more normal and productive life.

2.7.1.1.2 Dexedrine (Dextroamphetamine)

Dexedrine, brand name dextroamphetamine, is prescribed much less than Ritalin to treat AD/HD symptoms because Ritalin works best and produces the least number of side effects for most people. However, for those people who do not respond to Ritalin or experience bad side effects from it, Dexedrine can be very helpful. Approximately 3% of children with AD/HD take Dexedrine, which is also a Schedule II controlled substance. The optimal Dexedrine dosage for any individual is approximately half that of their optimal Ritalin dosage. Side effects from

Dexedrine are the same as those from Ritalin and are described in the Stimulant Medications section above. As with Ritalin, people with excessive anxiety, motor tics or a family history of Tourette's syndrome should not take Dexedrine (Goldstein, 1997).

2.7.1.1.3 Cylert (Pemoline)

Cylert, brand name pemoline, is effective for approximately 75% of AD/HD people who take it. If a child does not respond to Ritalin or Dexedrine, Cylert may be effective for him (Goldstein, 1997). Some people like Cylert because only one dose is needed per day, however positive effects cannot generally be seen for weeks after the first dosage is taken (Goldstein & Ingersoll, 1993). Even though Cylert has the same side effects as Ritalin, only approximately 6% of people with AD/HD take it because it has a few additional serious side effects. These side effects are liver failure, elevated liver enzymes, hepatitis (liver inflammation) and jaundice (yellowing of the skin and eyes). There are also more cases of insomnia and anorexia reported among Cylert users compared to users of other stimulant medications. Serious liver problems occur in approximately 2% of people taking Cylert but there are no apparent changes in the child's health so it is hard to detect. So far, two children have died from liver complications related to Cylert. There is a high degree of variability among metabolism rates of the drug, which may be the cause for these more serious side effects (Goldstein, 1997).

2.7.1.1.4 Adderall

Adderall is a mixture consisting of equal amounts of the following: dextroamphetamine saccharate; amphetamine aspartate; dextroamphetamine sulphate; and amphetamine sulfate. It lasts approximately six to eight hours so at most two doses per day are needed. It has side effects similar to Ritalin but side effects occur in more people so this drug is rarely used (Goldstein, 1997).

2.7.1.2 Antidepressants

Antidepressants are popular for the treatment of AD/HD symptoms because of the bad reputation of stimulant medications. They are also popular among people for whom stimulant medication either do not work or cause adverse side effects and for those with a comorbid mood or anxiety disorder. However, antidepressants are used less frequently than stimulant medications so their effects on AD/HD symptoms are not studied nearly as much and thus are not as well understood (Barkley & Mash, 1998). Some studies have been done on the more common antidepressants such as Wellbutrin (brand name bupropion). Research has shown Wellbutrin to be just as effective in treating AD/HD symptoms as methylphenidate with no side effects. Other antidepressants such as Prozac (brand name fluoxetine) did not fare as well in studies, however. Prozac was found to moderately improve AD/HD symptoms for only about 60% of patients with side effects including sleeplessness, loss of orgasm, irritability and headaches (Goldstein, 1997).

2.7.1.2.1 Tricyclic Antidepressants

Tricyclic antidepressants are the most common antidepressants used for the treatment of AD/HD symptoms (Goldstein & Ingersoll, 1993). Even so, well below 1% of children being treated for AD/HD are taking tricyclic antidepressants but the percentage is much higher for adults. They are especially helpful for children who have a comorbid anxiety or mood disorder or Tourette's syndrome. 60% of children with Tourette's syndrome find that tricyclics reduce their tics and approximately 96% of these children find that they also alleviate AD/HD symptoms. Some common tricyclics are Norpramine (brand name desipramine), Trofanil (brand name imipramine), Pamelor (brand name nortriptyline) and Elavil (brand name amitriptyline) (Goldstein, 1997).

The dose of tricyclics which is given to a person with only AD/HD is much smaller than the dose given to a person with multiple comorbid disorders or depression alone (Jones, 2000). Tricyclics work to improve AD/HD symptoms in 75% of people taking them and side effects usually only occur at doses higher than 100 mg. They work by improving mood, lowering impulsivity and increasing frustration tolerance and thus positively affect bad behavior more than attention (Goldstein & Ingersoll, 1993). Effects from low doses of tricyclics mimic effects from stimulant medications except tricyclics also provide a state of elevated happiness. However, unlike

stimulants, the effect tricyclics have on a patient decreases over time so they cannot be viewed as a long-term solution (Barkley & Mash, 1998). The most common side effects are drowsiness, dry mouth, constipation and flushing (reddening of the face). More serious side effects include tachycardia (rapid heart beat) and arrhythmia (irregular heartbeat) (Barkley & Mash, 1998). Electrocardiograms (EKG) should be administered regularly to monitor the patient's heart (Goldstein & Ingersoll, 1993). In some cases, coma and even death due to sudden heart failure was reported. Children may also develop slow reactions in the focusing of their optic lens or skin rashes, which will go away when the child is taken off of the medication (Barkley & Mash, 1998). If a person needs to be taken off of tricyclic antidepressants, it should be discontinued gradually to avoid flu-like withdrawal symptoms (Goldstein & Ingersoll, 1993).

2.7.1.3 Anti-hypertensives

The most common anti-hypertensive medication used for the treatment of AD/HD symptoms is Catapres (brand name clonidine). Catapres can help to prevent migraines and treat aggression (Jones, 2000). It is fairly ineffective at treating AD/HD symptoms such as inattention but is very useful for reducing hyperactivity, arousal levels, mood swings and sleep disturbances (Barkley & Mash, 1998). Those who benefit the most from Catapres are those who are severely overactive, aggressive or explosive and/or those with comorbid conduct disorder (Goldstein & Ingersoll, 1993). It has a 75% success rate at lowering the occurrence of tics in patients with Tourette's syndrome and is approximately 96% successful at treating AD/HD symptoms in patients with comorbid Tourette's syndrome (Goldstein, 1997).

Catapres is thought to work by inhibiting the release of neurotransmitters such as norepinephrine, dopamine and serotonin (Barkley & Mash, 1998). Therefore, side effects include depression and sedation as well as excessively low blood pressure. Also, Catapres only lasts for approximately two and a half hours and it can take up to three months to see maximum results. Catapres should not be mixed with Ritalin because several children have died from this combination in the past. As with tricyclics, Catapres usage should never be stopped abruptly due to withdrawal symptoms (Goldstein & Ingersoll, 1993).

Another type of anti-hypertensive medication used to treat AD/HD symptoms is Tenex (brand name guanfacine). It is very similar to Catapres except it lasts for approximately 18 hours and has fewer occurrences of side effects such as hypotension (abnormally low blood pressure) and sedation. It is believed to enhance working memory and attention, lower levels of arousal and activity and increase selective attention skills, inhibition and frustration tolerance (Goldstein, 1997).

The third type of anti-hypertensive medication which is useful for AD/HD patients is Inderal (brand name propanolol). Inderal is used to treat migraines, abnormally high blood pressure and certain heart disorders by relaxing muscles around blood vessels. It has been found to at least moderately reduce the occurrence of aggressive outbursts in 75% of people who take it (Goldstein, 1997).

2.7.1.4 Tranquilizers/Anti-Psychotics

Tranquilizers and anti-psychotic medication, such as Risperidone, should only be given as a last resort when all other treatments available for AD/HD have been tried extensively and have failed. Risperidone is a very strong medication and should not be given to children who are too young. Only approximately 0.5 to 1 mg should be given per day so that serious side effects do not occur (Jones, 2000).

2.7.2 Behavior Modification

While there are an extensive number of medications available for the treatment of AD/HD symptoms, many people are opposed to medication and must look to alternate methods of treatment. Also, an individual cannot be medicated for AD/HD for his entire life; at some point, he must rely on other methods of treatment to suppress his symptoms. Behavior modification is a very popular form of treatment, especially in conjunction with medication. In fact, a combination of both behavior modification and medication is the number one preferred treatment method in North America (Bilton & Cooper, 1999). Even though medication and behavior modification are used as treatment for the same disorder, each method is better at treating certain

aspects of AD/HD. For example, medication is better at reducing activity levels while behavior modification is better at increasing problem-solving performance, decreasing impulsivity and increasing on-task attention (Grimley & Kirby, 1986). When the behavior modification program is first started, it is helpful if the child is on medication so that he stays focused on being well-behaved and learning the behavior modification strategies. After a while, the child will ideally learn to control himself and medication will no longer be needed. Behavior modification techniques should be started as soon as the child is old enough and should consistently be carried out throughout the time the child lives with his parents. Therefore, when the child is prepared to move out of his parent's home or go to college, he will hopefully have learned how to control his own behavior. There are many different types of behavior modification including self-regulation, parent training and behavior modification in the classroom, but they are all based on the same general principle that positive and negative consequences can rule behavior (Goldstein & Ingersoll, 1993).

The most common form of behavior modification is the response-cost system which can be used in clinics, at home and at school effectively. There are many different versions of response-cost but all of them are based on the idea that constant and consistent positive and negative consequences can motivate a child, especially a child with AD/HD, to act appropriately. Every behavior modification program should begin by teaching the child what he is doing wrong. At first, he should be told exactly what he is doing wrong such as "you are daydreaming." As he gets used to the behavior modification program, he should be told what he is doing wrong in a more general way such as "you aren't paying attention" or "you are being hyperactive." There are a variety of different consequences, both positive and negative, that can be used by parents, teachers and clinicians. One method involves giving the child a certain amount of free time and every time they misbehave, a certain amount of time is deducted (Goldstein & Ingersoll, 1993). At the end of the day, if the person administering the consequences decides that the child was very good for the day, he or she may decide to do something extra such as play a game with the child, which is called a natural reward, or give the child a small present, a tangible reward. Both natural and tangible rewards should be used equally. The last version of a response-cost program involves starting the child out with a certain number of tokens per day. Every time the child is bad, one token is taken away. At the end of the day, they can either receive a small prize with

the tokens they earned that day or accumulate their tokens over a period of time for a bigger prize. This form of response-cost is used primarily by physicians in a clinical setting (Grimley & Kirby, 1986).

It is very important that behavior modification programs be used correctly, which is fairly difficult to do. Therefore, parents and teachers should be trained in how to use them effectively and appropriately. They must be sure not to make it too complicated for the child to fully understand and they should consult a physician about the program they are using, especially in the beginning (Goldstein & Ingersoll, 1993). However, there are seven general rules that all behavior modification programs should follow. The first rule is that rules given to the child should be brief, clearly stated and observable. The next two rules state that a consequence should be administered directly after the action that inspired it and that they should be frequent (Professional Developmental Resources, 1996). In fact, studies have shown that inconsistent consequences impair the AD/HD child more than no behavior modification. This is due to the fact that AD/HD children become overly excited by potential rewards and overly frustrated when they do not receive a reward for a positive action (Bloomingdale, 1985). Rule four states that both positive and negative consequences should be severe enough to motivate the child (Professional Developmental Resources, 1996). However, some consequences can be as simple as a smile or a frown, especially when the child is young (Goldstein & Ingersoll, 1993). Colorful stickers or small pieces of candy are also useful as positive reinforcers for young children (Bloomingdale, 1985). Time-out is an effective negative punishment for children. Studies have shown that time-out is more effective if the parent or teacher says that they are ~~"c~~ounting the child out" instead of the traditional ~~"y~~ou are in time-out." The child should be in timeout for approximately one to two minutes for every year they have been alive. For example, if the child is five years old, he should be in timeout for approximately five to ten minutes (Goldstein & Ingersoll, 1993). Rule five states that rewards should be established before punishments and that they should be of the same severity (Professional Developmental Resources, 1996). Some experts say that parents should be generous with positive consequences and that delivering too many negative consequences can lead to ill feelings and ~~"p~~ower plays" between the parent and child (Goldstein & Ingersoll, 1993). However, the wrong kind of positive rewards can make the child attempt to respond to rules or demands too quickly and thus lose their inhibition.

Improving inhibition is one of the main goals of behavior modification programs, so a parent or teacher should consult with a professional regarding what kind of consequences to administer. However, the balance between motivation, inhibition and frustration is different for each child and thus most children will also benefit from visiting a professional such as a psychotherapist or a clinician, especially during the development of the individualized behavior modification program (Bloomingdale, 1985). Rule number six states that consequences, especially rewards, should be changed or rotated frequently to keep the child interested. The last rule states that anticipation is the key to preparing an AD/HD child for a transition such as taking them off medication, changing consequences or starting a new grade at school (Professional Developmental Resources, 1996). Helping a child to prepare for small transitions while he is young can help him to learn to make important transitions later in life with more confidence and independence.

Behavior modification programs can be very discouraging because results are not seen right away, as they are with stimulant medications, and premature removal of a child from a treatment program will cause the child to return to pre-treatment levels. Also, behavior modification programs which are oriented toward one setting don't usually help the child's behavior in another setting unless the child is taught specific strategies to apply what he has learned in different situations and environments (Barkley & Mash, 1998).

2.7.2.1 Self-Regulation

Self-regulation, also called cognitive behavior modification, began in the 1970s and was viewed as teaching a child how to control himself instead of forcing him to rely on medication to fix his problems (Goldstein & Ingersoll, 1993). Today, however, cognitive behavior modification is used in conjunction with medication; medication makes it easier for the child to learn self-regulation techniques because it helps him to focus on what he is being taught. Cognitive behavior modification is very useful but it is not for everyone and it does not usually work for children under the age of seven. However, when it is used effectively, self-regulation is viewed as superior to external help, such as traditional behavior modification, because the child relies primarily on himself to change his behavior (Bilton & Cooper, 1999). Self-regulation skills are

especially important for a person with AD/HD when he moves away from home because he must rely solely on himself to control his actions. Cognitive behavior modification is taught by a licensed therapist in a clinical setting and learning it effectively requires that the therapist and the AD/HD child have a healthy relationship. The major drawback to self-regulation is the immense cost; the total cost of a self-regulation program is approximately one to two thousand dollars (Goldstein & Ingersoll, 1993).

Proponents of cognitive behavior modification believe that the main deficit in children with AD/HD is the lack of an internal dialogue which controls their actions and words (Bilton & Cooper, 1999). Therefore, the goal of cognitive behavior modification is to develop the child's internal dialogue so that he is able to use it to control his behavior and attention. The first step in cognitive behavior modification is to let the child be ruled by external instructions from adults such as "don't hit other children." The next step is to help the AD/HD child learn to verbally tell himself not to be aggresive and then follow his own instruction. The third and final step in self-regulation techniques is to internalize the instruction so that it is not verbalized; thus, the child has developed an internal instruction dialogue (Goldstein & Ingersoll, 1993).

Another large part of cognitive behavior modification is teaching the child problem solving skills. Therapists generally teach a child problem solving skills by verbalizing their approach to a certain problem, helping the child verbalize his own thinking process on a similar problem and then letting the child perform the problem himself. The therapist must be very careful to allow the child to develop his own natural ways of thinking and not to let the child mechanically recite problem solving skills. The therapist needs to be animated and responsive to the child so that the child will become involved in the sessions. Therapists usually start teaching problem solving strategies with games instead of academic subjects because many AD/HD children have failed in the academic field many times before they start seeing a therapist. Therefore, the child is probably uncomfortable when talking about school or performing school-related tasks. Once the child is comfortable with problem solving strategies for games, the physician should teach the child specific academic problem solving skills and teach the child to apply what he has learned to an academic setting (Grimley & Kirby, 1986).

The therapist must determine whether his or her AD/HD patient has problem solving skills but is too impulsive to use them correctly or whether he has little to no problem solving skills (Grimley & Kirby, 1986). A child who has the skills but is too impulsive and/or inattentive to use them may be helped by simple reminders to pay attention and to be patient and thoughtful. He may be provided with a "concentration tape" in which he hears random beeps. Whenever the child hears a beep, he is supposed to write down if he was paying attention and staying on task (Goldstein & Ingersoll, 1993). Another variation of this process is for the child to write down what problem solving step he was just thinking about before the beep sounded (Grimley & Kirby, 1986). This helps the child to self-monitor, self-observe and self-evaluate. The child should also be taught to self-reinforce by giving himself rewards and punishments (Bilton & Cooper, 1999).

2.7.2.1.1 Social Skills Training

Social skills training is a form of self-regulation directed toward helping the AD/HD child develop a better relationship with his peers. Academic and behavior modification training should be started before social skills training because they provide more consistent rewards. Not every child with AD/HD experiences problems with peer interactions or social situations; the symptoms which characterize an AD/HD child who lacks social skills are obstinacy, stubbornness, bossiness, severe mood swings, bullying, low frustration tolerance, temper outbursts, low self-esteem and lack of response to discipline. Therefore, these children usually aren't accepted by many of their peers and respond badly to provocation by other children and to losing. They also generally lack an awareness of appropriate social goals and so they usually do not have the same goals as their peers. For example, there are three different goals that a person can have in mind when playing a game: to win, to maintain friendships or to get better at the game. Most children use games to maintain friendships and possibly get better at the game. They would like to win but usually respond decently to losing. The AD/HD child will probably cheat because they are most likely playing to win, which essentially destroys the goal of maintaining a friendship (Grimley & Kirby, 1986).

There are five distinctive skills that need to be learned by the AD/HD child with inept social skills before he can interact appropriately with his peers. These five skills are problem

sensitivity and alternative, means-end, consequential and causal thinking. Problem sensitivity refers to the ability to know problems will arise and to recognize them when they do. Alternative thinking involves considering alternative solutions to a problem, which is especially difficult for significantly impulsive AD/HD children. Means-end thinking encourages the child to think about different obstacles which will be associated with each alternative solution. Causal thinking reflects the idea that people's behavior is fairly predictable and that their response to a certain action can be predicted from their response to a similar action in the past. Some clinicians have put the process of social decision-making into question form to make it easier for the child to understand and apply to everyday life. The child is supposed to ask himself the following five questions: what is my problem?; how can I do this?; can I think of other realistic plans?; which plan is best?; and am I following my plan? This is very similar to self-regulation in that it encourages the child to use his internal dialogue to help him get through difficult situations in everyday life. The child is also encouraged to reward himself appropriately whenever he fares well in a social situation (Grimley & Kirby, 1986).

Before a child can be taught to deal with social situations correctly, he must first realize that he has a problem. If the child will only realize certain problems, those problems should be worked on first. Social skills are usually taught by a physician in a clinical setting but parents and teachers should be involved so that they may help the physician determine the areas in which the child needs the most help or if the child is improving as a result of the training. The most common way that social skills are taught to children is through role-playing. For example, the physician may set up a scene in which there is a social problem and he will play one role while the child plays another. Role-playing only works if the physician is very animated and responsive and plays his or her role well so that the child becomes involved and plays his role well. The physician may also supply the child with a beginning and an end of a social scenario and the child must fill in the middle of the story. The child will probably supply wrong answers and play roles wrong, especially at first, but his wrong answers can tell the physician how he is thinking and thus help the physician to determine individualized ways to help the child. It is very important that the child and the physician reflect on each role-playing situation and possibly take different perspectives on the situation so that the child realizes what he did wrong and right (Grimley & Kirby, 1986).

Sometimes, however, the child does well in role-playing situations in the clinic but finds it hard to carry the lessons he has learned to real-life situations due to the heightened emotions and quick thinking involved. Therefore, the therapist should attempt to get stories of real-life situations from the child, his parents and his teachers and role-play the situations in the clinic. The child may also supply ways that he used his social skills training in real-life. Dealing with real-life situations induces interest and heightened emotions in most children but upsets some. However, it should be used with all children going through social skills training because it shows the child how to apply what he has learned to specific, real-life situations (Grimley & Kirby, 1986).

2.7.2.2 Help in the Classroom

Behavior modification in the classroom is slightly different from behavior modification at home or in the clinic. Teachers should use more positive consequences than negative consequences for all children in order to build their self-esteem (Barkley & Mash, 1998). However, studies have shown that teachers generally criticize more than they praise (Goldstein & Ingersoll, 1993). Teachers should use tangible rewards instead of social reinforcements such as attention and recognition. The most common form of negative reinforcement is taking away some of the child's recess time. However, the teacher should avoid lengthy explanations of what the child has done wrong because it will only confuse the child and he will not learn from his mistake (Barkley & Mash, 1998).

AD/HD children generally learn better from concrete experiences or active experimentation, which means that they prefer feeling over thinking and doing over observing (Bilton & Cooper, 1999). AD/HD children have a very unique learning style but most teaching strategies that benefit AD/HD children also benefit other children. Teachers are encouraged to increase children's interest in the task they are performing by making it novel and exciting (Professional Developmental Resources, 1999). Teachers should be very animated, theatric and responsive to their students (Barkley & Mash, 1998). They should vary the format in which they present material, be organized and always use lots of colors, especially with younger children. Children

should be allowed to actively participate in class and should be able to intersperse academic work with physical activity. Brief tasks should be assigned with prompt feedback and if there is a long task to be accomplished it should be broken down into smaller, simpler tasks (Professional Developmental Resources, 1999). The AD/HD child fares best when there are frequent changes in the nature of the task but no change in the actual subject (Barkley & Mash, 1998). Class periods should be longer to minimize the disruption due to changing subjects and/or classrooms (Bilton & Cooper, 1999). Frequent breaks, even if they are short, are necessary. Task instructions should be written on the board or repeated frequently throughout the duration of the task to keep the AD/HD child focused on the task at hand. Rules should be displayed in the classroom at all times. Time limits should be clear and, if needed, the child should be given a timer to remind him how much time he has left on a certain task (Barkley & Mash, 1998). AD/HD children work better in the morning so it is helpful if the most difficult academic subjects are held in the morning. If this is not possible, high and low interest academic subjects should be dispersed across the school day (Bilton & Cooper, 1999). If an AD/HD child is not getting the attention that he needs in a regular classroom, he may need to go to a special education class for part of the day or the whole day (Barkley & Mash, 1998). If this is not possible, the child should at least be seated near the teacher and away from environmental distractions (Bilton & Cooper, 1999).

As the AD/HD child grows into his teenage years, his problems in school may escalate. Parents and their teenager should consider both private and peer tutoring for help in subjects in which he has difficulty. The AD/HD student should also have a separate ~~–or~~organizational coach," such as a guidance counselor, to help him organize his school work. If needed, he should have an extra set of books to keep at home and should have a daily or weekly behavioral report card sent home (Barkley & Mash, 1998). He should have a notebook for his homework which both the teacher and the parents check and initial everyday so that the teenager stays on task at home too. AD/HD teenagers should also be provided extra time on tests, which is required by law in some cases (Goldstein & Ingersoll, 1993).

When the AD/HD child goes to college, the same basic tips as for high school apply. Most schools have a disability services office (DSO) in which children with AD/HD can turn to for

help. A counselor at the DSO may serve as the student's organizational coach and as an advocate to help the student get more time on tests from teachers. However, at most colleges, the student himself is responsible for meeting with the professor to discuss his disability in order to receive accommodations from that professor. Disability services may also provide note takers for the AD/HD student because it is difficult for him to pay attention during long lectures with no breaks. However, this does not mean that the student should not attend lecture.

2.7.2.3 Psychotherapy

While the teenage years are difficult for everybody, they can be especially difficult for AD/HD teenagers because they have already failed many times in school, at home and with peers. Constant failure may cause the AD/HD teenager to develop an external locus of control which means that he attributes every bad thing that happens in his life to his own stupidity and any piece of success he experiences to pure luck. He may also feel helpless and hopeless and thus develop a negative view of himself, his disorder, the world and his future (Goldstein, 1997). Psychotherapy is not recommended for younger children because they cannot really understand what is going on and thus cannot really agree to it. The teenager must accept psychotherapy and trust his therapist because he must be very open and honest for psychotherapy to be useful (Jones, 2000).

Therapists can help the AD/HD teenager to realize that he cannot change the fact that he has AD/HD but he can learn to embrace his differences. The goal is to view AD/HD as a non-threatening explanation of the difficulties he has experienced in all aspects of life. By doing this, the therapist can help the AD/HD teenager develop a sense of hope that he is in control of his present and his future. Psychotherapists also stress an internal locus of control which means attributing success to one's own skills and not random luck (Goldstein, 1997). When appropriate, the entire family should also attend psychotherapy sessions regularly. It is proven that most hyperactivity, especially in young children, stems from problems in the home such as the parent's marital problems, alcohol abuse and depression or other emotional problems of the parents. Family sessions can also help the whole family to understand their AD/HD sibling or child (Jones, 2000).

2.7.2.4 Parent Training

Parent training can be very helpful for many AD/HD children and their parents. Having a child who is difficult to control can be very stressful for the parents and they may develop a negative or controlling attitude toward their child. On top of that, inappropriate parental responses to both positive and negative behavior can cause the child to become confused and maybe even act worse. Parent training works best for parents with children who are non-compliant, oppositional and/or aggressive or those who simply do not respond to typical parenting techniques. About fifty percent of families with an AD/HD child attend parent training sessions one-on-one with a therapist. Many communities also offer parent training in a group setting but this form of parent training is used much less than the one-on-one sessions (Barkley & Mash, 1998).

Parent training usually consists of approximately ten to twelve sessions in private or group meetings. There are a number of different types of parent training programs but they all focus on improving the relationship between the child and his parents. A typical parent training program starts by educating the parents about AD/HD so that they do not have any misconceptions about the disorder. Most parents think that their child's bad behavior is simply the child's way to get attention when in fact their child has a disorder which is causing them to misbehave. Then the parents are taught how to give commands effectively. Commands in the form of a question are far less likely to be followed than a direct and brief command. The frequency of commands should be increased but the complexity should be reduced. The parent is taught to keep a token system at home in which each chore that the child is given is assigned a value. Every time the child completes the chore without complaining, he will receive the full number of tokens for that chore and possibly even a bonus for giving the parents no hassle. If he complains about the chore or does not do it when asked, little to no tokens should be given but the child is still required to complete the task. After the token system has been established, the parents may start taking away tokens for noncompliant behavior. Next, the parents are instructed in using time-out effectively. The threat of a time-out in a public place is more useful than at home because it is more humiliating in public. However, time-out in public is not an especially good idea for children with AD/HD because they already have a low self-esteem. If consequences cannot be

rendered in the public place or if the parent does not feel it is necessary to have time-out in public, negative behaviors should be recorded and punished later. If punishment is going to be rendered later, the parent needs to talk to the child and help them understand why he is not being punished right away but that he will be punished later. Before entering a public place in which children are notoriously difficult, such as a church, the child should be reminded of the rules and the possible consequences of negative behavior (Barkley & Mash, 1998).

2.7.3 Dietary Intervention

The most important aspect of dietary intervention is making sure the child eats a healthy, well-balanced meal that is suitable for him. The child may be allergic to certain foods or may experience heightened hyperactivity after eating certain foods. Therefore, care must be taken to avoid these foods and still keep the child on a well-balanced and healthy diet. Diets can also be extremely difficult for young children to understand and adhere to so other factors contributing to the child's misbehavior and/or inattention should be addressed before a diet is even considered. Parents should consult a physician or dietician before putting their child on any sort of diet (Bilton & Cooper, 1999).

Most parents today, especially families in which both parents work, rely on heavily processed food to make cooking dinner easier and quicker. Foods which are overly processed, stored for a long time and/or are overcooked are practically void of the nutrients which they originally contained (Bilton & Cooper, 1999). Studies have shown that most AD/HD children are deficient in vital nutrients such as zinc, magnesium, B vitamins and vitamin C. Some of these vitamins are linked to the metabolism of essential fatty acids so children with AD/HD may not get enough of or may not metabolize essential fatty acids correctly. There is even evidence to suggest that the onset of AD/HD can be linked to a metabolic disorder (Jones, 2000). There are also studies which show that AD/HD children may have excessive levels of certain harmful materials, such as aluminum, cadmium and lead, in their blood. It is known that cigarette smoke increases cadmium levels and lowers zinc levels in the body so children with AD/HD may experience heightened symptoms of hyperactivity, misbehavior and inattentiveness after being exposed to cigarette smoke. In fact, most children with AD/HD have certain foods, even some staple foods

such as wheat, or environmental toxins, such as cigarette smoke or perfume, which trigger their symptoms (Bilton & Cooper, 1999).

Since some children may have their symptoms triggered by staple foods and since school lunches are usually practically void of essential nutrients, most children who are involved in a dietary intervention program should bring a packed lunch to school. This can cause other children to pick on the child with the packed lunch or think of them differently because they are required to eat a different diet. Especially for young children and teenagers, it is very important to fit in with peers and make friends, which can be difficult for an AD/HD child, even without eating differently. Therefore, the AD/HD child may try to be "cool" and swap his healthy packed lunch for foods which he is forbidden to eat such as sugary foods and sweets, which will cause him to be hyperactive and inattentive at school. At least at home the child should feel as though he is eating the same as everyone else, therefore the whole family should eat the same healthy diet that the AD/HD child is prescribed. Some parents, either intentionally or not, use the diet as a punishment for the child and/or become too obsessive about the child's diet. However, the child should have a positive outlook on his diet and should understand exactly why he eats the way he does because there is a large psychological factor in dietary intervention. That is, if the parents and child believe it is going to help treat AD/HD symptoms, it probably will help. However, parents also should not be afraid to bend the rules every once in a while so that the child can feel as though he fits in. That is, when the child is going to a friend's birthday party, he should not be required to bring his own lunch and should be allowed to eat cake and ice cream like everyone else (Jones, 2000). When the AD/HD child goes to college it can become very difficult for him to eat right, especially when his peers are eating pizza late at night like most college students. Students should consult with a dietician and with the school to determine a plan to keep them eating right. They may also wish to consider taking vitamins and minerals.

Dietary intervention does not work for all AD/HD children because diet is not the cause of AD/HD symptoms in all cases (Bilton & Cooper, 1999). In fact, there is a controversy in the medical profession as to whether or not dietary intervention is even a viable treatment for AD/HD. However, many parents and doctors claim that it has greatly improved their child's or patient's AD/HD symptoms (Jones, 2000). There is a large body of evidence from well-defined

medical studies to suggest that only a small group of children with AD/HD benefit from dietary intervention. The children that benefit the most are generally young and have comorbid food allergies, problems sleeping and/or neurological problems (Goldstein & Ingersoll, 1993). Many medical professionals warn that using an unproven treatment technique may cause more parent/child conflict and with no positive changes in the child's symptoms. Even though there is a lot of controversy surrounding dietary intervention, doctors suggest that every child should have a healthy and well-balanced diet (Goldstein & Ingersoll, 1993). It is also recommended that the mother and the father eat healthy before conception and that the mother continues eating very healthy through her pregnancy and breastfeeding (Bilton & Cooper, 1999).

2.7.3.1 Nutritional Therapy

It is believed by some that AD/HD symptoms are caused by a genetic need for an abnormally high dose of vitamins and minerals. Some doctors in the 1970s claimed that high doses of vitamins, which they called ~~"m~~ega" vitamins, could result in a decrease in hyperactivity and improved attention and concentration levels. They also claimed that large doses of minerals could treat behavioral disorders. Since large doses of vitamins and minerals have been proven to cure several serious physical disorders, memory impairment and confusion, intuition led these doctors to believe that ~~"m~~ega" vitamins and minerals could also cure AD/HD symptoms. The fact that vitamins and minerals are natural was very comforting to the general public. However, even natural substances in unnatural amounts can lead to bad side effects such as nausea, loss of appetite, abdominal pain, rashes, flushing and abnormal liver tests. It can also lead to abnormally high losses of zinc and calcium due to abnormally high levels of these nutrients in the body, therefore potentially causing a deficiency. Since there were no well-performed studies, and thus no real evidence, to support the use of ~~"m~~ega" vitamins and minerals as a treatment for AD/HD, the American Psychiatric Association and the American Academy of Pediatrics Committee on Nutrition denounced the use of ~~"m~~ega" vitamins and minerals as a treatment for AD/HD. They even stated that abnormally high levels of vitamins and minerals can be harmful to the body, especially the fat-soluble nutrients A, D, E and K. The Food and Drug Administration made it a law that a person in the United States needs to have a prescription to obtain abnormally high amounts of the vitamins A and D (Goldstein & Ingersoll, 1993).

Modern doctors realize that the goal of nutritional therapy is to determine what nutrients the individual child is lacking and add them to his diet in a way in which they can be absorbed and used properly. The best way to add nutrients to a diet is through eating the right foods, however vitamin and mineral supplements may be appropriate in some cases (Jones, 2000). In these cases, a vitamin and mineral supplement which is of good quality, low dosage and which contains no additives is best. Even though the idea of vitamin and mineral supplements is not new, new supplements and new uses for existing supplements are constantly being discovered. There is a new supplement by the name of phosphatidyl serine for the potential treatment of AD/HD symptoms. This supplement is important for the structure and function of cell membranes in the brain. If these cell membranes are disrupted, there is a reduction in cognitive function. It is said that use of the supplement can result in improved perception, memory, concentration, focus, sleep patterns, motor reactions, mood and behavior as well as increased social interest and participation. Phosphatidyl serine is available over the counter in the United States (Bilton & Cooper, 1999).

Even though proteins are, in general, very good for the body, an excess of certain types of proteins, namely tyrosine, can actually be harmful. Tyrosine is found in large quantities in milk so children with AD/HD should generally avoid milk products. Too much tyrosine in the body causes a buildup of a substance by the name of p-cresol, which, in large quantities, is toxic to the central nervous system of the body. P-cresol is tyrosine's break-down product, which means that the higher that the tyrosine levels are in the body, the higher the p-cresol levels will be. Certain food additives impair the way that the body gets rid of p-cresol, so children with AD/HD may also be required to avoid certain food additives or even food additives altogether (Jones, 2000).

There are several tips available for eating right and avoiding the use of vitamin and mineral supplements. The most common, and most useful, tip is to eat little and often. That is, instead of the usual three meals a day, a child with AD/HD should eat small, protein-rich and starchy snacks throughout the day. Sugary snacks should be avoided because one of the main goals of eating little and often is to keep glucose levels constant in the blood. The other goal is to make sure the child never gets too hungry because misbehavior and inattentiveness increase

dramatically when the child has not eaten for a while, even for children who do not have AD/HD. Eating little and often is the healthiest way for any person to eat because the body does not have to digest too much food at once and it does not receive too much of any one food (Bilton & Cooper, 1999). Eating little and often can be especially difficult at college because students generally have to use one of their meals every time they enter the dining hall and they aren't generally allowed to take small foods, such as fruit or muffins, with them. Even though the AD/HD child is recommended to eat little and often, some meals are going to be bigger than others, especially lunch at school and dinner with his family. It is important that the child doesn't eat dinner after six in the evening because he may have problems digesting the food, and thus may have problems sleeping, if he eats any later than that. Parents should try to avoid buying processed foods and cooking in the microwave. Some children may be sensitive to fungicides and pesticides which come in contact with food while they are still growing, so parents may need to buy organic fruits and vegetables (Jones, 2000). It is extremely important to consult a doctor or a dietician before starting any sort of dieting plan and for advice on how to accommodate your child's food intolerances and allergies (Bilton & Cooper, 1999).

2.7.3.1.1 Amino Acids

A certain amount of essential amino acids is needed for the normal development and health of the human body. There are 22 amino acids in total and 12 are created naturally in the body while the remaining eight need to be obtained from foods. When an individual eats a protein-rich food, the body breaks down the protein into peptides and then into very small units called amino acids. Amino acids are components of many neurotransmitters in the brain such as dopamine, norepinephrine and serotonin (Goldstein & Ingersoll, 1993). As stated in the Medication section, it is theorized that medications for the treatment of AD/HD may work to normalize the levels of these neurotransmitters (Barkley & Mash, 1998). Therefore, it has been suggested that certain amino acids such as phenylalanine tyrosine and tryptophan can be used a treatment for AD/HD due to how they affect neurotransmitters in the brain. Again, however, one must consult a doctor or dietician because large quantities of any substance, whether natural or not, may be harmful. As an example, in the previous section it was stated that tyrosine is harmful to the body in large quantities, especially when the individual's body has problems digesting its breakdown product

p-cresol, but it can also be viewed as a potential treatment for AD/HD in controlled amounts (Goldstein & Ingersoll, 1993).

2.7.3.1.2 Essential Fatty Acids

Essential fatty acids (EFA) are essential for a variety of biochemical reactions needed by the body to maintain health (Jones, 2000). EFAs are major structural components of cell membranes, influence cell membrane fluidity and help to transport ions across these membranes. When necessary, EFAs are converted to prostaglandins which affect almost all tissues of the body and have anti-inflammatory abilities and effects on neurotransmitters (Bilton & Cooper, 1999). EFAs are not produced naturally by the body and must be obtained from foods (Goldstein & Ingersoll, 1993).

EFAs are found naturally in salads, nuts, seeds and seafood and may also be derived naturally in the body after the intake of certain fatty acids. EFA deficiency can be caused by many factors, including simply not getting enough EFAs in one's diet, not absorbing them correctly, having an abnormally high requirement for EFA intake or not metabolizing EFAs correctly (Jones, 2000). Deficiency can also result if the child's diet is too high in sugar or refined flour because they both increase the body's requirement for EFAs. The child may also be eating too much hydrogenated vegetable oil, margarine and certain snack foods which interfere with EFA availability (Goldstein & Ingersoll, 1993). Anti-inflammatory, non-steroidal medications, such as ibuprofen, and aspirin block EFA pathways so these types of medications should be avoided in AD/HD children who also have food intolerances or allergies (Bilton & Cooper, 1999). EFA intake in pregnant women is especially important because a lack of sufficient EFAs in the womb may lead to an increased risk of AD/HD for the unborn child. Pregnant women should get at least 14 grams of EFAs per day during their pregnancy (Jones, 2000). Symptoms of EFA deficiency are excessive thirst, allergies, antisocial behavior, improper functioning of the body's tissues or organs, dry mouth, lumpy skin on the arms and thighs, cradle cap in babies, fluid retention and behavioral problems (Bilton & Cooper, 1999).

If it is determined that a child has an EFA deficiency, there are dietary supplements available for EFAs, namely evening primrose oil and fish oil. Evening primrose oil is naturally derived from certain varieties of the evening primrose plant. The oil is extremely rich in the EFA gamma-linoleic acid (GLA) which can be derived naturally from the fatty acid linoleic acid, which is very common in any normal diet. It has been theorized that some children's hyperactivity may be caused by an inability to derive GLA from linoleic acid, causing a deficiency in a very important EFA (Jones, 2000). Evening primrose oil is manufactured under the name Efamol and can be found in most health food stores. However, Efamol is rather expensive and the effect of essential fatty acids on AD/HD symptoms is not yet fully understood (Goldstein & Ingersoll, 1993).

2.7.3.2 Food Intolerances or Allergies

It is essential for all young children and growing teenagers to eat a healthy and well-balanced diet, especially for children with learning and behavioral problems. However, over 60% of hyperactive children react negatively to one or more of the following: synthetic colorings and flavorings; preservatives; cow's milk; chocolate; cheese; wheat; tomato; sugar; orange; MSG flavor enhancer; fish; egg; citrus fruit; banana; berry fruit; and possibly even tap water. Some of these foods are staple ingredients and/or are present in a large number of foods, which can make eating a well-balanced diet difficult (Bilton & Cooper, 1999). While some ingredients, such as caffeine, chocolate and sugar, make almost all children more hyperactive, children with learning and behavioral problems may have food intolerances and/or allergies which intensify their symptoms (Jones, 2000). Some doctors, such as the well-known pediatrician and dietician Dr. Rapp, believe that certain behaviors, such as temper tantrums, whining, screaming, clinging, hyperactivity, aggression, nonsense and/or repetitive talk, reluctance to smile, excessive fatigue, depression, refusal to stay dressed and/or be touched and a desire to hide from others, signal allergic reactions. She also claims that allergies, especially to food, are the most common cause of behavioral and learning problems and that 65% of children diagnosed with AD/HD can improve their symptoms by avoiding the foods which they are allergic or intolerant to (Goldstein & Ingersoll, 1993).

There is a big difference between food intolerances and food allergies. Symptoms resulting from food intolerances are similar to the symptoms one experiences when they have food poisoning and they may not appear for hours to days after exposure. Symptoms may include eczema, asthma, headaches, migraines, digestive problems, chronic fatigue, irritability and hyperactivity. Children can develop food intolerances to staple foods, such as wheat, and may even develop cravings for the foods which they are intolerant to. It can be very difficult to determine which foods the child is intolerant to because intolerances cannot be determined from the standard blood and skin tests used to determine allergies. An allergic response to a food is immediate and dramatic. The child may develop skin rashes around his mouth, become ill and/or go into anaphylactic shock, which involves breathing difficulties, a drop in blood pressure and hives, when he eats a food he is allergic to (Bilton & Cooper, 1999). The body responds to a food it is allergic to by producing specific antibodies which release histamines which produce the symptoms commonly associated with allergies.

The first step is to try to determine what foods the child is allergic or intolerant to. The parent or guardian of the child must watch what the child eats and attempt to determine which foods the child experiences a reaction to, which can be especially difficult with food intolerances (Goldstein & Ingersoll, 1993). The last resort is the few foods diet. Almost no one is allergic to lamb, pear and rice, so the child must eat only these at first and should add one more food to their diet every few days and determine if there is a reaction to this food. Since this is such a restrictive diet, the child may need to be hospitalized during the procedure. Even though the child's symptoms may worsen initially due to food cravings, adherence to the diet is essential. A few foods diet is very difficult for children to understand so parents and doctors should make sure that the child doesn't think that the diet is a punishment for something they did and should help the child through the program both physically and mentally. Some type of positive reinforcement for good behavior is needed, especially for younger children (Bilton & Cooper, 1999).

If, after all of the child's food allergies and intolerances have been determined, the child's diet is too restrictive, a procedure known as enzyme potentiated desensitization (EPD) may be helpful for curing both intolerances and allergies. EPD involves injecting a mixture of allergens and the

enzyme beta-glucuronidase into the child's bloodstream (Bilton & Cooper, 1999). The allergens are mixed in pre-defined, standardized groups so the child may be allergic to some or all members of the group (Rohrer, 2002). Beta-glucuronidase is part of the immune system and is naturally released when the body is exposed to something it is allergic to. The dose of beta-glucuronidase given during EPD is smaller than the naturally occurring dose. EPD is safer and better at treating allergies than the traditional procedure of simply injecting the allergen into the bloodstream because the dose of the allergen given to the patient during an EPD procedure is significantly smaller than the dose given during the traditional procedure (Bilton & Cooper, 1999). Even though EPD is very helpful for approximately 80% of people who decide to go through with it, it is fairly expensive. It takes approximately three weeks, and at least 20 shots, to see the full effects of EPD (Rohrer, 2002). Excessive exposure to the allergen up to 24 hours after an EPD procedure can completely reverse the positive effects of EPD. The body is also easily affected by hormones, nutrition, the environment and body condition for 24 hours after the procedure so the child's parent or guardian should make sure the child avoids allergens, eats healthy, has plenty of water, is taking their vitamins and minerals if advised and that their gut is free of gut parasites, which are common in children with AD/HD (Bilton & Cooper, 1999).

2.7.3.2.1 Sugar-Free Diet

Even if a child does not have AD/HD, too much sugar can cause him/her to display symptoms of the disorder. There are many theories regarding how sugar affects behavior. Some believe that a change in behavior after normal sugar intake signals an allergic reaction while others thing that sugar intake stimulates excessive yeast growth in the body or that it affects neurotransmitter levels in the brain. Both yeast growth and abnormal neurotransmitter levels are a possible cause of AD/HD symptoms (Goldstein & Ingersoll, 1993). As described in the Essential Fatty Acids section above, essential fatty acids are necessary for a wide range of biochemical reactions in the body (Jones, 2000). It has been hypothesized that sugar interferes with the way essential fatty acids combine and interact with other vital substances in the body, thus potentially causing or heightening AD/HD symptoms (Goldstein & Ingersoll, 1993).

The body naturally produces insulin after sugar intake to normalize blood sugar levels. If too much sugar is ingested, too much insulin will be produced. The abnormally high levels of insulin will cause the blood sugar level to drop drastically, possibly even dangerously low. If the blood sugar level drops much below normal, either because the intake was initially too high or too low, adrenaline is naturally released to make up for the energy loss from the lack of glucose in the blood. The lack of glucose, called hypoglycemia, causes a person to become aggressive, sweaty, pale, to tremble and to display symptoms of hyperactivity, such as a lack of concentration. Hypoglycemia is especially bad for children with AD/HD because it may heighten their already existing symptoms (Jones, 2000).

A diet which releases sugars into the blood slowly is essential for children with AD/HD. All children need protein-rich foods, fresh vegetables, wholemeal bread, grains and lots of carbohydrates and fats to suit their high energy requirements. Eating lots of small meals throughout the day can help with keeping the child's glucose levels constant but it is also important to monitor what he is eating. Every food has a glycaemic index, which indicates how quickly the blood sugar level rises after that food is ingested. Pure glucose has a glycaemic index of 100 but a food can have an index anywhere from one to 100. Children with AD/HD should mostly eat foods with a glycaemic index of 50 or less (Jones, 2000). Some doctors claim that children can benefit from a completely sugar-free diet. However, this is not a proven technique and may result in hypoglycemia and other adverse effects (Goldstein & Ingersoll, 1993).

2.7.3.2.2 Additive-Free Diet

Many doctors believe that there is a connection between the intake of certain food additives and preservatives and the occurrence of inappropriate behavior in children (Bilton & Cooper, 1999). Food additives are listed beginning with an "E" but they are not all harmful. Only salicylates, azo-dyes and benzoate preservatives have been shown to increase hyperactivity in some children. There are only ten benzoate preservatives, which are numbered E210-219. However, some doctors claim that the preservatives E249-251, E320, E321 and E621-623 should also be avoided. There are twelve azo-dyes: E102; E104; E107; E111; E122-124; E128; E151; E154;

E155; and E180 (Jones, 2000). The azo-dyes tartrazine (E102) and sunset yellow (E111) dramatically increase the amount of zinc lost through urination in hyperactive children. These two azo-dyes also inhibit digestive enzymes so food is not digested properly or sufficiently and thus all of the nutrients from the child's diet are not used properly by the body, which can have adverse effects on his behavior (Bilton & Cooper, 1999). Some studies claim that 50% of children respond positively to an additive-free diet but others claim that very few children are affected and those who are affected only respond negatively to food colorings. Removing all food additives from a child's diet is a very large task and will make eating a healthy and well-balanced diet difficult (Goldstein & Ingersoll, 1993).

2.7.3.2.3 Feingold Diet

Since an additive-free diet is so restrictive, an American doctor by the name of Feingold proposed his own version of a diet suitable for children with AD/HD in the 1970s. He claimed that foods with a high number of salicylate and chemical food additives are responsible for the occurrence of AD/HD symptoms because hyperactive children have a biological disorder which makes these substances poisonous to them. It is a very popular and well-known diet because the exclusions are not as rigorous as most other diets for AD/HD and it works for a good number of children (Bilton & Cooper, 1999). The goal of the diet is to eliminate all foods with artificial coloring, preservatives and salicylates. Salicylates are naturally occurring chemicals found in fruits such as apples, bananas, grapes, plums and strawberries as well as in Worcestershire and tomato sauce. They have been shown to block the production of prostaglandins, which are naturally produced by the body from essential fatty acids. Prostaglandins are necessary for many functions throughout the body such as the constriction and widening of the arteries and the promotion and inhibition of blood clotting. Artificial sweeteners like saccharin, aspartame and cyclamates as well as medicines with artificial coloring and aspirin-containing compounds should also be avoided according to the Feingold diet (Jones, 2000).

2.7.4 Complementary Therapies

Although many medical professionals cannot agree on what exactly causes AD/HD, they can agree that there is a multitude of possible causes. The first step for parents to take when they are considering complementary therapies for their child is to attempt to determine possible causes for their individual child's AD/HD symptoms. Most complementary therapies are geared toward eliminating AD/HD symptoms caused by something specific such as tense muscles, pressure on the brain, etc. However, even if the complementary treatment for the individual child is not selected properly, the child may still benefit from the treatment because there is a large psychological factor involved. Due to the weight of the psychological factor, the parents, child and therapist should carry out the treatments with a positive attitude and should always believe the treatment will help the child. Thus, it is very important to find a good therapist because they must be very interested and communicate well with the child (Jones, 2000). While different complementary therapies are more suitable in different stages of the disorder's development, they are generally directed toward younger children. However, some therapies, such as acupuncture and other pressure relief therapies, may be useful for older people as well (Bilton & Cooper, 1999).

Complementary therapies are based on the Hippocratic principle that medicine should work to assist nature. That is, they aim to help the patient self-heal and change themselves instead of taking medication to suppress their symptoms or relying on other people to control their behavior. However, complementary therapies should be used in conjunction with other treatments such as medication, dietary intervention and behavior modification. Many potentially helpful therapies are discussed in this section but they by no means entail every available complementary therapy (Bilton & Cooper, 1999).

2.7.4.1 Acupuncture/Acupressure

Traditional Chinese medicine places emphasis on preventing the disorder rather than curing it. The goal of most traditional Chinese therapies is to restore a balance to the body's energy flow, called Ch'i or Qi. Energy flows along pre-defined paths, called meridians, in the body but the specific anatomy of these paths is not yet fully understood. There are 14 different meridians, 12 of which are associated with at least one internal organ. If one of these 14 meridians is

disrupted, the functioning of the internal organs and tissues along its path becomes disrupted. Once the energy flow is balanced again, the organs and tissues can begin to self-heal. There are two main energies that must be in balance for the body to be considered healthy: Yin, the female energy, and Yang, the male counterpart (Bilton & Cooper, 1999). Too much Yin can make a person cold, quiet, slow, inward and tired as well as make their voice weak. On the other hand, too much Yang can overheat a person, make him restless and give him insomnia and a loud voice (Jones, 2000). Thus, therapies such as acupuncture and acupressure stimulate the body's own healing resources so they can be used as treatment for a wide variety of physical and emotional disorders, including AD/HD (Bilton & Cooper, 1999).

When a patient first goes to see an acupuncturist, the acupuncturist will want an understanding of the person's lifestyle, personality, work and medical history. He or she will also study the way their patient walks, sits, his facial expressions, his tongue, his breathing and his voice (Jones, 2000). On top of these observations, the therapist will also want to take the patient's pulse because it is a good indicator of health. These observations are important because the points of acupuncture are different for every individual; it takes an experienced therapist to determine the correct spots. It is very important that the child and parents are comfortable with the therapist and believe that the therapy will help the child because there is a large psychological factor involved. There are over three million acupuncturists world-wide so if the child does not like one acupuncturist, there is probably at least one more in the area (Bilton & Cooper, 1999).

Acupuncture and acupressure are based on the ancient Chinese belief that stimulation of certain areas of the skin can affect the functioning of internal organs and tissues. In acupuncture, four to eight fine and sterile disposable needles are inserted approximately five millimeters below the surface of the skin (Bilton & Cooper, 1999). The needles should stay in for only a few seconds when treating children and not much longer for adults. The procedure is very rarely painful but some children are scared of any type of needle. In this case, acupressure is a good alternative to acupuncture. In acupressure, therapists use their knees, elbows, fingers or a rounded probe to deliver quick bursts of pressure to spots where the needles would have been inserted in acupuncture. Oftentimes, acupuncturists apply heat in the critical spots by burning specific herbs.

This process is called moxibustion and is used to further stimulate the body's energy (Jones, 2000).

Some people believe that hyperactivity is a symptom of excessive heat in the body. Excessive heat can be caused by many of the potential causes for AD/HD such as cow's milk, oranges, sugar, artificial colorings and flavorings, food allergies, poor diet, the mother's poor diet during pregnancy and/or breastfeeding, shock before or during birth and tension in the family. Excessive heat can cause a buildup of phlegm in the body. The Chinese believe that a combination of heat and phlegm causes severe mania. Five to ten acupuncture sessions are generally needed to significantly help the child, however, if the child is suffering severe mania, he will require more sessions (Bilton & Cooper, 1999).

2.7.4.2 Aromatherapy

The nerves in the olfactory region of the nose are linked directly to the brain so people can develop psychological responses, both good and bad, to certain smells. Some people may even begin to behave abnormally in response to certain smells due to a buildup of chemicals, such as hydrocarbons, in the fatty tissues of the brain. Repeated or prolonged exposure to these smells can cause a wide array of symptoms, including those associated with AD/HD. If the child's symptoms are caused by sensitivity to certain smells, such as cigarette smoke and perfume, aromatherapy may alleviate his symptoms. Aromatherapy is thought to help the left and right sides of the brain communicate and, in doing so, calm the mind. Thus, aromatherapy can be used for physical, mental and emotional disorders. The concept of aromatherapy dates back to the ancient Egyptians in 3000 BC and certain plant extracts are still used in modern medicine. The oils used in aromatherapy are extracted from all sorts of plants, flowers, herbs, trees and bushes and from almost every part of each plant. Some oils are expensive because it takes so much of the certain part of the particular plant to make only a small amount of oil (Bilton & Cooper, 1999).

At first, it is helpful to see an aroma therapist or take classes on aromatherapy so that the oils are used effectively and appropriately at a suitable cost. However, aromatherapy is fairly simple to

use and can be used successfully at home, even for very young babies. Professionals use over 300 different types of oil, however, a set of 10 carefully chosen oils is suitable for home use. If the oil is expensive, it can be mixed with other oils or a neutral substance. However, interactions between certain oils can have negative effects and may even eliminate the potential for alleviating symptoms so parents should be careful when mixing oils and should only buy pure oils (Bilton & Cooper, 1999). Pure oils need to be diluted before being given to children because they have a keener sense of smell than adults. They can be diluted with carriers such as pure olive oil, beeswax, full-fat milk, goat's milk and honey (for baths) (Jones, 2000). There are many different ways to give the child the oils including a therapeutic massage, a bath with oil droplets, placing a few drops on the child's sheets at night, skin compresses and inhalation. A therapeutic massage given to a child from one of his parents can have a positive effect on the parent/child relationship. The parent needs only to massage the feet to reduce tensions and restore the flow of positive energy throughout the child's body. The hands should not be massaged, especially with younger children, because they may get the oils in their eyes. Children under the age of 10 should not directly inhale oils but instead should use a handkerchief or a diffuser. As the child gets older, he can learn how to use the aromatherapy by himself. Therefore, even after the child moves out of the home, he can use the techniques he has learned to help alleviate his AD/HD symptoms. Aromatherapy oils can also be mixed with the Bach flower remedies to create enhanced effects (Bilton & Cooper, 1999).

2.7.4.3 Bach Flower Therapy

Dr. Bach, a physician and homoeopathist in the 1930s, found that certain remedies of wild flowers could be used to correct certain personality traits and emotional disorders. These remedies do not aim to change the patient's personality but rather to help him achieve equilibrium in his mind and body, which brings out his natural positive personality traits (Bilton & Cooper, 1999). The flower remedies are made by soaking freshly picked flowers in pure water and letting the mixture sit in sunlight for approximately three hours. After soaking, the flowered water is mixed with an equal amount of pure brandy. Only a few drops of this mixture should be added to a child's drink (Jones, 2000).

Due to the nature of the treatment, there is a large psychological factor involved so a positive attitude toward the treatment from the therapist, the child and his parents is essential. The parents should keep in mind that Bach remedies do work for most people and are potentially useful for their child. However, if they don't work, it could be for a number of the following reasons: the Bach remedy used is not suitable for the child; the remedy was stored in sunlight, extreme heat or cold or near an emitter of radiation, such as a microwave; the remedy was not used within three months; the remedy was taken with food; or the remedy was given with the wrong attitude (Bilton & Cooper, 1999).

There are 38 Bach remedies and each remedy or combination of remedies works for a different purpose. The selection of an appropriate Bach remedy depends on the individual child, his personality traits and the nature of his disorder. The most common remedy for ADHD is vervain, which is designed to relieve tension and over activity in hyperactive children (Bilton & Cooper, 1999). The two most common remedies for AD/HD are impatiens, which is for impatience, and larch, which is for those with a low self-esteem and a fear of failure. A few drops of the Bach remedies can be added to a child's bath, rubbed on their skin or added to their drink (Jones, 2000). Three doses per day produces maximum results, however, it is impossible to overdose and the remedies are non-addictive. They do not negatively interfere with other methods of treatment but effects can be enhanced when other therapies, such as aromatherapy, are used concurrently with the Bach flower remedies. Bach flower remedies can be purchased at most health food stores and pharmacies and books are available regarding appropriate usage (Bilton & Cooper, 1999).

2.7.4.4 Biofeedback

Medical professionals have determined that there are four main classes of brain waves: alpha waves, which are present when the body is relaxed and calm; beta waves, which are used when the brain is trying to concentrate and be alert; delta waves, which are mainly present when a person is sleeping; and theta waves, which are the slow waves predominant in all young children. A child with AD/HD generally has more theta waves than alpha and beta waves even after childhood, which inhibits his ability to concentrate and tends to make him daydream more than

other children. A procedure called biofeedback may actually teach a child to consciously produce more alpha and beta waves (Goldstein & Ingersoll, 1993).

During an EEG (electroencephalography) biofeedback session, 18-20 electrodes are attached to the scalp. These electrodes are connected to a monitor which displays the levels of the four waves in the brain. The child is taught to concentrate on producing more alpha and beta waves instead of theta waves (AD-IN, 1992). Biofeedback can also be used to teach a hyperactive child to individually relax every muscle in his body and thus experience a deep sense of relaxation (Goldstein & Ingersoll, 1993). It is essential for the child to be very still because movement and increased heart rate can cause bad readings. It is also a very long procedure; it takes approximately 40-80 sessions at 40-60 minutes each to experience the full effects of the treatment. It is also not recommended to spread the treatments out over a long period of time so two to three sessions are usually conducted per week. Therefore, a behavior modification program may be necessary to motivate the child to cooperate for the entire procedure (AD-IN, 1992).

However, doctors are not even sure if the abnormal number of theta waves in AD/HD children is a cause or an effect of the disorder. If it is an effect, then teaching the child to produce more alpha and beta waves will not have any positive effect on his symptoms. Therefore, many medical professionals do not fully believe in the usefulness of an EEG biofeedback treatment. On top of being a time-consuming procedure and an unproven technique, biofeedback is also an extremely costly procedure. The entire procedure can cost anywhere from $3000-6000 and medical insurance may not cover it (AD-IN, 1992). However, there have been studies which claim that EEG biofeedback can improve the patient's handwriting skills and manual dexterity, raise a child's IQ level by 33 points, increase their grade point average by 1.5 points and raise their grade level by 2.5 years. Additionally, over 60% of patients do not require medication after training. In theory, EEG biofeedback is, unlike any other treatment for AD/HD, permanent. That is, once the child learns the technique, he will never forget it and can use it to easily control himself in everyday life (Goldstein & Ingersoll, 1993). EEG biofeedback is usually too complicated and/or intimidating for young children so it is generally only used on older children and teenagers (Jones, 2000). The large cost and time commitment, as well as the use of the

impressive equipment and the look of the child with 20 electrodes attached to his scalp, can significantly add to the placebo effect, which may be an explanation for the effects observed during these studies (AD-IN, 1992).

2.7.4.5 Chiropractic Approach

Tension, stress and misalignment of bones in the body can reduce the amount of blood which flows to the brain, which can cause AD/HD symptoms in children. X-rays can sometimes, but not always, diagnose these problems so it may be helpful to see a chiropractor even if the x-rays do not detect anything wrong. Chiropractors apply a light and quick motion to the misaligned bones to help them return to their appropriate position in the body (Jones, 2000). Positive effects are oftentimes dramatic and can usually be seen after only one session. However, one to eight sessions may be needed to see full improvements and the child may need to see the chiropractor semi-regularly to maintain these improvements. Chiropractors are abundant so even if a grown child moves out of the home, it will be easy to find a new chiropractor to continue the treatments. Some claim that the chiropractic approach is 20-40% more effective than medication. However, the American Chiropractic Association does not claim that the cure for learning and attention problems can be found in their practice (Goldstein & Ingersoll, 1993).

2.7.4.6 Color Therapy

Color influences the focusing of the eye because different colors focus on different parts of the eye with respect to the retina. For example, blue focuses in front, red focuses behind and green focuses directly on the retina. Thus, blue is the most gentle and green is the worst for the human eye. When a particular color hits the eye, the pupil should expand and contract, which helps the person to focus. Some children's eyes do not expand and contract normally and thus the child may have problems shifting his focus from one object or setting to another at normal speed. Problems adjusting focus can be caused by food intolerances and too much exposure to toxic elements, such as cigarette smoke, and can cause a decrease in frustration tolerance and attention span, which are common symptoms of AD/HD. An eye-strengthening chart is available to improve the eye's function, especially the ability to focus (Bilton & Cooper, 1999).

However, it is not just the eyes which are affected by colors; the whole body is affected because colors are representative of a certain mood or aura ((Bilton & Cooper, 1999). Thus, certain colors, such as indigo, have a calming effect on children while others can make them more hyperactive (Jones, 2000). However, different people, especially children versus adults, perceive colors differently. Colors required for treatment by color therapy are different for every child and are based on the child's general personality as well as his attitude at any one particular moment. Since the child's most suitable color can change, possibly even daily, it may be helpful for the child's room at home to have white walls which can be easily colored with lights (Bilton & Cooper, 1999). If the parent or child does not like white, indigo and most other non-stimulating colors are suitable for AD/HD children (Jones, 2000). It is best to see a color therapist before painting the child's room (Bilton & Cooper, 1999).

2.7.4.7 Herbal Medicine

Herbs are the basis of modern medicine and can be very detrimental to the child's health if they are used or mixed inappropriately or if too much is taken. Thus, it is essential to consult a qualified herbalist to determine the most suitable herbs for the individual child before using any type of herbal medication (Bilton & Cooper, 1999). Western herbalists generally prescribe one or more unmixed herbs to help alleviate the child's different symptoms. However, Chinese herbalists concoct a unique blend of herbs for every individual. A good Chinese herbalist studies the person's mental states, body language, physiology, tongue and pulse to determine the correct mix of herbs to individually equalize the body's energies. Both Chinese and Western herbalists are suitable for children. Herbalists generally use their herbs in liquid form. However, if only the plant form of the herb can be found, pour a cup of boiling water over 2 teaspoons of the herb, let it sit for 15 minutes and then drain the liquid. The liquid can be swallowed, applied to the skin, put in bathwater or inhaled (Jones, 2000).

Although each case is individualized, certain herbs are good for certain general symptoms (Bilton & Cooper, 1999). For example, red clover is good as a general nerve relaxant; dandelion and centaury alleviate stress; and wild lettuce helps the child sleep and calm down (Jones, 2000).

Echinacea has been found to be especially helpful for children with AD/HD because problems with the gut are a hypothesized cause for the onset of AD/HD symptoms. Echinacea helps protect against illnesses without antibiotics, which is important because antibiotics irritate the gut and cause food intolerances and a buildup of toxins (Bilton & Cooper, 1999).

2.7.4.8 Homeopathy

Hahnemann, an 18th century physician, introduced the following two theories: a medicine which, in large doses, produces symptoms of a certain disorder will, in small doses, cure it; and by dilution with water and alcohol, a medicine can help alleviate, or even cure, symptoms without side effects. Children should see a qualified homoeopathist because a correct homeopathic treatment considers the patient's temperament, mental and physical symptoms and family history. The extent and length of the treatment is also different for every individual (Bilton & Cooper, 1999). However, there are very few bad side effects from homeopathic treatment because there is so little medication involved (Jones, 2000). According to homeopathic theory, the higher the dilution of a medicine, the more potent it is. A potency measure of 6c means that six drops of medicine is added to approximately 600 drops of a certain alcohol and water solution and then the mixture is shaken vigorously, usually mechanically. Therefore, a potency measure of 12c and 30c is considered more potent than one of 6c because the medication is more diluted. 6c is considered suitable for most beginners and children (Bilton & Cooper, 1999).

Homeopathic treatment can be used as a replacement for modern drug therapy, such as prescribing stimulant medications for AD/HD, or in combination with other treatments. Care must be taken, however, to avoid certain aroma oils such as peppermint, eucalyptus and clary sage because they may interfere with the effects of a homeopathic treatment. Peppermint is found in most toothpastes and eucalyptus in most decongestant medications. Homeopathic treatment is aided by getting sleep and fresh air and eating well, which are general health measures that everyone should practice (Bilton & Cooper, 1999). Even though homeopathic treatment is a very individualized process, certain remedies are generally more suitable for certain symptoms. For example, China officianalis is good for disobedience and lycopodium for poor concentration. Treatments are given in tablet, capsule, liquid or powder form. It is

recommended that the patient not eat anything for twenty minutes before and after the medication is ingested (Jones, 2000).

Even though many people praise homeopathy, many scientists are skeptical of the practice. Some medical professionals claim that not even one molecule of the original medication can be located in the extreme dilutions, for example 30c, that are used in homeopathy. Therefore, it is impossible for the diluted mixture to affect the patient's symptoms. The weight of the psychological factor is heavy in homeopathy, as it is with many other complementary therapies (Jones, 2000).

2.7.4.9 Osteopathy

The meninges are comprised of three layers: the dura mater, arachnoid mater and pia mater; all of which are located between the brain and the skull. The dura mater is closest to the skull while the pia mater is closest to the brain. Cerebrospinal fluid, which delivers nutrients to the brain, flows between the arachnoid and pia mater. A small amount of tension in the meninges is healthy and normal. However, some people have too much pressure which can cause a lack of concentration and a decrease in frustration tolerance, both of which are common symptoms of AD/HD. Possible causes for pressure on the brain are: poor diet, pre- and post-natal shock, toxic fumes (such as cigarettes), medication (especially those given during birth) and a stressful home life (Bilton & Cooper, 1999).

An osteopath in the United States is a trained physician who is licensed to perform surgery and prescribe medications. However, their main practice is detecting abnormalities and tensions in the body simply by touch. Many hyperactive children tend to have an excess amount of tension in their body, which can lead to headaches and ill temperament. An osteopath uses thrusting, stretching and pressure techniques to relieve tensions throughout the body. By relieving the tension, the osteopath restores the proper transmission of nerve impulses and the proper flow of blood and cerebrospinal fluid (Goldstein & Ingersoll, 1993). Some people may need 10 or more treatments, as opposed to the normal two to three sessions; the tension may also reoccur in some patients (Bilton & Cooper, 1999).

2.7.4.10 Reflexology/Massage

A general massage is very helpful for most AD/HD children. Hyperactive children usually develop tension in their muscles, which can lead to a wide array of symptoms. A massage can help him to relax, which will release some of the tensions and toxins in his body and help him sleep better. Also, many AD/HD children love the attention that parents give them during a massage. The practice of reflexology embodies the idea that all of the body's tensions collect in the hands and feet. Thus, a massage of the hands and feet alone can address the whole body (Jones, 2000). Reflexology works for all ages but lighter pressure should be used for younger children and simply blowing is more useful for babies. After only a few massage sessions, an AD/HD child may begin to perform the massage on himself when he is feeling an onset of symptoms (Bilton & Cooper, 1999).

Even though a massage may seem simple enough to perform on a child without seeing a professional, it is useful to see a qualified reflexologist or take a few classes at first because overstimulation of certain areas of the hands and feet can have severe adverse effects. For example, overstimulation of the tip of the big toe or thumb can cause a seizure. Also, massage movements should be slow and methodical to calm the child instead of quick movements, which will only make him more hyperactive (Bilton & Cooper, 1999). Also, symptoms may get worse at first due to the release of built-up toxins into the body but reflexology techniques are very helpful for most people and can create a deep sense of relaxation (Jones, 2000).

3 Methodology

3.1 The Creation of the Website

The website was created with information from the literature review above but it was specifically directed toward incoming WPI students with AD/HD. The website, which is a link off WPI's disability services homepage (www.wpi.edu/Admin/Disabilities), consists of coping strategies, tips for making the transition from high school to college and personal stories of current WPI

students with AD/HD. The coping strategies focus on tips for surviving in WPI's fast paced environment and short seven week terms. The personal stories were added to show potential WPI freshman that current students are successfully coping with their disorder at WPI and that there are organizations on campus, such as the Disability Services Office and Academic Resources, which can provide guidance and accommodations. Other topics covered on the website are the history and information on the disorder. Although these sections are not the main focus of the website, they both provide interesting and important background information on the disorder.

3.2 The Creation and Distribution of the Survey

After the website was developed, an online survey (Appendix A) was created. We designed the survey questions to tell us what information in the site people found most and least helpful and what needed more emphasis so that we could use their answers to fix the content of the website. The IQP students posted a message on www.masspac.org, a website designed for parents of children with special needs, asking users to take our survey. One of the students on the IQP team asked his mother, a school psychologist in New York, to take the survey and she asked her coworkers to take it as well. Dale Snyder of Academic Resources at WPI, the co-advisor of this IQP, asked her students and colleagues to take the survey. Of the 36 people who took the survey, there were 10 parents, 3 current students with AD/HD, 2 current students without AD/HD, 5 teachers, 6 special education teachers, 2 school counselors, 4 academic advisors and 4 in the "other" category (Appendix B).

3.3 The Results

3.3.1 Positive Comments

There was a wide variety of positive and negative comments as well as suggestions on how to improve the website; a full list of all of the comments made can be seen in Appendix C. Many people felt as though the website was very helpful, informative and easy to understand. For the survey, we asked people to rate visual appeal, ability to navigate the site and clarity, usefulness

and quality of the information presented in the website. Many people rated each of these categories as highly effective; a graphical representation of the results of this part of the survey can be found in Appendix C. Some teachers, counselors and parents said they would recommend the site to their children and students. Others said that the site helped them to understand that people with AD/HD and other such disorders are not helpless or hopeless. The main goal of this IQP is to make a website which is aimed toward helping incoming WPI students with AD/HD; many people mentioned that the website was aimed toward students and had very practical coping strategies. Therefore, the IQP team feels as though the main goal of the IQP was accomplished based on the results of the survey.

Many people who took the survey specifically commented on the usefulness of Eric's personal story. One person said that it was a "great articulation of personal feelings, struggles and solutions." Another even offered his or her own personal story:

> I have ADHD. The problem is that it is so severe that even when I have every factor conducive for concentration my mind will not allow me to work or pay attention. And there is nothing I can do to overcome this. I have never been able to study or learn without turning it mentally into something enjoyable. This is not something that can be done for most topics of study. Luckily, I have a visual and audio photographic memory. It is still hard though. But, I have made it through it and continue my struggle in college. Wish me luck.

Presenting history on the development of the disorder cleared the misconception that AD/HD is a disorder created in the 1990s. Many people who took the survey commented that the history was very interesting. While making the website, the IQP team tried to emphasize the coping and transition to college sections because these two sections specifically help incoming students with AD/HD. Many people commented that these two sections were especially thorough and useful. These sections helped many users to understand how students must advocate their needs to get accommodations and how hard this task can be. 14 people said that there was no part of the website that they found unnecessary and 4 people said that there was nothing that they felt deserved more emphasis.

3.3.2 Suggestions and Changes

Our decision as to whether or not to make a change based on results from the survey was mainly subjective. Even though we considered all of the comments and suggestions made, we placed more emphasis on those comments which were made by two or more people. We went through the surveys and made two lists: one for suggestions which we are going to ignore and another for suggestions which we made changes from.

Overlooked Suggestions	
Don't make history the first page	**1**
Co-morbid disabilities	**1**
Error in 504 ADA	**2**
Allow user to change background color	**1**
Personal references in preparing for college section	**1**
ADD should not be presented behaviorally	**2**
Remove history section	**1**
Water down diagnosis section	**1**
More emphasis in the coping section	**4**
Experiences with medication	**1**
More information on learning theory	**1**
Make a point that ADHD does not mean stupid	**1**
More graphics	**2**
Make font bigger	**1**

Suggestions which sparked change	
History of AD/HD after 1972	**3**
Make heading font bigger	**1**
Add links	**10**
Check lists for preparing for college	**2**
References, bibliography	**2**
More personal stories	**13**
Evaluation where others can respond with personal stories	**1**
State that personal stories are a generalization, only one point of view	**1**
Format page to fit the screen	**6**
Contact info	**1**
More emphasis on preparing for college	**1**
Grammar, and sentence structure needs to be looked at	**1**
Link back from the student disabilities web site	**1**
Information on how to get counseling help if you need it	**1**

3.3.2.1 Overlooked Suggestions

One person remarked that the history section should not be the first page and another recommended that it not be included at all. The history section of the website is the first page because it doesn't contain as much information as the other pages and it is not overwhelming for the viewer. From the survey results, many people commented that they never knew the history of AD/HD and found this particular section very interesting. Therefore, the IQP team kept the history section as the first page because we feel as though it captures the user's attention and sustains their interest. Another person thought that the diagnosis section was too thorough. The IQP team put all of the widely used tests for AD/HD in the diagnosis section so that students could compare the number of tests they went through for diagnosis to the number of tests available for a comprehensive diagnosis. This type of comparison allows the student to determine how accurate their own diagnosis is.

One person wanted more information on comorbid disabilities while another wanted information on learning theory. The IQP team wants the focus of the website to be how AD/HD students can be successful at college and feels as though adding information on comorbid disabilities and learning theory would clutter the website and make our purpose less clear. Other people wanted more emphasis on the coping section. However, most people who took the survey commented how thorough the coping section is and the IQP team feels as though all of the information from the literature review which is pertinent to college life is included in the coping section already. Other people who took the survey said that there should be personal experiences in the medication and the preparing for college section. The IQP team feels that it is necessary to have both factual information and personal stories on the website. The impersonal parts of the website provide an unbiased view of the disorder which allows the user to formulate their own ideas and find their own unique versions of the various coping strategies. The personal stories give a very narrow point of view but they show that students with AD/HD have succeeded at WPI and that success is possible if the student is willing to try. Therefore, the IQP team feels as though we should not intermingle the factual and personal sections of the website.

One person said not to present AD/HD behaviorally and another said that we should emphasize that AD/HD people are not stupid. The IQP team does not feel as though our information is presented in a behavioral sense and feels as though the fact that AD/HD does not mean stupid is

sufficiently expressed in our website. Since only one person made each of these comments and the IQP team does not feel as though these comments are warranted, no changes were made. Another person claimed that programs which receive federal financial assistance do not have to conform to standards set by the Americans with Disabilities Act (ADA) or the 504, a legal document for people with disabilities. The IQP team cannot do anything with this comment because this information is on the student disability services page, which is linked from our page. However, the IQP team has informed the Disability Services Office of the comment.

There were also a few comments on the look of the website. One person said that the viewer should be allowed to change the color of the background. The IQP team feels as though the white background is sufficient and that having more colors would provide nothing but distraction. One person said that there should be more graphics on the website. However, the IQP team could not find any more appropriate, meaningful graphics besides the ones which are already on the site and we feel as though meaningless graphics will only clutter the website. Another person said that the font on the website should be bigger. However, the font on any website can be changed simply by changing the web browser's settings so we do not feel that such a change is necessary.

3.3.2.2 Changes

Even though the font of the website as a whole was not enlarged, the IQP team did enlarge the font of the headings to make them stand out more. Another person said that there were grammatical errors throughout the website so the IQP team reviewed the website again, found some errors and corrected them. When users click on the "How to Get Accommodations at WPI" link, they are directed to the student disability services page; there is no link to return to our website on this page. The IQP team fixed the website so that the student disability services page appears in a different window when the link is clicked so that the user can simply close that window to return to our webpage. During testing, we realized that if the viewer's screen was not at the correct resolution, they would need to scroll to the left and right in order to view all of the information. The IQP team corrected the website so that it was always viewed at 100% of the page regardless of the user's screen resolution. This aspect of the website was changed during

the testing period because it was preventing people from reading all of our information and giving a good opinion of the content because it is so frustrating to scroll to the left and right for every sentence. This was the only aspect of the website which was changed during the testing period.

Many people suggested that we add links to other websites for information on AD/HD. The IQP team added links to Children and Adults with AD/HD (www.chadd.org), ERIC Clearing House on Reading, English and Communication (eric.indiana.edu), Learning Disabilities Online (www.ldonline.org) and National Information Center for Children and Youth Disabilities (www.nichcy.org). The IQP team also added the bibliography of this paper to the website because all of the content in the website comes from this paper. Many people suggested that more personal stories be added to the website, especially some from students with AD/HD. During testing, the only personal story we had on the website was Eric's, who has a deficit in active working memory, but after testing we added personal stories from AD/HD students. The IQP team also added a comment to the bottom of the personal stories page inviting viewers to submit their own personal story to Dale Snyder of Academic Resources. Another comment was added to the top of the page stating that personal stories represent a certain point of view and that the information presented in the stories does not apply to everyone. Although it was not mentioned in any of the surveys, the IQP team added a section for acknowledgements to the IQP students, the IQP advisors, those who helped distribute the surveys and Marc Avila of 3 Media Web Solutions for his help improving the website from a technical point of view.

The IQP team added more information to the website, such as the history of AD/HD after 1972 and checklists for preparing for college, as requested by various people who took the survey. Information on where to seek counseling at WPI and who to contact at WPI for disability services was also added as requested.

4 Conclusion

Although the IQP team thought the website creation and surveying process as a whole went very well, there are a few changes we would make if we could do it again. For example, we would

have sent out an initial survey to see what types of information people wanted to see on the website. We also should have asked if the person filling out the survey has any story of their own to add so that we could build up our database of personal stories.

The IQP team found a way to give something back to our school and our fellow classmates through the creation of the website. Also, learning so much about AD/HD helps us to understand how much of a struggle the disorder can be, especially in a fast-paced environment such as WPI; it helped us to admire those who overcome these difficulties. We feel as though we accomplished our goals of spreading information about AD/HD so that others can better understand those with the disorder and to help those with the disorder cope with it at college.

Appendix A: The Survey

1. Please choose the description that fits you best:
Incoming student with AD/HD
Current student with AD/HD
Academic advisor
Professor/Teacher
Parent
Other:

2. How does the content in the following website sections assist you specifically?
Background:

Preparing for college:

Coping:

Personal experiences:

3. Is there any part of this website that you find unnecessary?

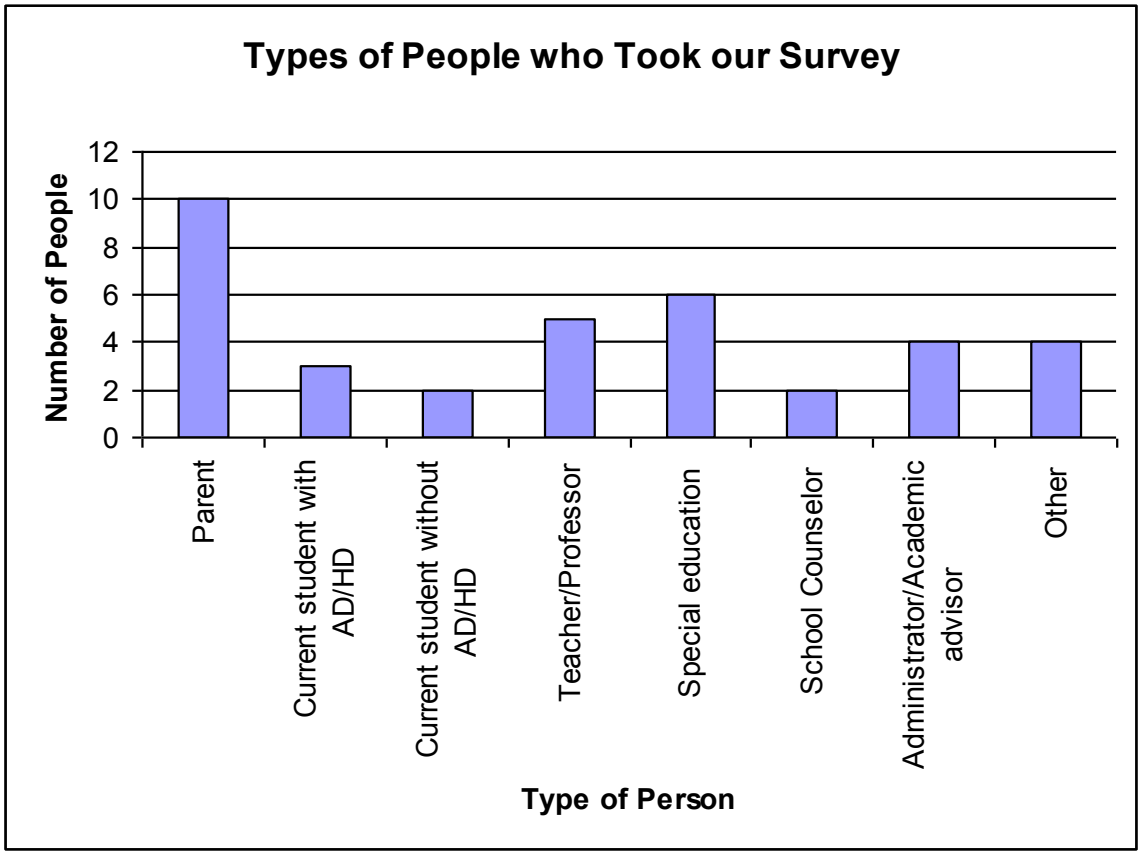
4. Is there any part of the website that you think deserves more emphasis?

5. Are there any unmentioned topics which you think should be added to increase the effectiveness of the website?

6. As a whole, please rate our website on the following topics:

Visual Appeal:	Highly effective	Average	Needs Improvement
Ability to navigate the website:	Highly effective	Average	Needs Improvement
Clarity:	Highly effective	Average	Needs Improvement
Usefulness of information:	Highly effective	Average	Needs Improvement
Quality of Information:	Highly effective	Average	Needs Improvement

Appendix B: Types of People who Took our Survey



Appendix C: All Comments and Suggestions Made

2. How does the content in the following website sections assist you specifically?

Background:

Positive comments:

- It gives a good overview - informative and to the point.
- It was nice viewing an in-depth historical perspective on ADHD
- Helps me understand the disorder much.
- Informative history
- enlightened me as to early research.
- I think you did a great job. The entire website is very comprehensive. Have a wealth of information which should assist both students & parents.
- Good overview
- Interesting
- I was not aware of the information that was presented and found it quite interesting.
- Didn't actually know all that history –interesting
- Interesting to follow the information gathering process that resulted in the understanding that we have today.
- This is a site that I would suggest to students that I work with.
- I had never seen the history of ADHD, which I found very interesting. Also, I liked the idea that this website was directly aimed at the student. It is hard to begin advocating for yourself when entering college, but the website gave many good ideas.
- Interesting to see how long it has been an issue. Really thought it was something from the 1990.
- So your website will be very useful to me as a parent and as an educational consultant—will put on my website www.ipest.org have children 18,19,20 with disabilities
- I will refer students with whom I work to the website to help them prepare for their college experiences.
- Very interesting, good information to have. Nice graphics.
- The site assists me in discussions with parents of children with ADHD. Particularly it helps them to understand that the future more their child does not have to be dismal. It is written in layman terms which will make it useful for many individuals.
- This is a nice overview of ADHD
- Will be interesting to share with colleagues, parents, students
- Well researched and presently succinctly.
- This website explains ADHD in a clear, concise manner. What a wonderful job!

Suggestions:

- What about post-1972?
- majority of AD/HD research that I have studied has been from the 70\'s to the present.

- My only suggestion would be to enlarge or change the font. With so much to read, I personally found it difficult to read the small font
- I would like to know more about the advances since 1972.
- The background section was interesting, highlighting information that I previously did not know. Even so, I\'m not sure that it should be the first page to come up.
- A number of learning disabilities are also part of their profile.(other disabilities)
- On the suggestions for faculty page you mention that programs that receive federal financial assistance have to comply with Section 504 and the ADA. This is not true of the ADA. You do mention the correct information in another part of the site.
- I'd suggest providing some sources for folks who wanted to read more. What were the sources of your information / claims? Liked the breadth of info. Some things to check: in history - 1937; I think you are missing the word "is" under Academic Results of AD/HD he 2 sections looked like they were about the same thing.
- The background is fine... you might want to try having the able to have the view choose what color back ground they are most comfortable reading.

Negative Comments:

- Not really, just gave me knowledge and insight into my problem.
- I am a school psychologist in the primary grade levels, but I do see it affecting me when I work with older student populations.
- Specifically none of these assisted me.

Preparing for college:

Positive comments:

- Strong in WPI resources and first person accounts
- Helps me understand my friends that have ADHD.
- very good recommendations, you have definitely gotten the most important points in considering college adjustment
- helpful
- The suggestions were excellent and would be helpful to any high school student making the transition to college.
- Could have helped me a while back for sure.
- Good strategies for preparation
- Most students and parents would find this information useful.
- Can help high school students getting ready for college
- Great overview of what one needs to do
- This section was good.

Suggestions:

- some personal references might be a good touch: ie explaining how some tips have helped
- checklist of the suggested procedures to ensure all areas are covered.

Negative Comments:

- I am already here, so it's kinda too late for that
- Could have been more informative

Coping:

Positive comments:

- Many of these are good strategies for younger children - good stuff!
- Gave me methods and ideas for actions I ca ndo to better get through life with this gift
- very good
- I found it very helpful and would highly recommend it to anyone applicable.
- I thought that this was perhaps the best part of the site. You provide others with very sound and usable advice. The time management section could be extremely helpful to many people even if they don\'t have AD/HD. Encouraging self-advocacy skills is one of the best ways to help people achieve their goals. Outstanding job on this entire section!
- Information make me more aware of the fast pace in college that is a huge obstacle for a student with AD/HD. I became more aware of how assertive a student must be to accomplish his goals. Time management section is excellent along with need to balance one\'s life. The test taking and note taking skills would be helpful to all high school students going on to college.
- very helpful
- Knowing the background of this disorder creates a new perspective on the prejudice
- Most students and parents would find this information useful.
- I really like the lists. I think this is essential for students to help them be more organized,
- something that is very difficult for people with ADHD
- Fine
- helpful to all students
- Very practical strategies
- Good range of coping strategies.
- This section was very good.

Suggestions:

- good tip and references, I think some more references could be used though

Negative Comments:

- against people with ADHD. At least the understanding of the origin is advancing.

Personal experiences:

Positive comments:

- Although my son is only 12, it was good seeing Eric\'s write up on his experiences. Even now, Matt(my son) spends more time on homework, projects; many teachers (even in middle school) appear understanding, but are not accommodating. Eric, you sound like an overcomer!!
- I have worked with high school students who would benefit greatly, no enormously from the information and help provided here.

- Loved it! Great articulation of personal feelings, struggles, and solutions.
- honest and open, my daughter is a freshman at college, she is also learning disabled and she has had similar experiences and has felt the same. I will send this on to her as well.
- This part of the Web site really helps one get to know someone who is coping with a disability. I think this section is a must to include. When people can tell their story, people begin to listen. It also would be so helpful to someone who has a disability.
- Will be wonderful to share with students who are feeling alone, scared, and thinking
- no one else has to work as hard as they do and go through what they do to be successful
- Excellent.

Suggestions:

- lacks variety: only one person. good idea to incorporate someone with another learning disability, but would be a pretty good idea to have someone who actually has AD/HD on there too. That way students have someone to relate to more closely than Eric. A reader might be turned away if they think you have only read about AD/HD and the closest thing you can find is Eric\'s disability.
- More stories like Eric\'s would be great.
- Very good -would be great to have more personal experiences described
- Everything from behavioral modifications to meds have been employed for control over the disability. The outside world does not deal well when a disability is presented behaviorally. Educating those that taught my children became a focus. Teachers also assumed stupidity was a part of the disorder in spite of IQ scores well above genius. The schools did educate the boys at the highest classes. Boredom was an enemy we could eliminate once we impressed on the school FAPE.
- Very interesting, expand on this. This is what will help other students the most.
- Needs to be from more then 1 student. Most parents and student would want to know.
- It would be nice to have more personal experiences added or a section on the
- evaluation for people to respond with their personal experiences or be invited to formally respond via e-mail or a phone call.
- Much of what you wrote resonated with me. I, too am ADHD. I also know that some of these observations / generalizations may be more true than others for certain readers. I suspect you may want to say that, particularly for younger readers. It is likely students NOT in college will find this web site and glean info from it.
- wish there were more.....perhaps one from a student with ADHD
- My IQP was actually designing a web site for students with Dyslexia. I was unable to get anyone to write a personal story expect me. I think i would be great if you could get more.

Negative Comments:

- I didn't read this one

Personal stories:

- I have ADHD. The problem is that it is so severe that even when I have every factor conducive for concentration my mind will not allow me to work or pay attention. And there is nothing I can do to overcome this. I have never been able to study or learn without turning it mentally into something enjoyable. This is not something that can be done for most topics of study. Luckily, I have a visual and audio photographic memory. It is still hard though. But, I have made it through it and continue my struggle in college. Wish me luck

3. Is there any part of this website that you find unnecessary?

- 14 people said that there was nothing unnecessary

Positive comments:

- I could imagine that all parts are highly relevant to someone. As in all subjects individuals find some parts more important to themselves.

Suggestions:

- Need good AD/HD links - nothing there now. If it's not completed, perhaps a note to that effect... This is key, since it\'s your main focus.
- We would suggest formatting all pages for a 15\" monitor, so one doesn\'t have to scroll back and forth to read the page. Some of the pages are fine, but others are too wide. We would also suggest that every page have a link that leads one back to the AD/HD home page, rather than to the WPI home page. Perhaps a few graphics would make it easier to quickly locate a particular topic. Some of the "legalese" about how a student can get accommodations is rather tortuous, and could be discouraging to a student. It seems to be written for the instructor, and perhaps a more friendly version could be written for the students.
- The wide page size.
- the AD/HD links are not there. I would like these to be part of the website
- The left side frame, bumped the right hand frame (which had the bulk of the text) off to the right of my Macintosh screen.
- I found myself scrolling over to read the text, then scrolling back to see the left frame, which only had items near the top of that frame. If you made those tabs across the top, would they still show on my screen if I scrolled down through the text screen below it? I like having easy access to the navigation anchors. If you keep it on the left, I\'d advise shorten the width of the left frame of text.

To Remove:

- The history... but then again it depends on the person reading it.
- the diagnosis section is pretty extensive and may not be as important to the general public

4. Is there any part of the website that you think deserves more emphasis?

- 4 people said there was nothing that deserves more emphasis

Suggestions:

- Contact information in the Coping with ADHD at WPI section
- Not really, maybe coping

- the Scientific background, some more visuals that explain what's going on in the reading Use a wider variety of colors to keep visually stimulating the reader...Blue, red, and black can get repetitive, perhaps a different color scheme for more vital information would do well
- I could imagine links to more extensive historical info and latest studies would be of great
- I would like to see more, brief personal experiences. it\'s helpful for those with learning challenges to know that they are not alone and to hear of how others cope.
- AD/HD links
- Preparing and coping
- The role of the ADA should be emphasized a bit more. The ADA requires schools to make reasonable modifications to policies and procedures in basically the same way as 504. While students can use the 504 info to get the accommodations they need at your school, the knowledge that the ADA requires basically the same but in employment and public accommodations and public entities would be very useful for when students graduate from college.
- When I looked at the Links, I did not find any.
- I think the first person account by Eric is a terrific idea. It gives credibility to the promise of accommodations, and shows WPI to be a school that is willing to teach to each student\'s strengths. I'd like to see more "personal experiences." The section on coping with AD/HD at WPI seems very practical and replete with coping mechanisms to try. I applaud the school for making the creation of this website a priority.
- Where are the links (i.e. Chadd). Need more 1 personal experience.
- grammar needs to be look at...too many 'so's' and other sentence structure errors
- It would be nice to see a few more WPI student personal experiences in the personal experience section.
- I like the content of the website as is. However, I would not use this website because I need to scroll horizontally and find that more effort than it is worth. The page is too big for my screen. Maybe a small issue, but for me it is crucial.
- The "How to get accommodations" link from the left hand frame menu took me to the "Student Disabilities Services" site. This was the only link where I lost the navigation menu on the left. It was replaced by a new set of navigation options. No where could I find a link to take me back. I used the back button on my web browser. I\'d suggest placing a link back.
- the coping section could use more emphasis
- I would be interested in more information on coping strategies
- Continue gathering personal experiences from other students with attentional difficulties. Personal stories are a great ice-breaker for a student trying to come to grip with their own issues.
- possible add more personal experiences.

Positive comments:

- Procedure for Obtaining Accommodations had good information and was given emphasis. It was an excellent section, clear and specific. Suggestions for faculty were

excellent. In a competitive and fast paced school like WPI, faculty members could easily acquaint themselves with helpful techniques.
- I found the history very interesting.

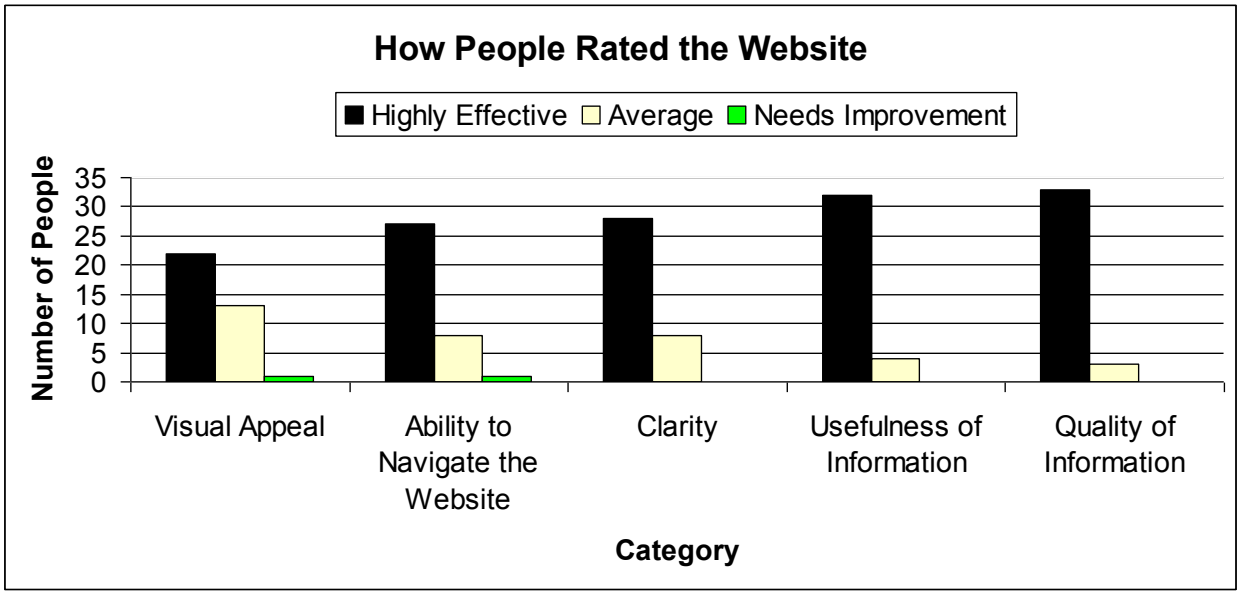
Negative Comments:
- It looked like links weren't yet done.

5. Are there any unmentioned topics which you think should be added to increase the effectiveness of the website?
- 8 people said there is nothing to be assed

Positive comments:
- wonderful website... accurate information provided in a very user friendly style
- Eric, very thorough job. I found it really informative!!!
- I can\'t imagine what you left out!!! Very comprehensive
- Can't think of any at this time.

Suggestions:
- Medications - experiences with them
- Not that I can think of, especially since you provide links to additional sites on the topic.
- Perhaps a link to non-verbal learning disorder information, because this may relate to some individuals with AD/HD
- Recommending that Learning Disabled Students should make an appointment with the Student Support service of the colleges that they are applying to would be good idea.
- Perhaps some information about learning theory. Many of us aren't diagnosed AD/HD but we all have different learning styles. I think that better understanding of learning theory might enlighten all of us to better understand students with AD/HD. As I read your suggestions for note taking. studying etc., I could not help but think how many students would benefit from these. I realize how other students don't "think" they have a need but many do. Anyway, a better understanding of how all of us learn might be of help. I am very impressed with this Website!
- ADHD does not mean stupid.
- I did not see any mention of a place to get counseling or where to go when a student felt overwhelmed.
- A list of books to read would be useful. A particular favorite for incoming college students would be Learning Outside the Lines by Jonathan Mooney.
- Webpages are too wide, needed to scroll right and left (not user friendly). Can't print out information with out having text cut off.
- I quickly skimmed the website. Were coaches mentioned as possible helping resources?

Appendix D: How People Rated the Website



Works Cited

Alexander-Roberts, Colleen. (1995). A Parent's Guide to Making it Through the Tough Years, ADHD and Teens. Dallas Texas: Taylor Publishing Company.

Anastopoulos, Arthur D. & Shelton, Terri L. (May 2001). Assessing Attention-Deficit/Hyperactivity Disorder. Greensboro; Kluwer Academic/Plenum Publishers.

Anzick, Helen. Personal Interview. 25 July 2002.

Attention Deficit Information Network (AD-IN). (17-18 May 1991). A collection of papers presented at the Third National Conference on ADD. Hynes Convention Center, Boston, Massachusetts.

Attention Deficit Information Network (AD-IN). (13-14 March 1992). "ADD-A Multimodal Approach". A collection of papers presented at the Fourth National Conference on ADD. Brandeis University, Waltham, Massachusetts.

Attention Deficit Information Network (AD-IN). (21-22 May 1993). "ADD Throughout the Life Cycle". A collection of papers presented at the Fifth National Conference on ADD. Bentley College, Waltham, Massachusetts.

Barkley, Russell A. (1990). Attention Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment. New York: The Guilford Press.

Barkley, Russell A. (1997). ADHD and the Nature of Self-Control. New York: The Guilford Press.

Barkley, Russell A. Attention Deficit-Hyperactivity Disorder (Workshop Manual).

Barkley, Russell & Mash, Eric. (1998). Treatment of Childhood Disorders Second Edition. New York: The Guilford Press.

Beckley, Ross A. & Fisher, Barbara C. (1999). Attention Deficit Disorder: Practical Coping Methods. Boca Raton: CRC Press.

Bilton, Katherine & Cooper, Paul. (1999). ADHD: Research, Practice and Opinion. London: Whurr Publishers.

Bloomingdale, Lewis M. (1985). Attention Deficit Disorder: Identification, Course and Rationale. New York: Spectrum Publications.

Brown, Thomas E. (2000). Attention Deficit Disorders and Comorbidities in children, Adolescents, and Adults. Washington DC: American Psychiatric Press.

Cole, David & Mooney, Johnathon. (2000). Learning Outside the Lines. New York: Simon and Schuster.

Crutsinger, Carla & Moore, Debra. (1997). ADD Quick Tips: Practical Ways to Manage Attention Deficit Disorder Successfully. Carrollton: Brainworks.

DeGrandpre, Richard. (1999). Ritalin Nation. New York: W. W. Norton & Company.

Fadely, Jack L. & Hosler, Virginia N. (1992). Attention Deficit Disorder in Children And Adolescents. Springfield Illinois: Charles C Thomas.

Flick, Grad L. (1998). ADD/ADHD Behavior-Change Resource Kit: Ready-to-Use Strategies and Activities for Helping Children with Attention Deficit Disorder. West Nyack: The Center for Applied Research in Education.

Goldstein, Sam. (1997). Managing Attention and Learning Disorders in Late Adolescence and Adulthood. New York: John Wiley & Sons Inc.

Goldstein, Sam & Ingersoll, Barbara. (1993). Attention Deficit Disorder and Learning Disabilities. New York: Doubleday.

Greenhill, Laurence & Osman, Betty, eds. (2000). Ritalin: Theory and Practice Second Edition. Larchmont: Mary Ann Liebert, Inc.

Grimley, Liam & Kirby, Edward. (1986). Understanding and Treating Attention Deficit Disorder. New York: Pergamon Press.

Gross, Monroe A. (1997). The ADD Brain. Commack, New York: Nova Science Publishers.

Hallowell, Edward M. & Ratey, John J. (1994). Driven to Distraction: Recognizing and Coping with Attention Deficit Disorder from Childhood through Adulthood. New York: Pantheon Books.

Hartmann, Thom. (1993). Attention Deficit Disorder, A Different Perspective. Penn Valley California: Underwood-Miller.

Hunsucker, Glenn. (1998). Attention Deficit Disorder: A Common but Often Overlooked Disorder of Children. Fort Worth: Forrest Publishing.

Ingersoll, Barbara, Ph.D. (1998). Your Hyperactive Child: A Parents Guide to Coping with Attention Deficit Disorder. New York: Doubleday.

Jones, Maggie. (2000). Hyperactivity: What's the Alternative?. Boston: Element.

Kelly, Kate & Ramundo, Peggy. (1993). You Mean I'm Not Lazy, Stupid or Crazy. Cincinnati: Tyrell and Jerem Press.

Koziol, Leonard F. & Stout, Chris E. (1993). Hand Book Of Childhood Impulse Disorders And ADHD. Springfield Illinois: Charles C Thomas.

Levine, Mel. (1990). Keeping A Head In School. Toronto: Educators Publishing Service.

Levinson, Harold N. (1990). Total consideration, How to understand ADD. New York: M. Evans and Company.

Millichap, Gordon J. (15 January 1998). Attention Deficit Hyperactivity and Learning Disorders, questions and answers. Chicago: PNB publishers.

O'Connell, Denise A. (1992). Training Parents In the Evaluation of the Individualized Education Plan (IEP) Process. University of Massachusetts: Doctor of education.

Penrice, John W. (August 1996). A History of ADD. <http://members.aol.com/addnews/history.html> [2003, February 16].

Professional Developmental Resources, Inc. (1996). "Attention Deficits in Children and Adults". A paper presented at a conference held by Professional Developmental Resources, Inc., Jacksonville, FL.

Quinn, Patricia O. (1994). ADD and the College Student: A Guide for High School and College Students with Attention Deficit Disorder. New York: Magination Press.

Quinn, Patricia O. (1997). Attention Deficit Disorder: Diagnosis and Treatment from Infancy to Adulthood. New York: Brunner/Mazel, Inc.

Robin, Arthur L. (1998). ADHD in Adolescents: Diagnosis and Treatment. New York: The Guilford Press.

Rohrer, S. (28 May 2002). Enzyme Potentiated Desensitization Frequently Asked Questions (with answers). < http://www.dma.org/~rohrers/allergy/epd_faq.htm> [2002, October 15].

Sangare, Janet. (March/April 2000). "ADHD: Making the Appropriate Pediatric Assessment Volume 4". Lippincott's Primary Care Practice.

Shaywitz, Sally E. (1992). Attention Deficit Disorder Comes of Age: Toward the Twenty-First Century. Austin: Pro-ed.

Silver, Larry B. (1999). Attention-Deficit/Hyperactivity Disorder Second Edition. Washington D.C.: American Psychiatric Press Inc.

Vitale, Barbara M. (1982). Unicorns Are Real. A Right-Brained Approach to Learning. Rolling Hills Estates, California: Jalmar Press.

Weaver, Constance. (1994). Success At Last, Helping Students With ADHD Achieve Their Potential. Portsmouth, NH: Heinemann.

Vitale, Barbara. (1986). Free Flight, Celebrating Your Right Brain. Rolling Hills Estates, California: Jalmar Press.