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**I Am Confused-**

**So What Is ADHD?**

Having ADHD is not just a matter of being inattentive or overactive, nor is it a stage a child goes through as he grows up. Poor parenting does not cause ADHD, and it is not the result of marital problems. It also does not necessarily signify a severe neurological abnormality. The child does not want to have ADHD, nor does the parent want her child to have ADHD. What makes this disorder so difficult to understand, and at times accept, is that this child in many ways is not significantly different from other children. *One of the most difficult aspects of identifying ADHD is deciding how much of unusual is normal.* An affected child differences certainly is one of degree and not of kind. A child with this disorder does not look physically different from other children, nor does he act differently most of the time. In fact, many characteristics of affected children are socially appropriate and desirable. They can be spontaneous, enthusiastic, stimulating, creative, and the life of the party, yet research finds that they have a neurodevelopmental disorder (related to the brain and neurological development) that can affect their day-to-day performance in school and their interactions with peers and caretakers.

New research has given both parents and clinicians working with these children promising ideas for success. Ongoing investigation and understanding has allowed better treatment and counseling for families dealing with ADHD. Most parents ask, "What is ADHD and how can I help my child?" No better questions can be asked or deserves to be answered. Our goal is twofold - to help you separate myth from current scientific understanding and to help you deal with your child's behaviors.

**What Are the Roles of Biology and Environment?**

Our book will provide you with a biological understanding of ADHD as well as a greater understanding of environmental contributors that can elevate as well as minimize many of your child’s ADHD symptoms. Understanding the role that biology and environment plays in ADHD expression is an important step towards appreciating the complexity of your child’s disorder. Man’s actions are influenced and directed by both biology and environment.

Professionals working with ADHD no longer accept that we are dealing merely with or only with poor parenting. Current research strongly suggests that ADHD is a genetic based neurodevelopemental disorder; however, scientists cannot definitively prove that any one neurological abnormality directly causes ADHD. This applies to other psychiatric disorders, too, including disabling diseases such as schizophrenia (NIMH 1999). Research can give us highly suggestive evidence, but so far, no absolute proof. However, you can say with conviction to doubters, "Yes, my child has a biologically based disorder, and no, it is not caused by poor parenting." As a parent, you can now look to science to give you emotional ballast to fight off unfair and sometimes cruel criticism by teachers, relatives, and neighbors.

The environment can help or hinder, but it's never neutral. It may not be as critical a component in understanding ADHD behaviors as biology, but environmental settings can have an influence on a child's life. Being raised in a chaotic and highly stimulating home or school setting will cause more problems than a child raised in a more structured and calming environment. In later chapters, you will learn ways to provide environmental settings that can promote more success for your child at home and in school.

**According to the Experts, What Is ADHD?**

ADHD refers to several chronic neurobiological disorders that interfere with an individual's capacity to regulate age-appropriate activity level, inhibition, and attention; however, there is no blood test, brain scan, or definitive psychological test that can currently diagnose ADHD. This lack of tests is not unique to this disorder, but applies to most psychiatric disorders, such as schizophrenia and autism (NIMH 1999).

ADHD is one of the most studied of all psychological disorders in children, but our knowledge is still incomplete and the diagnosis remains a controversy in many public and private sectors. This confusion stems from the fact that so many experts are involved, and their opinions regarding the diagnosis and treatment of ADHD can vary widely, resulting in uncertainty about the status of this disorder and whether it should or should not be treated and, if so, how. Adding to this confusion is inconsistent diagnosis, with the disorder sometimes being overdiagnosed or underdiagnosed. As a consequence, experts continue to debate both the cause and definitions that best describe ADHD.

**Readings on ADHD Can Become Overwhelming:**

Is ADHD the primary contributor to this child’s difficulties, or could other factors be equally important? In trying to answer this important question, ADHD has become the subject of rigorous studies in genetics, neuroscience, psychiatry, psychology, and education.

Thousands of scientific papers and numerous books for teachers and parents have been written on ADHD. It has become one of the conditions most frequently seen by child guidance personnel in this country. So much effort and study has been dedicated to ADHD because it has social and educational implications, and the cost to society for untreated ADHD is high. This population consumes a disproportionate share of resources and attention from the health care system, criminal justice system, schools, and other social agencies. These children usually have impairment across multiple settings: home, social, and school. Early diagnosis is critical, therefore, for minimizing problems they will encounter in academic activities and interactions with peers and adults. Unfortunately, ADHD has often been mishandled; leaving thousands of children, adolescents, and adults incorrectly diagnosed and thus denied the benefits of proper treatment.

The amount of readings on ADHD can become overwhelming even for the serious reader on ADHD. New information on ADHD is presented on a regular basis with the recognition that our understanding of this disorder may change and will always be open to revision. Consequently, to both the general and professional reader on ADHD, it is often overwhelming when trying to keep up with new research and recommendations on this disorder. Even professionals can find themselves confused trying to separate proximate and ultimate causation when looking at a particular child with ADHD.

**Etiology:**

The etiology of ADHD is unknown, although family studies of ADHD suggest a genetic basis for most forms of this disorder. ADHD is seen today as primarily a polygenic disorder (more than one gene contributes to it) (Ditte Demonitis, Raymond K. Walters, (…) Benjamin M. Neal, Discovery of the first genome-wide significant risk loci for Attention deficit/hyperactivity disorder, *Nature Genetics*, 51, 63-75, 2019) that can often be minimized or exacerbated by environmental factors. It is a biologically determined spectrum disorder presenting a myriad of variables and distinctions, yet it's often best treated by environmental accommodations, behavioral management interventions, and medication. There is increasing scientific awareness that ADHD is a heterogeneous disorder that carries a high risk of comorbidities, e.g., mood and anxiety disorders, learning disabilities. (Pastor & Reuben, 2002).

**Current Biological Studies on ADHD:**

The most current studies suggest that ADHD symptoms are the result of diminished function of the prefrontal executive centers of the brain’s cortex, which are responsible for impulse control and sustained attention.

ADHD is often described as a *hypodopaminergic disorder* or a disorder of self-regulation, often called an *executive function dysfunction* (see Table 4 for further discussion of Executive Function). Important in the proper functioning of the prefrontal executive centers of the brain are two primary neurotransmitters systems most directly involved in ADHD: dopamine and norepinephrine. These two neurotransmitters work in concert with each other to control attention, inhibition, and motor planning. An imbalance in dopamine and norepinephrine contributes to the symptoms we see in ADHD (Sadiq, 2007). *The medications used in the treatment of ADHD intervene by regulating norepinephrine and dopamine levels, thereby normalizing brain function and improving self-control.* In addition to ADHD behaviors, decreased activity of dopamine has been associated with increased risk for addiction (cigarettes and substance abuse disorders).

Brain based studies finds decreased blood flow in areas of the brain that are involved in attention and inhibition (i.e., prefrontal regions, striatum, and limbic system). Preliminary results from positron emission tomography (PET) scans (which measure metabolism of glucose in the brain) suggest differences in the brains of individuals with ADHD. These findings of decreased blood flow and decreased glucose metabolism suggest lower levels of brain activation (Sadiq, 2007).

Other areas of the brain thought to be involved in producing atypical functioning seen in the ADHD population are the frontostriatal complex, basil ganglia, and the right anterior frontal lobe.

Epidemiologic research has also considered environmental toxins such as lead can contribute to ADHD symptoms. However, lead poisoning is not the primary cause of ADHD for most individuals, although it may possibly be a factor in a few.

Lastly, the possibility of ADHD being caused by food allergies was fiercely debated in the past and there are new studies currently looking at dietary topics, such as the link between fatty acid deficiency and ADHD. However, this research is still developing and causality cannot be inferred.

Research has not stopped, however, and more information may change the way we view this disorder.

**Prevalence of ADHD**

The behavior patterns we associate with this disorder generally appear between the ages of three and five; however, some children do not display symptoms that can become problematic until late childhood or adolescence. The majority of children, contrary to popular belief, continue to have the full disorder into adulthood (Spencer 2000, 16). More boys are diagnosed than girls; however, when hyperactivity is not present, the ratio between boys and girls seems to be closer to equal.

The male to female ratio is 4:1 for the predominantly hyperactive type (ADHD-HI) and 2:1 for the predominantly inattentive type (ADHD-I). ADHD may be underidentified in girls (Sadiq, 2007). Girls have been overlooked because they often lack the classic symptoms of hyperactivity and impulsivity. Typically, girls do not disrupt classes, but they have clinically meaningful levels of inattention and underachievement, related, in part, to poor self-esteem and untreated ADHD (Lougy, DeRuvo, Rosenthal, 2009). Girls, unfortunately, continue to be underdiagnosed and are not provided with preventative and early intervention strategies so important for their social, emotional, and academic success.

This disorder affects 3% to 20% of the national population, depending on the information source. Most professionals accept 3% to 7% as the range of population diagnosed with ADHD; (Vaughan & Kratochvil, 2006) however, some studies suggest 4% to 12% as the range of unscreened school-age population (six-12 years old) (Brunk, 2000, 1, 5). Findings of studies conducted in New Zealand, Canada, and Germany show an overall prevalence rate of 3% to 7%, like prevalence rates in the United States (Hoagwood, Jensen, Feil, Benedetto, & Bhatara, 2000).

There has been an increase in the diagnosis of ADHD children over the last two decades. Russell, Barkley (1995, 18), one of the leading experts in this field, proposed in 1995 that more than two million school-age children may have ADHD. That averages out to one or two children in each classroom. A report from the 2003 National Survey of Children’s Health wrote that approximately 4.4 million children ages 4-17 years in the United States had a history of ADHD diagnosis (Bukstein, 2006). A more recent study as reported from the Center for Disease Control (CDC) reported that one in five high school boys and 11% of kids and teens overall have been diagnosed with ADHD at some point in their lives. About 6.4 million children have received an ADHD diagnosis at some point – an increase of 16% since 2007 and 53% increase in the last decade. In addition, more than 3.5 million children in the United States (6% of 4 to 17 year olds) were reported by their parents to be taking medication for ADHD, a 28% increase from 2007-2008 to 2011-2012. The report also notes that medication is most common with more severe ADHD. The CDC findings come from a cell phone and landline survey of more than 76,000 parents between February 2011 and June 2012 (Daily News .com/Health, 6/2/2013), “ADHD diagnosis in U.S. children rise 53% in the past decade, CDC data shows”.

We believe there are a variety of reasons for the increase in the number of children diagnosed with ADHD. First, there is a greater awareness by the public about ADHD. Second, over the last decade, preschool and adolescent children are increasingly being identified with ADHD, whereas in the past, preschool children were rarely identified, and professionals felt that most children outgrew ADHD by the time they had reached adolescence. Today, we know that both groups can be appropriately identified and diagnosed. Third, because of insurance guidelines and restrictions, most children today are initially diagnosed with ADHD by pediatricians and family physicians, who may not have true expertise or knowledge of ADHD and proper diagnosis protocols. The result may be that children may be diagnosed with ADHD who present only mild symptoms. Also, some parents will push for a diagnosis of ADHD for their adolescent in high school or college because they have read that ADHD medications can help “boost” academic performance. Lastly, because there are still very few developmental pediatricians, referrals to mental health specialists (such as a child and adolescent psychiatrist) are often made only if a child is presenting significant mental health concerns in addition to ADHD. Unfortunately, the consequence can be that a child may be misdiagnosed either because of limited time for assessment or because of inadequate expertise in ADHD by a pediatrician or family practitioner.

Robin (1998) offers other possibilities to explain the increase in the diagnosis of ADHD in the United States. He attributes the fast-paced, 15-second sound bite mentality of our culture, which tends to encourage ADHD-like behaviors, and the pressure in many middle-class circles for high achievement and the keen importance in finding good jobs. Because of these stresses, parents may look to a diagnosis such as ADHD and treatments such as medication to help their children climb the academic and economic ladder. Last, the recognition that ADHD is a life-span disorder has increased the number of adolescents and adults seeking evaluations (Robin, 1998, p.28; Lougy, DeRuvo, Rosenthal, 2009, pp.7-8)

**Definition and Symptoms**

"I do not assume everything that wiggles is ADHD" Louis B. Cady, M.D.

**Are There Different Types of ADHD?**

Early attempts to define ADHD focused primarily on motor activities, hence the diagnosis of "hyperactivity." Since then, a broader and more inclusive definition has changed both its labels and our understanding of it. The core symptoms include developmentally inappropriate levels of attention, concentration, motor activity, distractibility, and impulsivity.

The current diagnosis is divided into three primary categories along with two categories where clinicians want to communicate a concern around ADHD behaviors but find that the patient does not meet the full criteria for a diagnosis of ADHD. These categories help in ensuring that professionals use the same language and have the same understanding when they identify ADHD and communicate among each other about a patient or client. A child's diagnosis will fall under one of these categories, which depends upon the component that is most representative of the child's behavior. (See Table 1: “**Diagnostic Criterias for ADHD**”)

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| **Table 1 Diagnostic Criterias for ADHD** **Combined Type (ADHD-C)** This diagnosis applies to children who present predominantly with inattention and hyperactivity but not significant impulsivity (DSM-5, 2013). These are fidgety children who have difficulty staying seated, struggling finishing classroom assignments and home chores, often losing school assignments and personal clothing, and easily distracted by extraneous stimuli (like noises in the school hallway or home distractions like T.V. background noises), and often forgets daily routines without reminders.  **Predominantly Inattentive Type (ADHD-I)** This diagnosis applies to children who present with inattention but neither hyperactivity nor impulsivity (DSM- 5, 2013). These children are often seen as daydreamers or as underachievers and are inattentive and unfocused. Their distractibility is often internalized and is not always recognized by teachers or parents. These children also struggle with organizational skills and have difficulty finishing home chores or schoolwork.  **Predominantly Hyperactive-Impulsive Type (ADHD-HI)** The diagnosis applies to children who present with hyperactivity and impulsivity that is maladaptive and inconsistent with their developmental level. These children do not usually present with inattention (DSM-5, 2013). This population of children typically has the most difficulties with schools and outside agencies (e.g., law enforcement or social services). In the classroom, these children seem to be constantly on the go, not seated, talking all the time, and are involved in behaviors that may not be safe or logical. Their high impulsivity often leads to problems on the playground and with peers. Going to the store or eating at a restaurant can be World War III.**Other Specified Attention/Hyperactivity Disorder** This diagnosis applies to presentations in which symptoms characteristics of attention-deficit/hyperactivity disorder can cause clinically significant distress or impairment but does not meet the criteria for attention-deficit/hyperactivity disorder or any of the disorders in the neurodevelopmental disorders diagnostic class (DSM-5, 2013). This population, typically adolescents and adults, still present some of the symptoms and are often diagnosed with ADHD *in partial remission*. Therefore, even though an adolescent or adult may no longer meet the criteria for a diagnosis of ADHD, she or he can still present functional impairment in school and work. **Unspecified Attention-Deficit/Hyperactivity Disorder** This category is used by clinicians where the patient presents symptoms characteristic of attention-deficit/hyperactivity disorder that causes clinically significant distress or impairment in social, occupational, or other important areas of functioning, but does not meet the full criteria for a diagnosis of Attention-Deficit/Hyperactivity Disorder. This category is used when the clinician chooses not to specify the reason that the criteria are not met for attention-deficit/hyperactivity disorder because of insufficient information to make a more specific diagnosis (DSM-5, 2013).  |
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 The primary core symptoms currently associated with ADHD are *inattention, hyperactivity, and impulsivity*. *These primary symptoms can be viewed as dimensional aspects of behavior rather than as categories*. The relative degree and pattern of these primary symptoms help us better index this disorder for purposes of diagnosis. Not all children present these symptoms in the same way or to the same degree. Some will present only mild impairment, while others present moderate to severe impairment that can impact day-to-day interactions with others, and performance in school and on the job. Those whose symptoms show significant impairment will often be diagnosed with ADHD.

ADHD presents symptoms differently at different times, and the symptoms can change with age. Some symptoms are more of a problem at some ages than at other ages. Hyperactivity is generally more noticeable in a six-year-old than in an adolescent, but inattention and cognitive impulsivity may be present throughout the child’s life and continue into adulthood. (Please go to Appendix J for an overview of developmental stages of ADHD: infant, toddler, preschool, and school age).

**ADHD Represents One End of a Continuum of Traits:**

If ADHD represents one end of a continuum of traits, then the problem with diagnosis lies in determining the boundary between the unaffected population and those with ADHD. Where one falls on the continuum determines whether one's trait is considered normal or abnormal. Like other human traits, these traits probably undergo developmental changes as the individual matures.

We all have ADHD traits, and those diagnosed with ADHD may simply represent the extreme.  *A child to be diagnosed with ADHD must show significant impairment from the ADHD symptoms in two or more settings (e.g. at school or work and at home) and there must be clear evidence of clinically significant impairment in social, academic, or occupational functioning* (DSM-V, 2013). Sometimes, however, a child will be mistakenly diagnosed with ADHD because the clinician viewed only the symptoms without assessing their impairment on the child’s daily functioning.

This disorder can be viewed as like other traits, such as reading ability, height, weight, or intelligence. Children with ADHD differ in how much they inherit the traits in much the same way we all differ in how much we inherit height or intelligence. No two children inherit or present similar behaviors.

John F. Taylor (1994, 13), an expert on ADHD, talks about this difference by using an analogy of a deck of cards. Imagine, he writes, every child being given a deck of 200 cards. On each card is a trait of ADHD, e.g., running around all the time, entering a sister's bedroom without permission, not following teacher's directions, or jumping from one activity to another, and its overlapping conditions, e.g., impulsivity, hyperactivity, distractibility, and inattention, to name a few. Each child receives cards that represent a particular behavior, but some children will receive only a few cards, and others will receive many. Those who receive many cards stand out from other children and are seen as different.

Also, even though two children may have the same number of cards, their collection of traits or behaviors may be different. One child may be inattentive without hyperactivity, another child predominantly impulsive and hyperactive. Your child may be inattentive and highly distractible, but less hyperactive than another. This variability in symptoms is one of the most confusing and frustrating factors for parents and caretakers. You know this if you have ever tried to explain to a teacher, grandparent, or doctor why your child has ADHD when he acts so differently from the child with ADHD down the street. This can especially be true if your child is not that particularly hyperactive but is inattentive.

It would be a lot easier for parents and clinicians if children were like mathematical formulas-clear, consistent, and tested true over time-but they're not. Each child comes with his or her own temperament, personality, bumps, and bruises that don't fit neatly into any category. All that any list of symptoms can do is to give us an approximate idea of behaviors in a child, not an exact match. No child should be thought of as the poster child for ADHD. If you could line up 100 affected children on the street, you would find that they definitely don't look alike, generally don't act alike, and some will be more noticeable than others.

Below in Table 2 we profile four children diagnosed with ADHD who range from kindergarten to high school. These children are a composite of children with ADHD. We try to show how each age group can present with similar as well as dissimilar challenges stemming from their ADHD diagnosis (Lougy, DeRuvo, Rosenthal, 2007).

Table 2

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| **Tyler: (Kindergarten)**Tyler, 5 years 3 months, entered kindergarten with a history of delays in social development and was described both by his parents and his kindergarten teacher as highly emotional, impulsive, and inattentive.Tyler’s parents reported he had a history of ear infections, was colicky, and had great difficulty getting to sleep as an infant and toddler. He presented normal developmental milestones accept that he continues to wet his bed at night and can have accidents during the day. His parents reported he struggled with motor coordination, had motor tics, and that he was being treated for allergies. He was not a moody child but very active. He was hard to cuddle because he was so active and would push away and wanted to be let down. He had difficulty with eye contact but his parents, both doctors, contributed this behavior to his “fast moving thoughts” and his “being highly distractible”. When Tyler entered preschool he had great difficulty adjusting to the schedules and routines. He quickly came to the attention of the staff because of his impulsive behavior. He would grab toys from a child without asking, walk away during circle time and go play with a toy, and swing or throw objects carelessly in the classroom. Free time was especially difficult because staff would find him in isolated play because other children were guarded around him and avoided his company because of his behaviors. Coupled with his impulsive and hyperactive behaviors, Tyler presented significant difficulties in regulating his emotions. He would quickly become angry or upset, leading to long periods of crying.Tyler, even on medication, continued to need accommodations at school. He still had difficulty with paper-pencil tasks, transitioning, and maintaining positive peer interactions. The parents, because of Tyler’s young age, took him off medication; however, his impulsivity and hyperactive behaviors were still very pronounced, and he was put back on medication after a 10-week trial period off medication. Tyler’s difficulties stemmed in part from his untreated ADHD, but his parents reported that by the end of his kindergarten year, when back on medication and seeing a therapist specializing in ADHD, he had a more positive outlook. He was better able to adjust to the classroom environment. Tyler was provided the needed support for more success from his school, doctor, and parents. His parents again spoke of taking him off medication at a later date, but not in the near future. Even doctors can have second thoughts when it’s their own child. Medicating very young children is never easy for any parent or physician. (Lougy, DeRuvo, Rosenthal, 2007)**Andy: (Second grade)**Andy, a second-grade student, was diagnosed with ADHD in the middle of the first grade. They were apprehensive about putting him on medication because he was a picky eater. His parents had put him on medication for a short time during the first grade, but decided to take him off to see what would happen the following year. They felt possibly his difficulties in school were related to his sleeping difficulties. It was hard to get him down for bed and “asleep without lying next to him”. They had recently moved and were anxious to see if he would do better in a new school and with a new teacher. Andy’s parents, when enrolling him in his new school, did not share his diagnosis with the principal or classroom teacher. They wanted to wait and see and felt that talking to the teacher would “prejudice her against Andy”. After a short period of time Andy’s new teacher called requesting a meeting to discuss Andy’s disruptive and impulsive behaviors.Recess was often difficult for Andy. He would be playing and forget to line up when the bell rang and would quickly become angry if reprimanded or become upset with another child. He would impulsively strike out at other children or bark back at teachers who tried to intervene. He had to be put on a modified recess schedule because of his behavior. Andy was resistant to writing tasks, and it often took many reminders by his teacher to get him started and to stay with a writing task. His parents reported that even short writing assignments would “take an unreasonable amount of time” and create a “World War III” atmosphere at home. Paper/pencil tasks, from spelling tests to worksheets, are more common as a child advances in grades. Andy, struggling with writing tasks, became noncompliant and oppositional, which would bring negative attention from his teacher and parents. Andy presented both ADHD behaviors and problems with completing writing assignments. His parents started him on medication which helped with his focusing, impulsivity, and hyperkinetic behaviors, but he still struggled with writing tasks. Andy was soon identified with a learning disability in written language and his parents started to regularly attend a local CHADD meeting (a national support group for parents with children with ADHD) to help them better understand their son’s disorder.Andy needed ongoing support but was showing improvement in school because of early treatment for his ADHD and additional educational support through an IEP. (Lougy, DeRuvo, Rosenthal, 2007)**Sarah: (Seventh grade)**Sarah was first diagnosed with ADHD in the fourth grade. Her parents and teachers described her as a charming child, very social, but struggled both at home and in school with high distractibility, forgetfulness, and with tasks requiring sustained and focused attention (schoolwork, chores). She was not hyperactive or impulsive, but very inattentive. Both her parents and teachers commented that she would often be observed “daydreaming” when she should have been listening to her teacher’s directions or working on desk work. Her grade schoolteachers reported she was a very bright child, but an “underachiever”. She had many friends but struggled remembering to turn in her homework, taking needed material home for homework, and often would describe herself as very anxious when taking tests. Review of her report card found many notations around missing assignments or incomplete work.Sarah was finding school more challenging as she moved up in her grades. Prior to the seventh grade her grades were generally average, but her grades started to fall in the seventh grade. The seventh grade was especially difficult for Sarah because she had to deal with more than one teacher and both parents’ and teachers’ expectation for her was that she should be more self-directed and more focused by this time in her schooling. Some of her teachers reported to Sarah’s parents that she was “lazy” and “unmotivated” with schoolwork in class. They described her as often “sleepy looking” in class and “looking bored”. Her seventh-grade report card noted her biggest challenge was in task completion and incomplete class work stemming from inattentiveness and poor organizational skills. Her citizenship grades were good, and her teachers generally reported that she was a “good kid” but didn’t “work hard enough in class”. Sarah was placed on medication for ADHD the second semester of the seventh grade. Her in-class performance improved significantly, and she was more focused and attentive to her teachers directions. Her grades improved and she commented to her parents that “she could pay attention and not daydream as much anymore”. She did continue to need support in the evenings at homework time and additional tutoring around organization and time management skills. **Zack: (Tenth grade)**Zack had struggled academically and socially all through school. Middle school and his freshman year in high school were especially challenging. He had failed two of his classes and was required to go to summer school. He was not provided any academic or behavioral support through a 504 Plan because his father was opposed to “making any excuses” for him. He was first diagnosed with ADHD in the first grade, but his treatment was often inconsistent, and his parents vacillated between acceptance and questioning his diagnosis. The father was opposed to medication because he didn’t think Zack “had any disease”. His mother was more accepting of his diagnosis which caused marital discord and conflicts at home around discipline for Zack. His teachers described him as “unmotivated” and “argumentative when asked to get back to work”. He would often refuse to work on homework at night, not respect “school rules”, and was seen by many caretakers and his parents as oppositional and defiant. Zack was at great risk of failing high school and getting into trouble with the law. He was starting to not come home after school, and he would sometimes sneak out of the house after bedtime “so he could go visit his buddies”.He described himself as very angry and discouraged and felt there was “no hope for him in school so why try”. Immediate medical and psychological treatment for Zack, along with appropriate educational interventions, was of upmost importance; however, parental disagreements and lack of appropriate educational support was making needed interventions for Zack very difficult: Zack acted younger than his chronological age which compounded his situation. His maturation hindered him taking personal ownership for his misbehaviors and acceptance that his diagnosis made academic school tasks more challenging. He had developed a stance of “victimization” and viewed teachers and other authority figures as “out to get me”. His father’s focus on his behaviors as one of “willfulness” and not seeing ADHD as a significant risk factor in his decision making made meaningful change more difficult: “Dad says I am not dumb, just lazy”. Zack was not only suffering from untreated ADHD but a possible mood disorder and oppositional disorder that made any potential treatment more difficult. He had never been placed on medication for ADHD nor was he being evaluated for a suggested mood disorder. Sadly, Zack’s prognosis is poor for graduating from high school and not getting into trouble with the law.  |

The above attached profiles point out the importance of early treatment, consistent treatment, and the importance for parents to learn as much as possible about their child’s disorder. Untreated ADHD can cause unnecessary emotional harm to the child and bring additional stress to the family.

 Also, ADHD is commonly associated with other mental health disorders such as Oppositional Defiant Disorder, as well as learning disabilities and developmental delays in writing tasks, as well as language-based disorders, such as Auditory Processing Disorder.

**Three Core ADHD Symptoms:**

Let's briefly review the three core symptoms outlined in the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5, 2013) that professionals use in diagnosing ADHD.

**Inattention**

Have you asked your child to pay attention and then found that he/she still didn't remember what was asked of them? An important component of remembering is a factor called attention. An affected child often doesn't attend when given directions, so they may make decisions based on partial information, leading to incomplete or forgotten chores or schoolwork. Simple tasks such as remembering a small number of items to get at the grocery store can be embarrassing and frustrating for them. You are probably thinking to yourself, "Well, everybody forgets at times," and yes, that's true; however, people with ADHD forget more often, creating ongoing frustration and discord because of their difficulty “remembering to remember”.

**Lack Selection Control:**

Inattentive behaviors manifested by these children are chronic, pervasive, and problematic in their day-to-day activities. These children have difficulty attending to one thing because they often pay attention to everything! They may constantly scan the environment around them, distracted by all things except what needs their attention. Lacking the selection control to dispose of worthless information, they can often hear the lights buzz and the clock tick, making it difficult to determine which sounds should receive attention (Levine, 2002). With all this information activating their sensory perceptions, they will have a difficult time attending to the important aspects of school instructions and directions at home. With so much calling for their attention, they will usually choose to attend to something that they find immediately gratifying to help block out the other input that is calling for their attention (Lougy, DeRuvo, Rosenthal, 2009). They seem to have no internal voice saying, “Stop, listen to mom” or “Put down your pencil and listen to the teacher’s directions”.

**Laborious and Routine Activities:**

They seem to have difficulty with focused and sustained attention when involved in laborious or routine activities. Research suggests that deficits in attention are particularly evident under repetitive or “boring” conditions (Anastopoulos & Shelton, 2001; Barkley, 1997; Teeter, 1998; Brown, 2005), which could happen during classroom seatwork or tackling tedious homework. Furthermore, inattention may affect a child’s ability to engage in free play for long periods of time or participate in organized sports, such as baseball (Pelham, et al., 1990). During complex tasks, attention can be described as comprising the below three processes related to self-regulation (Teeter, 1998):

1. Maintaining attention over time.
2. Organizing and self-directing attention.
3. Investing effort to attend to tasks.

Children with ADHD are challenged by all three tasks which can have a negative impact on schoolwork and home chores, such as cleaning their room or vacuuming the house. (Lougy/DeRuvo, Rosenthal, 2009)

Also, when one or more of four characteristics are present-*something new, interesting, intimidating, or one-on-one with an adult*-you will often find that the child can pay attention as long as other children (Phelan 1996, 13). Several years ago one of the authors took a group of affected boys to an action movie and we can assure you, they were glued to the screen and showed no indicators of boredom or "short interest span."

**“Short Interest Span”:**

One authority suggests that when we say they have a short attention span, what we really mean to say is that they have a "short interest span" (Barkley 1995). The attention deficit is often verbalized by affected children as, “I’m bored.” They become bored with most mundane, repetitive, and low-stimulation activities, especially schoolwork and instruction that is nonengaging (lectures). They will often seek out new and exciting experiences to keep their interest- having an “attentional bias toward novelty” (Robin, 1998, pp.16-17). Sometimes this venture toward novelty can lead to high-risk behaviors in adolescence, such as sexual promiscuity, shoplifting, or drugs, to name but a few.

**White - Hot Focus:**

They will show no noticeable problem when involved in high-interest activities. In fact, when involved in high-interest activities, they can be hyperfocused- so focused on what they're doing that they are oblivious to what is happening around them. They tend to selectively focus on discrete things, having a white-hot focus on things that catch their interest. They can become so focused on an activity or assignment they are doing that holds their interest that they will fail to recognize that transitions in the classroom have occurred, or at home, mother has called the family to dinner. (Lougy, DeRuvo, Rosenthal, 2009) Put an affected child in front of a computer, action movie, or video game, and they will probably not stand out as less attentive than other children around them.

**Pays Attention to Everything:**

The affected child has great difficulty being attentive to one thing because he often pays attention to everything. He is constantly scanning the environment, distracted by all things around him except what he needs to attend to at the time. Where competing activities or distractions provide more immediate and meaningful gratification, he will often shift off-task to engage in those activities (Anastopoulos and Shelton 2001). In the classroom, he pays attention to a fly on a desk, the teacher's sparkling ring, or the custodian sweeping the sidewalk outside the classroom, and does not listen to the teacher giving directions. At home, he leaves chores undone, forgets where he left his shoes, or loses hat or gloves when playing, because some other attraction gets his attention. Furthermore, inattention often affects his ability to engage in free play for long periods of time and to participate in organized sports, such as baseball and soccer. Finding it difficult to pay attention to what is important at the time can get them into trouble in the classroom and cause accidents at home, affecting both academic performance and social functioning.

**Five Ways of Looking at Attention:**

Experts look at attention differently. Some emphasize one concept over another, but Sam and Michael Goldstein's (1990) discussion of attention is helpful because it relates to tasks that we have to do at home and school.

1. A child having difficulty taking notes and paying attention to the teacher simultaneously would have a problem with ***divided attention***.
2. One who is described as a daydreamer, preoccupied with other activities instead of what is being talked about, would have a problem with ***focused attention***.
3. One who is distracted by outside noises, such as a door closing or a child walking down the aisle to the front of the room, would have a problem with ***selective attention***.
4. A child unable to remain on a task long enough to sufficiently complete that task would have a problem with ***sustained attention, or persistence***.
5. One who is unable to wait for the next spelling word to be presented by the teacher would have a problem with ***vigilance, or readiness to respond***.

A child with the above difficulties would find everyday requirements surrounding following directions and finishing tasks difficult. Have you been disappointed in your child's seeming inability to consistently follow simple directions, or to remember to bring in the newspaper, feed the dog, or bring back his or her shoes from the bedroom? They will often find attending to directions difficult and this is not always because of lack of desire, but because the child has a neurodevelopemental disorder. All people sometimes choose not to listen or follow directions because they would rather do something else. Your great challenge is learning to know when your child is purposely ignoring you and when their seeming inattention is a symptom of their attention difficulties. Separating the two is not easy or foolproof, even for the most knowledgeable of parents.

**Often Don’t Attend to their Body States:**

Many of these children are not attentive to their body states. They may seem insensitive to pain, and when injured may not report it until much later. They may also seem inattentive to their internal body states-40% to 50% of hyperactive children have problems with bowel and bladder control. Daytime wetting and soiling of the pants occur because they don't seem aware they are about to have an accident (Taylor 1994). Sometimes they would rather not stop what they are doing than take the time to go to the bathroom, leading to embarrassing situations. Nighttime wetting, on the other hand, is more related to sleeping problems than to attention disorder. Very sound sleepers often have a history of bed-wetting.

Inattention is a core symptom and can present many problems. Your child would not have been diagnosed with ADHD unless he had difficulties with attention.

**Hyperactivity**

Although current research suggests that hyperactivity and impulsivity are different expressions of impaired behavioral inhibition (failure to inhibit the impulse for motor movement (Robin, 1998), it is still helpful to discuss hyperactivity separately because it is the behavior that often is first noticed by parents and teachers.

When people think of ADHD, they think of the hyperactive child in the neighborhood or in the classroom. He is known by everyone and, some would say, pesters everyone. Every teacher in an elementary school knows this child, and he becomes the topic of gossip of neighborhood mothers.

Hyperactivity is not just *high activity*, but *disorganized and purposeless activity*. Hyperactivity refers to a range of excessive body movements ranging from restless, incessant fidgeting while seated, to frantic running around the room for no apparent reason. The hyperactive child is often referred to as always "on the go" and "driven by a motor" (DSM-V, 2013). Boys, more often than girls, jump, wiggle, squirm, run, and hardly sits still or walks calmly from one place to another. He pokes, grabs, and touches things, especially where he shouldn't. He has difficulty playing or engaging in leisure activities and is accident- prone. He can talk excessively, hang on the edge of a chair, or make excessive noises during quiet times. He is consistently loud and noisy when playing, making whistles, clicks, sounds, and producing an endless stream of chatter. In a nutshell, he has great difficulty managing his activity levels and is seemingly unable to stop without reminders. Hyperactivity becomes a problem when he reaches the ages of two to four (See Appendix J for developmental stages of ADHD). Parents often feel they need to "batten down the hatches" when little Johnny gets out of bed. He's always on the go, getting into everything not locked up, screwed down, or put away or out of his reach. One mother said that simple tasks such as giving a morning bath to her toddler would turn into World War III. Hyperactive toddlers are difficult to handle even for the most energetic of parents. They take more time, more energy, and more patience to raise than unaffected children do. Parents describe going through a litany of interventions suggested by good neighbors, family members, and the child's doctor, but nothing seems to work consistently or for long.

This incessant motor activity and restlessness is especially troublesome when the child reaches school age. Staying seated in the school bus or in class can especially be challenging. Even when staying seated, he continues to be hyperactive, but in different forms, such as noisily tapping on a desk, rocking the desk chair, or swinging his feet to and fro.

**Adolescents: “Subjective Feelings of Restlessness”:**

The classic overactivity found in young children is often diminished or transformed by adolescence –transformed into “subjective feelings of restlessness” (Robin, 1998, p.18). Even though an adolescent may not appear restless to a parent or teacher, they often feel that way, struggling to focus or control this enormous amount of pent-up energy. They manifest their restlessness in different ways from the younger child with ADHD. They will often fidget or show other signs of restlessness. Adolescents often will describe feeling confined if asked to sit in a classroom for too long or when seated at a desk to study for a long period of time. Teachers often will find nonstop talking (especially in girls) and badgering as two common manifestations of hyperactivity in adolescence. To reduce the pressure of the pent-up energy, some will aggressively provoke people around them to bring attention to a point and relieve a sense of their internal chaos (Alexander-Roberts, 1995). They can manifest great energy by channeling their energy into many activities, as well as sometimes getting as little as four to five hours of sleep at night. Their high energy can wear out their friends and family (Robin, 1998), and the teacher that works with this high level of energy daily can quickly become less tolerant of these behaviors in the classroom – resulting in many classroom removals and lost learning opportunities (Lougy, DeRuvo, Rosenthal, 2009).

Hyperactivity - Classroom Expectations:

Let's look at behaviors expected in the classroom to see why the hyperactive child has such great difficulty there. Children in a classroom are asked to sit quietly at their desks, follow the teacher's directions, not bother the children next to them, and not fidget or rattle things while working. It would be easier for many children we work with to lie on a bed of nails than to master these behaviors.

Thom Hartmann (1993) writes that schools were set up for Farmer types, not Hunter types, of learners. Hunters are constantly monitoring their environment, are totally focused on the moment and have incredible bursts of energy but not staying power. They love the hunt but are bored with mundane tasks and have a low frustration level for mistakes. Farmers, on the other hand, are not easily distracted or bored, they set long-term goals, and they are team players. Farmers are cautious and need to be patient with others. They attend to details and will sustain their efforts until the crop is ready for harvesting. Even though Hartmann points out that these characteristics are simplified for purpose of explanation, they can be useful in demonstrating the different behavior and learning styles between the two archetypes.

Children with ADHD are Hunters, not Farmers. They usually get bored easily, are not cautious, and are easily distracted by outside noises and events. Add the incessant running, excessive body movements, and general disruptive behaviors, and it's no wonder your hyperactive child is called down to the principal's office more than other children in his classroom.

*Hyperactivity, unlike inattention, is not necessary for a diagnosis of ADHD*. However, the hyperactive child seems to come to everyone's attention right away, leading to more children with hyperactivity seeing the doctor and being diagnosed than the inattentive- type child.

**Impulsivity**

Impulsivity is difficulty waiting one's turn, blurting out before thinking, and interrupting or intruding on others' time and space. This child can alienate others around them because of this difficulty with impulsive behavior. They may come across as demanding and inflexible, appearing selfish. They often start things before the directions are completed, taking things without thinking, and often are seen by others as difficult to be with for any length of time. They will often butt into line to get ahead of someone or take another turn in a game because they can't wait until their turn comes again. They will raise their hand in class, and then when called upon, won't know what to say. They will start writing on a test paper before being given permission or, when playing a board game, they will not wait their turn or will move another child's piece without permission. They often have trouble keeping playmates because of their impulsive behaviors. They’re commonly not invited or asked to participate in recess games or to be partners in group activities in the classroom.

**My Child Can Test My Patience**:

The impulsive child can greatly frustrate parents and cause them to lose their temper and sometimes think they will go crazy raising their child. He seems driven by the moment, which can interfere with his relationships with peers, family, and school personnel. One parent described going to the grocery store with her child as an "embarrassing and frustrating experience." He would invariably grab a store item off the shelf or run ahead and disappear around an aisle. She never looked forward to taking her child out in public and talked about her guilt and anger. She was a single mother without outside support, which made the situation even more stressful. Another parent described her third-grade child during a school recital as "doing everything but listening to the recital." While the other children were attending to the recital, he was turning around, waving to his mother, pushing a classmate next to him, and unable to attend for even a short period of time. His behavior, driven by the moment, made his mother feel embarrassed both for him and for her.

**Not Invited to Birthday Parties:**

Because of difficulty with impulsive behaviors, these children have problems with free time or exciting events like a birthday or Halloween party at school. Unfortunately, they may not be invited to birthday parties, sleepovers, or skating parties because of their behavior. They will seem at times like children on the outside, not regular participants in normal childhood experiences. In talking to them, we sometimes find a general sense of sadness in their voices and stories. This sadness is sometimes expressed in anger or purposeful and mean- spirited behavior and is not recognized for what may be the beginning of a long ongoing battle with underlying sadness. It may not be clinical depression as experts define it, but it surely can be an early sign of more serious problems that often needs to be addressed.

High impulsivity often can put them at risk for accidents. This can be seen in the reckless driving behaviors of teenagers or the eight-year-old who decides to climb to the top of an 80-foot pine tree. The urge to experience risk, the desire for that adrenaline high, seems common in affected children more than other children we professionally evaluate.

**Adolescents Can Demonstrate High Impulsivity:**

Adolescents can continue to demonstrate high impulsivity. ***Behaviorally***, they often are driven by the moment and have a great difficulty with delayed gratification. They will do whatever pops into their mind without stopping to measure the consequence of their actions. They often opt for short-term gratification despite long-term pain for not completing a homework assignment or getting their chores done at home. They can be seen as irresponsible, selfish, immature, lazy, and outright rude. ***Cognitively***, the impulsive adolescents rush through schoolwork, overlooking crucial details, making careless mistakes, and writing sloppily. ***Emotionally***, impulsive adolescents can become easily frustrated, agitated, or moody and lose their temper quickly – sometimes accompanied by aggressive and verbal responses directed either at others or themselves (Robin, 1998; Lougy, DeRuvo, Rosenthal, 2009).

**Other Behaviors Associated with ADHD**

The three symptoms of inattention, hyperactivity, and impulsivity are the primary and core behaviors of ADHD. Understand that in addition to these symptoms, clinicians have also found other behaviors sometimes associated with ADHD (See Table 3).

**Table 3**

**Other Behaviors Sometimes Associated with ADHD**

***Oppositional and Defiant:***

Children with ADHD-especially those with strong hyperactive-impulsive behaviors-can often act noncompliant and oppositional. One-third of children diagnosed with ADHD also can qualify for a diagnosis of Oppositional Defiant Disorder (ODD). Research suggests that children diagnosed with ADHD-HI and ODD often present an earlier onset of ADHD when compared to those with ADHD alone. One study showed a mean age of 3.4 years for ADHD/ODD, versus 4.0 years for ADHD alone (Anastopoulos and Shelton 2001). The noncompliant and oppositional child with ADHD can be negativistic, hostile, and defiant towards peers and authority figures. He is commonly argumentative with adults, frequently loses his temper, swears, is often angry or resentful, and is easily annoyed by others.

 Noncompliant and oppositional children are often in trouble with authority figures and are at risk for moving into a diagnosis of Conduct Disorder where they can be found engaging in thefts, getting expelled from school, and drifting into alcohol and drug use. Particularly with conduct disorder adolescents, frequent truancy from school is common. Academic achievement may also be negatively impacted because of their behaviors. Grade retention, unfortunately, is very common. You will commonly find deficits in academic skills in reading and other language skills. Lastly, there is some research suggesting a genetic predisposition for Conduct Disorders, although the specific mechanisms for transmission have not been identified.

In addition, deficiencies in fundamental parenting skills have been implicated in the development of behavior problems in Conduct Disorders. Deficiencies have included inadequate monitoring of child behavior, insufficient involvement in the child’s life, inadequate provision for appropriate positive reinforcement, interactions patterns characterized by negative reinforcement and coercive behaviors, insufficient problem solving skills, and an overreliance on harsh, aversive methods of physical discipline for behavioral management of the child. (Breen, M., Altepeter, T.S., Disruptive Behavior Disorders in Children: Treatment-Focused Assessment, The Guilford Press, New York, 1990, pp 31-34)

***Elevated Anxiety:***

Another symptom sometimes associated with ADHD is elevated anxiety. They will fixate or ruminate on a thought or fear, which sometimes leads to elevated anxiety and avoidance of activities. The child can become very anxious about a number of activities, from test taking to staying overnight with a friend.

Elevated anxiety is often associated with a child who is diagnosed with *ADHD –Predominantly Inattentive Type*. These children often will describe themselves as very anxious around school tasks such as test taking. They also can be slow to finish a writing assignment because of their anxiety: “it doesn’t look neat” or “I think I may have left out something”.

**Emotionally Volatile:**

The child can be emotionally volatile, his unpredictable moods going up and down in a heartbeat. They seem to wear their feelings on their sleeves, showing little restraint and not cushioning their emotions, which are often expressed in extreme and raw ways-which overwhelm and sometimes frighten those around them. They can have low frustration tolerance, can be irritable, easily upset, and react viciously to others who irritate them. They often cannot tolerate being teased. They can explode, and then a few moments later seem happy and genuinely surprised that others won't play with them.

**Self-absorbed:**

They can seem self-absorbed, lacking awareness of their impact on others. Their own needs and wants seem to be their dominant concern. Their impatience, combined with high impulsivity, can lead to a lack of respect for others' boundaries. The child can be impatient regarding others' space, feelings, or wishes. They will start writing before listening to all the directions, push over a game board in anger, or shove a person ahead of them in line. They will walk into a room without knocking, repeatedly ring a doorbell while waiting to enter, or borrows things without permission. They are too impatient to wait until they have permission to use a bike or toy.

Not all affected children present the above behaviors, but many do show a tendency towards some or many of them.

**ADHD: Predominantly Inattentive Type (ADHD-I)**

Children who have a predominantly inattentive subtype are less likely to be referred for professional evaluation of ADHD because they do not display more commonly recognized disruptive behaviors.

Children without hyperactivity or impulsivity, that is those who are predominantly inattentive (ADHD-I) are often described as underachievers, anxious, less attentive, daydreamers, sluggish, disorganized, distractible, drowsy, and generally slow-moving compared to others children.

Research, though limited, suggests that the attention disturbance of the ADHD-I child is different from that of the other affected children. Inattention may come in two different forms: one related to poor selective attention, passivity, and sluggish information processing-found in children with ADHD-I, and the other represented by difficulties with resistance to distraction, recall of previously learned information, and persistence of effort-seen in children with ADHD-HI and ADHD-C (Barkley 1997).

They also have fewer problems than the child with ADHD-HI in making and keeping same-age friends or getting along with teachers and adults. Consequently, they may be initially overlooked by teachers and parents but they tend to have increased rates of academic problems as they advance in their schooling (Lougy, DeRuvo, Rosenthal, 2009).

Both children with ADHD-I and ADHD-C face academic problems. The child with ADHD-I, however, may have more problems in math, as well as delays in language and reading. He can find day-to-day school activities difficult. You may find the “inattentive child” sitting in the back of a classroom, being mentally all by him or herself, and not attending to the teacher's directions or classroom activities. Consequently, they often failto turn in schoolwork, hear what's being said, and will make more mistakes than their classmates. Unlike the child with ADHD-HI, who is headstrong or impulsive, the inattentive child seems to have difficulty sifting out relevant from irrelevant material. They may look like they are attentive and working, but mentally they’re not there, not processing the task or instructions, so they often make decisions based on misinformation or partial information. This leads to parental conflicts and teacher frustration.

Again, unlike the child with ADHD-C or ADHD-HI, the child with ADHD-I does not always get help from teachers and parents because they are seen as just immature or a child who doesn't try his or her best. They are often seen as a good student to have in class- she doesn't talk too much, and she makes and keeps friends more easily than the other two types, and she is usually not impulsive or physically aggressive towards peers or adults. Unlike the hyperactive and impulsive dimensions of ADHD, which seem to decrease in severity over childhood, inattention can be problematic throughout a child's education.

As noted earlier, this child can be very anxious. Research suggests that children with ADHD-I are more likely to have anxiety disorders and perhaps a mood disorder, and they are often seen as socially withdrawn, shy, reticent, and more apprehensive than those with ADHD-HI. Their anxiety, unfortunately, is frequently hidden from others, and is not considered troublesome for these children. Yet the child with ADHD-I seems to have fewer psychiatric conditions than those often associated with ADHD-HI.

Studies show that these children do worse than others on tests involving motor speed and hand-eye coordination, so it may take them longer to complete written work. It is often appropriate to provide accommodations for written work to address this difficulty. Children with ADHD-HI, unlike children with ADHD-I, can have trouble synchronizing hand- eye movements with their fast-moving thoughts. While they can produce interesting ideas at a rapid rate, their poor motor ability prevents them from keeping pace with these thoughts; their writing is disorganized and does not represent their knowledge of the subject (Levine 1987). However, sometimes difficulties with handwriting tasks can be symptomatic of impatience, rather than representing a fine visual-motor coordination problem. If your child has significant difficulties with written language tasks, request a psychoeducational assessment to check for the possibility of a learning disability. Children with ADHD-I can present challenges like those with other ADHD subtypes in social systems such as school. They also frustrate parents and caretakers because of their inconsistent performance in home activities such as chores. If your child has ADHD-I, be careful not to judge his or her forgetfulness as purposeful, when in fact, it may be a manifestation of your child’s disorder (R. Lougy, S. DeRuvo, D., P.14-15, 2009).

**Four Behaviors Worthy of Discussion**

When speaking to educators and groups of families, we like to discuss four kinds of behaviors that help them better understand these children: poor inhibiting behavior, rule-governed behavior, inconsistent performance, and motivation.

**Poor Inhibitory Behavior:**

Our ability to inhibit our behavior affects many areas of our life, from interacting with people to performing well on a job. Children with ADHD have great difficulty inhibiting their behavior. Russell Barkley (1997) proposes that ADHD is not a disorder of attention, per se, but rather *a developmental delay in the brain circuitry that underlies inhibition and self-control.* What we see as hyperactivity and impulsivity is a part of an underlying problem with inhibiting behavior. This impairment affects the ability to pay attention and to defer immediate rewards for future gain. The child will think, "I like to punch Johnny," and while thinking this thought, punches Johnny. The time between thought and action is short-sometimes nonexistent. He immediately responds without stopping to think about the consequences of what he is doing.

Without proper functioning in behavioral inhibition, the Executive Function (EF) cannot occur without interference. EF’s refers to an individual’s self-directed actions that are used to help that person regulate his or her behavior, that is, actions a person performs that help him or her exert more self-control and better reach his or her goals See Table 4 for more extensive discussion of Executive Function.

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| **Table 4****EXECUTIVE FUNCTIONS (EFs)**The term executive function (EF) refers to an individual’s self-directed actions that are used to help that person regulate his or her behavior, that is, actions a person performs that help him or her exert more self-control and better reach his or her goals. EFs represent the internalization of behavior that helps us anticipate changes in the environment and events that lie ahead in time. It provides a sense of readiness, the ability to inhibit habitual responses, delaying gratification, and adjusting ones actions to changing conditions. It is, in some ways, a cognitive process that serves as a kind of supervisor or scheduler that helps one select a strategy to integrate information from different sources. (Baddeley, 1986; Lougy, DeRuvo, Rosenthal, 2009)Many children with ADHD often have developmental delays in EFs. They often do not exert self-control in reaching important goals, for example, putting off watching their favorite T.V. program, so they can study and pass an important test the next day. Many children with ADHD show an aversion to delay, showing preferences for small and more immediate rewards compared to larger, delayed rewards (Doyle, 2006). A snapshot look at the primary EF processes finds (Melzer & Krishnan, 2007, p.74):* Selecting relevant tasks goals.
* Planning and organizing information and ideas.
* Prioritizing and focusing on relevant themes rather than irrelevant details.
* Initiating and sustaining activities.
* Holding information in working memory.
* Shifting strategies flexibly.
* Inhibiting competing actions.
* Self-monitoring, self-checking, and self-regulating behavior.

Children with ADHD can exhibit weaknesses in many of these processes. Russell Barkley, Ph.D. and Thomas Brown, Ph.D., two internationally renowned experts on ADHD, suggest that EF is an “umbrella term,” as suggested by one writer, that incorporates a collection of interrelated processes responsible for goal-directed and purposeful behavior (Meltzer, 2007, p. 79). Barkley and Brown propose that in affected children, those self-monitoring and self-regulating tasks important for educational and social adjustment are often delayed or impaired because of neurodevelopmental delays in EF. Educational and positive peer relationships both depend to a large degree on proper functioning of EF. Even though the authors recognize the very important role EF plays in affected children’s school performance and social experience, we also recognize that many other factors can have impact on children’s motivation and focusing. There is little debate that EF plays an important role in affected children’s learning and behavior; however, we suggest that important is not exclusive, and we encourage parents and teachers to be open to other factors that may be impacting on a child’s educational performance. As we emphasize throughout this book, academic and behavioral interventions need to be tailored to each child, and a cookbook approach to behavioral and academic interventions often falls short in meeting an affected child’s need. (Lougy, DeRuvo, Rosenthal, 2009)We will be referencing EF when appropriate throughout the book and the reader is encouraged to go to our reference section on books and articles related to EF if they would want more information on this neuropsychological process.  |

The child's pattern of talking more than other children, whether to self or others, and making more vocal noises than others, may be taken as evidence of poor behavioral inhibition. The child is slower to initiate inhibiting behaviors when asked by a parent or teacher and shows variance in compliance. Especially problematic at school is their tendency to not use the extra time when forced to wait to check their work and improve their classroom performance. This can sometimes be the result of poor interference control, that is, difficulty inhibiting responses to interferences while engaged in a task (Barkley 1997).

Distracted by both External and Internal Distractions:

Difficulty with inhibiting behavior underlies internal and external distractibility. Affected children often have great difficulty resisting both internal and external distractions. Distracters will not interfere with all tasks but are likely to do so when the task requires self-regulation (executive function). Classroom noises can be distracting, and unlike an unaffected child who can ignore such distractions, or quickly return to his work if distracted, the child with ADHD is always in turmoil, unable to inhibit reacting to normal activities around him. They seem especially distracted when mental discipline and self-restraint are needed, such as is required in school.

At home, they may head to their room to put their shoes away, and on the way is distracted by a toy in the bathroom. They may never reach their room, or they will need repeated reminders to stop what they are doing and put their shoes away. Sometimes, this distractibility has been compared to a faucet that keeps dripping, and as much as they want to stop being distracted, they can't.

Not only are they distracted by outside noises and activities, but they can also easily be distracted by internal distractions. They may be described as daydreamers, needing constant reminders to get back to work or "listen to me." Their mind and body seem disconnected from events and people around them. They seem controlled by the moment, a prisoner of their own internal distractions. Their mind dances with thoughts about what they have done or want to do, and they are unable to stay focused for any length of time, jumping from one thought or action to another. As one woman with ADHD says, "You don't mean to do the things you do, and you don't do the things you mean to do" (Hallowell and Ratey, 1994). Well said! The ADHD mantra could be, jokingly, “Do it, do it, do it!”

The child's difficulty with behavioral inhibition seems, in the word of one expert, the "hallmark symptom of ADHD," and all three core symptoms associated with ADHD can be reduced to a delay in the ability to inhibit behavior (Barkley 1995).

**Rule-Governed Behavior**

Psychologists refer to rule-governed behavior as the ability to control future behavior. When people set goals and then do things to reach those goals, they are using rule- governed behavior. Rule-governed behavior appears to help the individual sustain behavior over a long period of time and provides a process for constructing novel and more organized responses that help the individual reach future goals. Affected children have great difficulty with this task. Some writers suggest that rule-governed behavior gives rise to moral reasoning and moral regulation of behavior.

This class of human behavior is initiated and sustained by rules and language. Individuals, who have normal rule-governed behavior, are able to learn verbally through instructions, directives, and descriptions to modify their behavior responses in accordance with these instructions. ADHD children often have difficulty adhering to rules generated for them by the social community, such as parents and teachers. This deficit may result from a failure to comprehend the directives due to inattention with an initial compliance, and not always a failure to follow through due to distractibility and impulsivity.

Privatization of Language:

Privatization of language, Barkley (1997) suggests, has an important role to play not only in moral regulation, but also in motor behavior and development. These children seem to have difficulty developing internalized speech (self-talk) that assists them in following rules, instructions, and commands. Private speech provides a means for self-questioning through language, creating an important source of problem solving, as well as a way of generating rules and plans for action. They seem not to have an “internal voice”, as Thomas Brown (1995) writes, that whispers to them: “pay attention to your mother when she is talking to you” or “don’t play with the Play Station until you finish cleaning your room.” Teachers and parents find themselves pleading with their child or student to “pay attention” or “don’t forget your homework”, but often to no avail.

Internalized Speech:

The development of internalized speech provides an important control over behavior by shifting an individual's response from the immediate external environment towards more internal sources of control. Internalized speech helps a child develop the capacity to comply with instructions that require delayed performance. He should be able to follow instructions or complete tasks without the need for immediate or frequent reinforcement. This difficulty with self-talk, along with other executive functions, affects the child’s ability to comply with verbal instructions. So, internalized speech serves two functions, which seem to be problematic in this population: problem solving and control of motor responses (Barkley 1997).

Doesn’t Develop A Sense of the Future:

Because of his difficulty with delaying actions, an affected child doesn't seem to develop a sense of the future and how present behaviors can affect it. One frustrated parent said, "No matter how often I've told him, he still can't stay out of his sister's closet." Because he has difficulty inhibiting or delaying his responses, he is less adept than other children in using rules or instructions to control him, so he makes the same mistake over and over again. Russell Barkley notes that ADHD is in some ways a disorder of performance, and not acquired knowledge. *The child generally knows what to do; he just has difficulty doing it*.

Unaffected children, as they grow and mature, are not as controlled by immediate thoughts or feelings and are better able to reach future goals. They develop a sense of self- control, and outside events or internal distractions are not perceived as always controlling what they can accomplish. Their actions and plans can change what happens to them.

In a child with ADHD, this lack of self-control can lead to feelings of victimization, and he can develop a mindset that the world is unfair, and people are out to get him. An important goal when counseling is to help change this perception of victimization. One step in helping to change this perception is to teach the child winning ways to reach goals. The result, when successful, is that they can begin to feel that they can change things that happen to them.

**Inconsistent Performance**

This child is a puzzle to teachers and parents because he or she can be productive one moment, and the next moment or day gets nothing accomplished. There is a pattern of inconsistent performance both at home and in school. A parent or teacher may say, "If he did it one time, why can't he do it all the time?" Such admonitions cause pain and suffering to children with ADHD. This expectation, generally voiced in frustration, would be hard for any child or adult to live up to. No one does it well all the time!

*The problem is not that this child cannot be productive; it's that the affected child cannot maintain that level of productivity the way other children do.* Consistency in work habits requires the ability to not be driven by momentary thoughts or distractions-an ability that affected children often struggle with around chores or school assignments.

They are often described by teachers as being distracted, not turning in homework, and not using class time productively. Barkley (1998) writes that self-control, or the ability to inhibit or delay one's actions, is critical for completing any task. As children grow up, they gain the ability to engage in mental activities that help them "deflect distractions, recall goals and take the steps needed to reach them." To complete a task or goal, a person needs to remember the goal, keep his emotions under control, remind himself what he needs to do to reach that goal, and maintain a level of self-motivation to reach it. The affected child has great difficulty with these functions. It is not a matter of willpower, but a matter of the brain “thinking poorly”, as one child shared, where normal levels of self-control and willpower are nearly impossible.

Again, inconsistent performance is the hallmark of ADHD behavior. This may be explained in large part by developmental difficulties with inhibiting behavior; however, that's not to say that your child is not like millions of other children his age. All children will avoid doing things they don't like to do at times.

**Motivational Deficit**

Some writers suggest that part of the child's profile is a motivational deficit. Neuropsychological understanding helps explain in part this pattern of low motivation for routine activities and task completion -the child has difficulty with *goal-directed persistence*. Some theorists suggest that motivation, when coupled with other neuropsychological processes, helps an individual reach intended goals. Barkley offers that the proper functioning of these neuropsychological processes (executive functions) leads to "goal-directed persistence, characterized by willpower, self-discipline, determination, [and] single-mindedness of purpose. . ." (Barkley 1997).

Persistence of Effort:

There is strong documentation that these children have difficulties with self-regulation of motivation, particularly with *persistence of effort*. They seem to have more problems with tasks requiring repetitive responses that involve little or no reinforcement, e.g., arithmetic tasks where persistency of performance is important for success. Their poor motivation and self-regulation can help explain some research that shows their insensitivity to reinforcement. Unaffected children's behavior is superior to that of affected children when there are few or no rewards because unaffected children may be able to keep their goal in mind by talking to themselves (Barkley 1997).

Neurological Contributors to Low Motivation:

This suggested motivational deficit found in the ADHD population can also be explained in part by briefly reviewing studies done on the brain. By using a kind of brain scan known as positron emission tomography (PET), studies completed on the ADHD population have found blood-flow patterns of under activity in a part of the brain called the prefrontal lobes. Blood-flow patterns are measured by monitoring the rate of activity in certain parts of the brain when called upon to function. When parts of the brain are stimulated, the cells involved show an increased rate of metabolism. Research has found that the brain's prefrontal lobes are involved not only in functions related to paying attention and planning and execution of thoughtful behavior, but also in motivation. In the ADHD population, there may be under activity in the prefrontal lobes, affecting motivation (Comings 1990).

Low Motivation with Routine Activities:

A person with ADHD seems to have difficulty maintaining his interest in projects or activities for any length of time. He can be highly motivated with high-interest activities, but lose interest quickly with routine tasks. The result is that many projects or chores are started, but most are only partially or never completed. He gets bored quickly with routine activities and moves on to something else that attracts his attention. It's very difficult to keep him motivated.

W – W Theory:

This pattern of low motivation is why interventions to help modify behavior with children with ADHD need to be changed frequently. We suggest that parents hang the following saying on the refrigerator and review it often: *“Use whatever works, but it won't work for long”.* We refer to this as the W-W Theory. Use whatever works does not mean child abuse, but acceptable forms of discipline and reinforcement that help minimize problematic ADHD behaviors in the child. But it won't work for long means the parent will need to change forms of behavior reinforcement regularly. You may have great success with a new behavioral intervention, but in a couple of weeks, oops, it's not working anymore-"Bobby's bored with it!" That's right, Bobby will get bored more quickly than other children his age, and you will need to find something new to motivate him.

Motivation Is Not the only Contributor to Success:

The degree to which this suggested motivation deficit contributes to low motivation in getting good grades or completing home projects is probably not measurable. We all know that most children dislike doing homework, mowing the lawn, or cleaning up the room. Motivation is an important factor, but it is not the only factor that goes into decision-making and task completion; however, it should not be dismissed, even if it is difficult to measure or prove. The reader is referred to chapter 6, in "He Doesn't Seem Motivated to Get Good Grades," for further discussion.

To boost motivation, you must use methods that ensure success in maintaining productivity, such as breaking tasks into shorter periods of time, followed by immediate rewards for sticking to the task. Remember, in high-interest activities, these children seem to be as productive as other, so interventions need to address the more-routine tasks.

**Review and Tips**

• ADHD is a biochemical and neurodevelopmental disorder that can present itself differently in different children and at different ages. Some children seem to be significantly affected by their disorder, while others present mild to moderate symptoms.

• ADHD is a biologically based disorder affecting the central nervous system. Nerve cells, because of genetic differences, seem to function differently in affected children than other children.

• Environment does not cause ADHD, but it can exacerbate or minimize problems. Accommodations in the home and school can make a big difference.

• Educate your child about this disorder, and share information that is appropriate for his or her age. They need to understand that they are not stupid. They have a biochemically based disorder that can affect their day-to-day interactions with others. They can learn ways to find greater success in school and work with your support and guidance.

• Be a supporter and not an enabler of your child. Understand and separate ADHD behaviors from normal developmental patterns. Society does not tolerate aggressive behavior towards others or behavior that interferes with the education of other children.

The solution is not to make excuses but to communicate with schools and caretakers ways to work successfully with your child.

**Summary**

ADHD is a disorder that most experts feel is primarily caused by a genetic abnormality that affects the central nervous system. Weak will, a "bad seed," or poor parenting does not cause ADHD. Good parenting and a stable and secure environment in which to grow is good for all children. The disorder that can present itself differently in children and it also can present itself differently at different ages. Behaviors that may be of concern for an eight-year-old child will not necessarily be of equal concern for that same child at 15. Environment, even though not the cause of ADHD, can be a factor in minimizing or maximizing some problem behaviors. Appropriate educational and home interventions can help stabilize a sometimes volatile child. Intermittent counseling by a knowledgeable person can help with appropriate parenting, as well as facilitate educational accommodations for the child. Proper treatment of a child requires close communication between the family, school, and doctor.

We encourage you to refer to this chapter from time to time because it's the flagship of the book, an important chapter that will provide the reader more reassurance, meaning, and understanding to the interventions and recommendations suggested in this book.