

## Chapter 2

# Lessons from the Literature

*...if we have memorized a maxim and observed it, we may begin to be modified by the natural consequences.*

B. F. Skinner, from *About Behaviorism* (1974)

In this chapter, we review the current conceptualization of behavior problems in childhood and adolescence. Specifically, we will examine a class of disorders that was previously referred to as the “disruptive behavior disorders” (DBDs) in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association [APA] 2000). The DBDs were comprised of three constituent disorders: attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), and conduct disorder (CD). The definitions of these disorders have changed somewhat in the DSM-5 (APA 2013), and ADHD is now categorized as a neurodevelopmental disorder, while ODD and CD are classified in a separate section addressing “disruptive, impulse control, and CDs.” These diagnostic criteria will continue to change over time, so we will consider the DSM as well as the epidemiological, psychosocial, and academic facets of childhood behavior disorders discussed in the research literature. Much of this research has focused on ADHD, and it is important for practitioners who work with at-risk adolescents to understand this research and its implications for treatment. Perhaps most importantly, there appears to be a common developmental trajectory that begins with ADHD symptoms in early childhood and leads to comorbid ODD or CD in later childhood or adolescence. We explore this issue and then turn our attention to the research on treatments for these disorders, including the landmark Multimodal Treatment Study of Children with ADHD. We then conclude this chapter with an overview of the research we and our colleagues have conducted on the Challenging Horizons Program (CHP).

## Attention Deficit Hyperactivity Disorder

ADHD is one of the most researched childhood-onset psychiatric disorders, with more than 6000 peer-reviewed articles published to date (Barkley 2006). The cardinal symptoms of ADHD are marked and persistent impairment in attention or regulating one's activity level (i.e., hyperactivity and impulsivity), as compared to other individuals of the same developmental level. To be diagnosed with ADHD, individuals must exhibit clinical levels of inattention or hyperactivity-impulsivity beginning prior to age 12 and lasting for longer than 6 months, with several symptoms spanning two or more settings (e.g., home and school), leading to impairment in social, familial, vocational, or academic functioning (APA 2013).

To illustrate how ADHD affects children and adolescents, consider a hypothetical high school. According to the US Department of Education (2010), the average high school has 752 students, which we will round up to 1000 for simplicity,<sup>1</sup> and then divide by the four grades resulting in hypothetical class cohorts of 250. So imagine an incoming class of high school freshmen at the start of the school year. Because ADHD is thought to affect 3–7% of all school-aged children (APA 2013),<sup>2</sup> we would predict that up to 18 students in our freshman class would exhibit behaviors and impairments consistent with, and attributable to, ADHD. We would also predict that within this group, there would be 12 boys and 6 girls, based on the lowest sex ratio estimated by the DSM-5 (2:1; APA 2013).<sup>3</sup>

In truth, these estimates are difficult to ascertain in practice because there would be many students who would exhibit ADHD-like behaviors but *not* have the disorder. For example, depressed students would appear distractible, inattentive, and perhaps fidgety, but if their symptoms are better explained by a mood disorder, then the diagnosis of ADHD would be inappropriate. The same might be true for some children with anxiety disorders, as anxiety is often a better explanation for inattention or overactivity than ADHD. Similarly, some children with intellectual disabilities can exhibit attention-related difficulties,<sup>4</sup> or in other instances, head injuries or central nervous system damage can mimic ADHD. At the other end of the intellectual spectrum, gifted children can be misdiagnosed with ADHD due to academic boredom (e.g., daydreaming and off-task behavior), or alternatively, gifted

<sup>1</sup> High schools consisting of about 1000 students are the norm in states such as CA, NY, RI, NC, and SC.

<sup>2</sup> Prevalence rates of ADHD vary considerably across studies and locations within the USA, with most researchers noting an increase in diagnoses over time. For ease, we use the DSM estimates in our example.

<sup>3</sup> There is some suggestion that, beginning with the DSM-IV, the diagnostic criteria led to identification of more girls than the previous DSM-III-R criteria (e.g., Lahey et al. 1994), so we are assuming the lowest estimated sex ratio here in our example.

<sup>4</sup> Although the DSM allows for children with intellectual disabilities to be diagnosed with ADHD, the attention problems or overactivity must be deemed excessive given the child's mental age. Some research suggests that a lower IQ threshold should be established to *exclude* behaviors attributable to severe forms of intellectual deficits (Barkley 2006), but the DSM-5 allows dual diagnosis in instances where inattention or hyperactivity-impulsivity is excessive.

children with ADHD may not be diagnosed because adults cherish their intellectual strengths and willfully overlook disorganization or overactivity (Webb et al. 2005). Given the similarities among these conditions, the diagnosis of ADHD requires careful screening of similar psychiatric conditions to determine whether there are comorbidities or potentially better explanations for the symptoms. Still, even with a careful diagnosis that rules out all unrelated disorders, we would expect roughly 18 “true” cases of ADHD within our hypothetical freshman class of 250 students.

### ***Presentation Specifiers***

Now imagine that the school counselor at our hypothetical high school would like to work with the freshmen with ADHD, and she is able to identify, consent, and schedule counseling sessions for the entire group. Would it be reasonable to expect that the 18 freshmen would present with similar concerns? Despite their shared diagnosis, we would expect great variation within the group because ADHD manifests in myriad ways. Some of the group members would be well known among the school administrators due to frequent discipline referrals, and others would rarely (if ever) come to the administrators’ attention. Some would seem gregarious, outgoing, or even overbearing, while others would seem quiet, reserved, and withdrawn. In short, the 18 freshmen would appear an unlikely grouping, and this is partly because the current conceptualization of ADHD posits three presentation specifiers (formerly referred to as “subtypes”): predominately inattentive (ADHD-PI), predominately hyperactive-impulsive (ADHD-HI), or combined subtype (ADHD-C).<sup>5</sup> In other words, some children in our group will mostly have problems of inattention, others will mostly have problems of hyperactivity and impulsivity, and still others will have both problems. Of course, when all potential comorbidities and contextual factors are taken into account, there are as many manifestations of ADHD as there are cases, so any subtyping scheme is insufficient to describe the extreme heterogeneity of this population; but as we will see, the specifier distinctions offers a useful starting point for understanding the various risks associated with this disorder.

For two decades, studies have supported a distinction between symptoms of inattention and hyperactivity-impulsivity. For example, mothers’ ratings of the two factors were consistently distinct from early childhood through adolescence (Burns et al. 2001). Similar distinctions have been made among teacher ratings (DuPaul et al. 1997; Evans et al. 2013), in both European and American samples, and across rural and urban settings (Wolraich et al. 2003). These findings suggest that inattention is related to, but meaningfully different from, problems of hyperactivity and impulsivity. On the contrary, hyperactivity and impulsivity are rated in very similar ways, such that children and adolescents who are hyperactive are almost always

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<sup>5</sup> In the DSM-III-R, ADHD was described as a unitary disorder without subtypes. However, this conceptualization did not seem to comport with the research or prevailing clinical wisdom that recognized the diversity of concerns among children with ADHD.

impulsive, and vice versa.<sup>6</sup> Distinctions between inattention and hyperactivity-impulsivity are furthered by research that shows that these symptom clusters lead to different impairments, and this is where the research has meaningful implication for intervention. Specifically, inattention appears to be associated with academic impairment, whereas hyperactivity-impulsivity is related to global impairments that include both academic and social problems (Lahey et al. 1994).

Other research on ADHD suggests a third subset of symptoms that closely mimic inattention, including increased daydreaming, mental torpidity, tendency toward confusion, and physical hypoactivity. Collectively, these symptoms have been termed “Sluggish Cognitive Tempo” (SCT; Barkley 2006). Field trials for the DSM-IV found that although SCT symptoms were correlated with the PI subtype, most children with ADHD did not experience these symptoms. Hence, SCT criteria have not been included as diagnostic criteria in the DSM (Hartman et al. 2004), but it is clear that a minority of cases fit this general description and may have unique implications that are still unclear.

## *Gender Differences*

As mentioned at the beginning of this chapter, ADHD is disproportionately diagnosed among boys (APA 2000), which might reflect true biological differences in the population, referral biases, or some combination of the two. A meta-analysis of gender differences found that, in general, girls are less likely to exhibit hyperactivity, conduct problems, or externalizing behavior problems than boys; however, among clinic-referred samples, girls exhibit unusually high levels of intellectual impairments and inattention (Gaub and Carlson 1997). In other words, girls referred to clinics tend to be the most severe cases, and studying only clinic-based cases may provide a skewed picture of girls with ADHD in the community. This phenomenon has been referred to as the “paradoxical gender effect” (Waschbusch 2002, p. 120). In community samples, it is clear that boys exhibit more HI symptoms (Gaub and Carlson 1997) and inattention combined with hyperactivity-impulsivity when compared to girls (Hartung et al. 2002). Not surprisingly, adult raters generally perceive overactivity as more disruptive than inattention alone (Sciutto et al. 2004), which may explain some of the differential referral rates between boys and girls. Boys with HI symptoms have a more difficult time “flying under the radar” than do inattentive girls.

Even though symptom expression appears to vary between boys and girls, partly explaining differential referral rates, boys are more often referred for assessment and treatment *regardless* of symptoms. This is commonly referred to as a referral bias. Sciutto and colleagues (2004) found that when teachers were asked to rate fictional scenarios of children, teachers were more likely to refer boys than girls

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<sup>6</sup> Impulsive symptoms appear to load on a separate factor in some samples (Amador-Campos et al. 2006), but the conditions that produce a three-factor solution are unclear. Other research suggests that impulsivity may uniquely predict some long-term outcomes, such as conduct problems and antisocial behavior (White et al. 1994), but this possibility is also unclear.

despite identical symptom descriptions. Specifically, teachers—men and women alike—were 1.5 times more likely to refer a hyperactive boy than a hyperactive girl. The referral bias further helps to explain the higher number of referrals for boys as compared to girls. It may also suggest that many girls with the disorder are undiagnosed and untreated (Waschbusch and King 2006).

### ***Functional Impairment***

In our hypothetical freshmen cohort of 250, there would likely be some adolescents with ADHD-consistent behaviors who do not experience academic or social problems. In these instances, a mental health diagnosis of any kind would be inappropriate because of the lack of harmful or unwanted consequences. So if inattentive and HI symptoms do not result in significant impairment, a diagnosis of ADHD is unwarranted. According to parent and teacher reports, the impairments most commonly associated with ADHD include social difficulties, academic underachievement, and disrupted relationships with adults (Kent et al. 2011). Interestingly, these impairments appear to predict long-term outcomes better than ADHD symptoms alone (Pelham et al. 2005); so in our view, counselors and other interventionists are wise to focus their efforts on impairment, and not necessarily the symptoms that define the disorder. Educators generally adhere to the same standards when determining eligibility for special education, focusing on whether functional impairments caused by the disorder (e.g., academic underachievement) require targeted intervention.

**Social Difficulties** Over time, the professional literature has increasingly recognized social problems as a serious issue for many children with ADHD (Landau and Moore 1991), especially among children with HI symptoms (Gadow et al. 2004; Lahey et al. 1994) or aggression (Bagwell et al. 2001; Hinshaw et al. 1997). Children who mainly experience attention problems can also exhibit social impairments, but are more likely than HI children to be withdrawn or shy (Hodgens et al. 2000). Interestingly, significant social problems can occur even in the absence of comorbid disorders. For example, ADHD appears to uniquely contribute to peer rejection even in the absence of more serious delinquent or antisocial behaviors (Bagwell et al. 2001).

Children with ADHD exhibit communication problems, including dysfluent (e.g., shifting and non sequitur) conversation patterns. When our hypothetical school counselor interviews the group of 18 freshmen with ADHD, she will find that many will have difficulties staying on topic, and their conversations will jump from one topic to the next. Children with ADHD are also likely to have deficient social problem-solving skills, and are more likely than their undiagnosed peers to anticipate desirable consequences for aggressive behavior (King & Waschbusch 2010). So, in interviews with a counselor, adolescents with ADHD may describe recent problems with peers, but show difficulties in generating realistic solutions

for those problems. Moreover, their solutions are likely to be more aggressive or vindictive than those generated by same-age peers without the disorder.

Unlike children with developmental disorders and autism spectrum disorder where social learning is impeded, children and adolescents with ADHD largely understand social expectations, but are unable to perform them effectively at appropriate times. As a result, the social problems associated with ADHD are inconsistent because performance is adversely impacted by situation-specific behavioral excesses (Wheeler and Carlson 1994). We might find, for example, that a boy in our hypothetical group can calmly tell a counselor several appropriate ways to establish new friendships, but when this same young adolescent is observed in social situations, he appears excitable, sidetracked, and unable to implement the skills he previously described. Thus, the relevant literature draws a distinction between social skill deficits and social *performance* deficits, with ADHD associated mostly with the latter. In social interactions, performance deficits commonly lead to two primary negative outcomes: First, children with ADHD are often actively rejected by their peers, and this can be observed in settings where unfamiliar children are allowed to create their own impressions of one another. Social rejection can occur quickly, even within the first day that children meet one another (Erhardt and Hinshaw 1994). In fact, when children without ADHD are told that they will soon meet a peer who exhibits ADHD-consistent behavior (e.g., talkativeness and disruptiveness), the quality of subsequent social interactions is negatively impacted. Such expectations result in less reciprocal play and more disagreements (Harris et al. 1990). Unfortunately, when reputation biases are formed they appear highly persistent, even when intense efforts are made to remediate ADHD symptoms through behavioral or pharmacological interventions (Hoza et al. 2005). In fact, reputation biases can worsen with time, especially when children stay with the same class of peers through elementary and secondary school.

Second, many children with ADHD (especially boys) appear to have unrealistically positive self-appraisals of their social skills as compared to the appraisals of their peers (Diener and Milich 1997; Ohan and Johnson 2002; Owens et al. 2007) and teachers (Hoza et al. 2005)—a phenomenon that has been referred to as the *positive illusory bias* (PIB). Overly generous self-appraisals may serve to protect self-esteem, but often complicate intervention efforts. For example, when children with ADHD are given positive feedback on their social interactions, the result can be a counterintuitive increase in the child's self-criticism. So it is not unusual to find that attempts to encourage a child with positive feedback can unexpectedly undermine his confidence. One interpretation of these findings is that children with ADHD are motivated mostly to avoid appearing socially incompetent, and when this concern is assuaged by positive feedback, the self-protective PIB is removed (Hoza et al. 2005; Diener and Milich 1997). More research on the PIB is clearly needed, but it is interesting to note that clinicians working with adults have documented a similar phenomenon: After entering counseling, many adults with ADHD report positive treatment outcomes relative to symptoms and impairments, but curiously report lower self-esteem, perhaps as a result of coming to grips with limitations that were previously downplayed (Wiggins et al. 1999).

Taken together, these findings suggest that within our hypothetical group of 18 freshmen with ADHD, we can reasonably anticipate that many of the students would have a long history of social difficulties. Although it is difficult to predict the proportion of our group for whom this would be true, we can anticipate that social problems would be most likely for those with HI symptoms. We can also anticipate that the students themselves would have an overly positive assessment of their own social performance, even though peer relationships may have been clearly strained.

**Academic Underachievement** Children with ADHD are also likely to exhibit academic underachievement, which in some cases can include learning disabilities (LD).<sup>7</sup> Methods of defining LD vary widely and, as a result, varying rates of comorbid LD are found in the ADHD literature (Barkley 2006). Higher rates of comorbid LD are often found among school samples as compared to community or clinic samples for the simple reason that LD are most commonly diagnosed by school professionals (Staller 2006) who are likely to directly observe the poor study habits, disruptive classroom behavior, low test grades, and the troubled relationships with teachers (Robin 1998). Hence, studies conducted in differing settings are inconsistent on the question of comorbidity. Using a conservative definition of LD, Barkley (1990) found that 19% of children with ADHD had comorbid reading disabilities, 24% had comorbid spelling disabilities, and more than 26% had comorbid math disabilities.<sup>8</sup> Based on such research, it appears that LD occurs much more frequently among children with ADHD than it does in the general population. So, in our hypothetical group of 18 adolescents, we could expect that roughly three to five will have a comorbid learning disability, based on Barkley's conservative definition, but this would not mean that the remaining 13–15 students would be academically successful. Rather, students with ADHD are likely to lag behind in their classwork, even when LD is not diagnosed (Kent et al. 2011). As such, academic impairment would still be a common concern for most of our hypothetical group, even if it did not warrant a separate diagnosis or special services.

In elementary schools, the academic problems stemming from ADHD often manifest as failure to complete assignments and less overall productivity relative to peers; but in secondary schools, ADHD is associated with lower grades, special service use, and higher rates of grade retention and drop-out as compared to undiagnosed peers (Anastopoulos and Shelton 2001). Obviously, the demands for student independence in secondary school are much greater than elementary school, particularly in regards to organization and assignment tracking. Adolescents with

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<sup>7</sup> The temporal relationship between ADHD and specific LDs depends partly on how the latter condition is defined. If, for example, a traditional definition of LD is used (i.e., significant discrepancy between cognitive abilities (IQ) and measured academic achievement), ADHD can seemingly precede or even lead to LD because poor classroom performance over time can lead to cumulative deficits in academic performance that eventually reach the threshold for "significant discrepancy."

<sup>8</sup> In this study, LD was defined by a statistically significant discrepancy between IQ and achievement, as well as an academic lag 1.5 standard deviations below the norm-referenced mean. Modern definitions of LD have abandoned such discrepancy-based models, but many school districts still use them.



ADHD often struggle with these expectations and are likely to overestimate their academic performance in a manner that mirrors the PIB in social interactions. As a result, it is not unusual for secondary school students with ADHD to avoid special academic help (e.g., tutoring) when grade performance is well below parent and teacher expectations, or even below the child's own stated academic goals.

Research on the achievement goals of students with ADHD helps to clarify this troubling contradiction. For example, research suggests that children with ADHD tend to prioritize *performance-avoidance* goals over *performance-approach* goals, whereas children without the disorder tend to exhibit the opposite goal structure. In other words, children with ADHD are generally motivated to avoid appearing incompetent, whereas children without ADHD appear motivated to outperform their peers. Not surprisingly an orientation toward performance-avoidance goals is associated with ineffective learning strategies and an intolerance for academic challenge (Barron et al. 2006; Olivier and Steenkamp 2004).

So in our hypothetical group of freshmen, many would exhibit the performance-avoidance goal structure, such that successes seem unrewarding and failures are avoided or covered up with face-saving strategies. For example, an adolescent with ADHD who receives a good grade on a quiz might seem unaffected; attributing his success to luck or a temporary lapse in the teacher's demanding teaching style. Any student who views success in this way is unlikely to find the experience rewarding, thus missing the connection between the accomplishment and the behaviors that led to that accomplishment. Conversely, when placed in a potentially aversive situation such as playing a new sport, the same adolescent might mock or shun the activity. It is not unusual to see adolescents with ADHD "goof off" or easily give up in situations where failure or frustration is anticipated. For instance, an adolescent might passively participate in a basketball game, loosely following the action by walking the court, but avoid the ball or immediately pass the ball off whenever it comes into his possession. Children and adolescents with ADHD use such tactics to avoid the embarrassment of conspicuous incompetence by appearing disinterested, derisive, or oppositional. Similar self-protective behaviors can arise in any demanding activity with a perceived audience. Of course, adolescents of all stripes use these strategies at times, but the underlying goal structure that perpetuates these strategies appears to be unusually common among adolescents with ADHD.

**Strained Relationships with Adults** Children with ADHD often experience strained relationships with adults to a degree much greater than their peers. Of particular concern is the relationship between children and their parents or guardians, even at very early ages. For example, Stormshak and colleagues (2000) found that among a sample of 631 high-risk Kindergartners, hyperactivity was associated with elevated levels of punitive discipline by parents, which was defined as threatening with punishments, yelling, feeling angry when disciplining, and spanking or hitting the child. In general, it appears that parents of children with ADHD are more likely to resort to aggressive parenting tactics than parents of typically developing children (e.g., Edwards et al. 2001). Parents of children with ADHD often fail to reinforce appropriate behavior and instead focus on punishing unwanted behavior.



As a result, some children appear to exhibit behavior problems simply to gain adult attention. For some families, the preoccupation with inappropriate behavior leads to a pattern of harsh punishment that increases in severity over time. Among adolescents, ADHD is associated with more severe parent-adolescent conflict, especially in the case of oppositional behaviors. Thus, it is not surprising that parental measures of family cohesion and family interaction have been shown to negatively correlate with symptoms of ADHD, suggesting that as symptom severity increases, the quality of family functioning declines (Klassen et al. 2004).

ADHD is also associated with strained relationships with teachers. Teacher–student relationship difficulties may be partly attributable to a general lack of teacher understanding of ADHD that has been noted among preservice and early career teachers (Kos et al. 2004). Teachers report that students with ADHD create stress in the classroom, especially when there are social impairments and oppositional or aggressive behavior. Classroom observations confirm that students with ADHD command significantly more time from their teachers than their peers, and much of this time is spent in negative interaction (Greene et al. 2002). The inference is that students who demand lots of attention and have difficult interactions with teachers are likely to be perceived negatively, thus damaging the student–teacher relationship. However, this impact may not be limited to the student–teacher dyad, as it appears that such frustration can generalize to other students in the classroom, so that other classmates experience negative interactions with the teacher as well (Stormont 2001).

At the secondary school level, teacher relationships with students are further complicated by setting demands. Unlike elementary schools, where students generally interact with the same teacher throughout the entire day, student–teacher relationships in secondary schools are confined to the discrete and disconnected classroom arrangements typical in these settings. Rather than forming strong connections with one or two teachers, many secondary students—with or without ADHD—feel disconnected from their teachers (Gewertz 2004); but the lack of student–teacher connectedness is potentially more impactful for students with ADHD. We have found, for example, that teacher ratings of their relationships with ADHD students vary widely over time and between teachers (Evans et al. 2005), suggesting that teachers have differing capacities for building relationships with at-risk students.

So among our hypothetical sample of 18 freshmen, we would anticipate strained relationships with parents and teachers. We find that it is often difficult to identify teachers who have positive impressions of students with ADHD, even when they are unaware of the diagnosis. The inconsistency of ADHD stemming from performance deficits (as opposed to skill deficits) serve to frustrate attempts to informally intervene. When teachers try to help a student with poor study skills, for example, the effort often seems wasted because the student soon returns to their previous performance levels. Similarly, we find that many parents have a hands-off approach to school-related issues by the time their children reach secondary school, attributable to a long and seemingly unproductive history of trying to help. The “*three-steps-forward-and-two-steps-back*” phenomenon that marks chronic behavior problems

can lead both parents and teachers to believe that they have “tried everything” only to find that nothing seems to work.

### ***Causes of Attention Deficit Hyperactivity Disorder***

We will leave our hypothetical sample of high school freshmen for a moment to discuss potential causes of the disorder. Although no definitive cause of ADHD has been found, current research has given rise to neurobiological explanations of the disorder. Neurobiological explanations of the disorder assume an internal, within-child cause of the behavioral symptoms and impairments of ADHD. At face value, this research would seem to suggest that psychosocial interventions—like those commonly used in counseling—would have limited effectiveness; however, environmental events change the individual’s neurobiology. Therefore, it is wrong to assume that disorders with a biological basis are always best treated with medical interventions. Changes in the environment can have similar impacts.

**Cognitive Deficits** Theories of ADHD help to explain the associated deficits and impairments, and provide testable hypotheses regarding the nature and psychological mechanisms of the disorder. To date, there is no single, definitive theory of ADHD. Rather, several competing theories are found in the literature, and these theories have stimulated various avenues of research. Of all current theories of within-child causes, the most influential appear to involve two psychological phenomena: (1) dysregulation in the behavioral inhibition system (BIS); and (2) deficits in executive functioning. Of course, there are overlaps and inconsistencies in these theories, but the associated research has advanced enough to inform counseling strategies.

The BIS is a mental process posited to limit and control behavioral responses to environmental cues. Such processes are, in theory, a necessary prerequisite for self-control, as inhibition provides time for an individual to carefully consider situations, behavioral options, and the anticipated future consequences related to those options. There are several components to this system, which Barkley (2006) describes as the inhibition of prepotent (i.e., immediately reinforcing) responses, the ability to discontinue behavioral responses based on environmental feedback, and the ability to screen out interfering or distracting stimuli. For children and adolescents with ADHD, the BIS seems to be underdeveloped, particularly the ability to inhibit prepotent responses (Nigg 2006), and this hypothesized deficit seems to explain why children and adolescents with ADHD often have difficulties delaying gratification, or to forego short-term rewards for long-term gains. An immediate small reward is far more salient for children with ADHD than delayed large rewards, and theoretically this is because children with ADHD are less able than normally developing peers to inhibit their natural drive for immediate reward. Research examining risk-taking and gambling behaviors seems to confirm this hypothesis: Children with ADHD tend to make riskier and more impulsive decisions than their normal peers in pursuit of immediate, short-term gains (e.g., Garon et al. 2006).

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