Factors Associated with Healthy and Impaired Social Functioning in Middle-School Adolescents with ADHD

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Abstract

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Factors Associated with Healthy and Impaired Social Functioning in Middle-School Adolescents with ADHD

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There is variability in the extent to which adolescents with Attention Deficit Hyperactivity Disorder (ADHD) demonstrate social impairment, as the same diagnosis does not necessarily entail impairment in the same area of functioning. The current study is a cross sectional examination of enhancers to healthy social functioning and risk factors to social impairment in 324 middle school youth (ages 10-14 years) with ADHD, considering both parent and adolescent report of social functioning. A series of binary logistic regression analyses were used to evaluate risk-resilience models for social functioning, including testing compensatory (i.e., main; buffering) and protective (i.e., interaction) effects of enhancers in the presence of risk factors. Youth conduct problems, youth depression and negative parenting emerged as significant risk factors to social impairment. Adolescent self-perceived social acceptance, activity participation (breadth and intensity) and parental involvement acted as enhancers to healthy social functioning. Of these enhancers, activity participation and parental involvement showed buffering effects against the negative impact of the risk factors on social functioning. None of the enhancers displayed protective effects. The findings of this study enhance the knowledge pertaining to social functioning in a group of young adolescents with ADHD, which has been an understudied population relative to younger children with similar problems.

Keywords: adolescents, ADHD, social functioning, risk factors, resilience

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Table of Contents

Page

List of Tables

Page

List of Figures

Page

Introduction

About half of children with Attention Deficit Hyperactivity Disorder (ADHD) are socially impaired (e.g., MTA Cooperative Group, 1999; Pelham & Bender, 1982), but many youth with ADHD experience healthy social functioning (Nijmeijer et al., 2008). To meet diagnostic criteria for ADHD, an individual must exhibit clinically significant impairment in social, academic or occupational functioning (American Psychiatric Association [APA], 2013). This means that the degree and type of impairment varies among youth with ADHD, as individuals with the same diagnosis do not necessarily exhibit impairment in the same area of functioning. Thus, factors beyond a diagnosis of ADHD must explain why some adolescents with the disorder are socially impaired, while others display social functioning in or above the normal range.

The social impairments experienced by youth with ADHD can be debilitating, resulting in both short- (e.g., Greene et al., 2001) and long-term (e.g., Bagwell, Molina, Pelham, & Hoza, 2001) negative outcomes. Whether these problems stem from inattention or hyperactive/ impulsive symptoms or are associated with comorbid externalizing or internalizing disorders, youth with ADHD experience peer rejection (e.g., Mrug, Hoza, & Gerdes, 2001), and social adaptation problems (e.g., Hinshaw, Owens, Sami, & Fargeon, 2006). Overall, compared to their peers, youth with ADHD display social impairment that contributes to poor overall functioning and low quality of life (Wehmeier, Schacht, & Barkley, 2010).

Perhaps in an attempt to identify problems that can be corrected, most research on social functioning in youth with ADHD has been focused on detecting risk factors associated with impairment or social deficits. Some studies points to characteristics of the

child related to ADHD (e.g., severity of ADHD symptoms; Graziano, Geffken, & McNamara, 2011), or to comorbid disorders (e.g., Becker, Luebbe, & Langberg, 2012), as constituting risk factors that may be negatively correlated with healthy social functioning. Other studies indicate risk factors such as features of the parent (e.g., maternal ADHD symptoms; Griggs & Mikami, 2011) or parenting tactics (e.g., negative parenting; Kaiser, McBurnett, & Pfiffner, 2011). Albeit identifying issues that can be corrected is important in addressing social impairment, focusing only on risk factors may lead to a neglect of other possible ways of understanding the mechanisms involved in healthy social functioning.

Identifying factors associated with good social functioning (henceforth referred to as enhancers or enhancing factors), may increase our understanding of the existence of healthy social functioning in the presence of inattention and/or hyperactivity/impulsivity symptoms. The scarce research on enhancing factors from the ADHD literature includes findings supporting the association of positive parenting with child social skills (Kaiser et al., 2011). Research with typically developed youth identified the child's self-perceived social acceptance (e.g., McElhaney, Antonishak, & Allen, 2008), participation in activities with peers (e.g., Fredricks & Eccles, 2005), as well as parental involvement (El Nokali, Bachman, Votruba-Drzal, 2010) as variables related to good social functioning. In adolescence, individuals switch from many peer relationships to few close friendships, which helps them transition into early adulthood and set the building blocks for developing long term romantic relationships in adulthood (Bagwell, Schmidt, Newcomb, & Bukowski, 2001). Thus, adolescence may be a critical period for the development of social competencies, with implications for current and future social functioning.

Conceptualization of Social Functioning

Several theoretical frameworks have been proposed in both the developmental and the ADHD literatures for the conceptualization of social functioning. These theoretical models are reflected in the measures used in social functioning research.

Models of Social Functioning

Most definitions pertaining to the social realm offer some explanation of the terms "social competence" or "social impairment." The developmental literature underscores the notion of social competence. Rose-Krasnor (1997) posited that socially competent youth possess and demonstrate desirable skills. Dirks, Treat, and Weersing (2007) viewed the way in which the individual applies these skills in a given social context, as evaluated by significant others (e.g., peers, parents, teachers etc.), an equally important component of social competence. The clinical models employ a social impairment perspective. Although not tested in youth with ADHD, Gresham's (1988) model of childhood global social impairment includes social cognition deficits, the absence or poor use of prosocial behaviors and interferences (e.g., behavior disinhibition, aggression) to learning of social skills and performance. In her ADHD-focused review, Nixon (2001) unpacks social competence into: (1) social functioning: performance of skills or specific behaviors appropriate for a social situation, (2) requisite cognitive skills: internal cognitive structures pertaining to competent behavior (e.g., interpreting and understanding the social behavior of others, recognizing social problems, generating effective solutions, being mindful of the consequences of actions; (Erwin, 1994), and (3) outcomes of social functioning: consequences of social functioning, including evaluation of social competence by others (Dodge & Murphy, 1984; Cavell, 1990). In the current study,

social functioning is conceptualized in line with Nixon's (2001) definition of the first component.

Measures of Social Functioning

Both direct and indirect approaches to capturing social functioning have been proposed and are discussed below. Direct approaches to investigate social functioning examine in vivo behavior in either naturalistic or laboratory settings. Observations of adolescents' social behaviors in the natural environment are rare because many of their social interactions occur in the absence of adults, some of their relational behaviors may be too subtle to be observed, and adolescents tend to be more self-conscious of observation than young children (Inderbitzen, 1994). A structured observational procedure for adolescents was developed by Englund, Levy, Hyson, and Sroufe (2000) and consists of evaluating the youth's social behavior in a small same-sex group, during a task of deciding how to spend $150. Even though observational methodological techniques have a high level of ecological validity and are rich in qualitative and quantitative information (Thomas, Shapiro, DuPaul, Lutz & Kern, 2011), their feasibility is limited. Factors such as restricted time, limited training and financial constraints make it less likely for observation to be used (Hintze, Volpe, & Shapiro, 2002). Furthermore, observations are mostly intended for identifying target behaviors for intervention (Elliott, Malecki, & Demaray, 2001), and are less useful in providing a clear understanding of the extent of social impairment, as the youth's behavior is likely to vary across different contexts (Erdley, Nangle, Burns, Holleb, & Kaye, 2010). Measures of social functioning include self or informant reports, which are obtained via peer sociometrics, interviews, or rating scales (Thomas et al., 2011). Sociometric assessments encompass the combined

judgment of peers with regard to both behavioral and affective components of social competence (Poulin & Dishion, 2008) and can be predictive of adaptive and maladaptive social outcomes (Parker, Rubin, Erath, Wojslawwowicz, & Buskirk, 2006). However, in adolescence, youth interact with a wide range of peers, making it difficult to accurately select the best peer informants for peer sociometrics (Erdley et al., 2010). Interviews from teachers, parents, peers and the adolescents themselves can provide rich qualitative information pertaining to the antecedents and consequences of the target social behavior (Cavell, Meehan, & Fiala, 2003) and may offer explanations for sociometric ratings (Bierman, 2004). Therefore, interviews are more useful for clarification purposes, rather than for the identification of competence or impairment in social functioning. Rating scales are considered the first line of assessment for investigating social functioning (Merrell, 2001) because they are effective, time-efficient and provide information that is inaccessible to other assessment techniques (Erdley et al., 2010). Specifically, rating scales capture various aspects of the adolescent's behavior as observed by multiple informants across time and contexts, including behaviors with low frequency or that may be difficult to notice through observation. Two broadband scales that are frequently used in research and clinical practice are the Behavioral Assessment for Children (BASC-2; Reynolds & Kamphaus, 2004) and the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), both of which provide comprehensive assessments of youth behavior via standardized, parallel ratings by multiple informants (i.e., parents, teachers, adolescents). The Social Skills Improvement System – Rating Scales (SSIS-RS; Gresham & Elliott, 2008) is more specific than the BASC and the CBCL and is viewed as the most comprehensive rating scale instrument of social functioning (Erdley et al., 2010). The

SSIS-RS assesses both positive social behaviors and problem behaviors and includes forms available for multiple informants (i.e., youth, parents, teachers) and for various developmental levels (ages 3 through 18 years). Importantly, the SSIS-RS is highly recommended for assessment of social functioning due to its utility in interventions, reliability and validity (Demaray, Ruffalo, & Carlson, 1995). Additionally, the SSIS-RS allows for measurement of social skills as they appear broadly across contexts, hence not limiting social functioning to any one area (e.g., relationship with peers, parents, siblings, teachers). Although the SSIS-RS has its own limitations in that it (a) does not cover facets of social competence such as requisite cognitive skills and outcomes of social functioning and (b) was not designed specifically for the adolescent population, but rather for a wide range of youth (i.e., ages 3 through 18 years), it is the best currently available instrument. Therefore, in the current study, social functioning is measured via the SSIS-RS.

Typical Social Development in Early Adolescence

The developmental literature helps establish normative expectations for adolescent social development and provides guidance in the investigation of factors implicated in healthy and impaired social functioning in youth with ADHD. Notably, in early adolescence (i.e., ages 10 to 14 years), most youth, and not only those with ADHD, experience difficulties in social functioning. Young adolescents struggle with transitioning from childhood into adolescence, because this is a time characterized by many changes in social interactions.

Early adolescence is a period of negotiation of autonomy-related changes (Steinberg, 2001) and a time of battling differences in expectations and ideas about social conventions (Collins, 1990; Smetana, 1988). Despite parent-teen conflict, about two thirds of young adolescents report having happy relationships with their parents (Rutter, Graham, Chadwick, & Yule, 1976). Overall, in spite of the young adolescents's strive for autonomy, parents still play an important role in their social life. Thus, parenting factors should be considered as possible enhancers of healthy social functioning.

Young adolescents are concerned about peer acceptance and popularity and view their friends as sources of advice and comfort (Gould & Mazzeo, 1990) and as a platform of information about the social world outside their family (Santrock, 2001). Given the important role of peers in adolescent development, it may be that participation in activities with peers enhances healthy social functioning. Furthermore, considering the preocupation of young adolescents with peer acceptance, self-perception of social acceptance may also be a relevant to consider when examining enhancers to social functioning.

The many changes in social development and neurobiological theories related to pruning of synaptic networks in response to social learning in adolescents (Nelson, Leibenluft, McClure, & Pine, 2005) suggest that early adolescence is arguably one of the optimal times for examining factors that enhance or put at risk healthy social functioning. Given that social development in adolescence involves transitions to more complex social interactions and multiple agents (i.e., parents and peers), the developmental literature can be informative about factors that may enhance healthy social functioning, such as parenting practices, the adolescent's involvement in activities with peers, the youth's self perception of social acceptance, as well as being close in age with relevant peers.

Social Impairment and ADHD

Adolescents with ADHD typically exhibit various degrees of impairment in several areas of social functioning. Although some may not exhibit any social problems, many youth with ADHD have some level of social deficit. These deficits manifest in a variety of behaviors including alienating intrusive behaviors and irresponsibility. Social impairment warrants concern, as it has important consequences for the individual's social development and his/her potential for success in other domains of functioning (e.g., academics, vocations, citizenship).

Manifestations and Consequences of Social Impairment in Youth with ADHD

Parent and teacher ratings of teenagers with ADHD indicate poorer social competence, fewer social activities and fewer friends relative to comparison teens (Barkley, Anastopolous, Guevremont, & Fletcher, 1991). Albeit children with ADHD appear to possess knowledge about what they should do in social situations and can generate solutions to hypothetical social problems (Whalen & Henker, 1985), they show difficulties in understanding and generating appropriate responses to video-recorded social situations (Sibley, Evans & Serpell, 2010). Inattention problems hinder the adolescents' ability to learn social skills through observation (e.g., Mrug et al., 2001), to notice social cues relevant in social interactions (Landau & Milich, 1988), and to acquire appropriate social performance skills (Barkley, 2000). Hyperactivity and impulsivity symptoms contribute to the manifestation of unrestrained, overbearing interactional style and aggressive behavior of youth with ADHD and to the subsequent formation of aversive perception by others (Mrug et al., 2001; Whalen & Henker, 1992). Adolescents with ADHD may be intrusive and disruptive in ongoing social interactions and display

flaunting or silly behavior (Wehmeier et al., 2010). Overall, inattention and/or hyperactive/impulsive symptoms are unique contributors to social problems, above the challenges posed by social development in early adolescence.

The social problems exhibited by youth with ADHD have significantly debilitating short- and long-term consequences that place youth with ADHD at a higher risk for pervasive negative outcomes compared to their peers without ADHD. For example, poor social functioning has been associated with later social adjustment difficulties in adulthood (Bagwell, Schmidt, et al., 2001), academic performance problems (Flook, Repetti, & Ullman, 2005), substance abuse (Semrud-Clikeman & Shafer, 2000), and delinquency and psychopathology (Wheeler & Carlson, 1994). Most children with ADHD experience continuing impairments in psychosocial adjustment through adolescence (Hinshaw et al., 2006) and even through adulthood (Faraone, Biederman, & Mick, 2006; Mannuzza, Klein, & Moulton, 2003). These life-long consequences of social impairment suggest that finding ways to adress social impairment or enhance healthy social functioning in youth with ADHD is critical to their future social success and quality of life.

Factors Contributing to Impaired and Healthy Social Functioning

The few existing theories aimed at explaining social impairment in youth with ADHD are generally vague, and have little empirical support. Reviews of social competence in ADHD (e.g., Nixon, 2001) highlight social cognition mechanisms involved in the impairment displayed by children with ADHD. Other mechanisms, such as a need for optimal stimulation (Zentall & Zentall, 1983) or for delaying aversion (Sonuga-Barke, Taylor, Sembi, & Smith, 1992), have also been proposed to indirectly contribute to social impairment in ADHD. Albeit cognitive processes may mediate the relationship between risk factors or enhancers and social functioning, social problems ultimately manifest via behavioral deficits, highlighting behavior as the key outcome of social interactions. Therefore, in the current study, only the behavioral component of social functioning will be considered. The following is a discussion of studies that investigated risk factors and enhancers to social functioning as pertaining to behavioral outcomes. Notably, several studies discussed below include participants who are younger than the age group under investigation in the current study; this reflects the limited existing literature pertaining to adolescent samples.

Risk Factors for Social Impairment

Perhaps in an attempt to identify problems that can be corrected, the research on social functioning in youth with ADHD has identified risk factors that may be associated with impairment or social deficits. Some of these risk factors are related to the youth and his/her psychopathology, whereas others pertain to parent symptoms or behaviors.

Factors pertaining to the child. Possibly the most obvious factor associated with social impairment, given the impact of inattention and hyperactivity/impulsivity on social

functioning, is the severity of ADHD symptoms. Graziano and colleagues (2011) regressed social functioning onto ADHD symptom severity in youth (M_{age}=11.3 years; range: 6-18 years). Unsurprisingly, they found that the severity of ADHD symptoms was significantly associated with social functioning, which was in line with previous studies reporting that high symptom severity is related to low levels of social functioning (Jarett & Ollendick, 2008; Hinshaw & Melnick, 1995). Similarly, in a sample of children aged five to 11 years, Kaiser and colleagues (2011) determined that mother and teacher reports of ADHD severity linked to poor child social skills. These results were also confirmed by Griggs and Mikami (2011) who found that child ADHD status (i.e., ADHD vs. non-ADHD) had a main effect in predicting mother and teacher ratings of social problems in children aged six to 10 years. Although the measures and algorithm used to determine child severity of ADHD and social functioning differered across these studies, there is evidence for an association between symptoms of ADHD and social impairment, which is consistent with expectations based on diagnostic criteria of ADHD.

Graziano and colleagues (2011) also found that children with ADHD who had greater comorbid externalizing symptoms and atypical behaviors experienced worse social functioning, even after controlling for ADHD symptom severity. Booster, DuPaul, Eiraldi, and Power (2012) showed that the presence of a comorbid externalizing disorder (i.e., ODD or CD) was associated with higher social problems in five to 16 year olds. In another study (Mikami & Lorenzi, 2011), comorbid conduct problems was associated with peer acceptance and rejection in children between the ages of six and 10 years. Although studies examining the unique contribution of externalizing symptoms (i.e., conduct problems) point to either no effect on or an exacerbation of social impairment in

youth with ADHD, results concerning the additive impact of internalizing symptoms are mixed (Becker et al., 2012). Blackman, Ostrander, and Herman (2005) found that children (ages six to 11 years) diagnosed with ADHD and depression had lower scores on a latent construct of social compentence. Similarly, Mikami, Ransome, and Calhoun (2011) found that, in a sample of children aged six to 10 years, anxiety symptoms were significantly associated with both parent and teacher reports of poor social skills and more social problems, even after controlling for demographic covariates and ADHD and ODD. Although both of these studies (i.e., Blackman et al., 2005; Mikami et al., 2011) provide evidence that internalizing symptoms can uniquely relate to social impairment in youth with ADHD alone, most research findings show that, in youth with ADHD, internalizing disorders have a contribution only in the presence of additional externalizing disorders (e.g., ODD, CD). For example, Booster and colleagues (2012) found an association between the presence of internalizing disorders and higher social problems in youth with ADHD and a comorbid externalizing disorder (i.e., ODD, CD), but not in youth with ADHD only. Given the high rates of comorbidity with ODD/CD (45-84% of youth with ADHD) and with internalizing disorders (c.c.a. 50% of youth with ADHD) (Barkley, 2006), comorbidity is clearly important to consider. Overall, whether in the form of comorbidity or trimorbidity, externalizing and internalizing disorders may be associated with higher social impairment, suggesting that adolescents with ADHD who have additional psychopathology may be more impaired than their peers with ADHD only and may thus necessitate additional support or more targeted treatment.

Factors pertaining to the parent. Griggs and Mikami (2011) demonstrated that mothers' inattentive and hyperactive/impulsive symptoms were associated with social

difficulties in their children, above and beyond the effect of child ADHD status (i.e., ADHD vs. non-ADHD). In this case, the mother's struggle with her own symptoms of ADHD may have a trickle-down effect on the child's social development. Aside from parental ADHD symptoms, Kaiser and colleagues (2011) found that high levels of mother and father negative parenting were associated with lower child social skills in five to 11 year olds. In addition to the direct relationship between negative parenting and child social problems, negative maternal parenting also partially mediated the relationship between child ADHD symptom severity and social outcomes. Whether related to the child or the parent, identifying issues that can be corrected through interventions is important in addressing social impairment; however, focusing only on risk factors may lead to a neglect of other possible ways of understanding the mechanisms conducive to healthy social functioning, hence highlighting a need for examining factors that can augment social functiong.

Enhancing Factors for Healthy Social Functioning

Unlike the research on risk factors, few studies with individuals with ADHD have examined variables related to healthy social functioning. Although one could extrapolate from the risk factors literature and infer that the low (i.e., healthy) end of the risk factor spectrum is associated with healthy social functioning, such an approach can be problematic. Specifically, this method is focused on the normal to impaired range and does not consider the exceptional or above normal range of social functioning. Therefore, in a linear regression analysis intended to predict social impairment, a factor that may substantially enhance social functioning or predict exceptional social functioning may yield only a small correlation and may be disregarded as a contributing factor to social

functioning. Despite the scarcity of information that can be obtained from ADHD research, borrowing from the developmental literature may help construe a more comprehensive picture of possible enhancing factors of social functioning. As is the case with risk factors, some factors related to healthy social functioning pertain to the parent or to the youth.

Factors pertaining to the parent. Important parent-related variables are positive parenting and parental involvement, which have been studied with an ADHD sample. Specifically, in their investigation of five to 11 year olds, Kaiser and colleagues (2011) found that both mother and father positive parenting, asssessed as a composite of parent involvement, positive parenting and parental warmth, were linked to high child social skills. Similarly, a study conducted with typically developed children who were followed across first, third and fifth grades, showed that high parental involvement predicts improvement in the children's social skills and a reduction in problem behavior (El Nokali et al., 2010). Collectively, the results of these two studies provide evidence for the impact of parenting practices in determining adequate social development in both typically developed children and in youth with ADHD. Other factors indentified in the developmental literature may also be associated with good social outcomes in youth with ADHD.

Factors pertaining to the child. One overlooked factor that may related to social functioning could be the age of the adolescent relative to his/her peers from the same classroom or cohort. Social development occurs in stages that involve transitions from same-sex friendship groups (LaFreniere, Strayer, & Gauthier, 1984) to mixed-sex friendships (Poulin & Pedersen, 2007), to dyadic relationships, which can transform in

romantic relationships in middle and late adolescence (Dunphy, 1963). Although no studies have investigated this issue, given that (a) early adolescence is right at the cusp of transitioning from same-sex group friendships to relationships with other-sex peers and (b) some children from a cohort are chronologically younger or older than most of their peers, some children may be at a disadvantage because they have either not transitioned to the next social developmental stage or have transitioned faster than their peers. Having a level of "social maturity" that is line with that of same-cohort peers may enhance social functioning, as the adolescent has the opportunity to practice his/her social skills with peers who are at the same social developmental level.

Another child-related factor that may contribute to healthy social functioning is self-perceived social acceptance. In a study with typically developed youth, McElhaney and colleagues (2008) found that self-perceived social acceptance at age 13 predicted adolescent social success at age 14, regardless of their level of sociometric popularity. This suggests that, in early adolescence, having positive self perceptions of social acceptance can yield good social outcomes, even when the adolescent is not broadly popular. It is unclear if this finding will apply to young adolescents with ADHD as many of them have self-appraisals that are less consistent with their actual levels of social functioning than youth without the disorder (Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). Given that self-perceptions predicted social success even when unrelated to popularity, this discordance between self-perceived and actual may not matter and therefore the finding may be equally applicable to youth with ADHD.

Lastly, other contributors to healthy social functioning highlighted by the developmental literature are related to activity. Specifically, two factors associated with

positive adolescent friendships are: (a) activity participation intensity, which refers to the time spent engaging in a particular activity and (b) activity breath, which pertains to the variety of activity participation. Mahoney and Stattin (2000) found that participation in a leisure activity was related to a higher number of after-school friends in 14-year old youth. Similarly, Fredricks and Eccles (2005) showed that this effect holds even in high-school, as participating in school-based extracurricular activities was associated with belonging to a prosocial peer network. Moreover, both activity intensity and activity breath were related to stronger interpersonal bonds in 13 to 18 year olds (Rose-Krasnor, Busseri, Willoughby, & Chalmers, 2006). These findings highlight the role of social activity in securing good peer relationships, suggesting that extra-curricular activity could enhance social functioning.

Methodological Considerations

In investigating factors associated with social functioning, it is important to consider both the relevant sources of information and the appropriate models for testing risk-resilience issues.

Informant Reports of Social Functioning

Evidence-based guidelines for assessment of ADHD (e.g., Pelham, Fabiano, & Massetti, 2005) include recommendations for collecting multiple informant reports of symptoms and impairment. For children with ADHD, such reports are usually collected from parents and teachers. However, obtaining information about adolescents' social functioning poses unique challenges due to important developmental changes. Young adolescents spend more unsupervised time with friends and other peers than they had done in childhood (Fuglini & Eccles, 1993) and the time spent with peers outweighs the time spent with parents and other family members (Csikszentmihalyi & Larson, 1984). Therefore, the parent perspective about their adolescent's social functioning may be grounded in fewer data points, given that they have less opportunity to observe their adolescents in social interactions. Adolescents emerge as important informants about their own functioning. Although both parents and adolescents are biased by their own perception and limited to the data to which they have access, it is difficult to ascertain that one report is better than the other. Parent report captures social functioning from an observer's standpoint, whereas youth report encompasses social functioning from the perspective of an active participant to social interactions. Parents may be biased by their own goals for the adolescent and the value they place on social functioning relative to other areas (e.g., academic functioning). Adolescents may be influenced by positive

illusory bias (Owens et al., 2007), but they may also have more comparison benchmarks in the peers with whom they spend time. By examining both parent and adolescent reports of social functioning, a more comprehensive picture of risk and enhancing factors can be built.

A Methodological Model for Testing Risk and Resilience

Given the heterogeneity of social impairment among youth with ADHD, examining factors that distinguish between youth with ADHD who have healthy versus impaired social functioning can be crucial to our understanding of the issues that can impact youth's social development. If testing risk factors is relatively straightforward via the use of multiple regression analyses (method employed by most studies reviewed above), testing enhancing factors is generally done by using complex models of resilience. One such model, the variable-focused approach to resilience, entails the use of multivariate statistics to test for potential individual or environmental factors that may protect the individual from risk (Masten, 2001). To this end, in a hierarchical regression analysis, the risk factor would be introduced in the first step and the proposed enhancing factor would be introduced in the second step. A significant main effect of the enhancing factor (also known as positive asset or buffer), in the presence of the risk factor, would represent a compensatory effect. In other words, the buffer would counterbalance the negative effect of the risk factor, thus offseting the consequences experienced by the individual due to the influence of adversity. In the third step of the regression analysis, the interaction between the risk factor and the enhancer would be introduced; if significant, this would yield a protective effect. In other words, the effects of adversity would be moderated by the enhancer (in this case, protective factor), whereas the

enhancer may be more important at high rather than at low levels of risk with regard to any given outcome variable, depending on the results of the post-hoc analyses. Figure 1 provides a pictorial depiction of buffering and protective effects.

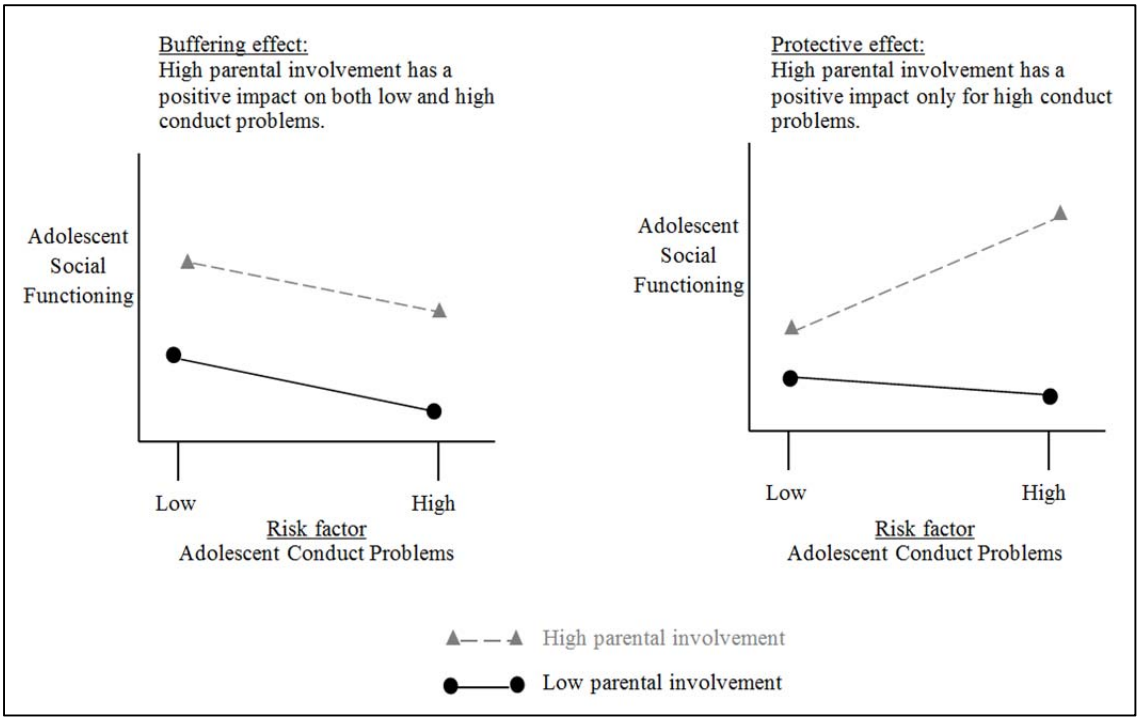

Figure 1. Pictorial depiction of buffering and protective effects. In this example, parental involvement is the enhancing factor and conduct problems represent the risk factor. Social functioning is the outcome variable.

In relation to social functioning, Mikami and Hinshaw (2003) used this methodology to investigate the effects of popularity with adults and engagement in solitary play on aggression and depressed/anxious behavior, in the presence of peer rejection, in youth with ADHD. Mikami and Hinshaw (2006) have also successfully employed this methodology within the context of a longitudinal study, in which the

outcome measure included assessments at baseline and at a 5-year follow up of externalizing and internalizing behavior, academic achievement, eating pathology and substance use. Although these studies provide evidence that the variable-focused approach to resilience model is applicable in investigations pertaining to social functioning, Mikami and Hinshaw's research also has some limitations. First, they used a sample of girls with and without ADHD, hence making it difficult to draw conclusions that may be generalizable to the clinical population of individuals with ADHD. Second, their outcome measures represent indices of behaviors associated with social functioning (e.g., agression), but only capture one small facet of the construct of social functioning. Third, their rationale for the chosen protective factors under investigation is unclear. The argument that popularity with adults may protect against the negative impact of peer rejection on various behaviors or psychopathology appears circular, as being liked by peers and adults may represent the same construct of social functioning. Thus, saying that popularity with adults buffers against peer rejection is as if saying that good social functioning buffers against poor social functioning. Fourth, Mikami and Hinshaw used multiple regression analyses that allowed them to investigate continuous outcome variables. However, the downside of this approach, as opposed to using a dichotomous outcome meausure and logistic regression, is that conclusions cannot be drawn with regard to the association of risk/enhancing factors with healthy and impaired patterns of behavior. The current study is intended to build on the model used by Mikami and Hinshaw in their studies and at the same time, address some of the aforementioned limitations.

Purpose of the Current Study

The primary purpose of the current study is to identify factors that distinguish between adolescents with ADHD who have healthy versus impaired social functioning. Importantly, this study is an investigation of a clinical sample composed of both boys and girls, intended to highlight risk and resilience issues as they pertain to adolescents with ADHD in particular. Moreover, the chosen outcome measure is deliberately one that captures a broader measure of social functioning, rather than one focused on any particular subdomain (e.g., relationships with peers, parents). Yet, it is one that clearly captures the construct of social functioning and not a latent variable such as behavior associated with social problems (e.g., aggression). Furthermore, variables considered as risk or enhancing factors have been chosen based on findings from previous ADHD and developmental literature and have been carefully selected to represent distinct constructs that may be associated with healthy or impaired social functioning. To this end, I hypothesize that factors such as youth symptoms of ADHD, youth externalizing symptoms (i.e., ODD, CD), youth depressive and anxiety symptoms, parent symptoms of ADHD and negative parenting will be predictive of membership to the impaired social functioning category, whereas factors such as youth age relative to other adolescents in the classroom, self-perceived social acceptance, youth activity participation (breadth and intensity), positive parenting and parent involvement will predict membership in the healthy social functioning category, when considering only youth, only parent or both accounts of social functioning. Secondly, I aim to explore the extent to which enhancers identified as significant in the previous analysis are compensatory (i.e., buffering, main effects) and/or protective (i.e., interaction effects) toward social functioning, in the

presence of risk factors. Therefore, the current study is structured around two research questions (RQs), namely: RQ1 - What enhancing and risk factors significantly predict membership to a healthy versus impaired social functioning category when: (a) only the adolescent account of social functioning is considered; (b) only the parent account of social functioning is considered; (c) both adolescent and parent accounts of social functioning are considered and these accounts are congruent with one another? RQ2 - In the presence of risk factors, what enhancing factors show a significant: (a) compensatory effect pertaining to social functioning?; (b) protective effect pertaining to social functioning?

Method

Participants

Participants were 324 youth (71.3% Male, 77.5% Caucasian) of ages 10 to 14 years (*M*=12.22 years), who were in sixth through eighth grade and received a diagnosis of ADHD, Predominantly Inattentive or Combined Type. Children were recruited from nine middle schools in Ohio and Kentucky, within the context of a large-scale grant-funded study. Eligible children participated in the Challenging Horizons Program (CHP), an after-school program designed to improve the success of students with ADHD in three primary areas of functioning (i.e., interpersonal behavior, academic success, and family functioning). Parents/caregivers of participants who attended the clinical interview and completed several ratings scales were the children's mothers (79.5%), fathers (13.3%), grandmothers (3.6%), cousins (1.2%), adoptive mothers (1.2%), or adoptive fathers (1.2%).

Procedures

Recruitment. Participants in this study were part of a randomized clinical trial (i.e., the Challenging Horizons Program). The study was approved by the Institutional Review Board at the two participating sites from which activities were supervised (i.e., Ohio University and Cincinnati Children's Hospital and Medical Center). In March and April preceding each school year, direct study announcement letters were sent to families, direct referral from school staff were received, and recruitment flyers were mailed to the families of all students enrolled in participating secondary schools during the 2010-2011, 2011-2012, and 2012-2013 school years. Parents/caregivers who responded to recruitment appeals subsequently completed a phone screening interview that included

questions about inattention symptoms and previous diagnosis of ADHD. Children whose parents endorsed more than four inattention items on the Disruptive Behavior Scale or confirmed a previous diagnosis of ADHD were invited to complete a clinical evaluation for the purpose of participating in the study.

Evaluations. The parents/caregivers and children invited for a clinical evaluation completed a consent/assent procedure. Next, the parent/caregiver accompanying the child to the evaluation participated in a diagnostic interview. Both the youth and the parent/caregiver completed several rating scales. Additionally, children also completed four subtests of the Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV, Wechsler, 2003). Parents and adolescents were compensated for their participation in the initial evaluation. In line with research recommendations that assessment of ADHD should include data from multiple sources (Pelham, Fabiano, et al., 2005), participating children's four core teachers (Math, Science, Language Arts, and History) were also asked to complete several rating scales relevant to assessment and were subsequently compensated.

Results from the initial evaluations derived from child, parent and teacher reports were reviewed by the clinicians at each site at bi-weekly consensus conferences. Diagnosis of ADHD was determined by administration of the parent version of the Children's Interview for Psychiatric Syndromes (P-ChIPS; Weller, Weller, Rooney, & Fristad, 2009), combined with parent and teacher ratings on the Disruptive Behavior Disorders rating scale (DBD; Pelham, Gnagy, Greenslade, & Milich, 1992) and on the Impairment Rating Scale (IRS; Fabiano et al., 2006). Diagnoses and eligibility decisions were made by unanimous agreement among clinicians.

In order to participate in the rest of the study, participants had to meet certain inclusionary criteria. Specifically, they had to (1) attend one of the nine participating schools; (2) meet full DSM-IV-TR diagnostic criteria for ADHD, Inattentive or Combined-type; (3) demonstrate impairment based on parent or teacher report on the Impairment Rating Scale (IRS; Fabiano et al., 2006); (4) have an IQ of 80 or above as estimated using the WISC-IV and (5) not meet diagnostic criteria for a primary diagnosis of a pervasive developmental disorder or any of the following: Bipolar Disorder, psychosis, or Obsessive–Compulsive Disorder. Only data collected at baseline (before random assignment) was included in the current study, as the effects of treatment on the variables being considered are not relevant to this research.

Measures

Children's Interview for Psychiatric Syndromes - Parent Version (P-ChIPS; Weller, Weller, Rooney et al., 2009). The P-ChiPS is a semi-structured diagnostic parent interview that is aimed at screening 20 Axis I mental health disorders based on the DSM-IV (APA, 1994) criteria in youth of ages six to 18 years. Research shows that the P-ChIPS is a valid measure for diagnosing psychiatric disorders in children (Weller, Weller, Fristad, et al., 2000) and demonstrates satisfactory sensitivity (average of 87% across diagnostic categories) and specificity (average of 76% across diagnostic categories) (Fristad, Teare, Weller, Weller, & Salmon, 1998). Agreement between the child and the parent versions of the instrument was low to moderate, with kappa coefficients ranging from .12 (ADHD) to .60 (Encopresis) and an average kappa coefficient of .45; similarly, agreement between the P-ChIPS and clinician diagnoses was moderate with an average kappa coefficient of .49 (Fristad et al., 1998).

The Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV; Wechsler, 2003). The WISC-IV is a clinical instrument for the assessment of cognitive abilities in children of ages 6 to 16 years. It contains ten core subscales and five supplementary scales. For the purpose of establishing inclusionary criteria in the CHP study, children were administered only four subscales of the WISC-IV (i.e., Vocabulary, Block Design, Digit Span and Coding). The WISC-IV has outstanding reliability, with internal consistency coefficients ranging from .82 to .94 for Vocabulary, from .83 to .88 for Block Design, from .81 to .92 for Digit Span and from .72 to .89 for Coding (Wechsler, 2003).

Impairment Rating Scale (IRS; Fabiano et al., 2006). The IRS is a 6-item scale that includes teacher or parent ratings of peer relations, relationship with teacher, academic progress, classroom functioning and self-esteem, as well as an overall severity of impairment and need for treatment rating. Scores range from 0 (*no problem*) to 6 (*extreme problem*) and have a cut-off score of 3, indicating impairment. The IRS showed good temporal stability with one-year correlations for the individual items and average IRS score ranging from .40 to .67 (Fabiano et al., 2006). Correlations with similar measures yielded good concurrent validity with coefficients ranging between .30 and .80 (Fabiano et al., 2006). The IRS was used to determine the impairment criterion in the diagnosis of ADHD.

Risk factors. ***Disruptive Behavior Disorders (DBD) Scale (Pelham, Gnagy et al., 1992).*** The DBD rating scale contains 45 items that correspond to DSM-IV-TR symptoms for ADHD, Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD). Items are rated on a four-point scale from 0 (*not at all present*) to 3 (*very much*

present). The DBD rating scale is completed by both parents and teachers. The teacher version of the DBD showed internal consistency estimates for the four subscales as follows: .67 for inattention, .67 for hyperactivity/impulsivity, .81 for ODD, and .92 for CD (Molina, Pelham, Blumenthal, & Galiszweski, 1998). Inter-rater reliability across multiple teachers' ratings of 13 to 18 year-old adolescent boys has been reported as .48 for the inattention scale, .46 for the impulsivity-overactivity scale, .53 for the oppositional defiant scale, and .49 for the conduct disorder scale when reliability was calculated only for two randomly selected teachers (all correlations $p < .01$; Molina et al., 1998). The parent version of the DBD also showed acceptable internal consistency and construct validity of the inattention and hyperactivity/impulsivity scales which significantly correlated with similar subscales of the Conners Parent Rating Scale (DuPaul, Power, McGoey, Ikeda, & Anastopolous, 1998). In the current study, reliability coefficients for parent report were: .86 (inattention), .89 (hyperactivity/impulsivity), .90 (ODD), and .77 (CD). Both parents and teachers completed this measure in order to establish the presence of ADHD, ODD and CD symptoms for adolescents with disruptive behavioral problems. Furthermore ADHD severity was determined by adding the scores on the parent completed ADHD items.

The Reynolds Adolescent Depression Scale – second edition (RADS-2; Reynolds, 2002). The RADS-2 is a 30-item self-report measure intended to assess depression severity in clinical and non-clinical individuals, ages 11 to 20 years. Each item is rated on a 4-point scale, from 1 (*Almost never*) to 4 (*Most of the time*), with higher scores representing a greater level of depressive symptoms. The RADS-2 had an overall

internal consistency of .93, with reliability coefficients for the subscales ranging from .80 to .87 (Reynolds, 2002).

The Multidimensional Anxiety Scale for Children – long version (MASC; March, 1997). The MASC is a 39-item self-report measure of anxiety symptoms in individuals of ages 8 to 19 years. The items are rated on a 4-point scale, ranging from 0 (*Never true about me*) to 3 (*Often true about me*). The MASC demonstrated very good internal consistency for the overall instrument (r = .90) (March, Parker, Sullivan, Stallings, & Conners, 1997).

The Conners' Adult ADHD Rating Scale (CAARS; Conners, Erhardt, & Sparrow, 1999). The CAARS is a 30-item self-report measure aimed at assessing the presence and severity of ADHD symptoms in adults. Conners, Erhardt, Epstein, Parker, Sitarenios, and Sparrow (1999) found a 4-factor structure for the CAARS, containing dimensions addressing (1) inattention/cognitive problems, (2) hyperactivity/restlessness, (3) impulsivity/emotional liability, and (4) problems with self-concept. The four scales represented on the CAARS demonstrate both high internal consistency (α = .86 - .92) and strong test-retest reliability (r = .80 - .91) over a period of approximately one month (Erdhardt, Epstein, Conners, Parker, & Sitarenios, 1999).

The Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wootton, 1996). The APQ is a 42-item parent measure capturing five parenting constructs: (1) positive parenting, (2) parental involvement, (3) inconsistent discipline, (4) poor monitoring/supervision, and (5) corporal punishment (Loeber & Stouthamer-Loeber, 1986). An “other” category containing 7 items is also included on the measure to reduce bias on the corporal punishment questions (Shelton et al., 1996). Items contain statements

about the individual's family and the parent is asked to rate the frequency for which those statements are true on a 5-point scale from 1 (*never*) to 5 (*always*). The APQ yielded moderate to low reliability coefficients on the poor monitoring/supervision, inconsistent discipline, and corporal punishment subscales (α = .67, α = .67, and α = .40 respectively) and good reliability coefficients on the parental involvement and positive parenting subscales (both α = .80) in children aged 6 to 13 years (Shelton et al., 1996). In the current study, the inconsistent discipline, poor monitoring/supervision, and corporal punishment subscales were used to compute a composite risk factor of negative parenting and the positive parenting and parental involvement subscales were used as enhancing factors. Reliability coefficients for these subscales were .73 (negative parenting), .77 (parent involvement), and .80 (positive parenting).

Enhancing factors. A *social maturity* measure was computed by calculating the difference between the mean age of children and each child's age in the middle of the school year.

The Self-Perception Profile for Children (SPPC; Harter, 1985). The SPPC is a 36-item self-report measure intended to capture the children's perceptions of themselves in six different domains. The domains are reflected by separate subscales and address the following constructs: (1) scholastic competence, (2) social acceptance, (3) athletic competence, (4) physical appearance, (5) behavioral conduct and (6) global self-worth. The items are formulated as bipolar statements e.g., "Some kids are popular with others their age" BUT "Other kids are not very popular." The child has to decide which kid is most like him/her and then report whether the statement is "really true for me" or "sort of true for me." Each subscale consists of six items, half of which are reversed with regard

to whether the first part of the statement reflects high or low perceived competence. Items are scored on a scale from 1(*low perceived competence*) to 4(*high perceived competence*). Only the social acceptance subscale was used for the purpose of the current study. This subscale reflects the degree to which the child perceives him/herself as popular or accepted by peers and is in no way a measure of social skills or social competence (Harter, 1985). The SPPC has high internal consistency with subscale reliability coefficients ranging from .71 to .86; the social acceptance subscale coefficients range from .75 to .80 (Harter, 1985). In the current study, subscale reliability ranged from .77 to .82 ($\alpha_{\text{social acceptance}} = .77$).

The Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). The CBCL is parent measure that contains 118 items about their child, each scored on a 3-point scale, ranging from 0(*not true*) to 2(*very true or often true*). The CBCL has shown satisfactory internal consistency and 15-day test-retest reliability (Achenbach, 1991). The CBCL was used to compute two measures: (a) activity breadth and (b) activity intensity. *Activity breadth* was determined by calculating the total number of activities in which the youth participates (i.e., sports, hobbies, clubs etc.) as reported by the parent's response on items I, II and III of the CBCL. *Activity intensity* was computed by adding scores reflecting reported amount of time that the youth spends in each of reported activity, compared to others of the same age, and then dividing that score to the number of activities reported. Answers were assigned different numerical values (i.e., scores), as follows: 'less than average'= 1; 'average'=2, 'more than average'= 3. 'Don't know' responses were coded as missing values.

Outcome measures. ***The Social Skills Improvement System – Rating Scales (SSIS-RS; Gresham & Elliott, 2008).*** The SSIS-RS contains three subscales: (1) the social skills subscale that assesses communication, cooperation, assertion, responsibility, empathy, engagement, self-control, (2) the competing problem behaviors subscale that assesses externalizing, bullying, hyperactivity/inattention, internalizing, autism spectrum, and (3) the academic competence subscale that assesses reading achievement, math achievement, and motivation to learn. Only the social skills subscale was used in the current study. Standard scores have a mean of 100 and a standard deviation of 15. Scores below 85 indicate deficits in social functioning. For the purpose of the current study, adolescents with SSIS-RS scores below 85 are considered impaired, and those with SSIS-RS score of 85 and above are considered healthy with regard to their social functioning. The items on the parent version of the SSIS-SR require that parents indicate the frequency with which the child exhibits each social skill on a 4-point scale, ranging from 0(*never*) to 4(*almost always*). The items on the adolescent version of the SSIS-SR require that the adolescents indicate how true a statement is about each social skill for them, using a 4-point scale of 0(*not true*) to 3(*very true*). Test–retest reliability estimates (over 42 to 66 days) were .84 and .81 for the total social skills scores for parents, and adolescents, respectively. The SSIS-SR has high internal consistency, at both scale and subscale level, with coefficients of around .80 (Gresham & Elliott, 2008). In the current study, reliability for the total social skills scales were .94 (parent report) and .95 (youth report). Furthermore, reliability coefficients for the social skills subscales were between .68 and .90 (parent report) and between .77 and .83 (youth report).

Results

Preliminary Analyses

Pearson Correlation analyses were conducted to determine relationships among enhancing/risk factors and the social functioning variables (i.e., parent and youth report on the SSIS-RS). In line with assumptions pertaining to multicollinearity in logistic regression, I expected that the proposed enhancing/risk factors would correlate highly with the dependent variables of interest and have a low or no correlation with the other predictor variables. As evidenced in Table 1a, this assumption was maintained for most of the proposed enhancers. The maturity variable did not significantly correlate with the social functioning variables; therefore, this enhancing factor was eliminated from subsequent analyses pertaining to the key research questions. Because parental involvement and positive parenting are both factors related to positive parental contributions, their medium-size correlation was expected. However, given that these factors represent different facets of parenting, both factors were kept independently for subsequent analyses. Table 1b illustrates correlations pertaining to risk factors. As expected, variables indicating disruptive behavior symptoms have moderate correlations with each other. However, as was the case with the parenting variables proposed as enhancers, the risk factors related to disruptive behaviors have some commonalities, but represent distinct constructs. For this reason, these factors were retained independently for future analyses. Because the anxiety variable did not significantly correlate with the social functioning variables, this risk factor was eliminated from subsequent analyses pertaining to the key research questions. Descriptive statistics for all variables under investigation can be found in Table 2.

Table 1

Pearson Correlations of Enhancing/Risk Factors with Social Functioning Variables

(a) Enhancers

Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. APQ Parental Involvement	_	.581**	-.016	.082	.273**	.173**	.351**	.221**
2. APQ Positive Parenting		_	.025	.050	.029	.082	.231**	.157**
3. Maturity			_	.042	-.144**	-.136*	-.005	-.002
4. Harter – Social Acceptance				_	-.038	.115*	.090	.285**
5. Activity Breadth					_	.124*	.208**	.080
6. Activity Intensity						_	.089	.155**
7. SSIS-RS – parent report							_	.305**
8. SSIS-RS – youth report								_

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

(b) Risk Factors

Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1. DBD – ADHD severity	_	.588**	.481**	-.022	-.007	.166**	.170**	-.268**	.019
2. DBD – ODD severity		_	.695**	.158**	.032	.114*	.341**	-.513**	-.205**
3. DBD – CD severity			_	.102	.006	.004	.336**	-.501**	-.247**
4. RADS – Total T score				_	.462**	.080	.068	-.160**	-.336**
5. MASC – Anxiety Index					_	.092	-.003	.030	.007
6. CAARS – ADHD Index						_	.213**	-.032	.117*
7. APQ – negative parenting							_	-.300**	-.175**
8. SSIS-RS – parent report								_	.305**
9. SSIS-RS – youth report									_

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Results Pertaining to Research Question 1

The first research questions was aimed at determining what enhancing and risk factors significantly predicted membership to a healthy versus impaired social functioning category. First, a dichotomous dependent variable (i.e., healthy vs. impaired social functioning) was created, considering parent and adolescent reports. Second, all proposed enhancers and risk factors were used as predictors in two separate sets of logistic regression analyses.

Identifying socially healthy versus socially impaired youth. A dichotomous social functioning variable was constructed via each of the following methods: (a) considering only the parent account of social functioning (i.e., parent SSIS-RS); (b) considering only the adolescent account of social functioning (i.e., youth SSIS-RS); and (c) considering both adolescent and parent accounts of social functioning when these accounts were congruent with one another (i.e., agreement SSIS-RS). To this end, SSIS-RS standard scores of 85 and below (equal to or more than one standard deviation below the mean) indicated membership to an impaired social functioning category and SSIS-RS scores of 86 and above indicated membership to a healthy social functioning category. Based on this algorithm, 60.5% of adolescents fell in the impaired category when considering parent report, and only 32.4% of adolescents fell in the impaired category when taking into account self-report. Of a total sample of 324 adolescents, agreement between parent and youth report on the SSIS-RS was reached in only 183 cases. Of those 183 cases, 44% of youth (i.e., 25% of total sample) fell in the impaired social functioning category based on the algorithm described above. Table 3 and Figure 2 illustrate the

break-down of youth considered impaired or healthy with regard to social functioning, depending on the type of report considered.

Table 2

Descriptive Statistics of Investigated Variables

Variable	**Range**	**Min**	**Max**	**Mean**	**SD**	**Skewness**		**Kurtosis**	
						Stat.	SE	Stat.	SE
APQ – Parental Involvement	27	23	50	38.44	5.06	-.29	.14	.06	.27
APQ – Positive Parenting	16	14	30	25.10	3.17	-.53	.14	-.16	.27
Age - Mid School Year	4.43	10.26	14.69	12.22	1.02	.17	.14	-.79	.27
HARTER – Social Acceptance	3.00	1.00	4.00	2.93	.73	-.42	.14	-.63	.27
Activity Breadth	8	1	9	5.24	1.82	-.04	.14	-.41	.27
Activity Intensity	2.00	1.00	3.00	2.12	.38	-.31	.14	.46	.27
DBD – ADHD severity	50	4	54	30.44	10.58	-.16	.14	-.55	.27
DBD – ODD severity	24	0	24	9.57	5.84	.44	.14	-.57	.27
DBD – CD severity	22	0	22	2.99	3.60	1.96	.14	4.69	.27
RADS – Total T score	47	30	77	44.45	9.27	.89	.14	.29	.27
MASC – Anxiety Index	60	25	85	48.15	12.27	.41	.14	-.18	.27
CAARS – ADHD Index	53	31	84	46.88	10.33	.79	.14	.31	.28
APQ – negative parenting	46	19	65	35.07	6.68	.60	.14	1.06	.27
SSIS-RS – parent report	88	43	131	82.05	15.07	-.02	.14	.02	.27
SSIS-RS – youth report	89	40	129	93.56	17.39	-.19	.14	-.38	.27

Identifying significant predictors of social functioning. Logistic regression analyses were conducted to identify significant contributors to social functioning. To this end, a total of six logistic regression analyses were performed to assess the association

between risk factors/enhancers on each of three measures of social functioning (i.e., parent SSIS-RS, youth SSIS-RS, and agreement SSIS-RS). Odds ratios with values greater than 1 indicate an association with healthy social functioning, whereas odds ratios with values below 1 indicate an association with social impairment. Outliers falling at least 3 standard deviations away from the regression line were screened for each logistic regression analysis conducted. In situations in which outliers were identified, the logistic regression analysis was rerun without the outliers. As a rule, results are reported based on the analyses without outliers only if the percent of correct classification of cases in the model without outliers was at least 2 percentage points higher than the percent of correct classification of cases in the model containing outliers (Hair, Black, Babin, & Anderson, 2010). Such situations are clearly highlighted in the results to follow.

Table 3

Frequency of Adolescents per Social Functioning Category

	Frequency	Percent
When considering SSIS-RS - parent report		
Impaired Social Functioning (*SSIS-RS* ≤ 85)	196	60.5
Healthy Social Functioning (*SSIS-RS* ≥ 86)	127	39.2
Missing Values	1	0.3
Total	324	100.0
When considering SSIS-RS – youth report		
Impaired Social Functioning (*SSIS-RS* ≤ 85)	105	32.4
Healthy Social Functioning (*SSIS-RS* ≥ 86)	216	66.7
Missing Values	3	0.9
Total	324	100.0
When parent and youth report on SSIS-RS are in agreement		
Impaired Social Functioning (*SSIS-RS* ≤ 85)	81	25.0
Healthy Social Functioning (*SSIS-RS* ≥ 86)	102	31.5
No agreement on SSIS-RS	141	43.5
Total	324	100.0

Note: SSIS-RS scores have a mean of 100 and a standard deviation of 15.

The enhancer model (see Table 4) contained five predictors (parental involvement, positive parenting, youth self-perceived social acceptance, activity breadth and activity intensity). The full model containing all predictors was statistically significant for parent SSIS-RS, χ^2 (5, N=315) = 24.97, $p < .001$; youth SSIS-RS, χ^2 (5, N=314) = 29.51, $p < .001$; and, agreement SSIS-RS, χ^2 (5, N=181) = 36.14, $p < .001$, indicating that the models were able to distinguish between socially impaired and healthy youth. The model as a whole explained 10.3% of the variance in parent SSIS-RS, 12.5% of the variance in youth SSIS-RS and 24.2% of the variance in agreement SSIS-RS, when considering the Nagelkerke R^2 index[1]. A more appropriate representation of goodness of fit in logistic regression is the correct classification of cases. This index has to be equal to or higher than a benchmark number that is individually calculated for each analysis and represents the classification accuracy rate that is 25% greater than chance (Hair et al., 2010). This benchmark is called the proportional chance criterion (PCC) and is hereafter noted in parenthesis after the report of the correct classification of cases. The enhancer model correctly classified 62.9% (*PCC*=69%)[2] of cases when using parent SSIS-RS, 70.4% (*PCC*=70.1%) when using youth SSIS-RS, and 70.2% (*PCC*=63.3%) of cases when using agreement SSIS-RS. As shown in Table 4, not all considered predictors made a unique statistically significant contribution to the model. Specifically, based on parent

[1] The output for logistic regression analyses provides two options for an R^2 index: Cox and Snell R^2 and Nagelkerke R^2. Similarly to linear regression, the R^2 in logistic regression provides the amount of variation (0 to 100%) accounted for by the logistic model with values from 0 (i.e., 0%) indicating no fit to 1 (i.e., 100%) indicating perfect fit. The Cox and Snell R^2 is limited in that it cannot reach the maximum value of 1 (i.e., 100%). The Nagelkerke R^2 is a conversion of the Cox and Snell R^2 such that it allows for a maximum value of 1 (i.e., 100%). The Nagelkerke R^2 value is reported for ease of interpretation. However, unlike in linear regression, where the R^2 value is considered the cardinal goodness of fit measure, in logistic regression, the percentage of correct classification of cases is considered a better representation of goodness of fit (Hair et al., 2010).

[2] The correct classification in this case is 14% above chance, rather than the recommended 25%.

report on the SSIS-RS, parental involvement and activity breadth were the only factors that significantly predicted membership to the healthy social functioning category. Notably, the results show that participants with high activity breadth are 1.2 times more likely than those with low activity breadth to have healthy social functioning.

Based on youth report on the SSIS-RS, parental involvement, youth self-perceived social acceptance and activity intensity emerged as significant predictors of membership to a healthy social functioning category. Importantly, adolescents with high activity intensity were twice more likely than those with low activity intensity to have healthy social functioning. When parent and youth reports on the SSIS-RS were in agreement, parental involvement significantly predicted membership to a healthy social functioning category. High levels of parental involvement increased the likelihood of having healthy social functioning by 1.15 times.

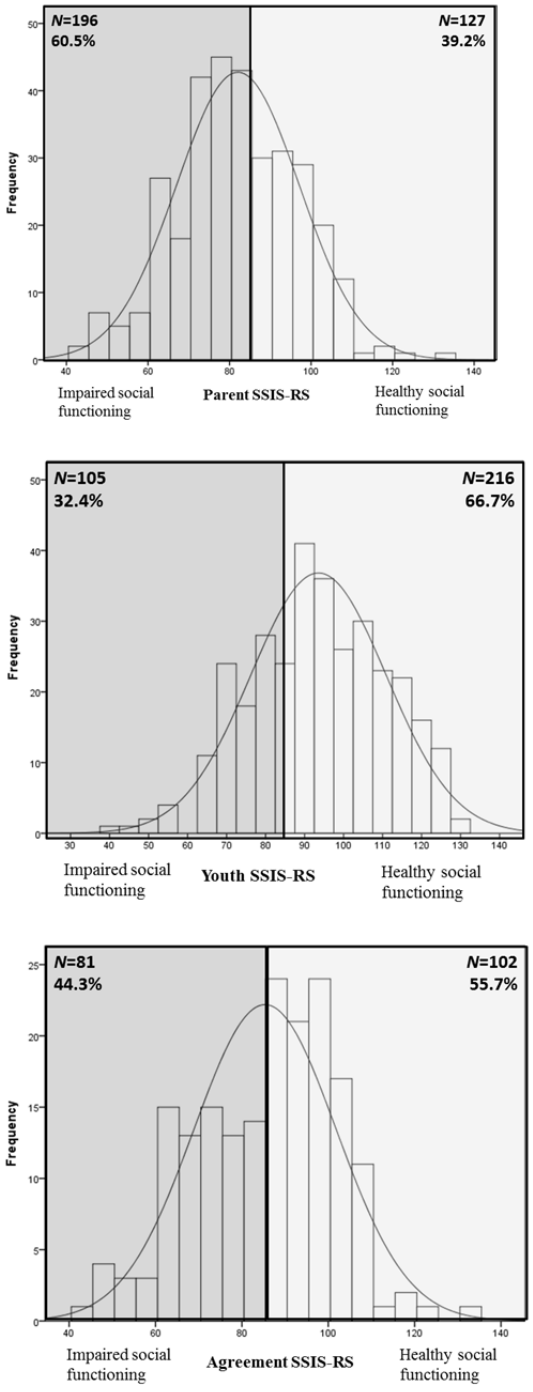

Figure 2. Frequency distribution of participants into impaired and healthy social functioning categories, based on the type of SSIS-RS report considered (i.e., parent, youth, agreement).

Table 4

Logistic Regression – Enhancers Predicting Likelihood of Being Socially Healthy

(a) Parent SSIS-RS

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
APQ Parental Involvement	.079	.033	5.757	1	.016	1.082	1.015	1.154
APQ Positive Parenting	.003	.049	.004	1	.950	1.003	.911	1.104
Harter – Social Acceptance	-.009	.166	.003	1	.958	.991	.716	1.373
Activity Breadth	.175	.071	6.036	1	.014	1.191	1.036	1.370
Activity Intensity	.327	.336	.949	1	.330	1.387	.718	2.679
Constant	-5.169	1.325	15.208	1	.000	.006		

(b) Youth SSIS-RS

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
APQ Parental Involvement	.067	.033	4.094	1	.043	1.069	1.002	1.141
APQ Positive Parenting	.020	.049	.164	1	.685	1.020	.926	1.124
Harter – Social Acceptance	.514	.174	8.700	1	.003	1.672	1.188	2.353
Activity Breadth	.062	.074	.706	1	.401	1.064	.920	1.231
Activity Intensity	.698	.340	4.226	1	.040	2.010	1.033	3.912
Constant	-5.585	1.347	17.202	1	.000	.004		

(c) Agreement SSIS-RS

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
APQ Parental Involvement	.137	.049	7.650	1	.006	1.146	1.041	1.263
APQ Positive Parenting	-.005	.069	.006	1	.941	.995	.869	1.139
Harter – Social Acceptance	.401	.235	2.909	1	.088	1.494	.942	2.369
Activity Breadth	.163	.107	2.322	1	.128	1.177	.954	1.453
Activity Intensity	.796	.439	3.289	1	.070	2.218	.938	5.244
Constant	-8.643	1.865	21.469	1	.000	.000		

The risk model (see Table 5) contained six predictors (youth ADHD severity, youth ODD severity, youth CD severity, youth depressive symptoms, parent ADHD symptoms, and negative parenting). The full model containing all predictors was statistically significant for parent SSIS-RS, χ^2 (6, N=308) = 89.34, $p < .001$; youth SSIS-RS, χ^2 (6, N=306) = 52.86, $p < .001$; and agreement SSIS-RS, χ^2 (6, N=171) = 94.51, $p <$

.001, indicating that the models were able to distinguish between socially impaired and healthy youth. The model as a whole explained 34.1% of the variance in parent SSIS-RS; 22.2% of the variance in youth SSIS-RS and 56.9% of the variance in agreement SSIS-RS, when using the Nagelkerke R^2 index. The risk model correctly classified 71.4% (*PCC*=65.5%) of cases when using parent SSIS-RS, 71.9% (*PCC*=70.6%) of cases when using youth SSIS-RS, and 79.5% (*PCC*=63.5%) of cases when using agreement SSIS-RS. As shown in Table 5, not all considered predictors made a unique statistically significant contribution to the model. Specifically, based on parent report on the SSIS-RS, youth symptoms of conduct disorder and negative parenting were the only factors that significantly predicted membership to the impaired social functioning category. Notably, adolescents with high conduct problem severity were 1.4 times more likely than those with low conduct problems severity to be socially impaired. Based on youth report on the SSIS-RS, youth conduct problems severity, depression, and parent symptoms of ADHD emerged as significant predictors of impaired social functioning. Similarly to the previous analyses, severity of conduct problems emerged as the most important predictor when considering youth report on the SSIS-RS as a dependent variable. Importantly, adolescents with high conduct problem severity were 1.2 times more likely than those with low conduct problems severity to be socially impaired. Although parent symptoms of ADHD emerged as a significant predictor of social functioning, this variable cannot be considered a risk factor because the direction of the relationship with social functioning was in the opposite direction from the one predicted. Specifically, the odds ratio value indicated higher parental symptoms of ADHD increases the likelihood of belonging to a healthy social functioning category rather than to an impaired social functioning

category, as predicted. When parent and youth reports on the SSIS-RS were in agreement, all four risk factors identified in the previous two analyses emerged as significant predictors, with conduct problems severity remaining the strongest predictor. High severity of conduct problems increased the likelihood of being socially impaired by 1.7 times. Parent symptoms of ADHD emerged again as a significant predictor, but in the opposite direction from what was predicted.

Table 5

Logistic Regression – Risk Factors Predicting Likelihood of Being Socially Healthy

(a) Parent SSIS-RS

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
DBD – ADHD severity	.002	.016	.022	1	.881	1.002	.971	1.035
DBD – ODD severity	-.068	.038	3.123	1	.077	.934	.867	1.007
DBD – CD severity	-.333	.088	14.325	1	.000	.717	.603	.852
RADS – Total T score	-.021	.015	1.929	1	.165	.979	.950	1.009
CAARS – ADHD Index	.003	.014	.042	1	.838	1.003	.976	1.031
APQ – negative parenting	-.071	.025	7.724	1	.005	.932	.887	.979
Constant	4.041	1.210	11.156	1	.001	56.891		

(b) Youth SSIS-RS

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
DBD – ADHD severity	.030	.017	2.979	1	.084	1.030	.996	1.065
DBD – ODD severity	-.031	.036	.737	1	.391	.969	.903	1.041
DBD – CD severity	-.136	.054	6.433	1	.011	.873	.786	.970
RADS – Total T score	-.068	.015	20.859	1	.000	.934	.907	.962
CAARS – ADHD Index	.035	.015	5.778	1	.016	1.036	1.007	1.066
APQ – negative parenting	-.026	.022	1.414	1	.234	.974	.934	1.017
Constant	2.960	1.085	7.446	1	.006	19.298		

(c) Agreement SSIS-RS

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
DBD – ADHD severity	.042	.027	2.411	1	.120	1.043	.989	1.099
DBD – ODD severity	-.096	.058	2.747	1	.097	.908	.811	1.018
DBD – CD severity	-.513	.148	12.068	1	.001	.599	.448	.800
RADS – Total T score	-.098	.028	12.118	1	.000	.907	.858	.958
CAARS – ADHD Index	.068	.024	7.729	1	.005	1.070	1.020	1.123
APQ – negative parenting	-.078	.039	4.054	1	.044	.925	.857	.998
Constant	5.141	1.859	7.652	1	.006	170.910		

Results Pertaining to Research Question 2

The second research question was aimed at identifying buffers (i.e., significant main effects of enhancers in the presence of risk factors) and protective factors (i.e., significant enhancer-risk factor interaction effects in the presence of a main effect of the risk factor and a main effect of the enhancer) to social functioning. Answering this question entailed a two-step process. First, risk factors and enhancers were used as predictors of social functioning in hierarchical logistic regression analyses to help identify factors that should be retained in subsequent analyses. Second, risk factor-enhancer pairs were tested in separate logistic analyses to determine buffering and protective effects. All analyses included screening for outliers. Consistent with previous outlier procedures, results from the model without outliers were reported only if the percent of correct classification of cases in the model without outliers was at least 2 percentage points higher than the percent of correct classification of cases in the model containing outliers.

Testing all risk factors and enhancers in comprehensive hierarchical models. Hierarchical logistic regression analyses were conducted with the risk factors entered at step 1 and enhancers entered at step 2 (see Table 6). Only factors that emerged as significant predictors of the social functioning variable in the analyses pertaining to research question 1 were used for these analyses. A total of three hierarchical logistic regression analyses were performed to assess the association between enhancers and each of three social functioning variables (i.e., parent SSIS-RS, youth SSIS-RS, agreement SSIS-RS), in the presence of risk factors.

Table 6

Logistic Regression – Enhancers Predicting Likelihood of Being Socially Healthy in the Presence of Risk Factors

(a) Parent SSIS-RS

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
DBD – CD severity	-.422	.074	32.795	1	.000	.656	.568	.758
APQ – negative parenting	-.055	.024	5.295	1	.021	.946	.903	.992
APQ Parental Involvement	.035	.030	1.417	1	.234	1.036	.977	1.098
Activity Breadth	.208	.080	6.829	1	.009	1.231	1.053	1.439
Constant	-.078	1.513	.003	1	.959	.925		

(b) Youth SSIS-RS

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
DBD – CD severity	-.145	.041	12.481	1	.000	.865	.799	.938
RADS – Total T score	-.060	.016	13.949	1	.000	.941	.912	.972
APQ Parental Involvement	.058	.030	3.848	1	.050	1.060	1.000	1.123
Harter – Social Acceptance	.379	.204	3.446	1	.063	1.461	.979	2.180
Activity Intensity	1.150	.384	8.944	1	.003	3.157	1.486	6.705
Constant	-1.687	1.689	.997	1	.318	.185		

(c) Agreement SSIS-RS

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
DBD – CD severity	-.506	.109	21.540	1	.000	.603	.487	.747
RADS – Total T score	-.076	.025	9.579	1	.002	.927	.883	.972
APQ – negative parenting	-.038	.036	1.118	1	.290	.963	.897	1.033
APQ Parental Involvement	.098	.043	5.121	1	.024	1.103	1.013	1.201
Constant	2.427	2.591	.878	1	.349	11.326		

The model examining associations related to parent SSIS-RS contained two risk predictors (i.e., conduct problems severity and negative parenting) entered at step 1 and two enhancing predictors (i.e., parental involvement and activity breadth) entered at step 2 (see Table 6a). The full model containing all predictors was statistically significant, χ^2 (4, N=321) = 93.91, $p < .001$. The model explained 34.4% (Nagelkerke R^2 index) of the

variance in parent SSIS-RS and correctly classified 70.7% (*PCC*=65.4%) of cases. Notably, in the presence of conduct problems, negative parenting and parental involvement; high activity breadth increased the likelihood of being socially healthy by 1.2 times.

The model examining associations related to youth SSIS-RS contained two risk predictors (i.e., conduct problems severity, youth depressive symptoms) entered at step 1 and three enhancing predictors (i.e., parental involvement, child self-perceived social acceptance, and activity intensity) entered at step 2 (see Table 6b). The full model containing all predictors was statistically significant, χ^2 (5, N=298) = 67.34, $p < .001$. The model explained 28.4% (Nagelkerke R^2 index) of the variance in youth SSIS-RS and correctly classified 73.2% (*PCC*=71%) of cases. These results are based on the model without outliers. Notably, in the presence of all other risk and enhancing factors in the model, high activity intensity increased the likelihood of being socially healthy by 3.2 times.

The model examining associations related to agreement SSIS-RS contained four risk predictors (i.e., conduct problems severity, youth depressive symptoms, and negative parenting) entered at step 1 and one enhancing predictor (i.e., parental involvement) entered at step 2 (see Table 6c). The full model containing all predictors was statistically significant, χ^2 (4, N=180) = 89.81, $p < .001$. The model explained 52.6% (Nagelkerke R^2 index) of the variance in agreement SSIS-RS and correctly classified 76.7% (*PCC*=63.3%) of cases. In the presence of all four risk factors from the model, high parental involvement increased the likelihood of being socially healthy by 1.1 times.

Identifying buffers and protective factors to social functioning. Factors emerging as significant in the first set of analyses pertaining to the second research question were used to create pairs of risk and enhancer factors to be tested in the same hierarchical logistic regression analyses (i.e., resilience model), with each of the social functioning variables (i.e., parent SSIS-RS, youth SSIS-RS, agreement SSIS-RS). To this end, the risk factor was entered at step 1, the enhancer was entered at step 2, and the interaction term between the risk factor and the enhancer was entered at step 3. A significant main effect (i.e., compensatory effect) of the enhancer (logistic regression - step 2) would show that the respective enhancer buffers the effect of the risk factor on social functioning. A significant interaction (i.e., protective effect; logistic regression - step 3) would show that the enhancer protects against the effects of the risk factor on social functioning at a higher degree for one level of the risk factor (i.e., high or low) than for the other level. The following results are grouped by dependent variable (i.e., parent SSIS-RS, youth SSIS-RS, agreement SSIS-RS). Compensatory (i.e., main; buffering) effects are presented first, followed by protective (i.e., interaction) effects.

Testing risk-enhancer pairs pertaining to parent SSIS-RS. Two risk-enhancer pairs were constructed, as follows: (1) youth conduct problems severity and activity breadth (noted as "CD-breadth"); and (2) negative parenting and activity breadth (noted as "neg.parent-breadth"). At step 2 (see Table 7), the CD-breadth model was statistically significant, χ^2 (2, N=321) = 85.36, $p < .001$, explained 31.6% (Nagelkerke R^2 index) of the variance in parent SSIS-RS and correctly classified 70.7% (*PCC*=65.4%) of cases. Activity breadth significantly buffered (p=.001) against the effects of conduct problems on social functioning and increased the likelihood of being socially healthy by 1.3 times.

At step 2, the neg.parent-breadth model was also statistically significant, χ^2 (2, N=322) = 36.17, $p < .001$, explained 14.4% (Nagelkerke R^2 index) of the variance in parent SSIS-RS and correctly classified 66.1% (*PCC*=65.5%) of cases. Activity breadth significantly buffered (p=.001) against the effects of negative parenting on social functioning and increased the likelihood of being socially healthy by 1.3 times.

Table 7

Parent SSIS-RS – Compensatory Effects (i.e., Logistic Regression - Step 2 Results)

(a) Youth conduct problems & activity breadth

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
DBD – CD severity	-.468	.074	39.977	1	.000	.626	.541	.724
Activity Breadth	.246	.076	10.485	1	.001	1.278	1.102	1.483
Constant	-.714	.431	2.744	1	.098	.490		

(b) Negative parenting & activity breadth

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
APQ – Negative Parenting	-.095	.020	21.568	1	.000	.910	.874	.947
Activity Breadth	.227	.069	11.002	1	.001	1.255	1.097	1.435
Constant	1.617	.770	4.407	1	.036	5.038		

Although both the CD-breadth and the neg.parent-breadth models were statistically significant at step 3 (see Table 8), χ^2 (3, N=321) = 85.70, $p < .001$ and χ^2 (3, N=322) = 39.68, $p < .001$, the interaction terms tested in these models yielded nonsignificant results. In other words, activity breadth (i.e., the enhancer from both models) did not emerge as a protective factor in any of the analyses pertaining to parent SSIS-RS.

Testing risk-enhancer pairs pertaining to youth SSIS-RS. Four risk-enhancer pairs were constructed, as follows: (1) youth conduct problems severity and activity intensity (noted as "CD-intensity"); (2) youth conduct problems severity and parental involvement (noted as "CD-involvement"); (3) youth depressive symptoms and activity intensity (noted as "RADS-intensity"); and (4) youth depressive symptoms and parental involvement (noted as "RADS-involvement"). At step 2 (see Table 9), the CD-intensity model was statistically significant, χ^2 (2, N=317) = 30.13, p<.001, explained 12.7% (Nagelkerke R^2 index) of the variance in youth SSIS-RS and correctly classified 71.9% (*PCC*=70.8%) of cases. Activity intensity significantly buffered (p=.003) against the effects of conduct problems on social functioning and increased the likelihood of being socially healthy by 2.8 times.

Table 8

Resilience Models for Parent SSIS-RS

(a) Youth conduct problems & activity breadth

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
DBD – CD severity	-.598	.241	6.152	1	.013	.550	.343	.882
Activity Breadth	.206	.101	4.144	1	.042	1.229	1.008	1.499
CD x Act. Breadth	.022	.039	.332	1	.564	1.023	.948	1.104
Constant	-.497	.571	.758	1	.384	.608		

(b) Negative parenting & activity breadth

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
APQ – Negative Parenting	.010	.059	.031	1	.861	1.010	.899	1.135
Activity Breadth	.918	.387	5.614	1	.018	2.504	1.172	5.350
Neg. Parent x Act. Breadth	-.020	.011	3.324	1	.068	.980	.959	1.002
Constant	-1.950	2.074	.885	1	.347	.142		

The CD-involvement model was also statistically significant at step 2, χ^2 (2, N=320) = 28.25, p<.001, explained 11.8% (Nagelkerke R^2 index) of the variance in youth SSIS-RS and correctly classified 70.6% (*PCC*=70.1%) of cases. Parent involvement significantly buffered (p=.004) against the effects of conduct problems on social functioning and increased the likelihood of being socially healthy by 1.1 times. At step 2, the RADS-intensity model was statistically significant, χ^2 (2, N=315) = 35.52, p<.001, explained 14.9% (Nagelkerke R^2 index) of the variance in youth SSIS-RS and correctly classified 70.8% (*PCC*=70.3%) of cases. Activity intensity significantly buffered (p=.004) against the effects of depressive symptoms on social functioning and increased the likelihood of being socially healthy by 2.7 times. The RADS-involvement model was also statistically significant at step 2, χ^2 (2, N=318) = 36.71, p<.001, explained 15.2% (Nagelkerke R^2 index) of the variance in youth SSIS-RS and correctly classified 70.8% (*PCC*=69.8%) of cases. Parent involvement significantly buffered (p=.002) against the effects of depressive symptoms on social functioning and increased the likelihood of being socially healthy by 1.1 times. Although both the CD-intensity and the CD-involvement models were statistically significant at step 3 (see Table 10), χ^2 (3, N=317) = 30.27, p<.001 and χ^2 (3, N=320) = 30.50, p<.001, the interaction terms tested in these models yielded nonsignificant results. In other words, neither activity intensity nor parent involvement had a protective effect against youth conduct problems in the analyses pertaining to youth SSIS-RS. The RADS-intensity and the RADS-involvement models were also statistically significant at step 3, χ^2 (3, N=315) = 36.19, p<.001 and χ^2 (3, N=318) = 36.76, p<.001, but yielded nonsignificant interaction effects. Neither activity

intensity nor parent involvement had a protective effect against youth depressive symptoms in the analyses pertaining to youth SSIS-RS.

Table 9

Youth SSIS-RS – Compensatory Effects (i.e., Logistic Regression - Step 2 Results)

(a)Youth conduct problems & activity intensity

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
DBD – CD severity	-.155	.036	18.411	1	.000	.856	.798	.919
Activity Intensity	1.028	.341	9.105	1	.003	2.795	1.434	5.450
Constant	-.901	.721	1.564	1	.211	.406		

(b) Youth conduct problems & parental involvement

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
DBD – CD severity	-.127	.036	12.134	1	.000	.881	.820	.946
APQ Parental Involvement	.074	.026	8.281	1	.004	1.077	1.024	1.133
Constant	-1.703	1.011	2.835	1	.092	.182		

(c) Youth depressive symptoms & activity intensity

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
RADS – Total T score	-.068	.014	23.923	1	.000	.934	.909	.960
Activity Intensity	.992	.343	8.359	1	.004	2.698	1.377	5.286
Constant	1.730	.944	3.359	1	.067	5.642		

(d) Youth depressive symptoms & parental involvement

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
RADS – Total T score	-.062	.014	20.841	1	.000	.940	.915	.965
APQ Parental Involvement	.081	.026	9.948	1	.002	1.084	1.031	1.140
Constant	.444	1.189	.140	1	.708	1.560		

Table 10

Resilience Models for Youth SSIS-RS

(a) Youth conduct problems & activity intensity

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
DBD – CD severity	-.235	.216	1.184	1	.277	.790	.517	1.208
Activity Intensity	.902	.475	3.605	1	.058	2.464	.971	6.253
CD x Act. Intensity	.038	.100	.142	1	.706	1.038	.854	1.263
Constant	-.637	1.002	.404	1	.525	.529		

(b) Youth conduct problems & parental involvement

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
DBD – CD severity	.219	.226	.939	1	.333	1.245	.799	1.941
APQ Parental Involvement	.108	.035	9.727	1	.002	1.114	1.041	1.192
CD x Involvement	-.010	.006	2.339	1	.126	.991	.978	1.003
Constant	-2.955	1.319	5.019	1	.025	.052		

(c)Youth depressive symptoms & activity intensity

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
RADS – Total T score	-.005	.078	.005	1	.945	.995	.854	1.158
Activity Intensity	2.385	1.750	1.857	1	.173	10.857	.352	335.188
RADS x Act. Intensity	-.030	.036	.663	1	.416	.971	.904	1.043
Constant	-1.204	3.716	.105	1	.746	.300		

(d) Youth depressive symptoms & parental involvement

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95.0% C.I. for Odds Ratio Lower	Upper
RADS – Total T score	-.086	.105	.675	1	.411	.917	.747	1.127
APQ Parental Involvement	.051	.131	.153	1	.696	1.053	.814	1.360
RADS x Involvement	.001	.003	.053	1	.817	1.001	.995	1.006
Constant	1.580	5.053	.098	1	.754	4.857		

Testing risk-enhancer pairs pertaining to agreement SSIS-RS. Two risk-enhancer pairs were constructed, as follows (1) youth conduct problems severity and parental involvement (noted as "CD-involvement"); and (2) youth depressive symptoms

and parental involvement (noted as "RADS-involvement"). At step 2 (see Table 11), the CD-involvement model was statistically significant, χ^2 (2, N=182) = 80.30, p<.001, explained 47.8% (Nagelkerke R^2 index) of the variance in agreement SSIS-RS and correctly classified 74.7% (*PCC*=63.4%) of cases. Parent involvement significantly buffered (p=.002) against the effects of conduct problems on social functioning and increased the likelihood of being socially healthy by 1.14 times. The RADS-involvement model was also statistically significant at step 2, χ^2 (2, N=181) = 42.64, p<.001, explained 28.1% (Nagelkerke R^2 index) of the variance in agreement SSIS-RS and correctly classified 66.9% (*PCC*=63.3%) of cases. Parent involvement significantly buffered (p<.001) against the effects of depressive symptoms on social functioning and increased the likelihood of being socially healthy by 1.1 times.

Table 11

Agreement SSIS-RS – Compensatory Effects (i.e., Logistic Regression - Step 2 Results)

(a) Youth conduct problems & parental involvement

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
DBD – CD severity	-.555	.105	28.186	1	.000	.574	.468	.705
APQ Parental Involvement	.127	.041	9.655	1	.002	1.135	1.048	1.230
Constant	-3.326	1.592	4.366	1	.037	.036		

(b) Youth depressive symptoms & parental involvement

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
RADS – Total T score	-.079	.020	15.064	1	.000	.924	.888	.962
APQ Parental Involvement	.149	.037	15.843	1	.000	1.161	1.079	1.249
Constant	-1.962	1.724	1.295	1	.255	.141		

Although both the CD-involvement and the RADS-involvement models were statistically significant at step 3 (see Table 12), χ^2 (3, N=182) = 81.63, $p < .001$ and χ^2 (3, N=181) = 43.94, $p < .001$, the interaction terms tested in these models yielded nonsignificant results. In other words, parent involvement (i.e., the enhancer from both models) did not emerge as a protective factor in any of the analyses pertaining to agreement SSIS-RS. For a summary of findings directly related to the two research questions, please see Table 13.

Table 12

Resilience Models for Agreement SSIS-RS

(a) Youth conduct problems & parental involvement

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
DBD – CD severity	.363	.741	.239	1	.625	1.437	.336	6.144
APQ Parental Involvement	.176	.060	8.746	1	.003	1.193	1.061	1.341
CD x Involvement	-.024	.020	1.495	1	.221	.976	.940	1.015
Constant	-5.216	2.282	5.223	1	.022	.005		

(b) Youth depressive symptoms & parental involvement

							95.0% C.I. for Odds Ratio	
	B	S.E.	Wald	*df*	*p*	Odds Ratio	Lower	Upper
RADS – Total T score	.099	.159	.391	1	.532	1.104	.809	1.508
APQ Parental Involvement	.367	.199	3.403	1	.065	1.444	.977	2.133
RADS x Involvement	-.005	.004	1.263	1	.261	.995	.987	1.003
Constant	-10.418	7.725	1.819	1	.177	.000		

Discussion

This was the first study in which risk factors identified in the ADHD literature and enhancing factors detected in the developmental literature were considered together in a comprehensive risk-resilience model evaluating the contribution of these factors to the likelihood of being socially healthy or impaired. Both parent and adolescent perspectives of social functioning were taken into account, which allowed for differential considerations of risk factors and enhancers as they relate to multiple informant reports. Although employing the same theoretical approach for investigating risk-resilience models, this study is fundamentally different from the two studies (Mikami & Hinshaw, 2003; 2006) in the ADHD literature that employed a similar approach. Unlike Mikami and Hinshaw (2003, 2006) whose studies involved examining risk-resilience models in youth with and without ADHD and who considered ADHD status (i.e., diagnosis vs. no diagnosis) as a risk factor for socially inappropriate behaviors (e.g., aggression), this study addressed questions about youth characteristics as risk and resilience factors within a sample of young adolescents with ADHD. Additionally, including both boys and girls (as opposed to girls only in Mikami & Hinshaw, 2003; 2006) extends the generalizability of these findings to youth with ADHD of both genders. Finally, this study enhances the knowledge pertaining to social functioning in a group of young adolescents with ADHD, which has been an understudied population relative to younger children with similar problems.

The three significant risk factors to social impairment were youth conduct problems, youth depression and negative parenting. Additionally, significant enhancers to healthy social functioning were youth self-perceived social acceptance, activity

participation (breadth and intensity) and parental involvement. Of these enhancers, activity participation (breadth and intensity) and parental involvement showed buffering effects against the impact of the risk factors (i.e., youth conduct problems, youth depression, negative parenting) on social functioning. None of the enhancers displayed protective effects. The following section describes the key findings in more detail, highlighting contributions to the existing literature and differential findings depending on the type of informant report of social functioning (i.e., parent, youth, agreement SSIS-RS).

Table 13

Summative Depiction of Findings

		Parent SSIS-RS	Youth SSIS-RS	Agreement SSIS-RS
Research Question 1				
Significant risk factors		• Conduct problems severity (*OR*=1.395) • Negative parenting (*OR*=1.073)	• Conduct problems severity (*OR*=1.145) • Depression symptoms (*OR*=1.071)	• Conduct problems severity (*OR*=1.669) • Depression symptoms (*OR*=1.103) • Negative parenting (*OR*=1.081)
Significant enhancers		• Parental involvement (*OR*=1.082) • Activity breadth (*OR*=1.191)	• Parental involvement (*OR*=1.069) • Self-perceived social acceptance (*OR*=1.672) • Activity intensity (*OR*=2.010)	• Parental involvement (*OR*=1.146)
Research Question 2				
Buffers against	conduct problems	• Activity breadth (*OR*=1.278)	• Activity intensity (*OR*=2.795) • Parent involvement (*OR*=1.077)	• Parent involvement (*OR*=1.135)
	negative parenting	• Activity breadth (*OR*=1.255)	• N/A	• N/A
	depression symptoms	• N/A	• Activity intensity (*OR*=2.698) • Parent involvement (*OR*=1.084)	• Parent involvement (*OR*=1.161)
Protective factors against	conduct problems	• None	• None	• None
	negative parenting	• None	• None	• None
	depression symptoms	• None	• None	• None

Note: Odds ratios for risk factors pertain to the likelihood of being socially impaired, whereas odds ratios for enhancers pertain to the likelihood of being socially healthy.

Key Findings

The results of the current study provide additional evidence that youth conduct problems, youth depression and negative parenting bring negative contributions to social functioning, increasing the likelihood of impairment. With regard to externalizing symptoms, this study's findings are in line with Becker and colleagues' (2012) review that showed externalizing problems have either no effect on or exacerbate social impairment in youth with ADHD. Specifically, oppositional and defiant behaviors did not contribute to social impairment, whereas conduct problems increased the risk of social impairment. This study extended Kaiser and colleagues' (2011) finding of negative parenting as a contributor to poor social functioning to older youth with ADHD (i.e., ages 10-14 versus ages 5-11). Additionally, in the face of limited information about the contribution of internalizing disorders to social functioning (Becker et al., 2012), this study revealed that youth depressive symptoms and not anxiety symptoms represent a risk factor for social impairment.

Four factors (i.e., parental involvement, activity breadth, activity intensity and youth self-perceived social acceptance) were found to significantly increase the odds of healthy social functioning. The identification of parental involvement and activity breadth as enhancers to healthy social functioning in the parent SSIS-RS analyses should, however, be interpreted with caution because the goodness of fit for the resilience model was below the expected proportional chance criterion (albeit above chance). Nevertheless, given that this analysis was intended to simply identify potential factors to consider in the risk-resilience models, both enhancers were retained for the subsequent analyses. From the four enhancers identified across the three resilience models (i.e.,

considering parent, youth and agreement SSIS-RS), only parental involvement, activity breadth and activity intensity retained their effects in the presence of risk factors, hence displaying buffering properties. In other words, if an enhancer was found to have a significant effect on social functioning despite the presence of a risk factor, this enhancer would compensate for (i.e., buffer against) the negative effect of the risk factor on social functioning. Parental involvement was previously identified in both the ADHD (Kaiser et al., 2011) and the developmental (El Nokali et al., 2010) literature as a predictor of good social functioning and thus its buffering effect in this study comes as an additional confirmation of its positive contribution to social functioning with this population. More importantly, the emergence of activity participation variables (i.e., activity breadth and activity intensity) as buffers is unique to the ADHD literature, despite their established positive role for social functioning from the developmental literature. For the first time, this study provides evidence that participating in sports and leisure activities plays an important role in increasing the likelihood of being socially healthy, in spite of the presence of risk factors for social impairment. This is important because parents are sometimes concerned that, by having their child involved in activities, they are only adding to the child's frustration without yielding any benefit. Of course, these findings cannot be interpreted as determining causality; however, the findings do suggest that involvement in activities should be considered when evaluating influences on social functioning.

Although multiple enhancers yielded compensatory effects in that they buffered against the effect of risk factors on social functioning, no protective effects emerged as part of any of the conducted analyses. This means that enhancers did not show

differential resilience influences at high versus low levels of a risk factor. This implies that youth at all levels of the risk factors are likely to benefit from the presence of the enhancer with regard to their social functioning. For example, parental involvement increased the likelihood of healthy social functioning, despite the presence of conduct problems, regardless of the severity of the conduct problems.

Buffers against the Effect of Conduct Problems on Social Functioning

Different enhancers buffered against the effects of conduct problems on social functioning. Specifically, the number of activities in which the adolescent is involved (i.e., activity breadth) increases the likelihood of being socially healthy (per parent report) despite the presence of conduct problems. Perhaps being involved in multiple activities (e.g., sport or leisure) decreases the time that the adolescent can spend in deviant endeavors. High activity breadth may also be reflective of data about the adolescent's variability in socially proactive activities, which may be associated with higher parental confidence in the youth's social abilities.

Youth report of social functioning also allowed for the emergence of an activity participation variable as a buffer against the effect of conduct problems. However, in this instance, it is the amount of time spent in one activity (i.e., activity intensity) rather than the number of activities that creates this positive effect. Indeed, investing time in a specific activity may have the effect of increasing the opportunity for social interactions, hence producing a buffering effect. Furthermore, spending a lot of time in an activity may be an indicator of success with that activity that may yield social benefits. However, it is also possible that youth with conduct problems spend time with peers, which reflects

positively on social functioning at the cost of deviancy training and involvement in risky behavior (e.g., substance use, unsafe sex).

Parental involvement had a lower, yet significant, buffering effect of the effect of conduct problems on social functioning compared to the activity participation variables. This emerged as an important buffer when considering youth or agreement report of social functioning. A quick examination of the items from the measure of parent involvement reveals that much of parent involvement pertains to the parent's supportive role of the adolescent's involvement in activities (e.g., driving the adolescent to the activity; discussing plans for activities with the adolescent; facilitating the youth's participation in activities by volunteering in parent organizations). Therefore, even though the impact of parent involvement on social functioning may appear to be smaller, it could be parent involvement that facilitates participation in activities in the first place. Perhaps adolescents whose parents are involved in their life are also those who have a better relationship with their parents, which can explain why parent involvement emerged as a buffer when considering agreement report. On the one hand, having a better adolescent-parent relationship is likely to foster agreement among parents and adolescents. On the other hand, a good parent-adolescent relationship may translate into better peer relationships through social modelling or may be reflective of the adolescent's general ability of getting along with others.

Buffers against the Effect of Negative Parenting on Social Functioning

Activity breadth also buffered against the negative parenting effect on social functioning. This finding was unique to analyses pertaining to only parent report of social functioning. Perhaps involvement in multiple activities offers youth an opportunity to

engage with other adult figures (e.g., soccer coach) whose interactional style may be less coercive (i.e., more consistent discipline, lack of corporal punishment) and who may provide positive social models. Therefore, an adolescent who, at home, may be exposed to negative parenting, may have an opportunity to diminish the negative effects of such aversive exposure on social functioning by learning from situations that provide good social modelling. Additionally, youth who participate in leisure activities may use such activities as coping strategies against negative parenting, again diminishing the negative effect of negative parenting on social functioning.

Buffers against the Effect of Depression Symptoms on Social Functioning

With regard to the risk factor of youth depression symptoms, a differential pattern of results was observed. No buffers against depression emerged when considering parent report of social functioning. This may be reflective of the parents' being less aware of depression than they might be of other child characteristics (Jensen et al., 1999 as cited in Klein, Dougherty, & Olino, 2005). Additionally, parents of youth with ADHD may be hyper focused on the youth's disruptive behavior and be more likely to miss social impairment issues associated with depression.

When considering youth report of social functioning, both activity intensity and parent involvement emerged as significant buffers. Similar to what is described above, engaging in sports or other activities may not only facilitate good social interactions, but it can also be a way to avoid withdrawal and decrease time for negative cognitions. Furthermore, parent involvement may help provide support for engaging in such activities. When agreement report of social functioning was considered, parental involvement increased the likelihood of being socially healthy in spite of depression

symptoms. Again, perhaps parental involvement is reflective of a good parent-adolescent relationship, which in turn facilitates healthy social functioning even in the presence of risk factors.

Results from the current study highlight the contrast between parent and youth reports of social functioning in that twice as many adolescents were considered impaired based on parent report as opposed to youth self-report. Furthermore, ratings from only a little over half of participants yielded parent and adolescent agreement on social functioning categories (i.e., healthy versus impaired). This suggests that risk-resilience findings from this study should be interpreted through the lens of the source of data considered. Indeed, the findings outlined above highlight both agreement and disagreement with regard to contributors to social functioning. Conduct problems emerged as a significant risk factor to social impairment regardless of the informant on the SSIS-RS measure. Agreement was also found with regard to parental involvement as a significant enhancer of healthy social functioning, indicating that the parent communicating with the child about his/her friends and activities, helping plan family activities as well as supporting the child's participation in extra-curricular activities enhance social functioning based on reports from both parents and youth. Additionally, activity participation increased the odds of healthy parent and youth reported social functioning, even in the presence of risk factors such as conduct problems, negative parenting and youth depressive symptoms. However, the parent SSIS-RS analyses emphasized the compensatory role of activity breadth, whereas the youth SSIS-RS analyses highlighted parental involvement and activity intensity as significant buffers against identified risk factors. A quick inspection of the parental involvement items

unveils some overlap between activity breadth and parental involvement, as the parent may help facilitate activity breadth by "volunteering to help with special activities that [the] child is involved in (such as sports, boy/girl scouts, church youth groups)" or "driv[ing] [the] child to a special activity." Indeed, these partial construct commonalities are reflected in the medium correlation observed between these two variables, which is also the highest correlation among the considered predictors. It is therefore possible that the differential emergence of activity breadth versus parental involvement in the analyses considering parent versus youth report of social functioning can be explained by a statistical artifact created by the aforementioned partial construct overlap. With regard to the emergence of activity intensity in the analyses pertaining to youth and not parent report of social functioning, the explanation may reflect differential opportunities for information considered in evaluations of social functioning. Specifically, adolescents are potentially more knowledgeable than their parents about the quality of social interactions from an activity. As a result, they may incorporate perceived social success, which is likely to occur as a function of opportunities afforded by time investment in a given activity (i.e., activity intensity), in their judgments of social functioning. Conversely, parents, who may not be privy to the content of those activities as it relates to social interactions, may base their judgments of social functioning on other criteria (e.g., variety of social activities in which the adolescent participates). Overall, the findings of the current study highlight the importance of considering multiple informants in evaluating risk-resilience models in young adolescents as different important factors may emerge depending on who provides the information.

Limitations

Although the current study represents a starting point for a comprehensive evaluation of risk-resilience models in young adolescents with ADHD, it was not void of limitations. First, the study entailed conducting numerous logistic regression analyses with multiple factors, posing potential problems related to Type I error (i.e., obtaining significance by chance, as opposed to because of actual results). Secondly, no assumptions can be made with regard to any causal relationships among the examined variables. Therefore, findings should be interpreted as associations rather than predictions. Examining relationships between social functioning and risk/enhancing factors over time could substantially add to our understanding of risk-resiliency models of social functioning within a dynamic framework. Third, the current study may be limited by construct validity issues pertaining to social functioning. Namely, the SSIS-RS is the best known indicator of social functioning, but it is not necessarily the best possible indicator. Research contributing to enhancing construct validity of social functioning in adolescence would offer an improved platform for investigating risk-resilience models in adolescents with ADHD. Lastly, the current study is limited in providing a clear-cut message about contributors to social functioning due to informant-related issues. Specifically, especially in adolescence, it is difficult to determine who the best informant (i.e., parent, child, peer, teacher) is and how discrepant findings across different informants can be interpreted. However, as opposed to some studies in the ADHD literature in which only the parent report is obtained (e.g., Graziano et al., 2011), the current study represents a step toward considering two informants both independently and together (i.e., agreement report). As suggested by De Los Reyes and Kazdin (2006),

inconsistent findings across multiple informants may be attributed to the context in which the informant observes that specific behavior. Compared to parents of young children, parents of adolescents have less opportunity to observe their youth's social behavior and thus their report is confined to what they can observe. Adolescents are present to all of their social interactions, but may not be very accurate reporters of their own abilities and behavior. Combining parent and adolescent perspectives is an attempt to reconcile both reports, but it is not necessarily a more accurate way of capturing relationships between risk/enhancing factors and social functioning because of other possible confining variables (e.g., parents and adolescents who agree may also be those who have a better relationship with one another than those who disagreed). Therefore, findings should be interpreted through the lens of the informant considered.

Future Directions

The current study provided important insights pertaining to contributors to social functioning in young adolescents with ADHD. Albeit several factors associated with impaired or healthy social functioning were identified, questions for future investigation remain open. The literature on Conduct Disorder provides a clear message that childhood-onset conduct problems are a stronger predictor of later negative outcomes (e.g., substance use, delinquency, unsafe sex, dangerous driving habits) than adolescent-onset conduct problems (e.g., Moffitt & Caspi, 2001). In the current study, conduct problems emerged as a significant risk factor to social impairment in young adolescents with ADHD. Future studies should investigate if the magnitude of the risk for social impairment differentially increases based on the type of onset of conduct problems or the type of trait-specific subgroup. Given that youth with childhood-onset CD show more

severe conduct problems and higher functional impairment (Moffitt & Caspi, 2001), it is possible that this impairment would be extended to social functioning, making childhood-onset CD a more potent risk factor than adolescent-onset CD. Additionally, a subgroup of youth with CD, who show high rates of callous and unemotional (CU) traits (e.g., lacking empathy and guilt) were found to display a more severe and aggressive pattern of conduct problems (e.g., Frick, Cornell, Barry, Bodin, & Dane, 2003). Future studies should investigate whether having CD accompanied by CU traits augments or reduces the risk for social impairment.

For the first time, the important association between activity participation and good social outcomes shown in the developmental literature was now shown to also hold true for youth with ADHD. However, in the current study activity participation included multiple types of activities such as individual and team sports as well as leisure activities (e.g., clubs, hobbies). Future research should examine whether or not the specific type of activity (i.e., team sport versus individual sport versus leisure activity) matters with regard to the magnitude of contribution to healthy social functioning. For example, being successful in a team sport may require better social functioning given the need to collaborate and interact with others than having a hobby such as collecting stamps, which requires no social interaction.

As mentioned above, the findings of the current study are confined to measures collected at the same time point, hence precluding inferences pertaining to causal relationships. Research shows that certain factors impact functioning even at later points in a youth's life. For example, studies show that conduct problems are associated with life-long maladaptive adjustment (e.g., Frick & Loney, 1999). Similarly, parental

involvement has been associated with good long-term social outcomes (e.g., El Nokali et al., 2010). Longitudinal studies employing a risk-resilience model would not only have the capacity to show whether or not there is a causal relationship between buffers from the current study (i.e., activity breadth and intensity and parental involvement) and healthy social functioning, but also if this relationship has the potential to have implications for social functioning in late adolescence, early adulthood or even later developmental stages. Furthermore, longitudinal designs would allow for the examination of the maintenance of the buffering effect in the presence of risk factors that persist over time. The results of this study can inform the choice of child and family characteristics that could be included in these studies.

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