

Peer Functioning in Children with AD/HD: A Review of Current Understanding and
Intervention Options

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Abstract

This review critically evaluates the existing research literature on the peer relationship problems of children with attention deficit/hyperactivity disorder. Empirical evidence suggests that children with the disorder are severely impaired in the social area and strongly rejected by peers. The purposes of this article are to provide a review of key contributing factors to the peer relationship problems of children with AD/HD and to outline intervention options that have been supported as beneficial for children with the disorder. Finally, the article provides a framework to understand and address the complex social problems of children with the AD/HD.

Key words: Attention Deficit Hyperactivity Disorder; Peer relationship problems; Peer rejection; Social skills; Emotion regulation; Interventions.

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Options

Attention Deficit/Hyperactivity Disorder is the most commonly diagnosed childhood disorder characterized by symptoms of inattention, hyperactivity, and/or impulsivity (DSM-IV; American Psychiatric Association, 2000; Blachman & Hinshaw, 2002). International epidemiological studies using standardized diagnostic criteria suggest that 3 % to 7 % of the school-aged population is affected by the disorder (Barkley, 2006; Peterson, Pine-Cohen, & Brook, 2001). This prevalence estimate means that almost 1 in every 20 children, or at least 1 child per general education classroom, is likely to be identified as having AD/HD (Barkley, 2001; Barkley, 2006; McGoey, Eckert, & DuPaul, 2002; Peterson, et al., 2001). In addition to the primary symptoms of the disorder, increased rates of comorbid psychiatric conditions including oppositional defiant disorder (ODD) and conduct disorder (CD) (Barkley, 2006) and secondary impairments such as academic underachievement and learning problems are commonly reported in AD/HD (DuPaul, 2007; Farone et al., 1993). Social deficits in peer relations including social skills and social performance deficits (Maedgen & Carlson, 2000; Wheeler & Carlson, 1994) have been widely noted, as have difficulties in aggression (Hodgens, Cole, & Boldizar, 2000) and emotion regulation (Southam-Gerow & Kendall, 20002). Empirical evidence suggest that long term effects for some children with AD\HD include attending fewer years of school, achieving lower overall occupational status such as being ranked significantly lower than control groups (Mannuzza, Gittelman-Klein, Bessler, Malloy, & LaPadula, 1993; Weiss & Hechtman, 1993) and displaying worse job performance (Weiss & Hechtman, 1993), and experiencing greater range of social maladjustment and personality problems such as lower self-esteem depressive symptoms, antisocial and criminal status (Barkley, 2006; Treuting &

Hinshaw, 2001; Young, 2002). Even those children with AD/HD who are monitored into adolescence and found to be free of psychiatric disorders appear to have some social problems, such as significantly less community and school activity involvement (Mannuzza, Klein, Bonagura, Konig, & Shenker, 1988).

Although earlier research has focused primarily on the attentional, academic/learning, and behavioral problems associated with this disorder (DuPaul, 2007; Farone et al., 1993; Treuting & Hinshaw, 2001), the social domain is being increasingly accepted as one of critical importance for these youngsters (Blachman & Hinshaw, 2002; Hinshaw, & Melnick, 1995; Mikami & Hinshaw, 2003; Stoes, Alberts, & Van der Meere, 2003). The difficulties in the social domain are so common that some investigators have claimed that the phenomenon of disturbed social relations itself should serve as a classifying characteristic of the disorder (Landau & Moore, 1991; Whalen & Henker, 1991). Indeed, Erhardt and Hinshaw (1994) argued that social problems of children with AD/HD might be central to an understanding of the psychopathology of these children.

The interpersonal behaviors of children with AD/HD are often described as more impulsive, intrusive, excessive, disorganized, engaging, aggressive, intense, and emotional (Bagwell, Molina, Pelham, & Hoza 2001; Mikami & Hinshaw, 2003; Stoes, Alberts, & Van der Meere, 2003). Thus, they are disruptive to the smoothness of the ongoing stream of social interactions, reciprocity, and cooperation, which is an increasingly essential part of the children's social lives with others (Barkley, 2006). Problems caused by inattention and impulse control effect negatively the social performance of children with this disorder in a number of areas. First, they may enter ongoing peer activities in a sudden, disruptive manner. Second, their communication style often differs than their typically developing counterparts. Children with

AD/HD have difficulty in following the implicit rules of good conversation (Stroes, et al., 2003). They are likely to interrupt others, talk more during spontaneous conversation, pay minimal attention to what others are saying, and respond in an irrelevant fashion to the queries or statements of peers (Landau & Milich, 1988; Stroes, et al., 2003; Zentall, 1988). Further, studies of language fluency and discourse organization indicate that children with AD/HD are likely talk less and be more dysfluent in response to confrontational questioning (Tannock & Schachar, 1996). Third, these children frequently approach interpersonal problems in an aggressive manner, lose their temper, and become angry quite easily (Blachman & Hinshaw, 2002; Hinshaw, & Melnick, 1995; Mikami & Hinshaw, 2003). Thus, arguments and fights with peers are very common among children with the disorder (DuPaul & Stoner, 2003). Being inflexible if another child appeals, having a need to take control of play situations, becoming intimidating, and being stubborn about having things occur the way they want them to happen are other common observable behaviors of children with AD/HD (Barkley, 2006). It is not surprising then, that children with AD/HD are rejected at higher rates than are their non-AD/HD peers (Blachman & Hinshaw, 2002; Guevromont & Dumas, 1994; Johnston, Pelham, & Murphy, 1985; Mikami & Hinshaw, 2003). Although peer rejection does not, in itself, indicate an externalizing behavior disorder, it is well known that low social status with peers significantly predicts a host of negative outcomes in later life (Parker & Asher, 1987) and covaries positively with disruptive and particularly aggressive behavior. It is essential to note that, when tracking children diagnosed with AD/HD into adolescence and adulthood, those who ultimately experience the most serious clinical problems (e.g., substance abuse, criminal arrests and incarceration, psychiatric hospitalization) were previously identified as having difficulties with aggression or social relations (Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1998; Parker & Asher, 1987;

Young, 2002). Researchers have shown that from 45% to 84% of children and adolescents with AD/HD meet full diagnostic criteria for ODD alone or with CD (Barkley & Biederman, 1997; Pfiffner et al., 1999; Willens et al., 2002). Thus, most of these risks seem to be increased further by the coexistence of hostile, conduct disordered behavior patterns, or oppositional defiant disorder (ODD), with early onset hyperactive-impulsive behavior (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Barkley, 2006; Barkley, Fischer, Smallish, & Fletcher, 2004; Stormont-Spurgin & Zentall, 1995). To make the case worse, researchers have found that children with high ratings in kindergarten on hyperactivity and aggression were more likely than those initially rated average or low on hyperactivity and aggression to have third and fourth grade outcomes of peer rated aggression and self-reported delinquency (Vitaro, Tremblay, Gagnon, & Pelletier, 1994). Studies reveal that the early onset and persistence of CD symptoms such as lying, stealing, truancy and physical aggression are the hallmark of the later AD/HD+ODD/CD (Barkley, 2006). Overall, evidence suggest that impaired peer relationships is already set into motion by the early years of elementary school and is evident across various measures of peer functioning (Hoza et al., 2005). Further, impairment in peer relations has been found to persist into adolescence (Bagwell, Molina, Pelham, & Hoza, 2001) and young adulthood (Murphy, Barkley, & Bush, 2002).

In general, extant data suggest that social problems of children with AD\HD are pervasive and put these children at heightened risk for future social maladjustment (Barkley, 2006; Landau, Milich, & Diener, 1998; Young, 2002). Such children are more likely to develop conduct disorder, to participate in more delinquent or illegal acts as adolescents, and to engage in greater substance experimentation and eventual dependence and abuse than are purely hyperactive or impulsive children (Barkley, Fischer, Edelbrock, & Smallish, 1990; Biederman et

al., 1996). Indeed, follow-up studies suggest that early peer problems not only indicate concurrent difficulties for the child, but also represent a significant "at risk" marker for later emotional and behavioral disturbance (Landau & Milich, 1990; MacDougal, Hymel, Vaillancourt, & Mercer, 2001). Even if the long-term outcome measures did not reveal subsequent adjustment problems, one is left to wonder if children with AD/HD experience the same quality of life as other children (Landau & Moore, 1991). Given protracted nature of the disorder and the attendant long-term risks for a large percentage of children with AD/HD, there is an emerging consensus that peer relationship problems of children with AD\HD should be a crucial target for interventions. This article review the research relevant to the peer relationship problems of children with AD\HD including, emotion regulation deficits, social performance and social knowledge deficits, and aggression. Following section provides an overview of the various interventions that have been supported as beneficial for children with the disorder. Finally, this paper proposes a system perspective as a framework to understand and address the complex social problems of children with the disorder.

Emotion Regulation Deficits

Cole, Michel, and Teti (1994) define emotion regulation as processes or strategies used so that successful interpersonal functioning is possible. The construct of social competence is inexorably tied to emotion regulation (Saarni, 1999) and emotion regulation skills are essential to healthy social adaptation (Eisenberg, 2001; Gross & Munoz, 1995). Eisenberg (2001) argues that more important than having the cognitive ability to understand others' expression of emotion, social competence involves the ability to adequately manage one's own experience of emotion while interpreting signals from another. Accordingly, children who regulate emotion constructively are rated by their teachers as socially competent and by their peers as attractive

playmates (Eisenberg, Fabes, Bernzweig, Karbon, Poulin, & Hanish, 1993).

The social behaviors of children with AD/HD are suggestive of underlying difficulties with emotion regulation (Maedgen & Carlson, 2000; Melnick & Hinshaw, 2000; Southam-Gerow & Kendall, 2002). Children with AD/HD frequently exhibit increased emotionality, displaying greater degrees of explosive, unpredictable, and oppositional behavior (DuPaul, McGoey, Eckert, & Van Brakle 2001; Hinshaw & Melnick, 1995). Over reactions to minor inconveniences are common, and such children may seem overly aroused when in stimulating situations (Guevremont & Dumas, 1994; Waschbusch, Pelham, Jennings, Greiner, Tarter, & Moss, 2002). Cole, Zahn-Waxler, and Smith (1994) found that levels of negative affect were significantly correlated with symptoms of AD/HD. Likewise, peers tend to view these children as more aggressive, inflexible, intrusive, disruptive and annoying (Taylor, 1994). In an experimental design, Maedgen and Carlson (2000) examined emotion regulation problems of children with AD/HD along with their social skills problems. The researchers used an emotion control task that assesses children's expressive responses to receiving a disappointing prize. Findings from the study indicated that children with AD/HD were more intense in their emotional displays (positive and negative) and displayed more positive behavior than children in the other two groups displayed during both a nondisappointing and disappointing period. Interestingly, Melnick and Hinshaw (2000) found that impairment in emotion regulation in children with AD/HD was related to comorbid aggression rather than simply AD/HD symptomatology alone. The researchers reported that children with AD/HD in the high-aggressive groups used a less constructive pattern of emotional coping, including overresponsive emotionality and diminished problem solving, than AD/HD children in the low-aggressive groups or non-AD/HD diagnosed children. While more research is needed, the apparent

differences in emotion regulations skills between aggressive and non-aggressive children with AD\HD has led to the hypothesis that there may be an important distinction in underlying emotion regulation deficits (Sandstrom & Cramer, 2003). Specifically, children characterized by aggression display a distinct profile of social information processes (Sandstrom & Cramer, 2003). Studies have consistently found support for deviant social information encoding, response generation, response selection, and enactment in children with aggressive behavior (Dodge & Feldman, 1990; Dodge & Pettit, 2003; Sandstrom & Cramer, 2003). These distinct social information processes appear to be linked in transactional fashion with problems with emotion recognition, emotion regulation, and aggressive behavior. In a comprehensive review of both biological and psychological factors contributing to aggressive behavior, Dodge and Pettit (2003) noted that deficient social information processing (SIP) likely develops from a series of additive life events that gradually shape a child's mental representation of the world. Early harsh and negative interactions with parents and peers might result in the amplification of social cognitive difficulties. Consistent negative interactions with parents and peers, coupled with the gradual alteration of the child's environment lead to a self-fulfilling prophecy whereby emotional disturbances and aggressive behavior result from biased social cognitive processes and biased environmental factors (Dodge & Tomlin, 1987).

Overall, deficits in emotion regulation signify one of the primary areas of impairment in AD/HD which eventually result in various problems in peer relationships (Barkley, 1997; Hinshaw & Melnick, 1995). Even though a link has been demonstrated between deficits in emotional competence and the presence of social problems in general (Eisenberg, et al., 2001; Lemery, Essex, & Smider, 2002), less work has been done addressing the emotional functioning of children with specific types of psychopathological difficulties (Southam-Gerow & Kendall,

2002). According to Barkley (2006), most children with AD/HD have a disinhibitory deficit, which causes secondary impairments in domains of self-regulation such as emotion. Barkley (2006) emphasized that children with the disorder display greater prepotent emotional reactivity to “charged” events and less capacity to regulate emotion/arousal states in the service of goal-directed behavior. Certainly, there is a great need to move forward in our understanding of how emotion regulation develops in normative populations and how this process may become atypical in children with AD\HD (Southam-Gerow & Kendall, 2002). Information generated by research on children’s emotion regulation strategies eventually may yield reformulated interventions for children with the disorder. Such interventions could foster children’s abilities to reinterpret situations cognitively, build awareness of their acts on the negative or uncontrollable aspects of situations, and teach helpful ways of signaling distress (Melnick & Hinshaw, 1999).

Social Knowledge Deficit versus Social Performance Deficit

Social relationship problems of children with AD\HD can result from two types of deficits: social knowledge and social performance deficits, either of which may be accompanied by inferring problem behaviors such as anxiety and aggression. Social knowledge deficit refers to whether an individual knows the appropriate behavior that is called for in a given social situation (Landau, Milich, & Diener, 1998). In contrast, social performance deficit represents the presence of the social skills in a behavioral repertoire but failure to perform these skills at acceptable levels (Landau, Milich, & Diener, 1998; Maedgen & Carlson, 2000). Social performance deficit in children with AD/HD-Combined subtype is based on research findings showing that children with AD/HD interact with other people as much as their peers (Wheeler & Carlson, 1994). Because children with AD\HD frequently interact with peers, they arguably have similar opportunities to learn appropriate social behaviors (Whalen & Henker, 1985; Wheeler &

Carlson, 1994). Evidence also suggests that children with AD\HD are able to initiate appropriate prosocial behavior. Further, according to DuPaul and Stoner (2003) children with AD/HD-C are able to state the rules for appropriate social behavior as well as their typically developing peers. However, what makes them have problems in social situations is that they often do not act in accord with these rules. This performance deficit is consistent with the hypotheses that children with AD/HD-C are impaired in delaying responses to the environment (Barkley, 2006). In his theory, Barkley (2006) proposes that children with AD/HD act before they have a chance to think. In fact, studies have found that children with AD/HD-C engage in higher rates of unmodulated behaviors that are often inappropriate in the given context and insensitive to social expectations (e.g., yelling, running around, or talking at inappropriate times) both as verbal (teasing, commanding) and physical (hitting) (Barkley, 2006). Evidence suggests that impulsivity and hyperactivity can be the reasons that obstruct a child with AD/HD-C from displaying social knowledge properly (Maedgen & Carlson, 2000). Specifically, impulsivity may effect the social interactions of children with AD/HD negatively by causing them to act without thinking and to have a difficult time waiting their turn in games. Consequently, this behavioral style is expected to meet with dislike and subsequent peer rejection (Wheeler & Carlson, 1994).

Although it appears that children with AD\HD-I have less severe social problems than children with AD\HD-C, they do present difficulties in social relationships (Bachman & Hinshaw, 2002; Faraone, Biederman, Weber, & Russell, 1998; Maedgen & Carlson, 2000). Rather than being rejected by peers for disruptive or aggressive behaviors, children with AD\HD-I are more likely to be socially isolated, neglected, ignored, and teased by peers (Hinshaw, 2002; Hodgens et al., 2000; McBurnett et al., 1999). According to Wheeler and Carlson (1994), children with AD/HD-I may have deficits in both social performance and

knowledge, whereas children with AD/HD-C type have performance deficits. The researchers further argued that these deficiencies might be differentially mediated by the symptoms typically co-occurring with each subtype. Impulsivity and hyperactivity may prevent a child with AD/HD-C from using social knowledge appropriately, whereas the anxiety and disorganization that characterize children with AD/HD-I may limit social interactions and thereby restrict acquisition of adequate social knowledge (Maedgen & Carlson, 2000). If such a pattern is the nature of children with AD/HD-I, they may be too fearful to experience social interactions and therefore have fewer opportunities to learn appropriate social behaviors than children with AD/HD-C (Landau, Milich & Diener, 1998).

Overall, the distinction is important because it suggests that different interventions may be necessary, depending on whether a child presents with knowledge or performance deficits. If a child lacks competency in the basic skills necessary for social interactions, remediation approaches will focus on skill acquisition. On the contrary, if one finds that child knows, but is unable to judge when to or what specific skills to apply, interventions will emphasize performance. In general, direct instruction, modeling, coaching, and behavioral rehearsal frequently are used to remediate social skills deficits whereas contingent reinforcement, token economies that manipulate antecedents and consequences are beneficial for children with social performance deficits (Landau, Milich, & Diener, 1998). Interventions targeting social performance deficits are designed to increase the frequency with which children display the appropriate social behaviors typically by manipulating antecedents and consequences. Providing immediate feedback to children with social performance deficits is an especially important part of intervention design. To sum, the distinction between children with AD\HD's social knowledge and social performance deficits can directly address the risk factors of social failure and rejection

by peers before children become attached to deviant peer groups that promote antisocial personality disorders (Landau, et al., 1998; Ozdemir, 2009).

Aggression

Aggression has been a popular focus of research for developmental psychology and special education (Melnick & Hinshaw, 1996). Researchers have shown that children with AD/HD display social behavior that is described as disruptive, controlling, trouble-making, and frequently aggressive (Melnick & Hinshaw, 1996; Reid, 1993). The primary features of AD/HD combined with aggression often interfere negatively with a child's ability to interact effectively with peers, family members, and others (Bagwell, Molina, Pelham, & Hoza 2001; DuPaul, McGoey, Eckert, & Van Brakle, 2001). Temperamental and behavioral deficits observed in young children with AD/HD interfere with typical social interactions. They demand a great deal of attention from others, with their behaviors often being more intense or forceful than the situation requires (Sheridan, 1998). Researchers have found that at least one-half of all children with AD/HD are known to have comorbid problems with aggressive conduct (Hinshaw, 1987; Hodgens et al., 2000; Maedgen & Carlson, 2000). These children are more likely to propose aggressive solutions to a problem situation and are less able to anticipate negative consequences when compared to non-AD/HD peers (Matthys, Cuperus, & Van Engeland, 1999; Waschbusch et al. 2002). They frequently misinterpret neutral behaviors as hostile and confrontational, which may prompt an aggressive response (Hinshaw, 1987). Similar self-distortions were also found in aggressive rejected children (Dodge & Pettit, 2003). Sandstrom and Cramer (2003) proposed that aggressive rejected children are particularly prone to engage in biased encoding processes that "protect" them from negative peer feedback. Moreover, research has described that children with aggressive behavior not only misinterpret intent but also the degree of aggressive behavior in a

social situation (Dodge & Feldman, 1990; Hubbard et al., 2001). For example, when involved in an aggressive interaction, children with aggressive tendencies are more likely to underestimate their own level of aggression than are other children. These results suggest that aggressive children misjudge their level of aggression possibly because they over-attribute hostile intention to their peers' actions thereby justifying aggressive behavior. To make the case worse, aggression is one of the most pervasive social problems for children with the disorder (Landau, et al., 1998). Researchers showed that 67% of preschoolers at risk for AD/HD with aggression at age 3 continued to have behavior problems when they reached 9 years old (Campbell & Ewing, 1990). It is also important to note that in various studies, children with AD/HD were rated by their peers as starting fights and arguments more than non-AD/HD children (Hodgens, et al., 2000; Maedgen & Carlson, 2000). In fact, research documented that children with AD/HD tend to be aggressive without an obvious aim except to inflict harm on a peer and are also more likely to be aggressive to obtain something valuable for them, such as to come first in a game (Atkins & Stoff, 1993).

The overlap of AD\HD with Oppositional Defiant Disorder (ODD) and Conduct Disorders (CD) has probably received the most attention of all in the literature on comorbidity in AD\HD (Barkley & Biederman, 1997; Pfiffner et al., 1999; Wilens et al., 2002). The comorbidity of ODD\CD with AD\HD is often associated with a poorer outcome than either disorder alone. This comorbidity is also a marker for increased levels of symptomatology within each of the disorders making up the comorbid group, and with increased levels of impairment in functioning. For example, individuals with both AD/HD and ODD or CD have higher levels of CD/ODD symptoms than children with pure CD (Hinshaw, Lahey, & Hart 1993; Maughan, Rowe, Messer, Goodman, & Meltzer, 2004), greater levels of parental psychopathology, conflictual interactions

with parents, peer rejection, school problems, and psychosocial adversity (Fletcher, Fisher, Barkley, & Smallish, 1996).

Overall, research suggests that the majority of children with AD/HD experience either social incompetence or aggression, or a combination of both problems (Barkley, 2006). It is important to note that the more a child exhibits aggressive behavior or related comorbid disorders, the more challenging the treatment will be (Barkley, 2006). Although medications may decrease aggressive behavior, children with AD\HD need interventions that promote social competence because medication does not “normalize” the behaviors that lead peer rejection (Landau & Moore, 1991). Hence, practitioners need to understand these comorbid conditions to plan and implement effective interventions.

Interventions

Improving behavior in children with AD\HD depends on addressing a range of inter-related issues at the family level, in the classroom and in relation to individual children. In general, most current evidence based treatments for AD\HD include: behavior modification procedures, stimulant medication, the combination of behavior modification and stimulant medication (American Academy of Pediatrics, 2001), parent training, and social skills training (Stormont, 2001). Various intervention programs exist but all strive to promote more positive, compliant, and generally prosocial behavior while decreasing negative, defiant, and disruptive behavior in children (Shelton et al., 2000). These programs typically include antecedent modifications, skill development, and consequent strategies and focus on peer and family relations, classroom conduct, and school achievement (Arnold et al., 1997; Bierman, Miller, & Stabb, 1987; DuPaul & Weyandtb, 2006). In general, evidence suggests that most of these approaches appear to be acutely effective interventions for children with AD\HD in reducing the

symptoms of the disorder (DuPaul & Eckert, 1997; Pelham & Fabiano, 2007; Pelham, Wheeler, & Chronis, 1998). However, for the majority of children, a long-term intervention that requires the support and commitment of all people who have a close relationship with the children is crucial (DuPaul & Weyandtb, 2006). Despite the increased understanding and awareness about the nature of the disorder, many professionals face the challenges of designing programs that can be easily integrated into children' life and are practical in use. There remains, therefore, a pressing need to further develop long-term multimodal interventions that are intended to address the complex problems exhibited by this population.

Behavior Modification Interventions

Behavior modification interventions is probably one of the most commonly used interventions in AD\HD (DuPaul & Eckert, 1997; DuPaul & Weyandtb, 2006; Pelham, Wheeler, & Chronis, 1998). These interventions focus on manipulating the environment to decrease inappropriate behavior and increase appropriate replacement behaviors (Reid & Maag, 1998). Behavior modification interventions typically involve a functional behavior assessment to determine the target behaviors, training parents and\or teachers in behavior management techniques, reinforcement contracts for home and school, and daily reinforcements and consequences. Token reinforcement and response cost procedures are the most universally employed set of classroom management techniques in reducing disruptive, off task behavior and enhancing work productivity (Fiore, Becker, & Nero, 1993). Token reinforcement involves awarding or removing tokens or points to children contingent upon specified desirable behaviors. These tokens or points are collected and exchanged later for activities, objects, or privileges (Carbone, 2001). A token economy may or may not include a response cost procedure (Barkley, 2006), which involves the loss of privileges, tokens or points contingent upon inappropriate

behavior. It is widely accepted that behavior modification interventions can be of great value for children with AD\HD because children with the disorder need more structure, more frequent and powerful reinforces to act appropriately, more consistent and immediate negative consequences to avoid a fine, and accommodations of school work to address slow work style (DuPaul & Eckert, 1997; DuPaul & Stoner, 2003; Maag, 1999; Pelham, et al., 1998). Pertinent to this point, existing empirical support for token programs and the practical use of these programs with a wide range of problem behaviors have led to their widespread use in school settings (Rowland, Umbach, Stallone, Naftel, Bohlig, & Sandier 2002; McGoey & DuPaul, 2000; DuPaul & Eckert, 1997). According to Barkley (2006), behavioral interventions can be effective in managing the AD\HD symptoms, because the severity of the symptoms and that of comorbid conditions are very sensitive to environmental variables.

Medications

In addition to behavior modification interventions, pharmacological interventions with stimulant medication are also widely used to treat AD\HD. It is estimated that over 1.5 million school age children in the U.S. annually may be using stimulants for behavior management (Zito et al., 2003). Interestingly, research suggests that adolescents and adults meeting criteria for AD\HD are being increasingly prescribed for stimulants due to the persistence of the symptoms across multiple domains of life into adolescence and adulthood (Conner & Steingard, 2004). Not surprisingly, the use of medication in children with AD\HD has been the subject of some controversy and increased public concern. Despite remarkable popularity of pharmacological treatment of the disorder, not all children benefit from medication, and even those who do still do not “normalize” in their social relationships (Barkley, 2006). In fact, many professionals are hesitant to medicate young children and often remind that the use of psychostimulant drugs for

the treatment of AD\HD symptoms in young children necessitates serious consideration of risks relative to potential positive effects (Kern et al., 2007). Supportive of this view, some data suggest that the nature and severity of side effects may vary and be more intensive in young children (KoUins & Greenhill, 2006; Wigal et al., 2006). A related concern is that little can be said about the effects of medications on the developing brain as well as long-term side effects (Rappley, 2006). Although, serious concerns raised by many practitioners and parents remain to be addressed about medicating children with AD\HD, it is particularly challenging to design interventions that will effectively control the symptoms and treat the disorder without using stimulant medications. Some practitioners wisely discuss that behavioral interventions, structured preschool experience (KoUins & Greenhill, 2006; Rappley, 2002) social skills training, and parent education are attractive alternatives to medication (Dawson, 2007). Clearly, this is an area that requires considerable attention and further research.

Social Skills Training

One of the most widely used psychosocial interventions that directly targets peer relationships is social skills training (SST). Social skills training was originally developed for the purpose of enhancing the peer relationships of rejected and neglected children. It is based on the social skills deficit model, which posits that a child's lack of social skills results in less positive peer interactions and lower social status (Bierman & Greenberg, 1996; Durlak, 1997; Grossman et al., 1997; Kavale, Mathur, Forness, Rutherford, Quinn, 1997; Mrug, Hoza, & Gerdes, 2001; Pfiffner, Calzada, & McBurnett, 2000). Although short-term effects of SST are positive, long-term outcomes reveal discouraging results on social, vocational, and academic measures when it is applied to children with AD\HD (Carlson & Bunner, 1993; Kavale et al., 1997; Pfiffner et al., 2000). Apparently, the nature of the disorder requires certain changes in both the content and the

form of the interventions (Mrug, et al., 2001). In particular, evidence exists that children with AD/HD-C display performance deficit rather than a skill deficit. In other words, children with AD/HD-C are able to express the socially appropriate rules and behaviors, but they often do not act accord with these rules (DuPaul & Stoner, 2003). It is important to note that social performance deficits are more complicated to ameliorate than social skills deficits. First, existing SST's focus on deficits in skills rather than deficits in performance. Second, because social performance problems exist across settings, interventions addressing performance problems must be carried out by different individuals in a child's natural environments (DuPaul & Stoner, 2003). The other main problem is that most SST programs are designed for children who are apparently rejected without considering the unique topography of each child's performance in the social domain. As Hinshaw (1992) noted, social skills problems of children with AD/HD are quite heterogeneous and are not likely to respond to one-size fits all approach. For example, social needs of children with AD/HD-I who are withdrawn and isolated are different than children with AD/HD-C who display hyperactive and impulsive symptoms (Wheeler & Carlson, 1994). Thus, a social skills deficit approach may be applied to the children with AD/HD-I whereas both skills and performance deficit approach may work with children with AD/HD-C when conducting any SST programs.

Another important area to review is related to the structure of social skills interventions. Social knowledge and the acquisition of prosocial behaviors are thought and practiced generally in group therapy formats. However, research indicates that traditional group therapy format do not lead to stable changes in social relationships of children with AD/HD in "real-world" environments (DuPaul & Eckert, 1994; Gresham, 2003). The lack of maintenance and generalization of social skills training become a major problem because of the fact that

appropriate social behaviors are not essentially prompted by adults and peers on a consistent basis (DuPaul & Weyandt, 2006; Gresham, 2003). Indeed, the generalization of the newly acquired skills to other contexts requires their reinforcement across different settings in the child's natural environment for an enough period of time (Mrug, Hoza, & Gerdes, 2001). Essential components of environmental programming may involve teaching parents and teachers to reinforce children to perform the behaviors trained in the social skills sessions and developing contingency management programs at home and at school to prompt trained skills (DuPaul & Eckert, 1994). Therefore, it is critical to accomplish the inclusion of parents, teachers, and peers as crucial members of the "social skills treatment team" for generalization. However, individuals within the child's natural environment such as parents typically have not been involved in intervention programs. Providing parents with necessary knowledge and training not only increases the continuity of the program but also, the intensity. Indeed, parents are generally with their children more than are teachers; this puts parents in the top position to create difficult behavior environments, or, more constructively, to provide long-term interventions. Overall, research supports that parents who are educated in the description, causes, prognosis, and treatment of AD/HD are better able to facilitate behavioral change in their children (DuPaul, Guevremont, & Barkley, 1991). Likewise, interventions can be more effective especially with respect to generalization of improved behavior across settings, when parental involvement is combined with social skills training programs.

In addition, inclusion of parents in the SST program establishes consistency between the school and home environments (DuPaul & Stoner, 2003). Discussing behavioral strategies, rewards, and limits with parents to ensure continuity of approach to dealing with challenging behaviors between home and school is crucial. In that way, parents can encourage the same skills

and performance at home and in different peer groups. Indeed many children with AD/HD appear to need very strong and intense levels of reinforcement to produce appropriate behavior in certain settings (Barkley, 1997; Landau & Moore, 1991). Parents must learn to identify the specific behaviors they want to substitute and then by giving rewards for the new more appropriate behavior, teach the child how to control his actions and reactions (Barkley, 2006). This is particularly important for children who have difficulty with anger management. An anger management program focused on adaptive ways of managing anger in children with AD/HD and a behavioral skills training program focused on both social skills and motivation can be used to help children with AD/HD experience more positive social outcomes (Stormont, 2001).

The other considerable problem is that once a child is rejected, peers cognitive processing of the child behavior becomes biased. In other words, the peers may develop a negative stereotypical perspective of the child, and as a result of their view, the peers may selectively perceive and respond to the stereotype-consistent behaviors (Mrug, et al., 2001). Thus, social skills interventions not only should work on changing the negative social behaviors of children with AD/HD, but also the interventions should attempt to increase peers awareness of positive changes in a child's behaviors (Mrug, et al., 2001). In order to do that, peers should be allowed to play active roles in every phases of social skills intervention (Ang & Hughes, 2002). Specifically peers can participate in the social skills training sessions as role models and encourage the enactment of positive social behaviors of children with AD/HD (DuPaul & Stoner, 2003). Indeed, research supports that including diverse peer group rather than using only children with disturbed behaviors increases the success of social skills training (Ang & Hughes, 2002).

Parent Training

Another most widely used form of psychosocial interventions for young children is parent management training (Barkley, 2006). Studies have shown that parent management training alters parental disciplinary practices, including reducing the frequency of coercive exchanges between parents and children, reduces parenting stress, enhances parental confidence, and improves family relationships (Anastopoulos, Shelton, DuPaul, & Guevremont, 1993; Bor, Sanders, & Markie-Dadds, 2002; Chronis, Chacko, Fabiano, Wymbs, & Pelham, 2004). In addition, parents are encouraged to consistently monitor their children to prevent antisocial behavior (e.g., physical aggression) and to prevent accidental injuries associated with impulsive behavior (DuPaul & Stoner, 2003). Positive future outcomes for all children has been associated with stable family environments, consistent discipline, positive parental expectations for their future, positive parents-child relationships, perceptions of competence perceived by parents, and low rates of parental criticism. Research indicates that behavioral treatment that teaches parents to modify their reactions to the child's primary symptoms, should directly alter parental negative responses, and also train parents to increase their positive responses to children (Barkley, 2006; Wells et al., 2000). However, it is also important to recognize that the use of family relationship as a positive corrective experience in changing the relationship patterns of the child requires insight and support over time (DuPaul et al., 2001; Podolski & Nigg, 2001). Family members should learn necessary skills to apply behavioral interventions in a supportive environment and gain knowledge to identify indicators of emerging negative manifestations that will need assessment and intervention modifications (Barkley, 2006). Observing the child/parent interaction and then coaching parents in providing corrective behavioral interventions can be used via home visits while utilizing an empathic approach to the child and parents. Even though extensive research documenting the importance of positive parenting practices in remediating

children with AD\HD's social relationship problems (Barkley, 2006; DuPaul et al., 2001; Podolski & Nigg, 2001), there is undoubtedly more to the etiological chain. In fact, research has shown that despite the success of training programs for parents of children with AD/HD, improvements in child behavior within the family do not significantly transfer to school or to other environments (Anastapoluos, Barkley, & Shelton, 1996). Anastopoulos and colleagues (1996) posit such programs work because they lower parental stress by teaching them to regard disruptive behaviors as less severe than previously thought. For example, the teaching of skills to ignore minor missteps is a common element in parental training programs (Barkley, 1997). Furthermore, parent training only treats one of the many environments of which a child is a part. Research suggests that the key to change is connecting conduct at home with conduct at school while creating a system of communication between the two (Goldstein & Goldstein, 1998).

Discussion

From an ecological perspective, behavior inextricably intertwined in the complex network of persons and environment (Cook & Plas, 1984). Interventions are most effective when key players from each ecology of the child's world are involved in the treatment team. According to Noam & Hermann (2002), an important dynamic in selecting an intervention for at risk young children is that we specifically need programs placed directly in the natural ecology and developmental context where children grow up and that bridge the different worlds that children inhabit. Therefore, a key to developing effective interventions for children with AD\HD may be to adopt an ecological perspective, collectively addressing all of the factors that impact a child's life. Within this perspective, it is viewed that three major dimensions of a child's life may likely to determine the degree of AD\HD symptoms. These dimensions include family, school, and child related characteristics and risk factors. Indeed, many researchers strongly argue that the

use of multiple treatment modalities in AD\HD produces therapeutic benefit greater than the sum of each modality's contribution (Barkley, 2006, Stormont, 2001). For example, Ozdemir (2006) have examined the effectiveness of the First Step to Success Program on decreasing social emotional and academic problems of Turkish children with AD\HD. Her findings are particularly important for the current paper because of the focus on implementing a multi-component early intervention program with children with AD\HD. Study results revealed that all participant children displayed increased levels of academic engagement behavior and decreased levels of social emotional problems with the introduction of the program and at three months and two years follow-ups. The results of this study indicate compelling evidence that implementing a multi-component early intervention program can yield important benefits for children with AD/HD.

In general, research supports that some current treatment approaches, if rigidly applied, could dramatically decrease certain symptoms of AD\HD in short term (Barkley, 2006). A multi-component approach, however, would result in an overall remission of the AD\HD symptoms which could serve as the basis of positive social emotional development (Ozdemir, 2006). Such an approach would remind us that risk factors to peer relationship problems of children with AD\HD are by no means simple or linear. Bowen's concept of triangles (Bowen, 1978) can be used to articulate the dynamic shifts of alliance and discordance that occur among persons and systems. The systems theory implies that all the interior angles of the triangle will influence and be affected by transactional relationships within the triangle. Specifically, peer relationship problems of children with AD\HD appear to be in part mediated by family relational variables, school variables, and child related variables and the dynamic relationships between these elements. Thus, interventions that link different variables in the family-school-child triangle will

benefit from a focus on the interactive nature of child problems.

Conclusion

Various intervention approaches to AD\HD are reviewed in this study. Even though these treatment approaches are all evidence based treatment approaches for treating AD\HD in different settings such as classroom and home, the research findings establishing these interventions generally contrast one of the treatment against a control group, rather than comparisons of their combination. Thus, critical questions remain to be answered regarding how different treatment approaches might be best combined into a more meaningful package. Furthermore, there is a compelling argument in favor of an increased emphasis on primary prevention efforts because of the heavy burden of suffering of AD/HD and the short-term effectiveness of the interventions (Kern et al., 2007; McGoey et al., 2002). Unfortunately, until recently, minimal research has been conducted to help practitioners in identifying and supporting young children at risk for this disorder. It is essential to note that these two critical research gaps emphasize the importance of continuing program of research to develop interventions that better meet the needs of children with AD\HD. Further advances in helping children with the disorder in having relationships that are more satisfying with peers depend upon the continued research efforts to address these critical research questions.

Finally, consideration of a systems perspective may lead to refinement of current intervention models. Narrow conceptual models miss the complex nature of the disorder. In contrast, the systems perspective emphasizes that the systems interface and what happens in one system is likely to affect the child's behavior in the other. From such a perspective, interventions would be implemented most effectively with reference to a wider family, school, and child framework. Without intervention, children with AD/HD will likely remain frustrated, angry,

stressed, unmotivated, and unsuccessful in school and they will carry these problems to their future. Thus, interventions need to offer an ecological and certainly longer-term enterprise to have long-term impact on children with AD\HD's peer relationship problems and overall quality of life.

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