

Considering Positive Psychology Constructs of Life Satisfaction and School Connectedness When Assessing Symptoms Related to Attention-Deficit/Hyperactivity Disorder

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Children and adolescents diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) demonstrate significant difficulty with academic and behavioral functioning. This, in turn, can lead to lower educational attainment and vocational achievement, which has serious long-term consequences and costs to individuals and society (Barkley, 2002, 2006; Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1993). Researchers from a positive psychology framework suggest that ADHD symptoms (i.e., inattention, hyperactivity/impulsivity) alone may not fully explain academic impairment (Diener, Scollon, & Lucas, 2004). From the standpoint of positive psychology, life satisfaction and school connectedness are important constructs that examine positive life functioning; however, they have been understudied, particularly in the area of ADHD. The current study investigated the relationship between ADHD symptoms and these positive psychological constructs. Results indicate that as ADHD symptoms increase, life satisfaction decreases; however, no relationship between ADHD symptoms and school connectedness was found. Beyond our primary analysis, we examined the relationship between gender and these variables. Results suggest that gender significantly moderates the relationship between ADHD and life satisfaction, with life satisfaction ratings decreasing for males as ADHD symptoms increase, yet remaining stable for females. ADHD symptoms did not significantly predict changes in school connectedness. Furthermore, gender did not significantly moderate the relationship between school connectedness and ADHD symptoms.

Keywords: ADHD, life satisfaction, school connectedness, assessment, intervention, quality of life

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Numerous studies have demonstrated that youth diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) show significant academic and behavioral impairments compared to their nondiagnosed peers. For example, compared to nondiagnosed peers, students with ADHD are more likely to experience more educational problems (Barry, Lyman, & Klinger, 2002; Fergusson & Horwood, 1995; Rapport, Scanlan, & Denney, 1999), including lower grades, higher rates of grade retention, elevated use of remedial academic services, and disproportionate placement in special education classes (Biederman et al., 1996). Relative to the general population, students with ADHD are more likely to experience disciplinary problems that lead to suspension and expulsion (LeFever, Villers, Morrow, & Vaughn, 2002). These difficulties often lead to lower educational attainment and vocational achievement (Barkley, 2002, 2006; Mannuzza et al., 1993). Over time, these difficulties can have long-term consequences and costs to individuals and society.

Although ADHD symptoms are related to impairment, symptom severity does not account for all of the variance in academic impairment. Traditional methods of school- and clinically-based assessment have focused primarily on negative outcomes of mental health, such as a child's level of psychopathology, cognitive disability, or disruptive behaviors (Suldo, Huebner, Savage, & Thalji, 2011). These traditional methods of assessment are generally referred to as a "deficit-focused" or "disease" model of mental health. Researchers in the field of positive psychology have identified the need to study and intervene in critical areas of development related to optimal functioning and positive well-being (Proctor, Linley, & Maltby, 2009; Seligman, 2002; Seligman, Steen, Park, & Peterson, 2005). It has been argued that the assessment of positive well-being and developmental assets (e.g., life satisfaction and school connectedness) are important for evaluating the overall impact of school-based interventions, as many of the current interventions focus on reducing problem behaviors (e.g., disciplinary referrals), rather than increasing positive behaviors (Suldo & Huebner, 2004).

Life Satisfaction and School Connectedness

Life satisfaction (LS) has emerged as an important developmental construct of study in the field of positive psychology (Gilman & Huebner, 2003), particularly as it relates to students' connectedness and engagement in school (Gilman & Huebner, 2006). Measured as one indicator of well-being, LS is defined as an individual's own cognitive evaluation of his or her overall life in relation to critical domains, such as family, school, peer relationships, and personal self (Diener, 1994; Huebner, Valois, Paxton, & Drane, 2005). Previous research indicates that LS can serve as a critical predictor of students' beliefs in the importance of school, particularly during middle school (Lewis, Huebner, Malone, & Valois, 2011). Moreover, studies of children and adolescents have also shown that higher levels of LS are strongly correlated with increases in school grades and feelings of hope for future success (Ciarrochi, Heaven, & Davies, 2007;

Valle, Huebner, & Suldo, 2006). Thus, LS appears to have a strong positive relationship with students' academic achievement and school connectedness.

School connectedness (SC) is defined as a student's perceived social bonding and quality of relationships with peers and teachers (Karcher, 2005; You et al., 2008). In a recent study, Whitlock (2006) proposed a conceptual model based on SC as a protective factor leading to increased (a) student involvement in meaningful roles at school, (b) safety at school, (c) opportunities for creative engagement, and (d) opportunities for academic engagement (as cited in You et al., 2008). Research that emphasizes positive, or strengths-based, factors for students with ADHD-related symptoms is needed in order to improve outcomes for this population.

To date, little empirical research has been conducted on positive developmental factors for children with ADHD. There is some support for academic engagement as an important factor in classroom interventions for students with ADHD (Martin, 2012; Ozdemir, 2011), suggesting that this positive construct may buffer the impact of ADHD behaviors on academic impairment. Several researchers have found that as ADHD behaviors increase, LS decreases in college students and adults (Gudjonsson, Sigurdsson, Eyjolfsdottir, Smari, & Young, 2009; Mick, Faraone, Spencer, Zhang, & Biederman, 2008). However, to the authors' knowledge, there is a limited amount of research that has examined these positive factors for children and adolescents with ADHD, particularly in terms of self-reported LS and SC (e.g., Coghill, 2010). Given the high prevalence of school-related problems in students with ADHD, it is critical to examine these constructs in school-aged children in order to develop strategies to increase their opportunities for success in school.

Oppositional Defiant Disorder (ODD) is a disruptive behavior disorder that is often comorbid with ADHD (Barkley, 2006; The MTA Cooperative Group, 1999; Wilens et al., 2002). Youth with ODD symptoms display significantly lower academic achievement and increased rates of special classroom placement, compared to youth without these symptoms (Greene, Beszterczey, Katzenstein, Park, & Goring, 2002; Kuhne, Schachar, & Tannock, 1997). The increased school-based impairment associated with ODD symptoms may lead to decreased life satisfaction and school connectedness, confounding the link between ADHD symptoms and these constructs.

The current study examines the covariation between ADHD-related symptoms and students' self-reported perceptions of LS and SC. We predicted that students with more ADHD-related symptoms would have lower LS and SC than students with fewer symptoms. The effect of gender on these positive constructs was also examined. Compared to girls with ADHD, the difficulties that boys with ADHD experience in school tend to be more severe. For instance, ADHD in boys has been associated with more behavior problems (Biederman et al., 2002; Thorell & Rydell, 2008) and learning difficulties (Biederman et al., 2002). Vera and colleagues (2012) found that school satisfaction significantly predicted life satisfaction for boys, but not for

girls. Thus, it was predicted that the male gender would amplify the negative relationship between ADHD symptoms and both outcome variables (LS and SC). ODD symptoms were controlled for in analyses.

Method

Setting

Data were collected at two afterschool sites of the Challenging Horizons Programs of South Carolina (CHP-SC), provided as a partnership between a large, southeastern university and a local school district. The CHP-SC is a multimodal, evidence-based service-learning program that provides afterschool instruction in schools to at-risk students (Langberg et al., 2007). These students are referred to the afterschool program by school administrators and teachers, who are asked to consider family income (i.e., free or reduced lunch status), course grades (e.g., receiving a grade of “D” or “F” in one or more core classes), and standardized test scores (e.g., failing to score above the standards set by the state standardized achievement test or failing to meet growth goals on standardized tests) when recommending students for the program.

Participants

General demographic information was collected for this study (e.g., gender, age, race, free or reduced lunch status) using self-report surveys. Participants included students and their parents from both an elementary and middle school site located in a single school district. As there was a discrepancy between the number of measures completed, with 94 students completing LS measures, 78 students completing SC measures, and 69 parents completing ADHD and ODD measures, missing data were handled using listwise deletion for each set of analyses conducted. Participants included students in grades 3-8 who were enrolled in the CHP-SC afterschool programs and their parents. Students were mostly African American (73%, $n = 72$) and ranged in age from 7 to 14 years ($M = 10.57$, $SD = 1.86$). The remaining 27% of students were identified as Caucasian (13%, $n = 13$), Hispanic/Latino (2%, $n = 2$), and “other” (7%, $n = 7$). Four participants (4%) did not respond to this item. It was reported that 95% of the students received free or reduced lunch ($n = 93$).

Measures

Brief Multidimensional Students’ Life Satisfaction Scale (BMSLSS). The BMSLSS (Huebner, 1997) is a 5-item scale assessing students’ overall life satisfaction. It was developed for situations when only brief measures of life satisfaction are needed. The scale yielded reliable internal consistency estimates ($\alpha = .80$), which is consistent with previous studies examining psychometric properties in studies with elementary, middle, and high school students (Funk,

Huebner, & Valois, 2006; Seligson, Huebner, & Valois, 2003, 2005). Each item is designed to measure life satisfaction in one of five domains (family, friends, school, self, and living environment), with a sixth item that evaluates overall life satisfaction. Items are rated using a Likert scale that ranges from 1 (*terrible*) to 7 (*delighted*).

Hemingway Measure of Adolescent Connectedness (Hemingway). The Hemingway (Karcher, 2001) is a self-report survey consisting of 47 items that fall into three dimensions of connectedness to self, to others, and to society. The three overall dimensions of connectedness are measured with 15 subscales that include four to six items each. For this study, only the “school” subscale from the society connectedness dimension was used. This subscale consists of 6 items that are rated on a Likert scale with answer choices ranging from 1 (*not at all true*) to 5 (*very true*). The scale yielded reliable internal consistency ($\alpha = .73$).

The Vanderbilt ADHD Diagnostic Parent Rating Scale (Vanderbilt). The Vanderbilt (Wolraich et al., 2003) is a 49-item measure comprised of two subscales: a diagnostic and an academic rating scale. The diagnostic scale ($\alpha = .95$) includes all 18 criteria of the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition text revision* (American Psychiatric Association, 2000) for ADHD ($\alpha = .94$), 8 criteria for Oppositional Defiant Disorder (ODD; $\alpha = .89$), 12 criteria for conduct disorder, and 7 criteria that screen for anxiety and depression. Only the 33 items assessing ADHD- and ODD-related behaviors were used for this study. Parents were asked to rate the severity of each behavior on a 4-point scale ranging from 0 (*never*) to 3 (*very often*). Items from each subscale (ADHD and ODD) were totaled to create total scores for each student in order to evaluate ADHD and ODD symptom severity.

Descriptive statistics for the variables used in the study are shown in Table 1.

Table 1. Descriptive Statistics

Variable	<i>N</i>	<i>M</i>	<i>SD</i>
ADHD	65	0.43	0.87
ODD	66	1.06	1.61
Life Satisfaction	81	5.65	1.02
School Connectedness	94	3.91	0.60

Procedure

All procedures were approved at the district level and by the University of South Carolina Institutional Review Board (IRB). Questionnaires were completed on-site in the spring ($n = 45$) and fall ($n = 24$) semesters of 2011. Informed consent was obtained from parents prior to completing the Vanderbilt. Students were exempt from written consent due to the low risk nature of the study; however, parents were informed that students would be completing the surveys during the program. Student assent forms were completed at the beginning of each

survey. The first author administered self-report measures (i.e., the BMSLSS and the Hemingway) to students who voluntarily completed them in a computer lab at the afterschool program using Qualtrics, a website commonly utilized for data collection.

Data Analytic Strategy

As the data used in this study were collected at two different time points (fall and spring semesters), participants could have differed in terms of ADHD symptoms, LS, and SC. First, Multivariate Analyses of Variance (MANOVA) was used to examine potential group differences across the two time points prior to running further analyses. Second, multiple regression was used for the first set of analyses to examine the main effects of ADHD-related symptoms on LS and SC. The ODD and gender variables were included as covariates in the model. Finally, an interaction term between ADHD and gender was also specified. The ADHD variable was centered prior to creating the interaction term. A *post-hoc* power analysis using *G* Power 3* (Faul, Erdfelder, Buchner, & Lang, 2009) for linear multiple regression, with fixed group differences, was .81 to detect a small effect (.15) with a sample size of 69 students. Power to detect a medium effect (.30) was estimated at .98.

Results

The assumptions of multiple regression were met, indicating an absence of outliers, homogeneity of variance, no major deviations from normality, and independence of errors. The first analysis examined potential group differences across the two time points. Results indicated no group differences between the participants in the fall and spring groups based on the relationship between ADHD and LS, $F(16, 49) = .755, p = .72$, and ADHD and SC, $F(24, 60) = .9, p = .6$; thus, the time point variable was not included as a covariate.

The second set of analyses examined the main effect of ADHD on LS. Results indicated that ADHD symptoms significantly predicted changes in LS, $\beta = -0.89; t(46) = -4.16, p < .05$, controlling for gender and ODD symptoms. This suggests that for every one unit increase of ADHD symptoms, LS is predicted to decline by 0.89 units. Additionally, a significant gender by ADHD symptoms interaction was found, $\beta = 0.86; t(46) = 2.71, p < .05$, indicating that gender has a significant moderating effect on the relationship between ADHD symptoms and LS. For boys, LS decreased as ADHD symptoms increased; however, as symptoms increased for girls, LS remained stable, indicating that ADHD symptoms have little impact on LS for this group (see Figure 1). The main effect of gender and the main effect of ODD did not significantly predict changes in LS. The complete results of these analyses are reported in Table 2.

Figure 1. Relationship between ADHD Symptoms and Life Satisfaction for Males and Females

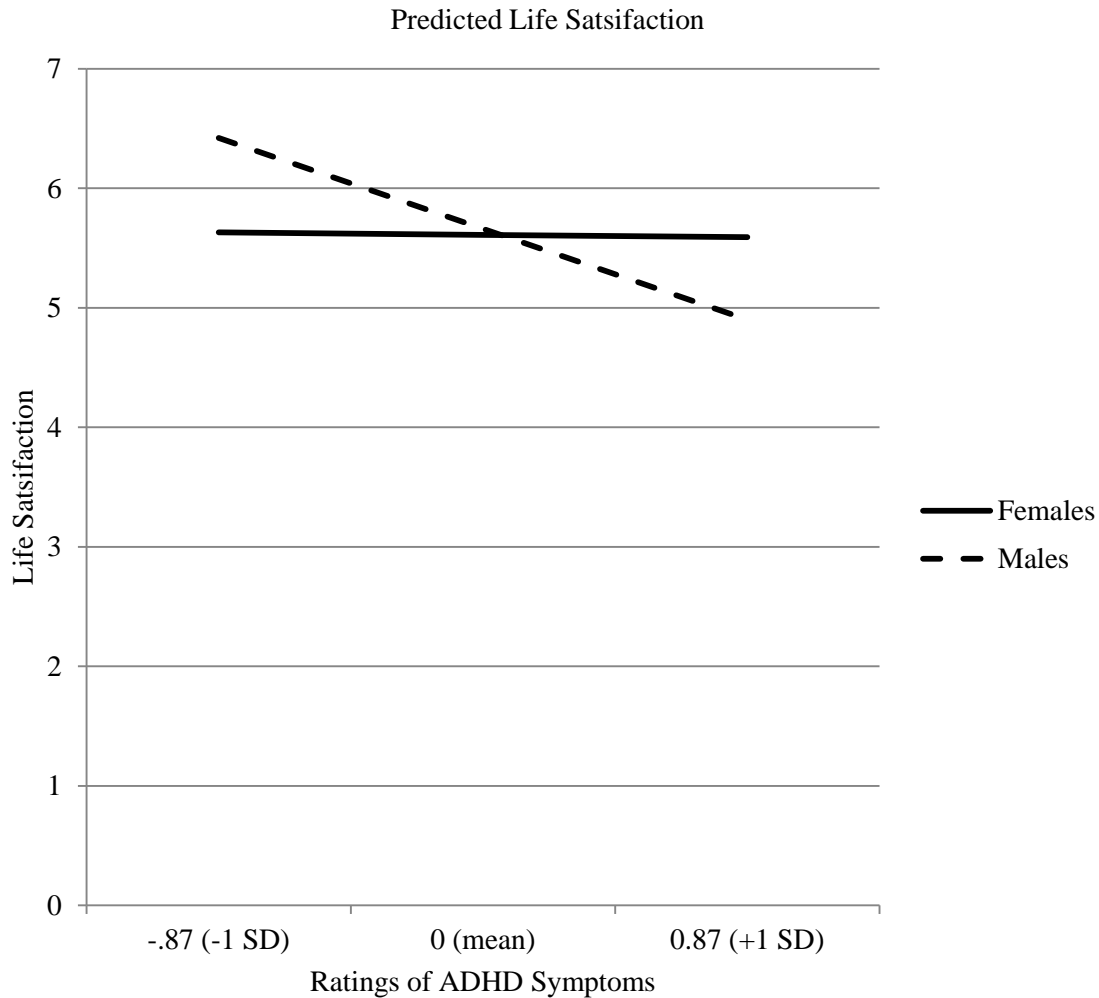


Table 2. Multiple Regression Analyses for Life Satisfaction (LS)

	<i>B</i>	<i>SE</i>	<i>t</i> -value	<i>p</i> -value
Intercept	5.65	0.20	28.15	0.00
Gender	-0.05	0.24	-0.21	0.83
ADHD	-0.89	0.21	-4.16	0.00
ODD	0.01	0.08	0.10	0.92
Gender*ADHD	0.86	0.32	2.71	0.01

Note: $R^2 = 0.30$; $F(4,46) = 4.90$, $p < 0.00$. ADHD and ODD variables are used to describe parent-reported symptoms.

The second set of analyses examined the main effect of ADHD on SC. Results suggest that gender and ODD symptoms were not significant predictors of SC. Contrary to our hypothesis, ADHD symptoms also *did not* significantly predict changes in SC, $\beta = -0.01$; $t(55) = 0.15$, $p > 0.05$. Furthermore, gender did not significantly moderate the relationship between SC and ADHD symptoms, $\beta = 0.11$; $t(55) = 0.20$, $p > 0.05$. The complete results of these analyses are reported in Table 3.

Table 3. Multiple Regression Analyses for School Connectedness (SC)

	β	<i>SE</i>	<i>t</i> -value	<i>p</i> -value
Intercept	3.93	0.13	29.63	0.00
Gender	-0.07	0.16	-0.43	0.67
ADHD	-0.01	0.15	-0.04	0.97
ODD	-0.05	0.07	-0.73	0.47
Gender*ADHD	0.11	0.20	0.54	0.59

Note: $R^2 = 0.23$; $F(4,55) = 0.23$, $p = 0.92$. ADHD and ODD variables are used to describe parent-reported symptoms. β and *SE* values indicate unstandardized variables.

Discussion

Results of the first analysis supported the hypothesis that as parent report of ADHD symptoms increased, student ratings of LS decreased. Studies have consistently demonstrated that untreated ADHD symptoms have an adverse impact on quality of life (Danckaerts et al., 2010). Nevertheless, quality of life (e.g., life satisfaction) is not routinely used to assess students with ADHD, and we recommend greater attention to this construct. Results from the interaction indicated that gender significantly moderated the relationship between ADHD and LS. As ADHD symptoms increased, ratings of LS for males decreased, whereas these ratings for females generally remained stable. This might suggest that social-ecological factors at school may impact boys differently than girls. It is well known that boys with ADHD tend to demonstrate higher rates of externalizing behaviors and “rule breaking” in the classroom when compared to girls (Abikoff et al., 2002). It is plausible that because boys tend to get “called out” for more problems at school, this may decrease their perceptions of satisfaction with life. Contrary to our hypothesis, results of the second analysis indicated that parent report of ADHD symptoms *did not* significantly predict changes in students’ SC. Furthermore, gender did not significantly moderate the relationship between SC and ADHD symptoms.

Given the statistically significant findings with this small sample, which in the case of LS was a large main effect, further investigation of ADHD symptoms and positive psychology constructs of LS and SC are warranted. However, further empirical guidance is needed for researchers and clinicians to integrate assessments for these constructs and develop evidence-based intervention strategies focused on students’ positive developmental outcomes. In recent decades, the dual

factor model has emerged as a promising approach for comprehensive mental health assessment (Diener, Suh, Lucas, & Smith, 1999). This approach examines symptoms and positive psychology constructs simultaneously, placing individuals into 4 distinct categories: flourishing (low symptoms, high well-being); vulnerable (low symptoms, low well-being); symptomatic, but content (high symptoms, high well-being); and troubled (high symptoms, low well-being). This joint consideration of symptoms and positive constructs leads to greater clarity about functioning and prognosis (Diener et al., 1999). Further investigation of these considerations is, therefore, strongly indicated in applied and research settings.

Limitations of the Study

This publication should be viewed primarily as a conceptual, rather than empirical, paper. The primary purpose is to call attention to the need to consider both symptoms and positive psychological constructs when examining students' impairment in school settings. The theoretical support for consideration of both ADHD symptoms and positive psychological constructs, such as LS and SC, is strong. However, empirical aspects of this study are limited by the sample and preliminary nature of our results. Nevertheless, these data help to showcase some constructs that may be impacted by ADHD. Results from this study suggest that examining these constructs in relation to ADHD symptoms for youth may provide a better picture of impairment and help to inform prevention and intervention strategies for school mental health.

A limitation of this study is that it relies on single sources for the measures collected cross-sectionally. ADHD symptoms were solely based on parent report and positive constructs were measured cross-sectionally, using self-report. A multimethod approach to collect data would be preferred and could yield a different pattern of results. Likewise, longitudinal studies would be highly informative.

As access to student health records was not available for this study, medication use (i.e., stimulant or other medications used for the treatment of ADHD) was not included as a covariate. Future studies should control for medication use, as this may impact students' ratings of life satisfaction and school connectedness, along with parent report of ADHD symptomology.

As little research exists, specifically pertaining to African American students with ADHD, these results may provide useful information for future researchers who wish to study this group. However, because the sample in the current study is selected as a high risk, racially homogeneous group, results of the current study may not generalize to other populations. These factors suggest that the findings must be replicated in more representative samples. Ideally, studies should evaluate a diverse sample stratified along important demographic characteristics, such as age, gender, ethnicity, socioeconomic status, school quality, and geographic location.

Findings related to SC raise questions regarding the stability and validity of the data. As the study had a small sample size, chances of making a Type II error were elevated. Further, self-reports were conducted at two time points (some students reported in the fall and some reported in the spring), which may have contributed to the error variance in responses. This suggests further investigation of the relationship between ADHD and SC in order to form stronger interpretations of the results.

Future Implications

Future research on school-based interventions should examine ADHD gender differences in LS and how SC relates to social functioning and other areas of impairment (e.g., academic performance). It is important to study how cultural and social expectations shape the way boys and girls respond to academic failure in order to develop strategies that will increase LS before academic failure occurs. In addition, the distinct effects of teacher-, peer-, and school-related connectedness on students' LS should be further evaluated to develop more appropriate interventions for children with ADHD and disruptive behavior problems who are struggling in school. Integrating positive behavioral strategies in schools has been effective in improving students' well-being and positive school functioning. Previous intervention strategies have included goal-setting and progress monitoring (Marques, Pais-Ribeiro, & Lopez, 2007), gratitude exercises (Froh, Sefick, & Emmons, 2008), and problem-solving skills (Cauce, Comer, & Schwartz, 1987). Examining the impact that positive psychology interventions have on the relationship between symptomology, LS and SC, and measures of academic impairment (e.g., course grades, disciplinary referrals) may inform intervention for this population more precisely than examining symptoms alone.

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