Published in final edited form as:
J Abnorm Child Psychol. 2006 December ; 34(6): 825–839. doi:10.1007/s10802-006-9062-7.

Resilient Adolescent Adjustment among Girls: Buffers of Childhood Peer Rejection and Attention-Deficit/Hyperactivity Disorder

Amori Yee Mikami and
University of Virginia

Stephen P. Hinshaw
University of California, Berkeley

Abstract

Examined a risk-resilience model of peer rejection and attention-deficit/hyperactivity disorder (ADHD) in a 5-year longitudinal study of 209 ethnically and socioeconomically diverse girls aged 6–13 at baseline and 11–18 at follow-up. Risk factors were childhood ADHD diagnosis and peer rejection; hypothesized protective factors were childhood measures of self-perceived scholastic competence, engagement in goal-directed play when alone, and popularity with adults. Adolescent criterion measures were multi-informant composites of externalizing and internalizing behavior plus indicators of academic achievement, eating pathology, and substance use. ADHD and peer rejection predicted risk for all criterion measures except for substance use, which was predicted by ADHD only. ADHD and peer rejection predicted lower adolescent academic achievement controlling for childhood achievement, but they did not predict adolescent externalizing and internalizing behavior after controlling for baseline levels of these constructs. Regarding buffers, self-perceived scholastic competence in childhood (with control of academic achievement) predicted resilient adolescent functioning. Contrary to hypothesis, goal-directed play in childhood was associated with poor adolescent outcomes. Buffers were not found to have differential effectiveness among girls with ADHD relative to comparison girls.

Resilient Adolescent Adjustment among Girls: Buffers of Childhood Peer Rejection and Attention-Deficit/Hyperactivity Disorder

Considerable evidence suggests that the risk factors of childhood peer rejection and attention-deficit/hyperactivity disorder (ADHD)—alone or together—predict a wide range of future adjustment problems (Barkley, 2002; Parker & Asher, 1987). Crucially, some children avoid these negative outcomes, yet there is a gap in knowledge in regards to these resilient children. Our purpose was to investigate buffers of childhood peer rejection and ADHD with respect to adolescent functioning, through a prospective longitudinal study of girls. Research has historically neglected girls with ADHD (Hinshaw & Blachman, 2005), so there is a particular need for understanding risk and protective factors in this population.

Children with ADHD are severely impaired in peer relationships (Whalen & Henker, 1992). Over half of children with ADHD are peer-rejected relative to 15% of comparison children

Address correspondence to Amori Yee Mikami, Department of Psychology - University of Virginia, 102 Gilmer Hall, P.O. Box 400400, Charlottesville, VA 22904-4400; mikami@virginia.edu.

This article was based on a dissertation completed by the first author at the University of California, Berkeley.

(Hoza, Mrug et al., 2005). The overrepresentation of boys with ADHD in the research literature —far stronger than the community boy:girl ratio of 3:1 (American Psychiatric Association, 2000)—may mask findings that girls with ADHD may be even more peer-rejected than their male counterparts (Arnold, 1996; Carlson, Tamm, & Gaub, 1997).

There is reason to be concerned about peer-rejected children, as they show increased risk for adolescent externalizing behavior, internalizing behavior, school failure, and substance use (Kupersmidt, Coie, & Dodge, 1990; Parker, Rubin, Price, & DeRosier, 1995). Predictions often hold after controlling for childhood levels of these problems (Miller-Johnson, Coie, Maumary-Gremaud, Bierman, & Conduct Problems Prevention Research Group, 2002). Although the relationship between childhood peer rejection and subsequent externalizing behavior is well established, the predictive relationships between peer rejection and internalizing symptoms as well as school failure may be even stronger (Hymel, Vaillancourt, McDougall, & Renshaw, 2002).

Children with ADHD are at high risk for poor future adjustment in domains similar to those for peer rejection (Mannuzza & Klein, 1999). The risks of peer rejection and ADHD appear to be additive. One study found that boys with ADHD and parent-rated peer problems fared worse that boys with ADHD only; both groups fared worse than boys without ADHD (Greene, Biederman, Faraone, Sienna, & Garcia-Jetton, 1997).

However, extremely little research has been conducted about the longitudinal outcomes of peer-rejected *girls* with ADHD (see Hinshaw, Owens, Sami, & Fargeon, in press). It is important to address this gap because domains of adolescent impairment may differ for girls versus boys. Girls may be more likely to show internalizing symptoms, given that adult women suffer from depression and anxiety at twice the rate of men (Magee, Eaton, Wittchern, McGonagle, & Kessler, 1996; Nolen-Hoeksema & Girgus, 1994). Compared to boys with conduct disorder, girls with conduct disorder appear more likely to develop depression, suicide, and somatization disorders later in development (Pajer, 1998; Robins & Price, 1991). Thus, investigations of both externalizing and internalizing outcomes is crucial for girls with ADHD.

Academic achievement is also an important outcome for this population. Both children with peer rejection (Buhs & Ladd, 2001; Parker & Asher, 1987) and children with ADHD (Barkley, 2002; Mannuzza, Klein, Bessler, Malloy, & Hynes, 1997) are at high risk for school failure, repeating a grade, and school dropout. However, little is known about the additive effects of peer rejection and ADHD on academic achievement, particularly for *girls*.

Additional domains of impairment are important to consider for adolescent girls with ADHD. First, rates of eating pathology (defined as body image dissatisfaction, maladaptive eating, and at extreme levels, eating disorders) skyrocket during adolescence, and females dramatically outnumber males in eating disorder diagnoses (9:1 female to male ratio) and subclinical discontent with weight (3:1 female to male ratio) (American Psychiatric Association, 2000; Sweeting & West, 2002). Eating pathology has not been investigated as an outcome variable for peer-rejection or for ADHD, probably because of the predominance of boys in such studies. However, there is reason to believe that peer-rejected girls with ADHD will be at risk for eating pathology, because eating pathology is related to depression (see Rierdan, Koff, & Stubbs, 1989), and depression is linked to peer rejection. Also, impulsivity is characteristic of ADHD, bulimia, and binge eating disorder (Fahy & Eisler, 1993).

An additional adolescence-relevant outcome for peer-rejected girls with ADHD is substance use. Because substance abuse rates increase sharply in adolescence (Chassin, Ritter, Trim, & King, 2003), this variable key is to study in an adolescent sample. Yet studies of the relationship between peer rejection and substance use, and between ADHD and substance use, have yielded inconsistent results. Some studies have found that childhood peer rejection (Ollendick, Weist,

Borden, & Greene, 1992) and ADHD (Mannuzza & Klein, 1999) positively predict adolescent substance use. Other studies contend that the relationship between peer rejection and substance use may be limited to hard drug use and persistence in drug abuse beyond adolescence (Allen, Porter, McFarland, Marsh, & McElhaney, 2005). Similarly, some investigators contend that ADHD-comparison differences (a) do not emerge until late adolescence or adulthood, (b) are dependent on comorbidity, and (c) are restricted to hard drugs (Biederman, Wilens, Mick, & Faraone, 1998; Molina & Pelham, 2003). Nonetheless, one investigation of a 95% male sample found that childhood ADHD predicted adolescent substance use, with this relationship mediated by increased likelihood for children with ADHD to be peer rejected and to have deviant peer associations (Marshal, Molina, & Pelham, 2003). Further study of the relationship between substance use and both peer rejection and ADHD is needed, particularly for female samples (see review in Hinshaw & Blachman, 2005).

Importantly, although most peer-rejected children and most youth with ADHD appear to be at risk for maladjustment, some of these children attain good adjustment (see Coie, 1990). Little is known about predictors of resilience for girls with ADHD. We aim to examine a risk-resilience model that may predict positive adjustment for girls with the risk factors of ADHD and peer rejection (see Masten, 2001, for discussion of resilience). We selected three hypothesized protective factors: self-perceived scholastic competence, engagement in goal-directed play, and popularity with non-parental adults. Because peer-rejected children with ADHD spend greater time alone and experience high rates of academic and social failure in school—a key arena for peer socialization—we believe that these protective factors provide children with distracting and engaging behaviors when isolated at school. Self-perceived scholastic competence may lead to a child's involvement in academic activities when she is excluded by peers. Goal-directed play can provide a child with a fun project to keep her mind occupied when alone. Popularity with non-parental adults may foster conversations with teachers to replace missing peer interactions and/or provide role models for competent outcomes. We elaborate on each factor below.

(1) Self-perceived scholastic competence pertains to an individual's belief that she is capable of academic success (Harter, 1985). This factor may be especially important for peer-rejected children because longitudinal studies suggest that rejection leads children to dislike school (Buhs & Ladd, 2001) and to form deviant peer networks supporting externalizing behavior and substance use (Dishion, 1990). High self-perceived scholastic competence, which fosters connection to school, could help to avert this risk. Research indicates that specific perceptions of scholastic competence (as opposed to global self-esteem) predict lower levels of antisocial behavior (Leung & Lau, 1989). Self-perceived scholastic competence may be a particularly effective buffer for children with ADHD, who experience major academic difficulties (Hinshaw, 1992), particularly because academic problems predict adolescent antisocial behavior (Pisecco, Wristers, Swank, Silva, & Baker, 2001). Importantly, self-perceived scholastic competence must be distinguished from academic achievement per se. Evidence supports a reciprocal process between self-perceived scholastic competence and academic achievement: Achievement leads to greater self-perceived competence but such perception in turn encourages achievement (Guay, Marsh, & Boivin, 2003). We hypothesize that self-perceived scholastic competence will predict resilience beyond the effects of achievement itself.

(2) A child's engagement in goal-directed play when alone may also promote resilience. Heterogeneity exists in children's solitary behavior, with different consequences for adjustment. Rubin and Coplan (1998) note that some preschoolers engage in a goal-directed activity (e.g., reading a book, doing a puzzle), which is associated with competency in this age group. Other children engage in unoccupied behavior, which is associated with internalizing symptoms. Goal-directed play when alone, compared to unoccupied behavior, may serve as a

protective factor, particularly for peer-rejected children who spend considerable time alone. Peer-rejected children who engage in elaborate, goal-directed play by themselves may sense less sadness and anxiety. Subjective feelings of loneliness vary among objectively socially-isolated, peer-rejected children (Qualter & Munn, 2002), and goal-directed play behaviors may contribute to these differences.

(3) Positive relationships with non-parental adults may predict resilience. Longitudinal studies of at-risk youth have consistently found that having a positive relationship with a non-parental adult increases the likelihood of youth becoming competent adults (Werner & Smith, 1992) and predicts lower levels of substance use and delinquent behavior, especially if in a deviant peer group (Zimmerman, Bingenheimer, & Notaro, 2002). Positive relationships with teachers predict fewer externalizing behavior problems years later, even after controlling for baseline externalizing behavior and especially if the child had initially high behavior problems (Hamre & Pianta, 2001). One factor that may indicate positive relationships between children and non-parental adults is the adults' liking of the child. Thus, having high popularity with adults may predict resilient outcomes.

In a cross-sectional investigation with a subset of the participants in the current sample, we found that (a) engagement in goal-directed play was associated with lower levels of concurrent internalizing behavior and (b) popularity with adults was associated with lower levels of concurrent externalizing behavior, after controlling for peer rejection (Mikami & Hinshaw, 2003). Goal-directed play had a stronger, negative association with both externalizing and internalizing behavior among the peer-rejected subgroup than among the peer-accepted subgroup. Hence, goal-directed play and popularity with adults may predict longer-term outcomes as well.

The above hypothesized buffers may have stronger effects for girls with ADHD than for comparison girls. Mikami and Hinshaw (2003) found that ADHD diagnosis moderated the concurrent relationship between goal-directed play and internalizing symptoms, such that girls with ADHD received more incremental benefit from engagement in goal-directed play than did comparison girls. ADHD diagnosis may moderate buffering effects because peer-rejected children with ADHD frequently have turbulent relations with parents and teachers in addition to difficulties with peers (Hinshaw & Simmel, 1994), whereas peer-rejected children without ADHD may be more likely to have problems in the peer domain only. Related research has found that boys with ADHD have greater susceptibility to the negative effects of a deviant peer group (Marshal, Molina, & Pelham, 2003) and reap greater benefit from authoritative parenting practices (Hinshaw, Zupan, Simmel, Nigg, & Melnick, 1997) than do comparison boys.

Hypotheses

First, we hypothesize that childhood peer rejection and ADHD diagnosis will be positively associated with externalizing behavior, internalizing behavior, low academic achievement, eating pathology, and substance abuse in adolescence. For externalizing and internalizing behavior, and for academic achievement, we conduct additional analyses controlling for childhood levels of these constructs to test changes in adjustment from childhood to adolescence. Second, we predict that high self-perceived scholastic competence, goal-directed play when alone, and popularity with adults will buffer the association between the risk factors of peer rejection/ADHD and these adolescent outcomes. Finally, we predict that stronger buffering effects will be found for girls with the risk factors of peer rejection and ADHD than for girls lacking these risk factors.

Method

Overview of Procedures

Girls with ADHD along with age- and ethnicity-matched comparison girls participated in research summer day camps in 1997, 1998, and 1999. Classes of 25–26 girls (60% with ADHD mixed with 40% comparison), grouped by age (6–8 yr, 8.5–10.5 yr, and 10.5–13 yr), engaged in classroom, art, drama, and outdoor activities. Families of any girls with ADHD receiving stimulant medication (10% of girls with ADHD) were asked to have their daughters participate while unmedicated. The majority did so; for girls whose families requested a medication trial, data herein reflect behavior during unmedicated periods. For details of the summer program methodology and initial cross-sectional findings, see Hinshaw (2002). All participants and their families were invited to return for assessments approximately 4.5 years after the summer program. Assessments recorded girls' typical functioning in their daily life; therefore, if the participants generally took medication, informants reported on their medicated behavior, except for ADHD symptoms and selected measures of family functioning and neuropsychological performance. For details of the follow-up methodology and overview of findings, please see Hinshaw et al. (in press).

Participants

At baseline, we evaluated 228 participants between the ages of 6–13: 140 with ADHD and 88 age- and ethnicity-matched comparison girls. At follow-up, 92% of the sample was evaluated (age range = 11–18): 127 with ADHD and 82 comparison girls. Note that the popularity with adults measure was collected in only the 1998 and 1999 summer programs (n=131). Both ADHD and comparison samples were recruited through school mailings and newspaper advertisements; girls with ADHD were additionally recruited from mental health facilities. The sample was diverse ethnically (53% Caucasian, 27% African American, 11% Latina, 9% Asian American) and socioeconomically. Participants with ADHD were diagnosed using commonly-used parent *and* teacher rating scales (CBCL: Achenbach, 1991a; TRF: Achenbach, 1991b; SNAP: Swanson, 1992), and clinical interviews with parents (DISC-IV: Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). Initial clinical cutoffs were a T-score of 60 on the CBCL/TRF, a criterion validated by Chen, Faraone, Biederman, & Tsuang (1994), and the presence of 5 of 9 symptoms of inattention and/or hyperactivity/impulsivity on the SNAP; these scores were intentionally set low to avoid false negatives in a female sample. Yet for inclusion into the study, the ADHD sample had to meet full criteria for ADHD on the DISC-IV. Comparison girls had to be below ADHD cutoffs on rating scales, and there could be no diagnosis of ADHD on the DISC-IV. However, because we did not want a "super-normal" comparison group, comparison girls were permitted to have other disorders. Overall, the comparison group fell close to national means on all subscales of the CBCL/TRF, and not significantly below average. Participants with ADHD were additionally classified as the Combined or Inattentive subtype based on parent/teacher/staff ratings (see Hinshaw, 2002).

Comparison of the retained sample (n = 209) versus those lost to attrition (n = 19) revealed that, for 29 of 31 demographic and symptom variables gathered at baseline, differences were not statistically significant. Those lost to attrition were (a) more likely to be from single-parent homes, and (b) had higher teacher-reported internalizing scores (small effect sizes). Please see Hinshaw et al. (in press) for further details. We also compared the follow-up sample of 127 girls with ADHD to the 82 comparison girls with respect to baseline demographic measures. The two groups did not differ significantly with respect to any demographic variable: age, $t(207)=1.58$; $p>.05$; family income $t(207)=-1.37$; $p>.05$; proportion white versus non-white, $\chi^2(1)=2.48$; $p>.05$; parents married, living together, or not together, $\chi^2(2)=3.92$; $p>.05$; or number of adults in household, $t(207)=0.32$; $p>.05$.

Baseline Measures

Most constructs were collected from multiple informants and combined into composite scores as described in the "Composite Scores and Transformations" section below.

Risk factor: Peer rejection—(1) Standard sociometric nomination procedures (Coie, Dodge, & Coppotelli, 1982) were performed during the summer camp programs. All children in a given classroom nominated three classmates with whom they would most like to be friends and three classmates with whom they would least like to be friends. Proportion scores were calculated by dividing the number of "most liked" and number of "least liked" nominations received by the number of classmates providing nominations. (2) Parents reported on the child's popularity with peers on a 1–5 Likert scale (1=extremely popular, 5=not at all popular). (3) Teachers reported on the child's popularity with peers on the Dishion Social Preference scale (Dishion, 1990), a well-established adult informant measure of peer status.

The atypical ratio of girls with ADHD to comparison girls at the summer program raises the question of whether summer program sociometric measures do not reflect peer standing in a regular classroom. As described in Blachman and Hinshaw (2002), nominations given by ADHD versus comparison girls were similar overall, in that girls with ADHD were universally rejected, but girls with ADHD nominated other girls with ADHD slightly more favorably than did comparison girls. Thus, the atypical ratio of ADHD to comparison girls may understate the degree of social rejection experienced by the participants with ADHD.

Externalizing behavior—(1) Parents reported on the widely-used CBCL (Achenbach, 1991a) Aggressive Behavior and Delinquent Behavior narrow-band scales and (2) teachers reported on the parallel TRF (Achenbach, 1991b) scales. All scales have excellent internal consistency, test-retest reliability, and validity. Each item is rated on a 0–2 metric and we utilized T-scores in all analyses. These scales best tap the domains of externalizing behavior assessed by camp staff reports and behavior observations. (3) Camp staff gave daily ratings about externalizing behavior on a 9-item scale (sample items: "was defiant", "hit, kicked, bit, or physically threatened peers") using a metric from 0=never happened to 3=happened with great frequency (see Hinshaw, 2002). (4) Observers coded children for five-second intervals, recording instances of physical and verbal aggression and noncompliance. Each child received over 200 data points over a total of 16–18 hours. Interrater reliability was acceptable (occurrence-only agreement proportions= .60 for physical + verbal aggression and .70 for noncompliance).

Internalizing behavior—(1) Parents reported on the CBCL (Achenbach, 1991a) Anxiety/Depression narrow-band scale and (2) teachers reported on the parallel TRF (Achenbach, 1991b) scale. This scale best taps the domains of internalizing behavior reported by camp staff and self-report. (3) Camp staff gave daily ratings of girls' internalizing behavior on a 14-item scale (sample items: "appeared sad, down, or depressed", "self-critical"), using a metric from 0=not at all to 4=a great deal (see Hinshaw, 2002). (4) Girls provided self-report on the well-established and psychometrically-sound Children's Depression Inventory (Kovacs, 1992). Each of the 27 items is scored on a 0–2 metric.

Academic achievement—Girls were administered the Basic Reading and Math Reasoning subtests of the Wechsler Individual Achievement Test (WIAT: Wechsler, 1992). The WIAT is a psychometrically sound, well-normed, and widely used test of academic achievement. Standard scores were utilized for analyses.

Protective factor #1: Self-perceived scholastic competence—This domain was measured using the Harter Self-Perception Profile for Children (Harter, 1985) "scholastic

competence" subscale. This six-item, self-report measure described different children (e.g., "some kids feel that they are very good at their school work, but other kids worry about whether they can do the school work assigned to them") and asked the participant to indicate which description was most like herself. Items assessed the degree to which children perceived themselves to be good at understanding class work, good at tests, and intelligent. Adequate internal consistency has been previously established for this measure (alpha= .71 to .86; Harter, 1985).

Protective factor #2: Engagement in goal-directed play when alone—At one-minute intervals a team of trained staff observed a designated child and recorded whether she was (a) socializing with another person, (b) alone but engaged in a goal-directed activity—for example reading a book or doing a puzzle (goal-directed play), or (c) alone but looking around aimlessly or without purpose—for example looking at other girls but not engaging with them, or staring off into space. Each child received 60–70 data points over the summer, over a total of 17 hours. Interrater agreement for all categories was acceptable (Kappa: .56–.66; Alpha: .78–.82). For further details see Mikami and Hinshaw (2003). We conceptualized goal-directed play as protective to the extent that it substituted for otherwise being alone doing nothing and not to the extent that it substituted for socializing with peers. Therefore, as the measure of goal-directed play, we calculated *the proportion of time a child was engaged in goal-directed play relative to the proportion of time the child was alone doing nothing*. Using this ratio ensured that a high score means that when a child was not socializing, she tended to engage in goal-directed play as opposed to doing nothing[1].

Protective factor #3: Popularity with adults—This variable was assessed in a parallel manner to peer rejection, except that adult staff rather than peers provided the data. (1) Ten raters per classroom, all adult camp staff at B.A. level or higher, nominated the three girls they most liked and the three girls they most disliked in each class. (2) These raters also reported their liking of each girl on a 1–5 scale (1=dislike a lot and 5=like a lot.) The average pairwise correlation between raters was .84, demonstrating good agreement (see Mikami and Hinshaw, 2003, for further details). (3) Parents reported girls' popularity with adults on a 1–5 scale (1=extremely popular, 5=not popular).

Follow-up Measures

Externalizing behavior—(1) Parents reported on the widely-used CBCL (Achenbach, 1991a) and (2) two teachers reported on the parallel TRF (Achenbach, 1991b) narrow-band Aggressive Behavior and Delinquent Behavior subscales. (3) Participant self-report was collected through the Self-Reported Delinquency scale (Elliott, Huizinga, & Ageton, 1985), an extensively validated instrument that taps overt and covert antisocial behavior. Similar to Elliot et al. (2005), we created a score reflecting the number of different types of antisocial acts committed, of 36 possible types. Scores correlate moderately (r=.34–.41) with criterion measures such as the CBCL/TRF.

Internalizing behavior—(1) Parents reported on the widely-used CBCL (Achenbach, 1991a) and (2) two teachers reported on the parallel TRF (Achenbach, 1991b) narrow-band Anxiety/Depression scale. (3) Participants reported on Child Depression Inventory (Kovacs, 1992).

[1]Reviewers suggested that the test of goal-directed play as a protective factor should be operationalized by first controlling for the total amount of solitary time, and then placing the proportion of goal-directed play on the next step in the regression. Analyses were conducted with this method and the effects for goal-directed play remained unchanged. Thus, we have retained the current conception of goal-directed play, to maintain consistency with Mikami and Hinshaw (2003).

Academic achievement—Girls were again administered the Basic Reading and Math Reasoning subtests of the WIAT (Wechsler, 1992).

Eating pathology—(1) Girls self-reported on the widely-used Eating Disorders Inventory 2nd edition (EDI-2: Garner, 1991), from which we selected the "Body Image Dissatisfaction" (sample item: I think my hips are too big), "Drive for Thinness" (sample item: I am terrified of gaining weight), and "Bulimia" (sample item: I have the thought of trying to vomit in order to lose weight) subscales for analysis; and (2) the Eating Attitudes Test (EAT: Garner, Olmstead, Bohr, & Garfinkel, 1982), from which we selected the "Dieting" (sample item: I am aware of the calorie content of foods that I eat) and "Bulimia and Food Preoccupation" (sample item: I feel that food controls my life) subscales. These subscales are the most commonly used and best reflect eating pathology. Garner and colleagues (1982, 1991) report both scales to be psychometrically-sound, with alphas between .80–.90, and scales differentiate between normal and clinical populations. On both scales, items were scored on a 1–6 metric.

Substance use—This was assessed by the Substance Abuse Questionnaire, a structured interview for adolescents (see Marshal et al., 2003; Molina, 1995). This measure includes both lifetime exposure questions and quantity/frequency questions. Kappas for 2-week test-retest reliability for "ever trying" one of five substances averaged .84. We created a severity score reflecting the frequency and variety of substance use. It shows a moderate correlation (r=.45–.53) with substance abuse/dependence symptom levels from the DISC. We used adolescent self-report because of evidence that substance abuse is generally not known by parents and teachers. To encourage truthful reporting, adolescents provided answers in their own copies of the questionnaire (questions were read aloud by interviewer from a separate copy).

Composite Scores and Transformations

The measures composing the constructs of peer rejection, popularity with adults, externalizing and internalizing behavior (baseline and follow-up), and eating pathology were amalgamated into composites, and thus were continuous variables. Multiple measure and informant composites provide more valid assessments of the domains of interest than single-informant scores (Achenbach, McConaughy, & Howell, 1987). For each domain, we first demonstrated through factor analyses that the constituent measures were inter-correlated. In all cases, the eigenvalue of the first factor was greater that 2.0 with all other eigenvalues less than 1.0. Additionally, each factor loading was at least 0.4 on the first factor. Factors were internally consistent (alpha>0.8). Each child's raw scores on all measures were converted into z-scores and averaged together (weighted equally), giving a composite score that was an amalgamation of multiple measures.

We examined potential violations of the assumptions of the regression model. No relationships between the predicted and residual values were observed and it was assumed that the assumptions of linearity and homoscedasticity were met. The assumption of normality was tested by plotting histograms of each variable overlaying a normal curve. Most variables were approximately normally distributed. However, externalizing psychopathology (both at baseline and follow-up) and substance abuse were right-skewed, such that most girls demonstrated few of these problem behaviors. In order to address the potential for the skewed nature of these variables to influence findings, natural log transformations of these variables were conducted and substituted in analyses. Results did not change, so results reflect original values.

In order to prevent the data's being affected by extreme outliers, cases more than 4 standard deviations beyond the mean were identified for every measure. The least extreme outlier was replaced with a score 4 sd beyond the mean, and the next outlier was replaced with a score 4.5

sd beyond the mean, in order to preserve the rank. This transformation was necessary for only two cases, both for the domain of substance abuse.

Results

Girls with and without ADHD were first compared on relevant variables. At baseline girls with ADHD, relative to comparison girls, were more peer-rejected, $t(207)=9.94$; $p<.001$; displayed more externalizing symptoms, $t(207)=11.72$; $p<.001$, and internalizing symptoms, $t(207)=10.89$; $p<.001$; and had lower academic achievement, $t(207)=-6.89$; $p<.001$. The ADHD sample also showed lower levels of all hypothesized protective factors: self-perceived scholastic competence, $t(207)=-4.83$; $p<.001$, goal-directed play, $t(207)=-2.98$; $p<.01$, and popularity with adults, $t(207)=-6.78$; $p<.001$. Girls with ADHD displayed poorer adolescent outcomes as well: greater externalizing symptoms, $t(207)=6.55$; $p<.001$, and internalizing symptoms, $t(207)=5.09$, $p<.001$; lower academic achievement, $t(207)=-8.49$; $p<.001$; increased eating pathology, $t(207)=4.36$; $p<.001$; and (with marginal significance) increased substance abuse, $t(207)=1.83$; $p=.069$[2].

Zero-order correlations revealed that the risk factor of peer rejection had moderately strong, positive correlations with the baseline variables of problem behavior and lower, but still noteworthy, positive correlations with the follow-up criterion variables of problem behavior, with the exception of substance abuse. Peer rejection showed negative correlations with all hypothesized protective factors. Similarly, the hypothesized protective factors had modest to moderate sized negative correlations with the criterion measures of problem behavior (see Table 1). In sum, examination of correlations established ADHD diagnosis and peer rejection as risk factors, as they were associated with poorer functioning at both baseline and follow-up, and with lower levels of hypothesized protective factors. Please see Mikami and Hinshaw (2003) for further description of associations between baseline variables.

Effects of Childhood Peer Rejection and ADHD on Adolescent Adjustment

We first examined childhood peer rejection and ADHD diagnosis as predictors of adolescent adjustment. We conducted hierarchical multiple regression analyses with peer rejection on step 1, ADHD diagnosis (dichotomous variable, dummy coded) on step 2, and the interaction between peer rejection and ADHD on step 3. Dependent variables were the five criterion measures of adolescent adjustment: externalizing behavior, internalizing behavior, academic achievement, eating pathology, and substance use. We found that both childhood peer rejection and ADHD diagnoses made significant contributions to greater levels of adolescent externalizing behaviors, internalizing behaviors, and eating pathology and lower levels of academic achievement. Only ADHD diagnosis and not peer rejection predicted greater adolescent substance use behaviors. In no case was the interaction between peer rejection and ADHD significant (see Table 2).

Second, when possible we examined childhood peer rejection and ADHD diagnosis as predictors of *change* in problem behaviors and adjustment from childhood to adolescence. For the adolescent criterion measures of externalizing behavior, internalizing behavior, and academic achievement, we conducted additional regressions in which we controlled for childhood levels of the relevant construct on step 1, peer rejection on step 2, ADHD status on step 3, and the interaction between rejection and ADHD status on step 4. Because we had no

[2]Because scores of problem behavior are z-scored composites, they do not provide a sense of absolute severity. Yet girls with ADHD fell in the clinically significant range on problem behaviors. Mother and Teacher average T-scores for aggressive and delinquent subscales on the CBCL/TRF ranged from 62–67 for the ADHD sample, relative to 52–53 for the comparison sample. Mother and Teacher average T-scores for anxious/depressed subscales on the CBCL/TRF ranged from 61–62 for the ADHD sample, relative to 53 for the comparison sample.

baseline measure of eating pathology and substance use (given the age of the sample at that time), we were unable to examine change over time in these domains.

After controlling for childhood externalizing behaviors on step 1, neither peer rejection, ADHD, nor the interaction between peer rejection and ADHD significantly predicted adolescent externalizing behaviors. Similarly, after controlling for childhood internalizing behaviors on step 1, neither peer rejection, ADHD, nor their interaction predicted adolescent internalizing behaviors. However, after controlling for childhood academic achievement, both peer rejection (R^2 *change* =.02; p<.01) and ADHD (R^2 *change* =.02; p<.01) predicted declining academic achievement into adolescence. The interaction between peer rejection and ADHD was not significant (see Table 3)[3].

Buffers of Adolescent Problem Behavior

We tested the hypothesized protective factors of self-perceived scholastic competence, engagement in goal-directed play when alone, and popularity with adults as buffers of the five outcomes. Parallel to the structure of the regressions described above, we tested effects of hypothesized protective factors both as (a) predictors of adolescent problem behaviors without statistical control of childhood levels of the relevant construct and (b) predictors of change in problem behavior from childhood to adolescence with statistical control of childhood levels of the relevant construct. We retained peer rejection, ADHD, and the interaction between rejection and ADHD on the first three steps, and then added the hypothesized protective factor on step 4, the interaction between peer rejection and the protective factor on step 5, and the interaction between ADHD and the protective factor on step 6. Significant interactions were probed in the manner recommended by Holmbeck (2002). We tested the three-way interaction between peer rejection, the protective factor, and ADHD on the final step, but because none of these interactions was significant, they are omitted[4]. Statistical power for a medium effect size was high (0.99) for 209 participants, with all main and interaction effects (up to 9 predictors) (Faul & Erdfelder, 1992).

Self-perceived scholastic competence[5]—Analyses testing effects of self-perceived scholastic competence controlled for actual academic achievement on the previous step. First, as a predictor of adolescent problem behaviors, self-perceived scholastic competence in childhood negatively predicted adolescent internalizing problems (R^2 *change* =.02; p<.05). Self-perceived scholastic competence also negatively predicted adolescent substance use (R^2 *change* =.04; p<.01). In both cases, findings held after control of peer rejection, ADHD, and childhood academic achievement. Notably, actual academic achievement did not predict

[3]When ADHD was placed on step 1 and peer rejection on step 2 in these analyses, instead of the reverse, results were unchanged for 6 of 8 outcomes (with and without statistical control of baseline adjustment). For substance abuse, ADHD diagnosis became marginally significant and peer rejection was *negatively* associated with substance use; as the correlation between rejection and substance use is close to zero, this negative relationship suggests that rejection has a suppressor effect when combined with ADHD. For academic achievement, after controlling for baseline achievement, ADHD diagnosis remained significant but the peer rejection effect was reduced.

[4]We conducted parallel analyses in which ethnicity, SES, age, and IQ were each considered as predictors before peer rejection and ADHD. We note that girls with ADHD and comparison girls were not significantly different at baseline regarding ethnicity, SES, and age; however, we examined their effects because of the wide range on these variables. We found no main effects for age or for ethnicity, and few effects for SES with two exceptions—SES was negatively correlated with adolescent externalizing symptoms and positively correlated with academic achievement, but only *without* control of baseline levels of these constructs. The pattern of results was largely unchanged with the addition of these variables. Regarding IQ, not surprisingly, girls with ADHD revealed significantly lower IQs than did comparison girls (see Hinshaw, 2002). When included as a predictor prior to peer rejection and ADHD, IQ was significantly and negatively correlated with all of the measures of adolescent problem behaviors and positively correlated with adolescent academic achievement. However, the pattern of results for the risk factors and buffers remained largely unchanged. Notably, even after controlling for the effects of IQ and baseline academic achievement the factors of peer rejection and ADHD remained significant in predicting adolescent achievement, and perceived scholastic competence remained marginally significant. Finally, we conducted parallel analyses in which ADHD subgroup (Combined Type, Inattentive Type, comparison) was substituted for ADHD diagnostic status (ADHD versus comparison). The pattern of results was unchanged, so we report results for ADHD vs. comparison diagnostic status herein.

[5]The potential buffering effects of all other Harter subscales were tested, and these results pertain uniquely to self-perceived scholastic competence.

adolescent externalizing, internalizing, eating, or substance use behaviors. None of the interactions between self-perceived scholastic competence and ADHD, or self-perceived scholastic competence and peer rejection, was significant (Table 4).

Second, as a predictor of change in problem behaviors, self-perceived scholastic competence negatively predicted externalizing behaviors (R^2 *change* =.02; p<.05), after control of childhood externalizing problems, peer rejection, ADHD, and academic achievement (Table 4). Self-perceived scholastic competence positively predicted, with marginal significance, adolescent academic achievement (R^2 *change* =.01; p=.07), after controlling for childhood academic achievement, peer rejection, and ADHD. None of the interactions between self-perceived scholastic competence and ADHD, or self-perceived scholastic competence and peer rejection, was significant. Again, actual academic achievement did not predict adolescent externalizing or internalizing behaviors.

Engagement in goal-directed play—Notably, every main effect for goal-directed play was in the direction contrary to our original hypothesis: Although goal-directed play had been associated with low levels of problem behavior cross-sectionally (Mikami & Hinshaw, 2003), it predicted high levels of problem behavior longitudinally. First, as a predictor of adolescent adjustment, goal-directed play in childhood positively predicted adolescent externalizing behavior (R^2 *change*= 05; p<.001), internalizing behavior (R^2 *change* =.02; p<.05), and substance use (R^2 *change* =.06; p<.01), after controlling for peer rejection and ADHD. There was also an interaction effect between goal-directed play and ADHD as predicting substance use (R^2 *change* =.05; p<.001). For girls with ADHD, goal-directed play was associated with increased substance abuse (slope significant; $t(203) = 4.04$, p<.01) but for comparison girls it was not associated (slope nonsignificant; $t(203) = 1.31$, p>.10). None of the interactions between goal-directed play and peer rejection was significant.

Second, as a predictor of change in problem behaviors, goal-directed play positively predicted adolescent externalizing behavior (R^2 *change* =.04; p<.001), after controlling for childhood externalizing behavior, peer rejection, and ADHD. Similarly, goal-directed play positively predicted adolescent internalizing behavior (R^2 *change* =.02; p<.05), after controlling for childhood internalizing behavior, peer rejection, and ADHD. None of the interactions between goal-directed play and ADHD, or goal-directed play and peer rejection, was significant.

Popularity with adults—Perhaps because of reduction in sample size for this measure, results only revealed two marginally significant effects for popularity with adults: It positively predicted academic achievement as a main effect (R^2 *change* =.02; p=.08) and as an interaction effect with peer rejection (R^2 *change* =.02; p=.06), after controlling for peer rejection and ADHD.

Discussion

Using a prospective, longitudinal design to examine predictors of risk and resilience among a girls, who constitute an understudied population, we found that both peer rejection and ADHD in childhood positively predicted a wide range of negative adolescent outcomes: externalizing behavior, internalizing behavior, poor academic achievement, eating pathology, and substance use (ADHD diagnosis only). There were no interaction effects between peer rejection and ADHD in predicting adolescent outcomes. Crucially, regarding prediction of change in problem behavior from childhood to adolescence, peer rejection and ADHD each predicted decreases in adolescent academic achievement, after controlling for childhood academic achievement, and despite the large association between childhood and adolescent academic achievement (r^2=.67). However, peer rejection and ADHD failed to predict adolescent internalizing and externalizing behavior after controlling for childhood levels of these

problems. Regarding protective factors, self-perceived scholastic competence in childhood, after controlling for academic achievement, predicted lower levels of adolescent externalizing behavior, internalizing behavior, and substance abuse. Contrary to the original hypothesis, engagement in goal-directed play was consistently associated with greater adolescent psychopathology, particularly among girls with ADHD. Popularity with adults did not significantly protect against adolescent problem behaviors. Surprisingly, there were few interactions between protective factors and ADHD, or protective factors and peer rejection, suggesting that the buffering effects of these factors were similar for girls with and without the risk factors of ADHD and peer rejection.

Despite considerable literature suggesting the contrary, in this study childhood peer rejection failed to add incremental variance to the prediction of adolescent externalizing and internalizing behaviors after controlling for childhood levels of these constructs. We were surprised by this null finding, especially regarding prediction of internalizing behavior, where the independent contribution of peer rejection has been most clearly established (Hymel et al., 2002). Furthermore, we did not find that peer rejection predicted increased substance use, although we did find that girls with ADHD showed higher substance use. However, we found that both peer rejection and ADHD independently contributed to declining academic achievement scores on a well-normed, standardized test, after controlling for childhood academic achievement. This finding replicates previous research showing the separate effects of peer rejection (Parker et al., 1995) and ADHD (Hinshaw, 1992) on academic problems.

Risk-resilience models of peer rejection and ADHD have largely, if not almost exclusively, focused on boys. Toward that end, a notable (and to our knowledge, unprecedented) finding was that both childhood peer rejection and ADHD predicted adolescent eating pathology. It may be that peer-rejected girls are more vulnerable to body image dissatisfaction because they lack the self-confidence that others accept them the way they are. Supporting this theory, research has found that girls who have little social support to counteract media pressures for thinness are vulnerable to eating pathology (Stice, Spangler, & Agras, 2001). Additionally, girls with ADHD may be at particular risk for eating pathology because of the impulsivity that is central to both ADHD and bulimia/binge eating disorders (Fahy & Eisler, 1993).

Regarding the hypothesized predictors of resilience, we found that self-perceived scholastic competence buffered against internalizing behavior, externalizing behavior, and substance abuse. This relationship held after controlling for actual levels of academic achievement; girls' self-perceptions of their academic abilities were the key factor. In the case of externalizing behavior, the relationship also held after control of baseline levels of these symptoms. Our finding that actual academic achievement did not predict adolescent problem behaviors relates to other literature suggesting that self-perceptions and "reality" have different, but equally important, implications for adjustment (Harter, 1985; Harter & Whitesell, 1996). Yet there remains a need for research into mechanisms behind protective effects. For example, based on this pattern of findings, we hypothesize that self-perceived scholastic competence buffers against externalizing behavior and substance use through the mediator of keeping adolescents connected to school and away from deviant peer groups. This mechanism should be a priority for testing in future research.

We had hypothesized that engagement in goal-directed play would predict resilience. However, results were consistently in the direction opposite to initial predictions, such that a *high* ratio (not a low ratio) of engaging in goal-directed play when alone, relative to doing nothing, was associated with externalizing behavior, internalizing behavior, and substance abuse in adolescence. Furthermore, goal-directed play was most associated with substance use in the subgroup of girls with ADHD. Inspection of plots reveals that these associations were not driven by a few outliers extreme in goal-directed play and psychopathology but, rather,

reflected a consistent tendency among the entire sample. This set of findings was surprising, directly contradicting our hypothesis and reversing our cross-sectional finding that goal-directed play was associated with *positive* adjustment, particularly for the ADHD subgroup (Mikami & Hinshaw, 2003, also see Table 1).

What are potential mechanisms underlying this contradictory finding? One possibility comes from the coping literature, where research suggests that "avoidance strategies" (orienting away from the stress, distracting) may reduce distress in the short-term, but lead to poorer functioning over the long term, whereas "approach strategies" (attempting to problem-solve and analyze the stressor) may show the opposite temporal pattern (Roth & Cohen, 1986). Perhaps goal-directed play behaviors are an avoidance coping strategy for dealing with the stress of peer rejection. They allow girls to go off in their own world, providing relief from internalizing symptoms as we found in cross-sectional analyses. However, solitary behaviors may deprive girls over the long term of learning important social skills, perhaps accounting for the association with increased adolescent psychopathology we found. Additionally, it is unknown whether girls who were high in goal-directed play at baseline continued to perform goal-directed play at follow-up. If so, perhaps goal-directed play is adaptive in childhood but becomes increasingly maladaptive in adolescence as the peer domain grows in importance. Previous research supports this idea (Rubin & Coplan, 1998), with one hypothesized mechanism that (a) peers become more socially aware by adolescence and (b) they perceive playing by oneself as increasingly deviant. Mechanisms are speculative and replication of this unexpected and perplexing finding is needed.

Effect sizes for both the risk factors (ADHD and peer rejection) and the protective factors (self-perceived scholastic competence and low goal-directed play) on adolescent adjustment were small to medium. By contrast, predictions between baseline and follow-up measures of adjustment were large: R^2= .31 for externalizing symptoms, R^2= .29 for internalizing symptoms, and R^2= .67 for academic achievement. Predictions between childhood and adolescent constructs may have been inflated because of the multiple-informant composites that formed the constructs of externalizing and internalizing symptoms, and the highly reliable nature of the academic achievement measure; alternatively, correlations between child and adolescent constructs may have been reduced because slightly different informants contributed to each construct. These high correlations between childhood and adolescent behaviors left relatively little variance to be explained by the risk and protective factors. However, another interpretation is that by ages 6–12 (the age of the sample at baseline), girls were already on a clear trajectory towards adolescent problem behaviors and achievement, leaving little room for other factors to affect that path. Related research by Campbell and colleagues (2000) suggests that trajectories toward externalizing behavior begin at the age of three, and Tremblay (2000) contends that risk research must begin in infancy or prenatally. Predictive models and interventions may well need to begin earlier.

We were also surprised by the lack of significant interactions between ADHD and peer rejection, and between both risk factors and all three protective factors, in predicting adolescent adjustment. This finding suggests that risk and protective factors appear to be *additive*, but not *interactive*, at least in this sample. Risk or protective factors each contribute to adjustment, but having one risk factor may not make a girl more susceptible to the effects of another risk or protective factor. Another implication of this finding is that perhaps models of risk and resilience are more similar than different for girls with ADHD relative to those without. Once again, however, we note that statistical power to detect interactions in nonexperimental designs is low (McClelland & Judd, 1993).

Strengths of this study include the theoretically-based longitudinal model of risk and resilience in an under-studied population of girls and the use of highly validated multi-method and multi-

informant measures for each criterion variable both at baseline and follow-up. For instance, data on internalizing and externalizing psychopathology came from parent and teacher report, camp staff report, child self report, and objective behavioral observations. Thus, there was complete or nearly complete separation of method variance between predictors, protective factors, and outcomes. Additionally, this study used many "gold standards" of assessment, such as naturalistic observation of behaviors and sociometric measures.

Regarding limitations, one is that the measures of popularity assessed at camp are proxies for the girls' popularity in every day life. Because everyday relationships would presumably have more effect on girls' development, the limitations of our measures may have reduced power to draw conclusions. The measure of peer rejection may have been restricted because the sample was not representative of the typical peer group in a school setting. Because popularity is influenced by the composition of the peer group (Stormshak et al., 1999), the atypical composition of our sample may have biased our measure of peer rejection, which may help to explain our null findings regarding the expected predictive power of peer rejection to adolescent psychopathology. Similarly, the measure of popularity with adults may not capture close relationships with non-parental adults in the child's everyday life, and the quality of such relationships may better predict resilience. Finally, future research on risk and resilience would benefit from exploring models with additional predictors. For instance, the role of factors such as SES, ethnicity, IQ, and age – as main and interaction effects with risk and protective factors--should be more fully explored. Investigating the contribution of baseline externalizing and internalizing symptoms on all adolescent domains (including eating pathology, substance use, and academic achievement) is another priority.

Overall, we found that girls with ADHD and peer rejection, relative to those without these factors, were at high risk for a wide variety of psychopathology in adolescence. We also found that some girls possess features, particularly self-perceived scholastic competence and (contrary to the original hypothesis) low goal-directed play, which may contribute to resilient outcomes. This finding is critical given that (a) peer-rejected status tends to be stable (Coie & Dodge, 1983), and (b) social skills interventions to improve the popularity of rejected children with ADHD is not strong (Hoza, Gerdes et al., 2005; Whalen & Henker, 1992). Future research can seek to elucidate more specific mechanisms through which girls become resilient, and other protective factors that may have differential effectiveness for girls with ADHD relative to comparison girls.

Acknowledgments

Work on this research was supported by National Institute of Mental Health Grants R01 MH45064 and F31MH12838, and the Sheldon J. Korchin Prize at the University of California, Berkeley. We express our great appreciation to the girls and their families who participated in this project, to Elizabeth Owens and the many individuals who assisted with data collection and data management, and to Ann Kring and Carolyn Hofstetter for their consultation on this study.

References

Achenbach, TM. Manual for Child Behavior Checklist and Revised Child Behavior Profile. Burlington, VT: University Associates in Psychiatry; 1991a.

Achenbach, TM. Manual for Teacher's Report Form and 1991 Profile. Burlington, VT: University Associates in Psychiatry; 1991b.

Achenbach TM, McConaughy SH, Howell CT. Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. Psychological Bulletin 1987;101:213–232. [PubMed: 3562706]

Allen JP, Porter MR, McFarland FC, Marsh P, McElhaney KB. The two faces of adolescent' success with peers: Adolescent popularity, social adaptation, and deviant behavior. Child Development 2005;76:747–760. [PubMed: 15892790]

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (4th ed. -Text Revision). Washington, DC: Author; 2000.

Arnold LE. Sex differences in ADHD: Conference summary. Journal of Abnormal Child Psychology 1996;24:555–569. [PubMed: 8956084]

Barkley, RA. ADHD: Long-term course, adult outcome, and comorbid disorders. In: Jensen, PS.; Cooper, JR., editors. Attention-Deficit/Hyperactivity Disorder: State of the Science and Best Practices. Kingston, NJ: Civic Research Institute; 2002. (pp. 4-1-4-12)

Biederman J, Wilens TE, Mick E, Faraone SV. Does attention-deficit hyperactivity disorder impact the developmental course of drug and alcohol abuse and dependence? Biological Psychiatry 1998;44:269–273. [PubMed: 9715358]

Blachman DR, Hinshaw SP. Patterns of friendship among girls with and without attention-deficit/hyperactivity disorder. Journal of Abnormal Child Psychology 2002;30:625–640. [PubMed: 12481976]

Buhs ES, Ladd GW. Peer rejection as antecedent of young children's school adjustment: An examination of mediating processes. Developmental Psychology 2001;37:550–560. [PubMed: 11444490]

Campbell SB, Shaw DS, Gilliom M. Early externalizing behavior problems: Toddlers and preschoolers at risk for later maladjustment. Development & Psychopathology 2000;12:467–488. [PubMed: 11014748]

Carlson CL, Tamm L, Gaub M. Gender differences in children with ADHD, ODD,and co-occurring ADHD/ODD identified in a school population. Journal of the American Academy of Child and Adolescent Psychiatry 1997;36:1706–1714. [PubMed: 9401332]

Chassin, L.; Ritter, J.; Trim, RS.; King, KM. Adolescent substance use disorders. In: Mash, EJ.; Barkley, RA., editors. Child Psychopathology. 2nd ed.. New York: Guilford Press; 2003. p. 199-232.

Chen WJ, Faraone SV, Biederman J, Tsuang MT. Diagnostic accuracy of the Child Behavior Checklist scales for attention-deficit hyperactivity disorder: A receiver-operating characteristic analysis. Journal of Consulting & Clinical Psychology 1994;62:1017–1025. [PubMed: 7806710]

Cohen, J.; Cohen, P.; West, SG.; Aiken, L. Applied multiple regression/correlation analyses for the behavioral sciences. 3rd edition. Mahwah, NJ: Lawrence Erlbaum Publications; 2003.

Coie, JD. Toward a theory of peer rejection. In: Asher, SR.; Coie, JD., editors. Peer rejection in childhood. New York: Cambridge University Press; 1990. p. 365-401.

Coie JD, Dodge KA. Continuities and changes in children's social status: A five-year longitudinal study. Merrill-Palmer Quarterly 1983;29:261–282.

Coie JD, Dodge KA, Coppotelli H. Dimensions and types of social status: A cross-age perspective. Developmental Psychology 1982;18:557–570.

Dishion, TJ. The peer context of troublesome child and adolescent behavior. In: Leone, PE., editor. Understanding Troubled and Troubling Youth: Multiple Perspectives. Thousand Oaks, CA: Sage; 1990.

Elliott, DS.; Huizinga, D.; Ageton, S. Explaining delinquency and drug use. Thousand Oaks, CA: Sage; 1985.

Fahy T, Eisler I. Impulsivity and Eating Disorders. British Journal of Psychiatry 1993;162:193–197. [PubMed: 8435689]

Faul, F.; Erdfelder, E. GPOWER: A priori, post-hoc, and compromise power analyses for MS-DOS (computer program). Bonn, FRG: Bonn University, Department of Psychology; 1992.

Garner, DM. Eating Disorder Inventory (2nd edition; EDI-2). Odessa, Florida: Psychological Assessment Resources; 1991.

Garner DM, Olmstead MP, Bohr Y, Garfinkel PE. The Eating Attitudes Test: Psychometric features and clinical correlates. Psychological Medicine 1982;12:871–878. [PubMed: 6961471]

Greene RW, Biederman J, Faraone SV, Sienna M, Garcia-Jetton J. Adolescent outcome of boys with Attention Deficit Hyperactivity Disorder and social disability: Results from a 4-year longitudinal follow-up study. Journal of Consulting and Clinical Psychology 1997;65:758–767. [PubMed: 9337495]

Guay F, Marsh HW, Boivin M. Academic self-concept and academic achievement: Developmental perspectives on their causal ordering. Journal of Educational Psychology 2003;95:124–136.

Hamre BK, Pianta RC. Early teacher-child relationships and the trajectory of children?s school outcomes through the eighth grade. Child Development 2001;72:625–638. [PubMed: 11333089]

Harter, S. Manual for the Self-Perception Profile for Children. University of Denver; 1985. Unpublished manuscript

Harter S, Whitesell NR. Multiple pathways to self-reported depression and psychological adjustment among adolescents. Development & Psychopathology 1996;8:761–777.

Hinshaw SP. Academic underachievment, attention deficits, and aggression: Comorbidity and implications for intervention. Journal of Consulting & Clinical Psychology 1992;60:893–903. [PubMed: 1460150]

Hinshaw SP. Preadolescent girls with attention-deficit/hyperactivity disorder: I. Background characteristics, comorbidity, cognitive and social functioning, and parenting practices. Journal of Consulting and Clinical Psychology 2002;70:1086–1098. [PubMed: 12362959]

Hinshaw, SP.; Blachman, DR. Attention-deficit/Hyperactivity Disorder in Girls. In: Bell-Dolan, D.; Foster, S.; Mash, EJ., editors. Behavioral and emotional problems in girls. New York: Kluwer Academic/Plenum; 2005.

Hinshaw SP, Owens EB, Sami N, Fargeon S. Prospective follow-up of girls with Attention-deficit/ Hyperactivity Disorder into Adolescence: Evidence for Continuing Cross-Domain Impairment. Journal of Consulting & Clinical Psychology. (in press).

Hinshaw, SP.; Simmel, C. Attention-deficit hyperactivity disorder. In: Hersen, M.; Ammerman, RT.; Sisson, LA., editors. Handbook of aggressive and destructive behavior in psychiatric patients. New York: Plenum Press; 1994.

Holmbeck GN. Post-hoc probing of significant moderational and mediational effects in studies of pediatric populations. Journal of Pediatric Psychology 2002;27:87–96. [PubMed: 11726683]

Hoza B, Gerdes AC, Mrug S, Hinshaw SP, Bukowski WM, Gold JA, et al. Peer-assessed outcomes in the Multimodal Treatment Study of children with Attention Deficit Hyperactivity Disorder. Journal of Clinical Child and Adolescent Psychology 2005;34:74–86. [PubMed: 15677282]

Hoza B, Mrug S, Gerdes AC, Bukowski WM, Kraemer HC, Wigal T, et al. What aspects of peer relationships are impaired in children with attention-deficit/hyperactivity disorder? Journal of Consulting & Clinical Psychology 2005;73:411–423. [PubMed: 15982139]

Hymel, S.; Vaillancourt, T.; McDougall, P.; Renshaw, PD. Peer acceptance and rejection in childhood. In: Smith, PK.; Hart, CH., editors. Blackwell handbook of childhood social development. Oxford, UK: Blackwell Publishers; 2002.

Kovacs, M. Children's Depression Inventory (CDI) manual. Toronto, CA: Multi-Health Systems Inc; 1992.

Kupersmidt, JB.; Coie, JD.; Dodge, KA. The role of poor peer relationships in the development of disorder. In: Asher, SR.; Coie, JD., editors. Peer rejection in childhood (pp. New York: Cambridge University Press; 1990. p. 274-305.

Leung K, Lau S. Effects of self-concept and perceived disapproval of delinquent behavior in school children. Journal of Youth and Adolescence 1989;18:345–359.

Magee WJ, Eaton WW, Wittchern H, McGonagle KA, Kessler RC. Agoraphobia, simple phobia, and social phobia in the national comorbidity survey. Archives of General Psychiatry 1996;53:159–168. [PubMed: 8629891]

Mannuzza, S.; Klein, RG. Adolescent and adult outcomes of attention-deficit/hyperactivity disorder. In: Quay, HC.; Hogan, AE., editors. Handbook of disruptive behavior disorders. New York: Kluwer Academic; 1999. p. 279-294.

Mannuzza S, Klein RG, Bessler A, Malloy P, Hynes M. Educational and occupational outcome of hyperactive boys grown up. Journal of the American Academy of Child and Adolescent Psychiatry 1997;36:1222–1227. [PubMed: 9291723]

Marshal MP, Molina BSG, Pelham WE. Childhood ADHD and adolescent substance use: An examination of deviant peer group affiliation as a risk factor. Psychology of Addictive Behaviors 2003;17:293–302. [PubMed: 14640825]

Masten AS. Ordinary magic: Resilience processes in development. American Psychologist 2001;56:227–238. [PubMed: 11315249]

McClelland GH, Judd CM. Statistical difficulties of detecting interactions and moderator effects. Psychological Bulletin 1993;114:376–390. [PubMed: 8416037]

Mikami AY, Hinshaw SP. Buffers of peer rejection among girls with and without ADHD: The role of popularity with adults and goal-directed solitary play. Journal of Abnormal Child Psychology 2003;31:381–397. [PubMed: 12831228]

Miller-Johnson S, Coie JD, Maumary-Gremaud A, Bierman KL. Conduct Problems Prevention Research Group. Peer rejection and aggression and early starter models of conduct disorder. Journal of Abnormal Child Psychology 2002;30:217–230. [PubMed: 12041708]

Molina, BSG. Adolescent substance abuse interview. Department of Psychiatry, University of Pittsburgh Medical Center; 1995.

Molina BSG, Pelham WE. Childhood predictors of adolescent substance use in a longitudinal study of children with ADHD. Journal of Abnormal Psychology 2003;112:497–507. [PubMed: 12943028]

Nolen-Hoeksema S, Girgus J. The emergence of gender differences in depression in adolescence. Psychological Bulletin 1994;115:424–443. [PubMed: 8016286]

Ollendick TH, Weist MD, Borden MC, Greene RW. Sociometric status and academic, behavioral, and psychological adjustment: A five-year longitudinal study. Journal of Consulting & Clinical Psychology 1992;60:80–87. [PubMed: 1556290]

Pajer KA. What happens to "bad" girls? A review of the adult outcomes of antisocial adolescent girls. American Journal of Psychiatry 1998;155:862–870. [PubMed: 9659848]

Parker JG, Asher SR. Peer relations and later personal adjustment: Are low-accepted children at risk? Psychological Bulletin 1987;102:357–389. [PubMed: 3317467]

Parker, JG.; Rubin, KH.; Price, JM.; DeRosier, ME. Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In: Cicchetti, D.; Cohen, DJ., editors. Developmental psychopathology, Vol. 2: Risk, disorder, and adaptation. New York: John Wiley & Sons; 1995. p. 96-161.

Pisecco S, Wristers K, Swank P, Silva PA, Baker DB. The effect of academic self-concept on ADHD and antisocial behaviors in early adolescence. Journal of Learning Disabilities 2001;34:450–461. [PubMed: 15503593]

Qualter P, Munn P. The separateness of social and emotional loneliness in childhood. Journal of Child Psychology and Psychiatry 2002;43:233–244. [PubMed: 11902602]

Rierdan J, Koff E, Stubbs ML. A longitudinal analysis of body image as a predictor of the onset and persistence of adolescent girls' depression. Journal of Early Adolescence 1989;9:454–466.

Robins LN, Price RK. Adult disorders predicted by childhood conduct problems: Results from the NIMH Epidemiologic Catchment Area Project. Psychiatry 1991;54:116–132. [PubMed: 1852846]

Roth S, Cohen LJ. Approach, avoidance, and coping with stress. American Psychologist 1986;41:813–819. [PubMed: 3740641]

Rubin, KH.; Coplan, RJ. Social and nonsocial play in childhood: An individual difference perspective. In: Saracho, ON.; Spodek, B., editors. Multiple perspectives on play in early childhood education. Albany, New York: State University of New York Press; 1998. p. 144-170.

Shaffer D, Fisher P, Lucas CP, Dulcan MK, Schwab-Stone ME. NIMH Diagnostic Interview Schedule for Children, Version IV: Description, differences from previous versions, and reliability of some common diagnoses. Journal of the American Academy of Child and Adolescent Psychiatry 2000;39:28–38. [PubMed: 10638065]

Stice E, Spangler D, Agras WS. Exposure to media-portrayed thin-ideal images adversely affects vulnerable girls: A longitudinal experiment. Journal of Social and Clinical Psychology 2001;20:270–288.

Stormshak EA, Bierman KL, Bruschi C, Dodge KA, Coie JD. Conduct Problems Prevention Research Group. The relation between behavior problems and peer preference in different classroom contexts. Child Development 1999;70:169–182. [PubMed: 10191521]

Swanson, JM. Assessment and treatment of ADD students. Irvine, CA: K.C. Press; 1992.

Sweeting H, West P. Gender differences in weight related concerns in early to late adolescence. Journal of Epidemiology and Community Health 2002;56:701–702.

Tremblay RE. The development of aggressive behaviour during childhood: What have we learned in the past century? International Journal of Behavioral Development 2000;24:129–141.

Wechsler, D. Manual for the Wechsler Individual Achievement Test. New York: Psychological Corporation/Harcourt Brace; 1992.

Werner, EE.; Smith, RS. Overcoming the odds: High risk children from birth to adulthood. Ithaca, N.Y.: Cornell University Press; 1992.

Whalen CK, Henker B. The social profile of attention-deficit hyperactivity disorder: Five fundamental facets. Child and Adolescent Psychiatric Clinics of North America 1992;1:395–410.

Zimmerman MA, Bingenheimer JB, Notaro PC. Natural mentors and adolescent resiliency: A study with urban youth. American Journal of Community Psychology 2002;30:221–243. [PubMed: 12002244]

Table 1

Correlations among Study Variables

Construct	1	2	3	4	5	6	7	8	9	10	11	12
1. Peer Rejection	-	−.60***	−.27***	−.20***	.74***	.71***	−.36***	.39***	.38***	−.31***	.26***	−.06
2. Pop w/ Adults		-	.40***	.15	−.49***	−.42***	.16	−.29***	−.23**	.16	−.18*	−.06
3. Goal-Directed Play			-	.02	−.21**	−.22**	.14*	.13	−.01	.17**	.00	.23***
4. Sch Competence				-	−.11	−.30***	.41***	−.21**	−.23***	.41***	−.05	−.22**
5. Bln Externalizing					-	.72***	−.40***	.56***	.43***	−.31***	.22**	.10
6. Bln Internalizing						-	−.46***	.40***	.54***	−.39***	.20**	.04
7. Bln Achievement							-	−.30***	−.27***	.82***	−.16*	−.22**
8. Fup Externalizing								-	.51***	−.21**	.11	.44***
9. Fup Internalizing									-	−.16*	.31***	.28***
10. Fup Achievement										-	−.16*	−.10
11. Fup Eating											-	.05
12. Fup Substance												-

* p<.05;

** p<.01;

*** p<.001

Pop w/Adults=Popularity with Adults; Sch Competence= Self-Perceived Scholastic Competence; Bln=Baseline; Fup=Follow-up

Table 2

Effects of Peer Rejection and ADHD on Adolescent Adjustment

Dependent variable: Follow-up externalizing behavior					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E. B**	**β**
1. Childhood peer rejection	.15	$.15^{***}$	.31	.05	.39
2. Childhood ADHD diagnosis	.21	$.06^{***}$	.34	.09	.29
3. Interaction between 1 and 2	.21	.00	.15	.17	.15
Dependent variable: Follow-up internalizing behavior					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E.B**	**β**
1. Childhood peer rejection	.14	$.14^{***}$	.29	.05	.38
2. Childhood ADHD diagnosis	.16	$.02^{*}$	.20	.09	.18
3. Interaction between 1 and 2	.17	.01	.22	.17	.23
Dependent variable: Follow-up academic achievement					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E. B**	**β**
1. Childhood peer rejection	.13	$.13^{***}$	−6.64	1.20	−.36
2. Childhood ADHD diagnosis	.27	$.14^{***}$	−12.63	2.04	−.45
3. Interaction between 1 and 2	.27	.00	−.74	3.82	−.03
Dependent variable: Follow-up eating pathology					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E. B**	**β**
1. Childhood peer rejection	.07	$.07^{***}$	.27	.07	.26
2. Childhood ADHD diagnosis	.09	$.02^{*}$	.24	.12	.16
3. Interaction between 1 and 2	.09	.00	.08	.23	.06
Dependent variable: Follow-up substance use					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E. B**	**β**
1. Childhood peer rejection	.00	.00	−.08	.09	−.06
2. Childhood ADHD diagnosis	.04	$.04^{**}$	.43	.16	.22

Dependent variable: Follow-up externalizing behavior					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E. B**	**β**
3. Interaction between 1 and 2	.04	.04	−.02	.30	−.01

* p<.05;

** p<.01;

*** p<.001

R^2 change effect size: .01=small, .06=medium, .14=large (Cohen, Cohen, West, & Aiken, 2003)

Table 3

Effects of Peer Rejection and ADHD on Changes in Adjustment

Dependent variable: Follow-up externalizing behavior					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E.B**	**β**
1. Baseline externalizing behavior	.31	.31***	.40	.07	.56
2. Childhood peer rejection	.32	.00	−.04	.15	−.05
3. Childhood ADHD diagnosis	.32	.01	.14	.12	.11
4. Interaction between 2 and 3	.32	.00	−.07	.16	−.07
Dependent variable: Follow-up internalizing behavior					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E.B**	**β**
1. Baseline internalizing behavior	.29	.29***	.42	.05	.54
2. Childhood peer rejection	.29	.00	−.01	.06	−.01
3. Childhood ADHD diagnosis	.29	.00	.02	.09	.02
4. Interaction between 2 and 3	.29	.00	.11	.16	.11
Dependent variable: Follow-up academic achievement					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E.B**	**β**
1. Baseline academic achievement	.67	.67***	.83	.04	.82
2. Childhood peer rejection	.69	.02**	−.2.43	.78	−.13
3. Childhood ADHD diagnosis	.70	.02**	−4.87	1.39	−.17
4. Interaction between 2 and 3	.71	.00	−2.21	2.46	−.09

* p<.05;

** p<.01;

*** p<.001

R^2 change effect size conventions: .01 = small, .06 = medium, .14 = large (Cohen et al., 2003)

Table 4

Effects of Self-Perceived Scholastic Competence on Adolescent Adjustment

Dependent variable: Follow-up internalizing behavior					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E. B**	**β**
1. Childhood peer rejection	.13	.13***	.28	.05	.36
2. Childhood ADHD diagnosis	.15	.02*	.20	.09	.18
3. Interaction between 1 and 2	.16	.01	.21	.17	.21
4. Academic achievement	.16	.00	.00	.00	−.01
5. Self-perceived scholastic competence	.18	.02*	−.08	.04	−.15
6. Interaction between 1 and 5	.19	.01	.09	.05	.12
7. Interaction between 2 and 5	.19	.00	−.10	.11	−.15
Dependent variable: Follow-up substance use					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E. B**	**β**
1. Childhood peer rejection	.00	.00	−.07	.09	−.05
2. Childhood ADHD diagnosis	.04	.03**	.43	.16	.22
3. Interaction between 1 and 2	.04	.00	−.01	.31	−.01
4. Academic achievement	.04	.01	−.01	.01	−.08
5. Self-perceived scholastic competence	.08	.04**	−.21	.07	−.21
6. Interaction between 1 and 5	.08	.00	−.01	.09	.00
7. Interaction between 2 and 5	.09	.01	−.30	.20	−.26
Dependent variable: Follow-up externalizing behavior					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E. B**	**β**
1. Baseline externalizing behavior	.30	.30***	.39	.04	.55
2. Childhood peer rejection	.30	.00	−.04	.07	−.05
3. Childhood ADHD diagnosis	.31	.01	.14	.09	.12
4. Interaction between 2 and 3	.31	.00	−.07	.16	−.07
5. Academic achievement	.31	.00	.00	.00	−.02
6. Self-perceived scholastic competence	.33	.02*	−.09	.04	−.15

Dependent variable: Follow-up internalizing behavior					
Variable	**Total R^2**	**R^2 change**	**B**	**S.E. B**	**β**
7. Interaction between 2 and 6	.33	.00	−.06	.05	−.08
8. Interaction between 3 and 6	.33	.00	−.07	.10	−.10

* p<.05;

** p<.01;

*** p<.001

R^2 change effect size conventions: .01 = small, .06 = medium, .14 = large (Cohen et al., 2003)