Attention Deficit/Hyperactivity Disorder and Well-being: Is Social Impairment an Issue for College Students with ADHD?

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Abstract

In this study, the psychological well-being of college students with Attention Deficit/Hyperactivity Disorder (ADHD) was analyzed. A survey was administered to a convenience sample of undergraduates aged 18-25 at a Southern university (N=317). Well-being was measured using Ryff's (1989) 6 likert scales of psychological well-being. Students with self-reported ADHD had lower scores on total well-being, environmental mastery, personal growth, and purpose in life. They reported comparable levels on autonomy, self-acceptance, and positive relations with others. Findings suggest that college students who reported an ADHD diagnosis were similar to other college students in their perceptions of well-being, but perceived more difficulties in their organizational and goal-oriented competencies compared to peers who had never received an ADHD diagnosis. Recommendations for university administrators and disability professionals are discussed.

Keywords: ADHD; college students; psychological well-being; social functioning

Although estimates vary greatly, approximately 4% of college students report a diagnosis of Attention Deficit/Hyperactivity Disorder (ADHD) (Heiligenstein, Conyers, Berns, & Miller, 1998). In the broader population, the prevalence rate for adults in the United States is 4.4% (Kessler et al., 2006). These rates are considered a conservative estimate of the number of people with this disability due to the possibility of undiagnosed cases (Cuffe, McKeown, & Moore, 2009; Sciutto & Eisenberg, 2007). While extant research focuses on the difficulties faced by those with the disability, very little is known about the overall well-being of university students with ADHD.

The focus of this research was to examine different aspects of well-being among college students with ADHD compared to their peers without disabilities. The college atmosphere represents a particularly interesting life stage for the individual with ADHD. Examining different aspects of well-being is critical to understanding these students as they move into later adulthood. Existing research suggests individuals with ADHD experience a broad range of problems ranging from academic performance to peer relations (Barkley, 2006). The research suggesting social impairment of college students with ADHD is mixed (Norwalk, Norvilitis, & MacLean, 2009; Shaw-Zirt, Popali-Lehane, Chaplin, & Bergman, 2005). In this study, the focus was on Ryff's (1989) measure of psychological well-being, which consists of six distinct subscales of well-being ranging from mastery of one's environment to having positive relations with others. Examining a broader picture of the difficulties facing university students with ADHD can inform campus efforts to address evidence-based supports that address the comprehensive range of services they may need to persist and graduate.

ADHD and College Students

Attention Deficit/Hyperactivity Disorder (ADHD) is a condition that is most likely detected in childhood, according to the U.S. National Institute of Mental Health (2006). Estimates suggest approximately 3-5% of children in the United States have been diagnosed with ADHD (National Institute of Mental Health [NIMH], 2006). The prevalence rate of college students who have ADHD is less consistent. One study has the estimates for American college students currently ranging from 0.5% to 5.0% (Farrell, 2003). In a review of six studies, DuPaul, Weyandt, O'Dell, and Varejao (2009) suggest the prevalence is somewhere

between 2% and 8% of all university students. Part of this discrepancy is due to the various methods by which ADHD is measured.

The *Diagnostic and Statistical Manual of the American Psychiatric Association DSM-IV-TR* (American Psychiatric Association, 2000) suggests three behavioral subtypes based on two groupings of symptoms (impulsivity/hyperactivity and inattentiveness). The three subtypes include ADHD Predominantly Inattentive, ADHD Predominantly Hyperactive-Impulsive, and ADHD Combined type. Research increasingly supports the belief that ADHD results primarily from neurobiological rather than environmental factors (Comings, 2000; Levy, Hay & Bennett, 2006; Spencer, Biederman, Wilens, & Faraone, 2002). Despite this research, the ADHD diagnosis remains controversial (Malacrida, 2004). ADHD is perceived by some as the result of parenting style or poor character of the individual (Singh, 2004). In addition, ADHD is particularly controversial as its overt symptoms represent common behaviors that are exhibited to an uncommon degree (Gordon & Murphy, 1998). Russell Barkley (2002), a leader in ADHD research, assembled the *International Consensus Statement on ADHD*, which cited research by leading international scientists in order to clarify the legitimacy of ADHD as a culture-free disorder found across many types of societies. Yet, controversy remains even among those who are well-informed about the diagnosis and treatment of ADHD. One area of debate concerns the diagnosis of ADHD being based on a heterogeneous set of symptoms which professionals often interpret differently. Also, the behavioral and pharmacological approaches to treatment of the disorder often conflict (Parens & Johnston, 2009).

The population of students with disabilities attending public universities is steadily increasing. According to the National Longitudinal Transition Study 2, 45% of youth with disabilities continued to postsecondary education after leaving high school (Newman, Wagner, Cameto, & Knokey, 2009). Nearly 17% of all postsecondary students in the United States report having a disability (National Council on Disability [NCD], 2000). This growing population warrants a better understanding of its specific needs. For particular disabilities such as ADHD, the transition to the university setting can be especially challenging due to the increased need to develop time management skills (Meaux, Green, & Broussard, 2009). Research suggests that approximately one quarter of the students utilizing disability services on campus are diagnosed with ADHD (Wolf, 2001). However, recent research suggests that only about half of the college students with ADHD who are aware of disability services such as accommodations actually utilize these services (Chew, Jensen, & Rosen, 2009). One reason for this avoidance is society's emphasis on college being a place where students navigate difficulties alone as part of growing up (Graham-Smith & Lafayette, 2004).

Many studies have reported that college students with ADHD experience a range of impairments. Much of this research focuses on academics. For instance, Reasor, Prevatt, Petscher, and Proctor (2007) found that students with ADHD had poorer time management skills and deficient test-taking strategies compared to other students. An earlier study found that students with ADHD had lower grade point averages and were more likely to be on academic probation (Heiligstein, Guenther, Levy, Savino, & Fulwiler, 1999).

Additional research examines both academics as well as outcomes related to social functioning. Shaw-Zirt et al. (2005) suggested that college students with ADHD experienced poorer academic, social, and personal-emotional adjustment as well as lower self-esteem. Lower self-esteem was also found among individuals with ADHD by Dooling-Liftin and Rosen (1997). Additional researchers have found that individuals with ADHD perceive a lower quality of life (Chao et al. 2008; Greenwald-Mayes, 2002). Greenwald-Mayes (2002) found that family dynamics played a more prominent role in the quality of life for students with ADHD compared to their non-ADHD peers. In a more recent study of college students, Rabiner, Anastopoulos, Costello, Hoyle, and Swartzwelder (2008) found no group differences for social satisfaction among college students with ADHD compared to other students. Norwalk et al. (2009) examined students reporting ADHD symptoms compared to others on social and academic functioning. More specifically, they separated those reporting hyperactivity symptoms from those reporting inattentive symptoms. Interestingly, these researchers did not find that hyperactivity symptoms were predictive of any of the outcomes. However, symptoms indicative of the inattentive subtype of ADHD were predictive of lower academic adjustment, career decision-making self-efficacy, and poorer study skills. On the other hand, neither hyperactivity nor inattentive symptoms predicted lower levels of social adjustment or grade point averages.

College represents a particularly difficult setting for students with ADHD. Compared to high school, when most students live with parents, college is extremely less structured. Parents and teachers play a reduced role in setting boundaries and providing structure (Swartz, Prevatt, & Proctor, 2005). This environmental shift poses a double dilemma. Students with ADHD lose the structure provided by the secondary school schedule but they are also further removed from people who have helped them manage their innate difficulties with self-regulation. In addition, compared to the high school context in which students are living with parents, campus life offers more opportunities to overindulge in activities coupled with a greater necessity to manage one's academic responsibilities (McCormick, 1998).

These issues are particularly relevant to ADHD students who have problems with executive functions. Brown (2005) and Barkley (1997) have written extensively on the interrelated facets of executive function that are impaired in persons with ADHD. Persons with this disorder are often aware of, but unable to begin, necessary routine tasks such as completing homework assignments. They may also have more difficulty properly estimating the amount of time specific tasks will take to complete. Not only are persons with ADHD more likely to get distracted from a task, they also have the opposite problem of focusing on one task excessively while neglecting others. In social situations, persons with ADHD are less capable of monitoring and self-regulating their behavior. They tend to pay too much attention to certain details and not enough to others (Brown, 2005). These impairments can potentially result in problems of social functioning for students with ADHD. Meaux et al. (2009) suggest the following strategies for helping college students with ADHD: learning from consequences, adherence to alarm clocks and reminders, removing distractions, and staying busy with proper scheduling. Quinn, Ratey, and Maitland (2000) suggest that life coaching can be a very effective method of keeping the ADHD college student on track.

Well-being

Growing numbers of studies about well-being have been published in recent years (Abbot et al., 2006; Huta & Ryan, 2010; Land, Lamb, & Zheng, 2011; Rath & Harter, 2010; Springer, Pudrovska, & Hauser, 2011). In many disciplines, well-being is typically handled as a concept associated with happiness, quality of life, and life satisfaction. In the psychological tradition, well-being research can be divided into subjective well-being and psychological well-being. Subjective well-being measures life in terms pleasure and happiness (Ryan & Deci, 2001). Ryff's (1989) conceptualization of psychological well-being offers an alternative to measures focusing only on happiness. *Eudamonia* is Greek word, the translation of which has been incorrectly limited to mere happiness. Ryff suggests that eudaimonia goes beyond happiness in that it measures a person's perceptions of potential, thriving, and functioning. Ryff's six distinct dimensions of well-being attempt to capture the challenges people experience as they pursue efforts to thrive and function. These dimensions of well-being are *environmental mastery, personal growth, purpose in life, autonomy, self-acceptance, and positive relations with others.* The first three address aspects of well-being related to organizational functioning while the last three dimensions address social comparison, relating with others, and acting independently when faced with disagreement by others.

Several demographic measures have been found to be related to psychological well-being, including gender, race, and socio-economic status. Two studies found that women reported higher levels of positive relations with others, personal growth, and purpose in life (Schwartz, Keyl, Marcum, & Bode, 2009; Ryff, 1989). Using models controlling for age, employment, and marital status, Ryff, Keyes, and Hughes (2003) found women lower on autonomy and environmental mastery and higher on positive relations with others. Another study found respondents reporting traditionally female expressive traits were higher on positive relations with others while those reporting traditionally male instrumental traits obtained higher scores on personal growth (September, McCarrey, Baronowsky, Parent, & Schindler, 2001). Minority status has been found to be a positive predictor of well-being (Ryff, Keyes, & Hughes, 2003). In a study of first year students at selective colleges, African American students reported as high or higher levels of social psychological well-being (Massey, Charles, Lundy, & Fischer, 2003). Finally, higher socio-economic status was linked to higher levels of self-acceptance, purpose in life, environmental mastery, and personal growth (Ryan & Deci, 2001). Ryff, Keyes, and Hughes (2003), using education as an indicator of socio-economic status, found that education level was a positive predictor of all dimensions

of well-being with the exception of autonomy.

College represents a context in which students are striving and expected to develop independence from their family of origin. Unfortunately, these expectations come at a time when many students need extra support and guidance to achieve this developmental life task (Kadison & DiGeronimo, 2004). One important factor related to a student's ability to manage the impact of stress in college is self-differentiation. Self-differentiation pertains to an individual's capacity for developing autonomy and emotional regulation while maintaining positive ties to family connections (Skowron, Wester, & Azen, 2004). In a study of first year college students, Bowman (2010) found that the development of positive peer interactions contributes positively to well-being while adverse social relations have a negative impact on well-being. College students' well-being is also influenced by their academic achievement, which can be a more challenging accomplishment compared to their high school years when their peers reflected a greater range of academic ability (Kadison & DiGeronimo, 2004). Ruthig, Haynes, Perry, and Chipperfield (2007) found a positive correlation between cumulative grade point average, perceived success, and well-being in college students using measures of positive and negative emotions, health behaviors, and future optimism. Additional research by Chow (2007) confirmed that college students with more positive self-images and lower academic stress levels reported significantly higher levels of psychological well-being.

Method

Examining the well-being of college students with ADHD across a number of domains can provide critical information for predicting and facilitating student achievement. Not only does the college experience represent a difficult and unique life stage for those with ADHD, but the functional limitations of this disorder may be much different for college students than for younger populations. Given that much of ADHD research focuses on children, a more thorough analysis of university students with ADHD is warranted. Few studies focus on the social functioning of college students with ADHD. This study was designed to investigate the well-being of college students with ADHD using Ryff's (1989) multi-dimensional conceptualization of psychological well-being. The main focus of this study was to address two specific questions. First, how do college students reporting an ADHD diagnosis compare to other college students on all dimensions of psychological well-being? Finally, are the psychological well-being differences less pronounced for the dimensions of psychological well-being most related to social functioning?

Participants

Prior to data collection, a research proposal was approved by the institutional review board at the author's university. The data came from a convenience sample of general education classes of a medium-sized, public university in the South. Participants completed a survey that included questions relating to psychological well-being, demographic information, and one item related to a prior ADHD diagnosis. By definition, general education classes are courses required for all the degrees offered by the university. The sampling frame was comprised of the total enrollment for the targeted classes (n=414). From this frame, 330 students completed the survey resulting in a response rate of 80%. Non-response was almost entirely a result of absence from class on the day the survey was administered. As age increases beyond 25, it becomes increasingly difficult to argue the sample represents traditional college students. In order to ensure that differences among students in similar life stages were analyzed, 12 students older than 25 and one case not completing the age question were removed. The final sample consists of 317 college students. Of the 317 respondents, 34 self-reported a prior diagnosis of ADHD.

Measures

Well-being. The main outcome measure is psychological well-being. Ryff (1989) created a survey instrument to measure this construct, consisting of six subscales: autonomy, positive relations with others, environmental mastery, personal growth, purpose in life, self-acceptance. For an overall measure of well-being, the 29 items used for the subscales are combined. The reliability coefficient for global measure of well-being is 0.82. In the Ryff (1989) initial formulation, each subscale consisted of approximately 20 items. The theoretical structure of the well-being dimensions has been supported using shorter forms of these scales in a study using a nationally representative sample (Ryff & Keyes, 1995). Reduced versions of the well-being scales have been used in the Midlife in the United

States Survey (Ryff, Keyes, & Hughes, 2003; Keyes, Shmotkin, & Ryff, 2002). A direct comparison of these reliabilities is presented in Appendix B. Appendix A contains the complete list of items used for each subscale.

Given the large size of the survey, reduced versions of the six well-being subscales were used for this study by selecting 4-6 items from the original version (approximately 20 items) of each scale. This resulted in an adapted survey instrument that included 31 items. The selected items were most indicative of a non-specific context. For instance, the following item was not selected due to contextual wording not suited for the college experience, "I have been able to build a home and a lifestyle for myself that is much to my liking." The response set for all of the well-being items in this study was as follows: 1= strongly disagree, 2= disagree, 3=slightly disagree, 4=slightly agree, 5=agree, 6=strongly agree. For the computation of the scale score, each respondent's item scores were summed and divided by the number of items constituting the scale. This computation returned scale scores to the same metric as each item.

Environmental mastery. Environmental mastery pertains to an individual's ability to participate in his or her environment successfully. A representative statement used for this five-item scale is, "I am quite good at managing the many responsibilities of my daily life." The reliability coefficient for this subscale of well-being was 0.44.

Personal growth. Personal growth addresses an individual's perception of his or her ability to maintain continual growth in life (Ryff, 1989). A representative statement used for this five-item scale is, "I have the sense that I have developed a lot as a person over time." The reliability coefficient for this subscale of well-being was 0.60.

Purpose in life. Purpose in life represents the perception that one has goals and a sense of directedness is a sign of maturity and well-being. A representative statement used for this four item scale is, "I am an active person in carrying out the plans I set for myself." The reliability coefficient for this subscale of well-being was 0.60.

Autonomy. Autonomy addresses an individual's ability to stand alone in the face of opposition as a self-determining, authoritative individual (Keyes et al., 2002). A person with high levels of autonomy should also have a greater internal locus of control. A representative statement used for this six item scale is, "My decisions are not usually influenced by what everybody else is doing." The reliability coefficient for the autonomy subscale of well-being was 0.55.

Self-acceptance. Self-acceptance is considered an important part of development, mental health, and self-actualization. Self-acceptance attempts to measure one's acceptance of one's past and in comparison with others. A representative statement used for this five item scale is, "The past had its ups and downs, but in general I wouldn't want to change it." The reliability coefficient for the autonomy subscale of well-being was 0.59.

Positive relations with others. Having positive relations with others demonstrates that a person is mature and developmentally healthy (1989). This measure attempts to capture that social aspect of well-being. Having positive relations with others has been found to be related to the lowered stress levels and increased autoimmune functioning (Ryff & Singer, 2000). A representative statement used for this six item scale is, "People would describe me as a giving person, willing to share my time with others." The reliability coefficient for this subscale of well-being was 0.63.

Attention Deficit/Hyperactivity Disorder. Respondents were provided with a survey question asking them to indicate whether or not they had ever been told by a doctor or a psychologist they had attention deficit disorder (ADD) or attention deficit hyperactivity disorder (ADHD).

Demographic and academic measures. Several demographic measures were included in the analysis as controls. These variables have been found to be related to well-being in previous studies (Ryff, Keyes, & Hughes, 2003). Also, the two groups (students with ADHD and their non-ADHD peers) potentially differ on these measures. Therefore, these measures became control variables in the regression analyses. Race was measured as a dummy variable that indicates whether the respondent is Caucasian {1=yes, 0=no}. There were 20 respondents reporting their race as other than white or black (6 reported they were black and white; 5 did not specify; 7 reported they were Hispanic; 1 reported Indian (from India), and one other respondent reported Asian as race. The non-Caucasian respondents were all included in one category. The final measure compares Caucasians to all other respondents. Sex was also measured as a dummy variable that indicates whether the respondent is female {1=yes, 0=no}. Household income was measured categori-

cally. Respondents were asked to check the annual income that best describes the family they grew up in. The categories were defined using $10,000 increments: less than $19,000=1, $20,000 - $29,999=2, $30,000 - $39,999=3, $40,000 - $49,999=4, up to $100,000 or more=10. For the regression analysis, eleven missing values were replaced with the mean of 6.21.

Social activities. Respondents were asked if they were college athletes {1=yes, 0=no}. Also, respondents were asked if they were members of a sorority or fraternity, or Greek organization {1=yes, 0=no}. For the frequency of going out with friends, the following response was used: 0= never, 1= a few times a month, 2= once a week, 3= several days a week, 4= everyday.

Results

Analysis Plan

The first objective of the analysis was to examine initial characteristics differentiating college students who self-report a prior ADHD diagnosis from their non-ADHD peers (*t*-tests for mean differences; Chi-squared (χ^2) tests for percentages). Next, initial well-being differences between the two groups (*t*-tests) were examined. Finally, well-being differences were examined after controlling for demographic differences between the two groups using ordinary least squares (OLS) regression.

Descriptive Analysis

In order to explore differences between students with ADHD and all other students, means were compared on all the measures. Chi-squared (χ^2) tests were performed for categorical variables and independent samples t-tests were performed on the continuous measures and ordinal measures with a sufficient number of categories. Students with ADHD were similar to their non-ADHD peers in terms of age and class standing (results not displayed). The results of this descriptive analysis are displayed in Table 1. Thirty-four respondents self-reported a prior diagnosis of ADHD.

A higher percentage of students with ADHD (88.2 compared to 66.8) were white ($\chi^2(1) = 6.5$, $p = .01$) and male (64% compared to 38%) ($\chi^2(1) = 8.5$, $p < .01$). Students with a prior ADHD diagnosis came from households with incomes over $80,000, on average, whereas the other students came from families with incomes of $60,000 - $70,000 (t(303) = 4.6, $p < .001$). In terms of social activities, the students with ADHD were surprisingly similar. These measures were self-reported estimates of social activity. However, the possibility of reporting bias notwithstanding, the students with ADHD were more likely to belong to a fraternity or sorority (35% compared to 13%) ($\chi^2(1) = 10.93$, $p = .001$) and more likely to be college athletes (21% compared to 9%) ($\chi^2(1) = 4.2$, $p = .04$). Finally, the students with a prior ADHD diagnosis were significantly higher on the reported frequency of going out with friends (3.1%, when 3= several days a week compared to 2.7%) ($t(315) = 2.2$, $p = .03$).

For the bivariate analysis of psychological well-being, the total well-being differences are displayed as well as the means for the six subscales of eudaimonic well-being. Students reporting a prior ADHD diagnosis were significantly lower on total well-being ($t(315) = 3.6$, $p < .001$) and four of the six specific well-being areas. Students with ADHD were significantly lower on perceptions of environmental mastery ($t(315) = 2.3$, $p = .02$), personal growth ($t(314) = 3.4$, $p = .001$), purpose in life ($t(315) = 4.6$, $p < .001$), and self-acceptance ($t(315) = 2.1$, $p = .04$). Students reporting a prior ADHD diagnosis were not significantly lower on perceptions of autonomy ($t(315) = 0.7$, $p = .47$) or positive relations with others ($t(315) = 1.3$, $p = .18$). The mean differences are displayed in Figure 1. The largest differences were present for measures of well-being related more to organizational rather than social functioning. Self-acceptance entails some amount of social comparison. However, in order to thoroughly examine these differences, the ADHD group differences need to be analyzed while controlling for the other differences between the groups.

Multivariate Analysis

To examine the impact of ADHD on well-being, the other measures differentiating the ADHD from the non-ADHD peer group were included in the models as control variables. In order to examine the group differences more thoroughly, a number of ordinary least squares regressions (OLS) were performed. The rationale for including these controls was to ensure that the impact of ADHD on the well-being measures was not just a result of differences between these two groups, other than ADHD. For the control variables, sex of respondent (female =1), race of respondent (African-American=1), and level of household income (in the respondent's family growing up) were included. The former control variables represented significant group differences in the earlier analysis (see Table 1).

Table 1

Descriptive Statistics by College Students Reporting ADHD Compared to All Others on Demographic Measures and Social Activities (N = 317).

	Students Reporting ADHD		**Other Students**		
Variables	**Mean**	**Percent**	**Mean**	**Percent**	***p***
Demographics					
female		38.2		64.0	.00**
white		88.2		66.8	.01*
household income (growing up)	8.3		6.0		.00***
Social Activities					
college athlete		20.6	9.2		.04*
fraternity or sorority member		35.3		13.4	.00**
frequency of going out with friends	3.1		2.7		.03*
N	34		283		

Notes: *p <= .05, **p <= .01, ***p<= .001; Two-tailed t-tests for continuous variables, $\chi 2$ test for categorical.

Table 2

Means Comparing Students Reporting ADHD to Other Students on Total Well-Being and Well-being Subscales (N = 317).

Variables	Students Reporting ADHD	Other Students	*p*
Total Well Being	4.3	4.6	.00***
Environmental Mastery	4.1	4.4	.02*
Personal Growth	4.5	4.9	.00**
Purpose in Life	4.2	4.8	.00***
Autonomy	4.2	4.3	.47
Self-acceptance	4.4	4.6	.04*
Positive relations with others	4.5	4.7	.18
N	34	283	

Notes: *p <= .05, **p <= .01, ***p<= .001; Two-tailed *t*-tests for continuous variables, χ2 test for categorical.

Additional control measures were initially included, but were not significant in any of the models, nor did their inclusion change the findings presented in any substantive way (results not displayed). These variables included family type growing up (single parent family or not), age, class standing (recoded as freshman or not), and high school grade point average. They were removed from the analysis.

A summary of the regression analysis results are displayed in Table 3. Recall that Table 2 displays the differences between the ADHD and non-ADHD peer group *without* controls. In each of the seven regression models, the *B* column represents the non-standardized regression coefficient, which is the mean difference in well-being (or subscale of well-being). The β column represents the standardized coefficient and is the relative contribution of the variable to the model. The statistically significant findings are italicized in Table 3. For total well-being, the difference remained significant after the addition of the control measures (B = -0.24, β = -0.16, p = .01). This suggests that even with the inclusion of the control variables, students reporting a prior ADHD diagnosis were 0.24 lower on total well-being compared to their non-ADHD peers. Caucasians were slightly lower and females were slightly higher on total well-being. The model explained approximately 7% of the variation in total well-being.

For environmental mastery, students reporting a prior ADHD diagnosis remained lower than others after the inclusion of controls (B = -0.25, β = -0.12, p = .04). Environmental mastery represents the respondent's ability to participate and manage his or her environment. The change in the variation explained (R^2) was not statistically significant.

For the well-being measure of personal growth, the results were similar for students reporting a prior ADHD diagnosis. The students reporting a prior ADHD diagnosis were significantly lower on perceptions of personal growth (B = -0.33, β = -0.17, p = .01). The control measures did not contribute to additional explanation of variation in personal growth. The model explained approximately 5% of the variation in personal growth (R^2 = 0.05).

Finally, purpose in life represents a person's level of agreement with statements such as: "I enjoy making plans for the future and working to make them a reality." Again, students reporting a prior ADHD diagnosis were significantly lower than their non-ADHD peers (B = -0.46, β = -0.20, p < .01). Females were slightly higher and Caucasians slightly lower on purpose in

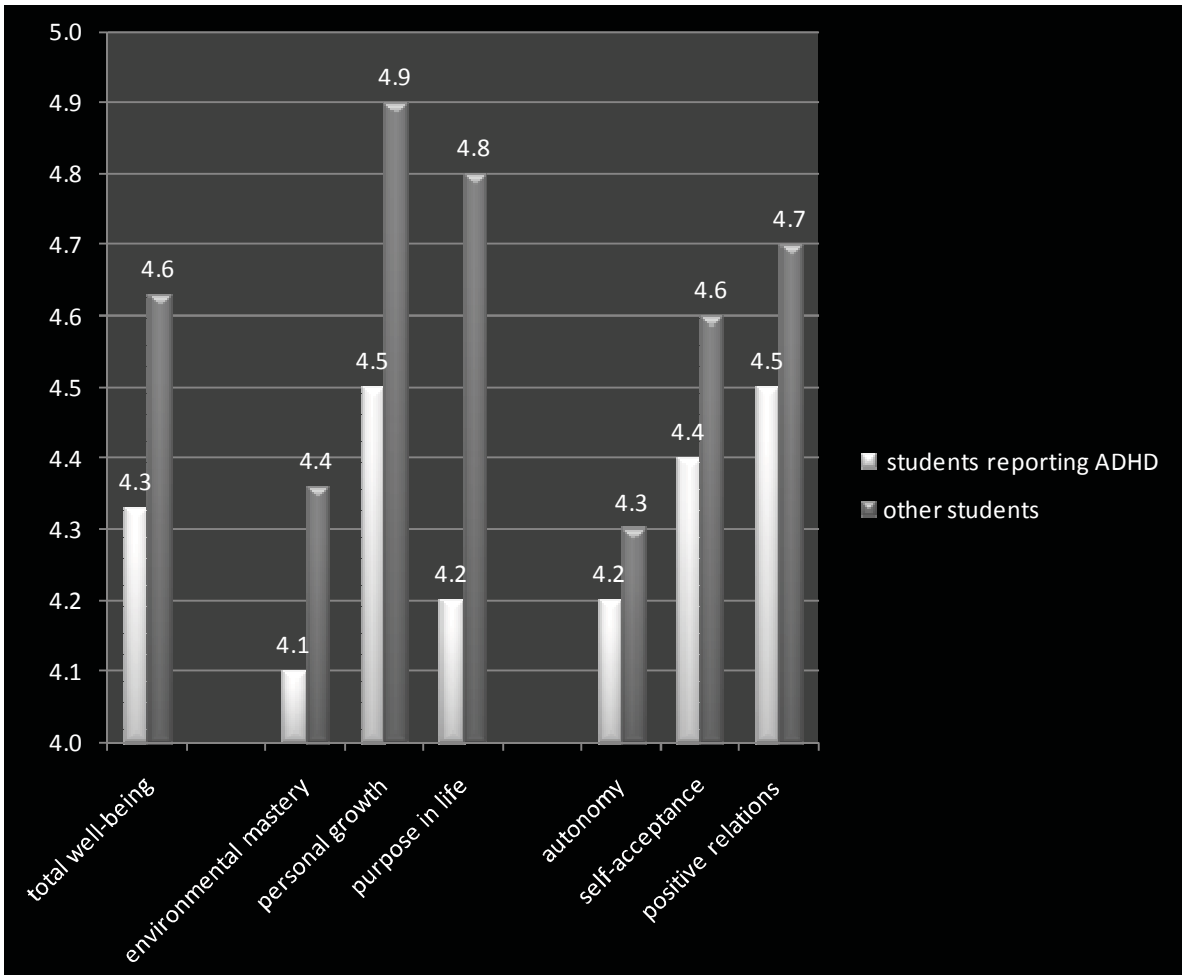

Figure 1. Means for Students Reporting ADHD Compared to Other Students on Total Well-being and Subscales.

life. The coefficient for the ADHD was slightly smaller with controls, which suggests part of the initial group difference between the groups (see Table 2, Figure 1) was related to the smaller proportion of non-whites and females in the ADHD group. The second model explained approximately 10% of the variation in personal growth (R^2 = 0.10).

In the next set of analyses, the models predicted differences on the well-being subscales more related to social aspects of well-being, or self-concept in relation to others. The autonomy subscale of well-being measured a person's ability to be independent amidst others that might disagree. One of the items representing this scale was the following: "My decisions are not usually influenced by what everybody else is doing." For this regression, students reporting a prior ADHD diagnosis were not significantly lower than the non-ADHD peer group (B = -0.01, β = -0.01, p = .92). This suggests that ADHD was not a predictor of lower perceptions of autonomy for this sample. The results showed a significant negative relationship for whites. The model explained approximately 6% of the overall variation in autonomy (R^2 = 0.06).

The self-acceptance subscale of well-being measured the level of agreement with items such as: "When I compare myself with friends and acquaintances, it makes me feel good about who I am." Students reporting a prior ADHD diagnosis were significantly lower on this scale before the inclusion of the control measures (see Table 2). After the addition of the block of control variables, they were no longer significantly lower (B = -0.15, β = -0.07, p = .23). Race (white = 1) was negatively related to self-acceptance (β = -0.17, p < .01). This suggests the initial difference between the groups can be attributed to the higher percentage of whites in the group reporting an ADHD diagnosis.

Table 3

Summary of Ordinary Least Squares (OLS) Regression Results

Dependent Variable and Predictor Variables	*B*	*SE B*	β	*p*	Model R^2
Total Well-being					0.07*
ADHD (reporting diagnosis = 1)	*-0.24*	0.08	-0.16	0.01	
Sex (Female = 1)	*0.10*	0.05	0.11	0.05	
Race (Whites = 1)	*-0.14*	0.06	-0.14	0.02	
Household Income (family growing up)	0.00	0.01	0.00	0.99	
Environmental Mastery					0.02
ADHD (reporting diagnosis = 1)	*-0.25*	0.12	-0.12	0.04	
Sex (Female = 1)	-0.03	0.07	-0.02	0.72	
Race (Whites = 1)	-0.11	0.08	-0.08	0.18	
Household Income (family growing up)	0.00	0.01	0.01	0.84	
Personal Growth					0.05*
ADHD (reporting diagnosis = 1)	*-0.33*	0.12	-0.17	0.00	
Sex (Female = 1)	*0.12*	0.07	0.09	0.10	
Race (Whites = 1)	-0.04	0.08	-0.03	0.60	
Household Income (family growing up)	0.00	0.01	-0.02	0.80	
Purpose in Life					0.10*
ADHD (reporting diagnosis = 1)	*-0.46*	0.13	-0.20	0.00	
Sex (Female = 1)	0.19	0.08	0.13	0.02	
Race (Whites = 1)	*-0.21*	0.09	-0.13	0.03	
Household Income (family growing up)	-0.01	0.02	-0.05	0.37	
Autonomy					0.06*
ADHD (reporting diagnosis = 1)	-0.01	0.13	-0.01	0.92	
Sex (Female = 1)	0.04	0.08	0.03	0.58	
Race (Whites = 1)	*-0.36*	0.09	-0.24	0.00	
Household Income (family growing up)	0.01	0.02	0.02	0.71	
Self-Acceptance					0.06*
ADHD (reporting diagnosis = 1)	-0.15	0.13	-0.07	0.23	
Sex (Female = 1)	0.04	0.08	0.03	0.57	
Race (Whites = 1)	*-0.26*	0.09	-0.17	0.00	
Household Income (family growing up)	-0.02	0.01	-0.07	0.23	
Positive Relations with Others					0.03
ADHD (reporting diagnosis = 1)	-0.22	0.13	-0.09	0.11	
Sex (Female = 1)	0.12	0.08	0.08	0.14	
Race (Whites = 1)	0.11	0.09	0.07	0.23	
Household Income (family growing up)	0.02	0.02	0.09	0.14	

Notes: *p <= .01 for R^2

The model explained approximately six% of the overall variation in autonomy ($R^2 = 0.06$).

Positive relations with others is a measure of a person's perception of his or her ability to positively interact with others. The ADHD measure was not a significant predictor of positive relations with others ($B = -0.22$, $\beta = -0.09$, $p = .11$).

Discussion

In this study, students who self-reported ADHD also reported lower perceptions of total well-being. When total well-being was broken down into its subscales, the lower well-being was particular to certain aspects of eudaimonic, or psychological, well-being. On the subscales that represented purpose in life, mastery of one's environment, and personal growth, individuals reporting a prior ADHD diagnosis rated themselves significantly lower than their non-ADHD peers. However, on the more social and self-image aspects of well-being, there were no significant differences. In addition, students with self-reported ADHD were not statistically different in terms of socializing with friends. Also, significantly greater percentages of the students who reported an ADHD diagnosis belonged to fraternities and participated in college athletics.

The findings should lead to a more critical examination of the socially related self-concepts of ADHD for young adults. This research replicates earlier findings that suggest college students with ADHD have a difficult time mastering their environments and organizing their lives (Reasor et al., 2007). On the other hand, this study's findings do not support the idea that ADHD hinders an individual in more socially-oriented aspects of life. Rather, these findings reinforce Hallowell and Ratey's (1994) observation that adults with ADHD are often overachievers, gregarious, and very social. Impairment with peer relations is a fairly consistent finding in research focusing on children with ADHD (Hoza et al. 2004; Mrug et al. 2009). However, extant research on college students report either a lack of psychological impairment or comparable levels of social satisfaction between students with ADHD and their non-ADHD peers (Rabiner et al. 2008; Heiligenstein et al. 1999). This suggests that college administrators and service providers should continue to provide services that help students manage the task-oriented aspects of the college experience. Life coaching has been identified as an effective method of keeping the college student with ADHD on track (Quinn et al., 2000). Colleges should also consider encouraging students with ADHD to access qualified medical providers to manage their use of prescription medications, which can have a substantial impact on their academic success. Many college students with ADHD are more apt to use these medications when alone (i.e. studying) than when socializing. Therefore, managing the appropriate use of medication could potentially contribute to overall functioning for college students with ADHD.

While the finding that college students reporting a prior ADHD diagnosis are similar in terms of their perceptions of their social functioning to the non-ADHD peers is promising, there is also cause for concern. One of the issues facing college students is a need for time management (Meaux et al., 2009; Swartz et al., 2005). Strategies such as keeping a strict calendar, prioritizing, keeping deadlines at the forefront, and creating start and stop times for all academic activities can help students with ADHD succeed in college in addition to utilizing a life coach (Quinn et al., 2000).

Without the structure provided by parents and secondary school, college students with ADHD may be less aware of their need to limit social activities. If they perceive fewer deficits in the area of social functioning but experience academic difficulties, they may gravitate to social activities and neglect academics. Research has found that college students with ADHD may overindulge in social activities (McCormick, 1998). Quinn et al. (2000) suggest several tactics related to appropriate social interactions such as self-monitoring and self-awareness. However, this study did not identify self-reported concerns about social interactions as a problem area for this sample. The respondents in this study were more likely to be in a sorority or fraternity and socialized with their friends more frequently than their non-ADHD peers. This could mean that students with ADHD were not having trouble thriving socially, but may be socializing too much. Alternatively, students with ADHD may select fraternities, sororities, and college athletics as an adaption to college life. These activities may provide both structure and improved social functioning. However, they may continue to experience difficulties beyond the social realm as they try to manage a busy college life while coping with their executive functioning weaknesses.

College professionals may need to focus more on helping students balance their social activities with academic demands. Consciously addressing the

social-academic balancing act may be an area totally missed by campus offices designed to provide support to students. Time management workshops and individualized sessions provided to all college students may need to enhance attention devoted to skills students need to live a productive, balanced life. There should *not* be a movement away from strategies focusing on academic success. However, these strategies should be examined within the context of the student's social life. College students with ADHD should not be encouraged to cut back on social activities. Rather, they should be provided with strategies to create more structure in those parts of their lives for which they have little external structure.

Limitations

Several limitations need to be considered when examining the findings of the present study. One limitation pertains to the use of a convenience sample of undergraduate students. Because the sample was not a random probability sample, the findings must be interpreted with caution. The sample consisted of classes of undergraduates that were classified as general education courses. Students from the entire university are required to take a certain number of general education classes. Therefore, the classes sampled potentially contained students from all majors. Also, due to the convenient nature of the sample and the overall sample size, the size of the group reporting ADHD is very small. A final limitation of the sample is that it comes from an institution in the Southern United States. This Southern data may not generalize to other regions in the United States in terms of well-being. Therefore, the differences may vary when examined in more nationally representative samples.

There are some methodological limitations to this study. In Ryff's (1989) original formulation, her subscale measures yielded higher reliability-coefficients than these data yielded. Part of this difference is a result of the higher number of items that her study included for each subscale (approximately 20 for each scale in Ryff, 1989). The well-being scales in the present study consisted of fewer items (4-7 per scale). However, earlier studies have used shorter versions of each dimension and yielded similarly reduced reliabilities (Ryff et al. 2003; Keyes et al. 2002). A direct comparison of these reliabilities is presented in Appendix B.

Another limitation relates to the use of a self-reported prior diagnosis of ADHD and well-being. First, it was not determined when the diagnosis occurred for the individual. Also, the method of diagnostic evaluation as well as the credentials of the evaluator may have varied dramatically across respondents. An alternative would have been to use only those students with documented ADHD via the office of students with disabilities. However, this would have only captured those students with ADHD who were utilizing accommodation services on campus. As Chew et al. (2009) reported, only about half of those students with ADHD on campus who are aware of services utilize them. The self-report method also did not distinguish sub-types of ADHD. Norwalk et al. (2009) found more difficulties among students with the Inattentive subtype compared to the Hyperactivity/Impulsive subtype. There may be differences in the well-being of students with hyperactivity versus inattentiveness.

In addition, the questions in this survey did not measure additional types of disabilities such as dyslexia, anxiety, or physical impairments. It is quite possible that a number of the students not reporting an ADHD diagnosis may have other disabilities not captured. Respondents were not asked about co-morbid conditions or the use of campus-based or private therapy. Students who reported ADHD may have had co-morbid conditions or used therapy, which could have had an impact on their well-being. Respondents also self-reported their levels of well-being. Based on the literature related to positive illusory bias, there is reason to believe that individuals with ADHD may not be the most accurate self-reporters (Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007).

Finally, limitations of the study are similar to those reported by Rabiner et al. (2008). Students with ADHD who achieve admission to a university setting may represent a select group. They may be the students with the most support from their parents in terms of guidance and economic resources. Therefore, they may not be representative of typical young adults with ADHD. There is also no information in this study about the utilization of the disabilities services office on campus. Those students willing to self-report their ADHD may represent a subgroup of undergraduates who are more comfortable with the disability and possibly more likely to be utilizing services on and off campus. Future research about the well-being of college students with ADHD could gather data about students' use of support services to further understand these issues.

Conclusion

While there are many limitations to the present study, the results can be interpreted as encouraging. College students with ADHD do not perceive themselves any differently than their non-ADHD peers in terms of the social aspects of psychological well-being. However, they reported lower levels on the psychological well-being measures not related to social functioning. This is an important initial step in the investigation of well-being among college students with ADHD. Future research should focus on the interplay between the social and non-social aspects of well-being. For instance, engagement in social activities on campus may either promote or inhibit academic functioning and life management. University professionals and students with ADHD would benefit greatly from a better understanding of these dynamics.

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Appendix A

Items Used for Each of Ryff's (1989) Six Scales of Well-being

Environmental Mastery

1. I am quite good at managing the many responsibilities of my daily life.
2. I generally do a good job of taking care of my personal finances and affairs.
3. I have difficulty arranging my life in a way that is satisfying to me (reverse-coded).
4. I do not fit very well with the people and the community around me (reverse-coded).
5. I often feel overwhelmed by my responsibilities (reverse-coded).

Personal Growth

1. I am not interested in activities that will expand my horizons (reverse-coded).
2. I don't want to try new ways of doing things – my life is fine the way it is (reverse-coded).
3. I do not enjoy being in new situations that require me to change my old familiar way of doing things (reverse-coded).
4. I think it is important to have new experiences that challenge how you think about the world.
5. I have the sense that I have developed a lot as a person over time.

Purpose in Life

1. My daily activities often seem trivial and unimportant to me (reverse-coded).
2. I don't have a good sense of what it is I am trying to accomplish in life (reverse-coded).
3. I am an active person in carrying out the plans I set for myself.
4. I enjoy making plans for the future and working to make them a reality.

Autonomy

1. I tend to worry about what other people think of me (reverse-coded).
2. My decisions are not usually influenced by what everybody else is doing.
3. It is difficult for me to voice my own opinions on controversial matters (reverse-coded).
4. I often change my mind about decisions if my friends and family disagree (reverse-coded).
5. I am not afraid to voice my opinions even when they are in opposition to the opinions of others.
6. Being happy with myself is more important than having others approve of me.

Self-Acceptance

1. In general, I feel confident and positive about myself.
2. My attitude about myself is probably not as positive as most people feel about themselves (reverse-coded).
3. I have made some mistakes in the past, but feel that all in all everything has worked out for the best.
4. The past had its ups and downs, but in general I wouldn't want to change it.
5. When I compare myself with friends and acquaintances, it makes me feel good about who I am.

Positive Relations with Others

1. It seems to me that most other people have more friends than I do (reverse-coded).
2. Most people see me as loving and affectionate.
3. I enjoy personal and mutual conversations with family members and friends.
4. People would describe me as a giving person, willing to share my time with others.
5. I often feel lonely because I have few close friends with whom to share my concerns (reverse-coded).
6. I know that I can trust my friends and they know that they can trust me.

Appendix B

Reliability Comparison of Revised Well-being Scales

Well Being Subscale	Ryff (1989) (20 Items)	Ryff, Keyes, Hughes (2003); Keyes, Shmotkin, Ryff (2002) (3 Items)	Present Study (4-6 Items)
Environmental Mastery	.90	.52	.44
Personal Growth	.87	.55	.60
Purpose in Life	.90	.37	.60
Autonomy	.86	.48	.55
Self-Acceptance	.93	.59	.59
Positive Relations with Others	.91	.58	.63

Note. Internal consistency reliability alphas for present study compared to earlier work on subscale measures of psychological well-being.