

# School-Based Interventions for Students With Attention Deficit Hyperactivity Disorder: Current Status and Future Directions

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*Abstract.* Attention deficit hyperactivity disorder is a relatively common childhood behavior disorder that typically is treated with psychotropic medication (e.g., methylphenidate), behavioral strategies, or their combination. This article provides an overview of the school-related difficulties associated with attention deficit hyperactivity disorder. School-based intervention strategies including behavioral interventions, modifications to academic instruction, and home–school communication programs are described briefly. Several important gaps in the school-based intervention literature are identified with particular attention to the need for feasible, effective strategies that can be used in general education settings with a variety of age groups. An overview of the purpose and content of the special series is provided.

Attention deficit hyperactivity disorder (ADHD) is a childhood behavior disorder characterized by developmentally inappropriate levels of inattention and/or hyperactivity-impulsivity (American Psychiatric Association, 2000). To meet *Diagnostic Statistical Manual* (4th ed.—text revision; American Psychiatric Association, 2000) criteria for this disorder, individuals must exhibit at least 6 inattention or at least 6 hyperactive-impulsive symptoms before age 7, for at least 6 months, with concomitant academic and/or social impairment. There are three subtypes of ADHD including the predominantly inattentive type (i.e., exhibits significant inattention but not hyperactive-impulsive symptomatology), the

predominantly hyperactive-impulsive type (i.e., exhibits significant hyperactive-impulsive but not inattention symptomatology), and the combined type (i.e., exhibits significant inattention and hyperactive-impulsive symptomatology).

Epidemiologic studies indicate that approximately 3–10% of the school-age population in the United States exhibits clinically significant levels of ADHD symptoms (for review, see Barkley, 2006). The disorder is 3–5 times more likely to be found in boys than in girls, although the ratio is closer to 2:1 in school-based (rather than clinic-based) samples (American Psychiatric Association, 2000; Barkley, 2006). ADHD symptoms typically appear during the preschool years and can

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extend into adolescence and adulthood for the majority of affected individuals (Barkley, 2006; Weiss & Hechtman, 1993). Thus, ADHD typically is viewed as a life-long disorder that must be addressed through ongoing treatment that is developmentally appropriate and that focuses on the unique needs and specific impairment of individual children (DuPaul & Stoner, 2003).

### **School Functioning of Students With ADHD**

Students with ADHD typically exhibit a variety of difficulties with school functioning. First, children with this disorder are frequently inattentive and exhibit significantly higher rates of off-task behavior relative to their non-ADHD classmates (e.g., Abikoff et al., 2002; Vile Junod, DuPaul, Jitendra, Volpe, & Cleary, 2006). Rates of on-task behavior are particularly low when passive classroom activities (e.g., listening to teacher instruction and reading silently) are required (Vile Junod et al., 2006). In addition, hyperactive-impulsive behaviors that may comprise ADHD often lead to disruptive behaviors in the classroom and other school environments including talking without permission, leaving the assigned area, bothering other students, and interrupting teacher instruction. Further, between 45% and 84% of children with ADHD can be diagnosed with oppositional defiant disorder, wherein students may frequently disobey teacher commands and overtly defy school rules (Barkley, 2006). The combination of ADHD and disruptive behavior can interfere with learning and classroom activities for students with ADHD and their classmates.

ADHD frequently is associated with deficits in academic skills and performance. On average, children with ADHD score between 10 and 30 points lower than non-ADHD control children on norm-referenced, standardized achievement tests (e.g., Barkley, DuPaul, & McMurray, 1990; Brock & Knapp, 1996; Fischer, Barkley, Fletcher, & Smallish, 1990). Further, approximately 20–30% of students with ADHD also have a specific learning

disability in reading, math, or writing (DuPaul & Stoner, 2003; Semrud-Clikeman et al., 1992). ADHD symptoms (i.e., inattention, impulsivity, and hyperactivity) have been found to be significant predictors of concurrent and future academic difficulties (e.g., performance on achievement tests, report card grades, and teacher ratings of educational functioning). The relationship between ADHD symptoms and achievement outcomes is evident for both referred (DuPaul et al., 2004) and nonreferred (Fergusson & Horwood, 1995) samples. As a result, students with ADHD are at higher risk for grade retention, placement in special education classrooms, and dropping out from high school (e.g., Fischer et al., 1990). Fewer students with ADHD go on to postsecondary education relative to similar-achieving non-ADHD classmates (Mannuzza, Gittelman-Klein, Bessler, Malloy, & LaPadula, 1993). Thus, poor educational functioning throughout the school years is a frequent outcome for students with ADHD.

A dual pathway model to explain the relationship between ADHD symptoms and academic achievement difficulties has been examined in several studies (e.g., Fergusson & Horwood, 1995; Rapport, Scanlan, & Denny, 1999). For example, Rapport and colleagues proposed both cognitive and behavioral mediators of the effects of ADHD on achievement. The cognitive pathway is hypothesized to mediate the effects of ADHD on achievement through vigilance and memory deficits, whereas the behavioral pathway mediates the effects of ADHD on achievement via disruptive classroom behavior. Two recent studies have extended this model by examining variables that may account for the connection between ADHD and achievement problems in mathematics and reading (DuPaul et al., 2004; Volpe, et al., 2006; Jitendra et al., 2006). The results of these investigations indicated that important classroom behaviors (motivation, study skills, and academic engagement) acted as mediators of the effects of ADHD and prior achievement on current achievement. The classroom behaviors were measured by teacher ratings on the Academic Competence

Evaluation Scale (DiPerna & Elliott, 2000) and collectively referred to as “academic enablers.” Thus, the relations between ADHD and achievement are complex, implying that practitioners and researchers should not expect direct routes between one specific intervention focusing on a single target and academic outcomes.

Children and adolescents with ADHD often have significant difficulty developing and maintaining positive relationships with peers, teachers, and other school personnel (Barkley, 2006; DuPaul & Stoner, 2003). Difficulties with inattention and impulsivity inhibit the development of appropriate social relationships in several ways. First, children with ADHD may not consistently follow the implicit rules of reciprocal conversation (Stroes, Alberts, & van der Meere, 2003). A child with ADHD is likely to interrupt during conversation, not listen closely to what others are saying, and respond in an irrelevant fashion (i.e., talk about something that is not germane to the conversation topic). Second, students with ADHD may enter ongoing peer activities (e.g., games and conversations) in an abrupt, impulsive manner, thereby disrupting the activity to a significant degree (DuPaul & Stoner, 2003). Peers may choose to exclude the child with ADHD from activities as a result. Third, children with this disorder are more likely than their non-ADHD classmates to behave in a verbally or physically aggressive manner, presumably because of their problems with impulse control (Barkley, 2006). Finally, given this combination of social relationship difficulties, several studies have indicated that children with ADHD are less well liked, more often rejected, and have fewer friends than their non-ADHD peers (e.g., Hoza et al., 2005).

Although most students with ADHD are placed in general education classrooms, they are at higher than average risk to be identified for special education services (Barkley, 2006). Of those children with ADHD receiving special education services, the largest numbers are identified with specific learning disabilities (41%) and speech–language impairments

(15%; U.S. Department of Education, 2005). It is important to note, however, that students with ADHD make up a significant percentage of children identified with a variety of educational disabilities including other health impairments (65.8%), emotional disturbances (57.9%), mental retardation (20.6%), learning disabilities (20.2%), and speech–language impairments (4.5%; Schnoes, Reid, Wagner, & Marder, 2006). Thus, ADHD may be associated with one or more educational difficulties that further compromise school functioning and that may require specialized intervention services.

### **Treatment of ADHD: Effects on School Functioning**

The most common and widely researched treatments for ADHD include psychostimulant medication (e.g., methylphenidate) and behavior modification strategies. In recent years, the effects of nonstimulant medications (e.g., atomoxetine and selective serotonin reuptake inhibitors) also have been examined. In addition, efficacy data supporting the use of academic interventions and home–school communication programs have been gathered. The effects of each of these treatment modalities on the school functioning of students with ADHD are reviewed briefly in this section.

### **Psychotropic Medication**

The most common and widely studied treatment for children and adolescents with ADHD is psychotropic medication, specifically the use of central nervous system stimulants (Barkley, 2006). In fact, methylphenidate and other central nervous system stimulants are the single most effective treatment for reducing ADHD symptoms in children (MTA [Multimodal Treatment of ADHD] Cooperative Group, 1999, 2004). Further, numerous studies have shown methylphenidate and amphetamine compounds to improve classroom attention, behavior control, and peer interactions as well as to enhance productivity and accuracy on academic tasks and curricu-

lum-based measurement probes (for review, see Connor, 2006). Alternatively, long-term effects on academic achievement (as measured by standardized achievement tests) have been either very small or nonexistent (e.g., MTA Cooperative Group, 1999, 2004).

Because central nervous system stimulants may not lead to positive effects in all cases and can lead to adverse side effects (e.g., insomnia and appetite reduction) in some individuals, nonstimulant medications have been studied. Most notably, atomoxetine (Spencer et al., 2002) and clonidine (Connor, Fletcher, & Swanson, 1999) have been found to reduce ADHD symptoms. The effects of nonstimulants on school performance beyond teacher reports of classroom behavior have not been studied extensively so it is unknown how these compounds affect academic performance and social interactions with peers.

### **Behaviorally Based Interventions**

Behavior modification interventions that involve manipulating consequences to change behavior are widely used to treat ADHD symptoms and comorbid behavioral difficulties. The two consequence-based interventions that have the strongest empirical support are token reinforcement and response cost (DuPaul & Eckert, 1997; Pelham, Wheeler, & Chronis, 1998). Specifically, token reinforcement programs (i.e., providing immediate reinforcers or tokens contingent on child-appropriate behavior) have been used to reduce disruptive, off-task behavior and to enhance task engagement and completion (e.g., Piffner, Rosen, & O'Leary, 1985). In similar fashion, response cost (i.e., the removal of token reinforcers contingent on inappropriate behavior) has been found to increase on-task behavior and work productivity in classroom settings (e.g., DuPaul, Guevremont, & Barkley, 1992; Rapport, Murphy, & Bailey, 1982). In fact, some studies have shown that behavioral changes induced by response cost are better maintained over time than are the behavioral

effects of an all-positive approach (Piffner & O'Leary, 1987). Further, in some cases, the effects of these consequence-based interventions are equivalent to those found for psychostimulant medication (e.g., Pelham, Carlson, Sams, Vallano, Dixon, & Hoza, 1993; Rapport et al., 1982).

When possible, behavioral interventions should be designed using functional assessment data (O'Neill, Horner, Albin, Storey, & Sprague, 1997). First, a limited number of clearly defined behavioral targets likely to have an effect on academic functioning should be selected. Next, functional assessment data should be used to determine the contingencies maintaining the target behaviors. In most cases, the intervention should include frequent and immediate positive reinforcement and/or response cost. Further, the specific consequences used in an intervention should be matched to the purported function of the challenging behavior. For example, if a student with ADHD appears to be talking out of turn and disrupting the activity of classmates to gain teacher attention, then the intervention should include the provision of teacher attention contingent on appropriate behavior and the removal of teacher attention for disruptive activity. Presumably, an intervention that includes consequences matched to the function of behavior will be more effective than one designed through a trial-and-error approach (i.e., that does not consider behavioral function). Although, in general, research findings in support of this critical assumption have been equivocal (for a review see Ervin, Ehrhardt, & Poling, 2001), several single subject design studies that included students exhibiting ADHD symptoms (e.g., Eckert, Martens, & DiGennaro, 2005; Ervin, DuPaul, Kern, & Friman, 1998; Northup & Gully, 2001) have indicated the value of an assessment-based approach to intervention design. Finally, systematic direct observations, along with teacher ratings, should be used to measure the effects of interventions (for a review of direct observation methods, see Volpe, Di Perna, Hintze, & Shapiro, 2005).

## Combined Medication and Behavioral Intervention

Investigations systematically comparing the combination of central nervous system stimulants, behavioral interventions, and their combination (i.e., multimodal treatment) have found medication superior to behavioral treatments in reducing ADHD symptoms (Abikoff et al., 2004; MTA Cooperative Group, 1999). The largest scale and most comprehensive investigation of these two treatments was the Multimodal Treatment of ADHD study; this investigation included a sample of 579 children, 7 to 10 years old, diagnosed with combined type ADHD, who were randomly assigned to one of four treatment groups. One group received stimulant medication (e.g., methylphenidate) that was titrated using state-of-the-art, multimethod, controlled trials, whereas a second group received multiple behavioral interventions across home, school, and summer camp settings. The school component of the latter protocol included (a) ongoing consultation with classroom teachers regarding behavioral interventions and (b) a paraprofessional working with the student with ADHD for 50% of the school day on a daily basis for 12 weeks in the fall of the school year. The paraprofessional implemented behavioral interventions such as token reinforcement for appropriate classroom behavior. A third group received both carefully titrated stimulant medication and comprehensive behavioral intervention. Finally, a control-comparison group consisted of participants who received treatment as delivered in the community (community care control group). Approximately 67% of control group participants were receiving stimulant medication that was titrated using less controlled procedures that are more typical for a private practice or clinical setting compared with the MTA medication group. Dependent measures across multiple areas of functioning were collected at three times during and immediately following the 14-month treatment protocol for all four groups.

Participants in all four groups showed significant reductions in ADHD symptoms during and following treatment. Significantly greater reductions in symptoms were obtained for the medication management and combined intervention groups relative to the behavioral only and community care control groups. Although carefully titrated stimulant medication clearly was the superior unimodal treatment, additional analyses shed light on the contribution of behavioral interventions. Specifically, the greatest improvement in problems associated with ADHD (i.e., a composite score of parent and teacher ratings of oppositional behavior, and social performance difficulties as well as ADHD symptoms) was found for children who received the multimodal treatment protocol (Conners et al., 2001). Children in the combined intervention group required a lower mean dosage of medication than did the medication only group. Using a relatively conservative definition of treatment “success” (i.e., composite parent and teacher ratings of ADHD and oppositional defiant disorder symptoms in the low severity range), Swanson and colleagues (2001) found that 68% of combined intervention children were successfully treated relative to 56%, 34%, and 25% of the medication only, behavioral intervention only, and community care control group children, respectively. Although the effect size separating the behavioral intervention and community care control group was small (Conners et al., 2001), it is important to note that most of the control group participants received stimulant medication as typically prescribed in the community. Thus, intensive behavioral programming (including school-based strategies) aimed specifically at reducing disruptive behavior appears equivalent to the medication-as-usual protocol typically used in the community.

## Academic Interventions

Students with ADHD often experience difficulties with academic achievement and development of core reading and math skills (DuPaul & Stoner, 2003; Hinshaw, 1992).

Thus, interventions directly addressing academic deficits are necessary. Although academic interventions for students with ADHD have not been as widely studied as behavioral treatments for this population, recent studies have provided initial support for academic remediation strategies. The results of single-subject research design studies indicate the efficacy of computer-assisted instruction (Clarfield & Stoner, 2005; Mautone, DuPaul, & Jitendra, 2005; Ota & DuPaul, 2002), class-wide peer tutoring (DuPaul, Ervin, Hook, & McGoey, 1998), home-based parent tutoring (Hook & DuPaul, 1999) or homework support (Power, Karustis, & Habboushe, 2001), self-regulated strategy for written expression (Reid & Lienemann, 2006), and directed note taking (Evans, Pelham, & Grudberg, 1995) in enhancing specific areas of academic performance.

Beyond their positive effect on scholastic skills, academic interventions also have several advantages as a treatment for students with ADHD. First, most academic strategies emphasize the modification of antecedent events (e.g., instruction and task presentation) that may precede problematic inattentive or impulsive behavior. Thus, in terms of behavior management, academic interventions may be considered proactive or preventive. As a result, a second advantage of academic remediation strategies is that these may lead to changes in problematic behavior. Stated differently, improvements in academic performance may lead to or be associated with enhancement of behavior control. In fact, effect sizes for behavior change associated with academic interventions are very similar to effect sizes obtained for contingency management strategies (DuPaul & Eckert, 1997). Thus, in some cases, academic interventions may serve the dual purpose of improving academic skills and attentive, reflective behavior. Finally, many of the academic strategies studied thus far involve the use of mediators (e.g., peers, parents, and computers) beyond an exclusive reliance on classroom teachers. The use of multiple mediators may enhance the acceptability and feasibility of classroom-based treatment by reducing the burden on teachers.

## Home-School Communication

Another viable treatment approach for enhancing the school functioning of students with ADHD is the use of home-school communication programs (e.g., daily report card). This strategy involves teachers, parents, and in the case of older students, students themselves, collaborating to (a) identify appropriate classroom-based target behaviors, (b) delineate home-based reinforcers that can be delivered on a daily and/or weekly basis, and (c) agree upon a process for regular communication, preferably on a daily basis (Barkley, 2006; DuPaul & Stoner, 2003). The assumption underlying this intervention strategy is that appropriate behavior at school can be reinforced by contingencies delivered at home, an environment that presumably has a wider variety of highly salient reinforcers available for this purpose. The efficacy of the daily report card strategy has been supported through several single-subject and group design studies, most notably in the research of Pelham and colleagues (e.g., Pelham et al., 1993). In particular, home-school communication programs appear viable for students with mild to moderately severe ADHD symptoms (Barkley, 2006; DuPaul & Stoner, 2003).

There are several factors that may enhance the utility and efficacy of a daily report card system (DuPaul & Stoner, 2003). First, a reasonable number (i.e., three or four) of behavioral goals should be targeted for change. Goals should be stated in a positive manner (i.e., what the student should do rather than what the student should not do) and should be set at an attainable level. Second, home-based reinforcement should be delivered on a consistent basis dependent on teacher ratings of goal attainment. Given that children with ADHD exhibit impaired delayed response to the environment (Barkley, 1997), the more frequent and immediate the reinforcement (i.e., daily), the better the possible outcome. Third, teacher ratings of goal attainment should be completed following each academic period or a segment of the school day rather than a summary judgment at the end of the day. In this fashion, students will have a clearer

idea of their status throughout the day and it will be easier for teachers to provide judgments for behavior over a shorter period of time. Finally, parents, teachers, and students should meet on a regular basis (e.g., biweekly) to review progress, adjust goals, and make any other necessary modifications to the communication system.

### **Important Gaps in the School-Based Intervention Literature**

Over the past several decades, a plethora of school-based interventions for students with ADHD and related behavior disorders have been studied. Yet, the number and scope of investigations of these interventions pales in comparison to the extensive research literature for stimulant medications. For research on school-based treatment to progress, two general directions are necessary. First, treatment outcome studies must go beyond a focus on simply reducing ADHD symptoms and disruptive behavior. It is clear that children with ADHD suffer from extensive deficits across multiple areas of functioning. Thus, strategies focused just on reducing physical activity and disruptiveness address only one aspect of children's school adjustment difficulties.

A second general direction for school-based intervention research is a more specific focus on treatment integrity and acceptability. The degree to which proscribed interventions are implemented accurately in classroom settings (i.e., treatment integrity) depends on several important factors including (a) the resources (e.g., time and money) needed for implementation, (b) the number of steps (i.e., complexity) to the intervention, (c) the teacher's beliefs about the treatment's potential effectiveness, (d) the feedback provided to the teacher regarding appropriate implementation, (e) the match between teaching style and intervention, and (f) the teacher's readiness or motivation to intervene (Klingner, Ahwee, Pilonieta, & Menendez, 2003; Witt, Noell, LaFleur, & Mortenson, 1997). An additional factor that may affect treatment integrity is treatment acceptability defined as the perception that the intervention is feasible, fair, and

reasonable for a specific problem (Kazdin, 1981).

Unfortunately, despite the potential importance of treatment integrity and acceptability to achieving successful outcomes, these variables have not been studied extensively in the ADHD treatment literature. Most studies have focused on acceptability of pharmacological interventions and/or school and home-based behavioral strategies in an analogue format (e.g., Gage & Wilson, 2000; Power, Hess, & Bennett, 1995). These investigations have shown that parents and teachers generally prefer behavioral strategies over stimulant medication; however, both approaches appear to be at least minimally acceptable. Cowan and Sheridan (2003) found high acceptability of interventions designed through conjoint behavior consultation for both parents and teachers of children with ADHD. The specific linkages among treatment acceptability, integrity, and outcomes need to be explicated in greater detail so that practitioners and researchers design interventions that are successful and sustainable over the long term.

In addition to these general research directions, several specific areas require attention to enhance school-based interventions for students with ADHD. A critical gap in the school-based intervention literature is a lack of information on how psychotropic medication and classroom behavioral intervention can be combined in an optimal fashion. It is clear that the combination of carefully titrated stimulant medication and contingency management strategies is effective for treating ADHD in a majority of cases; however, the best approach for sequencing and adjusting the relative dosages of these treatments is unknown. For example, should behavioral interventions precede use of psychostimulant medication or vice versa? Can a lower dosage of medication be used when a powerful contingency management intervention is implemented? These are the important questions that practitioners face when designing a comprehensive treatment plan for a student with ADHD. Yet, there are few research studies available to guide this process.

Although there is growing support for the use of specific academic interventions to address the reading and math difficulties of students with ADHD, we have limited knowledge regarding how best to consult with teachers in designing academic interventions for this population. The school psychology literature suggests that a data-based decision-making model may optimize academic intervention design; however, no studies have evaluated the use of this model in the context of treating students with ADHD. Again, this question is of critical importance to school-based practitioners who must collaborate with teachers in addressing academic difficulties encountered by students with this disorder. In addition, we have limited knowledge about how to integrate behavioral interventions with academic remediation strategies. Given the role that ADHD symptoms, academic enablers, and academic skills play in affecting achievement in this population, the combination of interventions appears necessary for many students with this disorder. That most classroom intervention studies have been conducted in special education or special school settings even though most children with ADHD are placed in general education settings compounds this critical gap in our literature base.

An additional limitation of the extant literature is that very few studies have examined the effects of early intervention for preschoolers at risk for ADHD. The design and evaluation of developmentally sensitive treatment for young children is critical given that (a) ADHD is a disorder that typically begins in early childhood; (b) many children with ADHD symptoms enter kindergarten academically behind their classmates (DuPaul, McGoey, Eckert, & VanBrakle, 2001); and (c) psychostimulant medication, although effective for this age group, may be less acceptable to parents and may be associated with greater adverse side effects (Kollins & Greenhill, 2006). In a recent review, McGoey, Eckert, and DuPaul (2002) found only nine studies of preschool-based interventions for young children with ADHD, and most of these studies

were case studies and/or single-subject design experiments.

Finally, the vast majority of school-based intervention studies have evaluated treatment for children of elementary school age with ADHD. There are very few studies examining interventions for adolescents with ADHD. Most treatment outcome studies with this age group have looked at the effects of psychostimulant treatment (e.g., Evans et al., 2001), and DuPaul and Eckert (1997) found only two school-based intervention investigations with this age group. The lack of information is particularly critical for practitioners working with middle school students given that this age group is passing through the sensitive transition from childhood to adolescence. In addition, students are expected to show more independence in study skills, completion of long-term projects, and organization of school materials. Needless to say, ADHD symptoms can interfere with the development of independence in these areas and are associated with a plethora of difficulties across the academic, social, and behavioral-emotional domains.

### **Purpose and Overview of Special Series**

This special series has three purposes. First, this series of articles will provide school psychologists and related professionals with state-of-the-art research on school-based interventions for children and adolescents with ADHD. Second, these articles report the results of empirical investigations that directly address critical gaps in the school-based intervention literature, as articulated previously. Third, the findings of these studies should encourage the use of best practice in designing interventions for students with ADHD.

Four empirical articles and three invited commentaries are included in this special series. Fabiano and colleagues (2007) report the results of a study examining the effects of combined pharmacological and behavioral interventions in a summer treatment program classroom setting. This is the first study to investigate the effectiveness of varying inten-

sities of behavior modification *and* methylphenidate alone and in combination in the context of a group research design. Next, Jitendra and colleagues (2007) present the results of the largest scale study of classroom-based academic interventions for this population conducted to date. The effects of academic interventions delivered in the context of two different consultation models were investigated across reading and mathematics outcomes. In the third article, Kern and colleagues (2007) have investigated the effects of a multisetting early intervention program designed specifically for young children at risk for ADHD in comparison to a community treatment control group. The study reports on 1-year outcomes for a large sample of 3- to 5-year-old children who received parent training and consultation-based behavioral interventions across home and preschool settings. In the fourth paper (Evans, Serpell, Schultz, & Pastor, 2007), the results of an evaluation of an innovative school-based program for middle school students with ADHD are reported. Specifically, this article presents outcomes from Years 1 and 2 of the implementation of an integrated model for the school-based treatment of middle school students with ADHD (Challenging Horizons Program). The special series concludes with commentaries on these empirical studies from four prominent experts on ADHD from the fields of school psychology (Dawson, 2007), clinical child psychology (Barkley, 2007), and child psychiatry (Vitiello & Sherrill, 2007).

### Conclusions

Students with ADHD experience significant academic, social, and behavioral difficulties in school settings. Empirical studies indicate that stimulant medication and atomoxetine as well as school-based intervention strategies, such as behavioral interventions, modifications to academic instruction, and home-school communication programs, are effective in reducing ADHD symptoms and enhancing school functioning. Nevertheless, there are many important gaps in the extant

treatment literature, including the need to (a) evaluate effects on academic and social functioning, (b) assess treatment integrity and acceptability, (c) document how the combination of stimulant medication and behavioral interventions can be optimized, (d) delineate effective methods for consulting with teachers in designing classroom interventions, (e) evaluate the effects of early intervention for preschoolers at risk for ADHD, and (f) investigate school-based interventions for adolescents with ADHD. The articles and commentaries in this special series are intended to begin to address these gaps by providing practitioners and researchers with feasible, effective strategies that can be used in general education settings with a variety of age groups.

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