Article

Hammill Institute on Disabilities

Journal of Learning Disabilities
2017, Vol. 50(3) 238–251

DOI: 10.1177/0022219415617164
journaloflearningdisabilities.sagepub.com
SAGE

First-Year College Students With ADHD and/or LD: Differences in Engagement, Positive Core Self-Evaluation, School Preparation, and College Expectations

George J. DuPaul, PhD[1], Trevor D. Pinho, MEd[1], Brittany L. Pollack, MEd[1], Matthew J. Gormley, MEd[1], and Seth D. Laracy, MEd[1]

Abstract

Students with attention-deficit/hyperactivity disorder (ADHD) and/or learning disabilities (LD) experience significant challenges in making the transition from high school to college. This study examined the ways first-year college students with ADHD, LD, ADHD+LD, and comparison peers differ in engagement, core self-evaluation, high school preparation behaviors, and goals/expectations. Participants were from the 2010 Cooperative Institutional Research Program Freshman Survey, including students with ADHD (n = 5,511), LD (n = 2,626), ADHD+LD (n = 1,399), or neither disability (n = 5,737). Controlling for SAT/ACT scores, family income, and parent education, students with ADHD, LD, or ADHD+LD differed from peers on self-ratings of academic and creative abilities and psychosocial functioning; school disengagement, substance use, and emotional difficulties during their last year of high school; reasons for attending college; and expectations for college activities. Several differences were found between disability groups. Implications for college support services and future research are discussed.

Keywords

ADHD, LD, college students, self-evaluation

Two of the most common disabilities reported by college students are attention-deficit/hyperactivity disorder (ADHD) and learning disabilities (LD). For example, a recent nationally representative survey of first-year college students indicated that 5% had been diagnosed with ADHD and 2.9% had been identified with LD (Pryor, Hurtado, DeAngelo, Blake, & Tran, 2010). Individuals with ADHD are significantly less likely to pursue postsecondary education relative to their non-ADHD peers (Barkley, Murphy, & Fischer, 2008), and, of those who attend college, students with ADHD are significantly less likely to enroll at 4-year institutions (Kuriyan et al., 2013). College students with ADHD are at increased risk for obtaining failing grades, withdrawing from courses, and not completing their degree programs relative to classmates without ADHD (Weyandt & DuPaul, 2013). It is presumed that difficulties experienced by college students with ADHD are not only due to the core symptoms of this disorder (i.e., inattention, hyperactivity-impulsivity) but also due to a lack of adequate preparation in academic and study skills (Advokat, Lane, & Lou, 2011; Blase et al., 2009; Heiligenstein, Guenther, Levy, Savino, & Fulwiler, 1999; Lewandowski, Lovett, Codding, & Gordon, 2008; Norwalk, Norvilitis, & MacLean, 2009; Reaser, Prevatt, Petscher, & Proctor, 2007; Weyandt et al., 2013). For example, Kent and colleagues (2011) found that high school students with ADHD were reported by teachers to turn in a significantly lower percentage of assignments and were significantly more likely to be absent or tardy from class. As a result, students with this disorder exhibited significant academic impairment across multiple measures including lower GPA, lower class placement (e.g., remedial vs. honors level classes), and higher rates of course failure.

Students with LD experience similar challenges with respect to postsecondary education. Although individuals with LD are as likely as students without disabilities to enroll in postsecondary education, the former are half as likely to enroll in 4-year institutions with only 21.2% of

[1]College of Education, Lehigh University, Bethlehem, PA, USA

Corresponding Author:
George J. DuPaul, College of Education, Lehigh University, 111 Research Dr., Iacocca Hall, Bethlehem, PA 18015, USA.
Email: gjd3@lehigh.edu

students with an LD enrolling in such institutions (Cortiella & Horowitz, 2014; Newman et al., 2011). Furthermore, a significantly lower percentage of students with LD (41%) complete college relative to the general population (52%; Cortiella & Horowitz, 2014; Newman et al., 2011). As is the case for students with ADHD, college success for individuals with LD may be limited by lack of preparation for college work (Shifrer, Callahan, & Muller, 2013); deficits in word reading, processing speed, semantic processing, and working memory (Bowden et al., 2008; Trainin & Swanson, 2005); greater academic procrastination (Hen & Goroshit, 2014); higher academic stress (Heiman, 2006); and lower levels of academic and social integration in the college environment (DaDeppo, 2009). Furthermore, college students with LD typically experience problems with managing their time, attending to academic assignments, and communicating their needs to instructors (Smith, English, & Vasek, 2002).

Three major, interrelated competencies, including cognitive, intrapersonal, and interpersonal domains, are hypothesized to impact knowledge and educational attainment in young adults (National Research Council, 2012). Although the strongest and most widely studied predictors of college success are traditional measures of cognitive ability such as high school GPA and SAT/ACT scores, student intrapersonal and interpersonal characteristics also play a role in postsecondary outcomes (Murray & Wren, 2003). Specifically, two intrapersonal characteristics, conscientiousness and positive core self-evaluation, have been hypothesized to affect educational functioning (National Research Council, 2012). Conscientiousness (i.e., student engagement that involves initiation of sustained action, effort, and persistence with academic tasks and activities; Skinner, Wellborn, & Connell, 1990) consistently correlates positively with postsecondary grades at a level equivalent to cognitive competencies (National Research Council, 2012). Furthermore, Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008) found that first-year college students who studied more hours per week and engaged in educationally purposeful activities earned higher GPAs and were more likely to persist in college; the effects of engagement were found even after controlling for other factors (e.g., prior academic achievement, receipt of financial aid) associated with educational success and retention in college.

Positive core self-evaluation is viewed as a broad dispositional trait that is comprised of the four specific traits of self-esteem, generalized self-efficacy, locus of control, and emotional stability (Judge, Locke, & Durham, 1997). One component of positive core self-evaluation, academic self-efficacy, represents students' confidence in their ability to complete important educational tasks such as preparing for exams and writing term papers (Zajacova, Lynch, & Espenshade, 2005). Higher levels of self-efficacy presumably increase effort to master challenging tasks (Bandura, 1993; Pajares, 2002). Empirical investigations have shown academic self-efficacy is positively associated with college grades (e.g., Chemers, Hu, & Garcia, 2001; Khan, 2013; Zajacova et al., 2005).

Richardson, Abraham, and Bond (2012) conducted a systematic review and meta-analysis examining correlates of college GPA in the general population. Medium-sized correlations with GPA were not only found for cognitive competency measures such as high school grades, SAT and ACT scores, but also for the positive core self-evaluation components of academic self-efficacy, grade goals (i.e., student goal for grade in a specific course or semester), and effort regulation. There is evidence that positive core self-evaluation may differ among students with disabilities. Specifically, research has indicated that students with LD report lower levels of global self-worth and academic self-concept relative to students without an LD (Shany, Wiener, & Assido, 2013). Conversely, college students with ADHD report higher levels of global self-worth relative to students without ADHD (Wilmshurst, Peele, & Wilmshurst, 2011). Furthermore, the ratings of students with ADHD have been found to differ from other key informants in their life (i.e., parents) possibly suggesting a positive illusory bias (J. M. Nelson, 2013).

Positive core self-evaluation may be related to college adjustment and success for students with disabilities. For example, Butler (2011) examined data from the National Longitudinal Transition Study–2 (Wagner et al., 2003) and found that for students with LD, academic self-efficacy was significantly related to perceptions of the secondary to postsecondary transition experience, perceived academic adjustment, self-reported cumulative GPA, and number of semesters completed. Similarly, Shaw-Zirt, Popali-Lehane, Chaplin, and Bergman (2005) reported that self-esteem mediates the relationship between ADHD status and academic adjustment among college students. Thus, it is important to consider intrapersonal skill or trait variables in predicting college success, particularly for students with ADHD and/or LD.

The comorbidity rate between ADHD and LD in the K–12 population is relatively high with approximately 31% to 45% of students with ADHD having LD and vice versa (for review, see DuPaul, Gormley, & Laracy, 2013). Unfortunately, very little is known regarding the degree to which ADHD and LD are associated in the college population as well as the potential impact of this comorbidity on transition to college and functioning in the postsecondary environment. Extrapolating from studies of this comorbidity in younger samples, it is possible that college students with both ADHD and LD will experience greater academic, social, and behavioral impairment than those with either disorder alone. For example, Mayes, Calhoun, and Crowell (2000) examined the functioning of 119 children between the ages of 8 and 16 who were diagnosed with ADHD, LD, or comorbid ADHD+LD. Those children with both disorders exhibited more severe learning problems than students with LD alone. In similar fashion,

children with ADHD+LD were reported to have more severe attention problems than those with ADHD alone. Mayes and colleagues concluded that learning and attention problems are on a continuum, are interrelated, and are most severe for students diagnosed with both ADHD and LD.

Compared to research concerning children, considerably less is known about the experiences and difficulties of transition-age youth with ADHD and/or LD who attend college. Although data regarding the rate of postsecondary enrollment and dropout/completion of students with LD and ADHD are readily available (e.g., Gregg, 2009; J. M. Nelson & Gregg, 2012; Newman et al., 2011) as are studies examining the self-concept and psychosocial adjustment in the general population of emerging adults attending college (L. J. Nelson, 2013; L. J. Nelson & Padilla-Walker, 2013), specific differences in engagement and core self-evaluation for those adolescents with one or both of these disabilities during their transition to college have not been systematically evaluated. Furthermore, to date, investigations of college students with ADHD and/or LD have included samples of students across class years and cannot shed light on the functioning and preparation of youth who are in the process of transitioning to the college environment (i.e., entering first-year students). Thus, we know very little about the (a) engagement and core self-evaluation of transitional age youth with ADHD, LD and their combination as they begin their first year of college; (b) academic preparation and behaviors (e.g., homework habits, social activities) of high school students with ADHD, LD, and their combination who go on to attend college; and (c) performance expectations for activities among youth with ADHD, LD, or ADHD+LD as they enter college. This information is particularly important given students with a disability are less likely to complete postsecondary education relative to students without disabilities with more than half of students dropping out prior to their second year (Newman et al., 2011; Tinto, 1996). Because persistence in education has been linked with intrapersonal competencies (e.g., engagement and positive core self-evaluation), data regarding these factors are vital to our understanding of college students (Lesgold & Welch-Ross, 2012). Furthermore, these same intrapersonal competencies could influence career aspirations and development, which in turn influence educational and career-related choices (Rojewski, 2005). Engagement, positive core self-evaluation, preparation behaviors, and expectations may be important variables related to whether students are successful in making the transition to college and developing career aspirations and, thus, represent potentially critical targets for assessment and intervention with this population.

The purpose of this study was to understand whether and in what ways first-year college students with ADHD, LD, ADHD+LD, and comparison peers differ with respect to engagement, positive core self-evaluation, high school preparation behaviors, and goals/expectations for college. The degree to which these four groups differed regarding reasons for attending college (i.e., for career preparation vs. learning) as well as anticipated actions in college (e.g., change major, transfer, regularly participate in class) were also investigated as these variables may relate to intrapersonal competencies and prior experiences. There were two primary research questions. First, to what degree do first-year college students with ADHD, LD, ADHD+LD, and neither disability differ with respect to intrapersonal competencies as they transition to postsecondary education? It was hypothesized that students with ADHD and/or LD would report lower core self-evaluation ratings than comparison peers particularly in academic and psychosocial functioning. Furthermore, it was expected that students with both ADHD and LD would report lower functioning in all areas than the other three groups. Second, to what degree do first-year college students with ADHD, LD, ADHD+LD, and neither disability differ with respect to academic preparation and behaviors in high school? It was hypothesized that students with ADHD (regardless of LD status) would report the lowest frequency of academic preparation behaviors and would report significantly higher frequencies of socializing, partying, and substance use. Finally, how do first-year college students with ADHD, LD, ADHD+LD, and neither disability differ with respect to reasons to attend college and expectations for involvement in campus activities? It was hypothesized that students with ADHD and/or LD would not differ from comparison peers in terms of reasons to attend college, but would be significantly more likely to change majors and significantly less likely to get involved in campus academic and social activities.

Method

Data and Sample

Participants for this study were drawn from 201,818 first-time, full-time first-year students at 279 four-year colleges and universities in the United States who completed the 2010 Cooperative Institutional Research Program (CIRP) Freshman Survey (Pryor et al., 2010). The 2010 CIRP Freshman Survey was administered during registration, freshman orientation, or the first few weeks of classes (i.e., before students had significant college life experience). A total of 7,412 respondents reported having ADHD only, 3,516 respondents reported having LD only, and 1,994 students reported having both ADHD and LD. A subsample of 7,412 respondents who did not report having ADHD or LD was randomly selected from the total sample to serve as a comparison group. Listwise deletion of cases with missing data resulted in a total sample of 15,273 (missing data ranged from 3.0% of emotional acts in the past year to 28.2% of SAT/ACT *z* scores). Specifically there were 5,511 participants in the ADHD only group, 2,626

Table 1. Means and Standard Deviations (in Parentheses) or Percentages for Demographic Variables Across Groups.

Demographic variable	ADHD	LD	ADHD+LD	Comparison	χ^2/F	Phi/partial η^2
Age	3.37 (0.57)	3.43 (0.59)	3.42 (0.56)	3.32 (0.52)	16.26	.006
Family income	10.07 (3.26)	9.35 (3.72)	10.31 (3.54)	9.22 (3.33)	46.05	.016
ACT standard score	25.78 (4.79)	23.82 (5.21)	24.72 (5.53)	25.93 (4.83)	76.68	.024
SAT-V standard score	605.93 (101.29)	571.91 (114.70)	586.31 (111.37)	605.92 (100.39)	39.56	.014
ACT/SAT z scores	0.92 (0.92)	0.55 (0.99)	0.72 (1.05)	0.96 (0.93)	69.55	.024
Father's education	6.05 (1.93)	5.82 (2.00)	6.15 (2.02)	5.51 (2.07)	46.48	.016
Mother's education	6.07 (1.75)	5.88 (1.87)	6.17 (1.87)	5.53 (1.87)	54.96	.019
Gender (% female)	43.45	55.36	52.36	57.47	317.63	.125
Race (% non-White)	21.17	23.64	23.23	35.30	403.88	.144

Note. All *p*s < .0001. Age: 1 = *16 years or younger*; 2 = *17 years*; 3 = *18 years*; 4 = *19 years*; 5 = *20 years*; 6 = *21 to 24 years*; 7 = *25 to 29 years*; 8 = *30 to 39 years*; 9 = *40 to 54 years*; 10 = *55 years or older*. Family income: 1 = *less than $10,000*; 2 = *$10,000 to $14,999*; 3 = *$15,000 to $19,999*; 4 = *$20,000 to 24,999*; 5 = *$25,000 to $29,999*; 6 = *$30,000 to $39,999*; 7 = *$40,000 to $49,999*; 8 = *$50,000 to $59,999*; 9 = *$60,000 to $74,999*; 10 = *$75,000 to $99,999*; 11 = *$100,000 to $149,999*; 12 = *$150,000 to $199,999*; 13 = *$200,000 to $249,999*; 14 = *$250,000 or more*. Father's/mother's education: 1 = *grammar school or less*; 2 = *some high school*; 3 = *high school graduate*; 4 = *postsecondary school other than college*; 5 = *some college*; 6 = *college degree*; 7 = *some graduate school*; 8 = *graduate degree.*

participants in the LD only group, 1,399 participants in the ADHD+LD group, and 5,737 participants in the comparison group. Groups differed with respect to age, family income, parental education, ACT/SAT scores, gender ratio, and race (see Table 1). Two of these variables (gender and race) were included as independent variables. Given obtained group differences and prior evidence that family income and parental education (e.g., Davis-Kean, 2005), as well as ACT/SAT scores are correlated with educational achievement (Kobrin, Patterson, Shaw, Mattern, & Barbuti, 2008), these variables were included as covariates (i.e., to statistically control for their impact on differences between groups included in this study).

Independent Variables

Three independent variables were included in the current analysis. Race (White or non-White) and sex (male or female) were coded into binary variables based on student response. Diagnostic group was defined by student responses to six items that asked participants to indicate if they have a given disability or medical condition. Students were classified in the ADHD only group if they indicated they had ADHD but no other disorders. Similarly, students were coded as LD if they indicated they have LD but not other conditions. Students indicating ADHD and LD were coded in the ADHD+LD group. Finally, students not indicating ADHD or LD, but indicating any other disability or medical condition, or indicating no disabilities or medical conditions were coded in the comparison group.

Dependent Variables

To reduce the number of dependent variables being subjected to statistical analysis, the current study utilized principal axis factoring model with Oblimin rotation and Kaiser normalization to create subscales within four areas of self-report: (a) self-ratings (which reflect the core self-evaluation construct), (b) acts in the past year (which reflect engagement and academic preparation behaviors), (c) reasons for attending college, and (d) future acts. The remaining dependent variable area, hours per week of various activities (also reflecting engagement), consisted of specific survey items described below.

Self-ratings. Students were asked to rate themselves relative to their same-aged peers on a range of traits (e.g., academic ability, popularity) using a 5-point Likert-type scale with the following anchors: (a) *highest 10%*, (b) *above average*, (c) *average*, (d) *below average*, and (e) *lowest 10%*. Results of data reduction suggested a three-factor solution (34.46% explained variance) consisting of academic self-ratings (e.g., academic ability, mathematical ability), creative self-ratings (e.g., artistic ability, writing ability), and psychosocial self-ratings (e.g., popularity, social self-confidence). Total academic self-rating scores (based on 3 items) ranged from 3 to 15; total psychosocial self-rating scores (based on 13 items) ranged from 13 to 65; and total creative self-rating scores (based on 2 items) ranged from 2 to 10.

Acts in the past year. Acts in the past year (i.e., last year of high school) consisted of student ratings of specific activities rated on a 3-point Likert-type scale (i.e., *frequently, occasionally*, or *not at all*). Results of the principal axis factoring resulted in four unique factors explaining 36.93% of the variance: school disengagement (e.g., skipped school/class, failed to complete homework), substance use (e.g., drank beer, smoked cigarettes), assistance (e.g., studied with other students, asked a teacher for advice after class), and emotional difficulties (e.g., felt overwhelmed, felt depressed).

Total school disengagement scores (based on 5 items) ranged from 5 to 15; total substance use scores (based on 3 items) ranged from 3 to 9; total assistance scores (based on 3 items) ranged from 1 to 9; and total emotional difficulties scores (based on 2 items) ranged from 2 to 6.

Reasons to attend. Students were asked to indicate how important specific reasons for attending their college were on a 3-item Likert-type scale (*very important, somewhat important*, or *not important*). Results of the principal axis factoring suggested a two-factor solution (35.43% of variance explained) consisting of career development (e.g., get a better job, be able to make more money) and education/learning (e.g., to learn more about things that interest me, to make me a more cultured person). Total career development scores (4 items) ranged from 4 to 12; total education/learning scores (3 items) ranged from 3 to 9.

Future acts. This variable asked students to indicate their "best guess" as to the chances they will engage in a particular act on a 4-point Likert-type scale (i.e., *very good chance, some chance, very little chance*, and *no chance*). Principal axis factoring suggested a three-factor solution (38.05% of variance explained) consisting of major or career change (e.g., change major field, change career choice), academic activities (e.g., communicate regularly with your professors, get tutoring help in specific courses), and challenges (e.g., need extra time to complete your degree requirements, seek personal counseling). Total major or career change scores (2 items) ranged from 2 to 8; total academic activities scores (3 items) ranged from 3 to 12; and total challenges scores (4 items) ranged from 4 to 16.

Hours per week of various activities. This dependent variable consisted of student responses to eight items regarding academic, social, and recreation activities. Specifically, students were instructed to indicate the number of hours per week they typically engaged in each act during their last year of high school. Responses were captured on an 8-point Likert-type scale (*none, less than 1 hour, 1–2, 3–5, 6–10, 11–15, 16–20*, or *20+*). Scores of each item ranged from 1 to 8.

Data Analytic Plan

To answer these questions we conducted a 4 (group) × 2 (sex) × 2 (race) multivariate analysis of covariance (MANCOVA) for each set of dependent variables. Multivariate analyses were conducted prior to univariate analyses to control, in part, for inflation in experimentwise Type I error given the large number of variables being examined. Furthermore, this analytic approach was chosen because the research aim was to examine possible differences in high school preparation behaviors, core self-evaluation, and goals/expectations for college between groups with defined disabilities (ADHD, LD, and ADHD+LD) while controlling for other variables (e.g., family income, SAT scores) that may correlate with dependent measures. MANCOVA is a well-established method to examine group differences on multiple variables while controlling for variance contributed by other measures (Weinfurt, 1995). Covariates included achievement (based on SAT/ACT score converted into *z* scores), mother's education, father's education, and parental income. It is unknown whether students with ADHD and/or LD received accommodations during SAT/ACT administration. Our intention was to also include age as a covariate because groups differed on this variable; however, the distribution of age was heavily leptokurtotic with a kurtosis of 7.478 (see Table 2). The latter is consistent with a distribution being extremely peaked around a specific value; in this case, most participants were 18 or 19 years old. As a result, age was dropped as a covariate because using a non-normally distributed covariate violates an important assumption of the MANCOVA procedure (Lewis-Beck, Bryman, & Liao, 2004). Follow-up univariate analyses were conducted for statistically significant MANCOVAs, and individual Bonferroni pairwise comparisons were used following statistically significant univariate analyses. Due to the size of the sample and large number of statistical tests conducted, a conservative alpha level of .01 was used to establish statistical significance for all multivariate and univariate analyses. Partial eta squared was computed to provide an estimate of effect size. All statistical analyses were conducted using SPSS v. 20 software (IBM, 2011).

Results

Table 3 presents means and standard deviations for all dependent measures across the three independent variables of group, sex, and race.

Self-Ratings

The overall multivariate test failed to find a significant three-way interaction among group, race, and sex, Wilks's $\Lambda = .999$, $F(9, 30015.43) = 0.92$, $p = .507$. Alternatively, there was a significant two-way interaction between group and race, Wilks's $\Lambda = .997$, $F(9, 30015.43) = 3.62$, $p < .001$, partial $\eta^2 = .001$. The main effects of group, Wilks's $\Lambda = .974$, $F(9, 30015.43) = 36.82$, $p < .001$, partial $\eta^2 = .009$, race, Wilks's $\Lambda = .992$, $F(3, 12333) = 31.24$, $p < .001$, partial $\eta^2 = .008$, and sex, Wilks's $\Lambda = .963$, $F(3, 12333) = 159.61$, $p < .001$, partial $\eta^2 = .037$, were all significant.

Follow-up univariate analyses for the group-by-race interaction found a significant effect for self-ratings of creativity, $F(3, 12335) = 4.33$, $p = .005$, partial $\eta^2 = .001$. Within all of the White students surveyed, those with LD reported being significantly less creative than the ADHD and comparison groups ($p < .001$). White students with ADHD reported significantly higher creativity than White

Table 2. Skewness and Kurtosis for Dependent Variables and Covariates.

Variable	Scale	Skewness	Kurtosis
Self-ratings	Academic	0.01	–0.16
	Creative	–0.03	–0.28
	Psychosocial	0.04	0.22
Acts in the past year	School disengagement	0.52	0.00
	Substance use	1.01	0.28
	Assistance	0.08	–0.34
	Emotional	0.25	–0.57
Hours per week of various activities	Studying and homework	0.35	–0.24
	Socializing with friends	0.03	–0.60
	Talking with teachers outside of class	1.19	2.83
	Partying	0.74	–0.06
	Student clubs and groups	0.77	0.31
	Watching TV	0.45	0.22
	Playing video and computer games	1.12	0.65
	Online social networks	0.64	0.35
Reasons to attend	Career	–1.15	0.97
	Education or learning	–1.18	1.03
Future acts	Major or career change	–0.06	–0.69
	Academic activities	–1.04	1.49
	Challenges	0.06	0.21
Covariates	ACT/SAT z scores	–0.47	0.58
	Mother's education	–0.68	–0.21
	Father's education	–0.62	–0.62
	Family income	–0.77	–0.11
	Age	1.50	7.48

students in all other groups ($p = .001$ for ADHD+LD; $p = .004$ for comparison). There were no significant differences between White students in the ADHD+LD and comparison groups ($p = .576$). Of the non-White students surveyed, those with ADHD reported being significantly more creative than those with LD ($p = .007$) or comparison students ($p < .001$). No other significant differences were observed. The group-by-race interaction was not statistically significant for academic, $F(3, 12335) = 2.76$, $p = .04$, or psychosocial self-ratings, $F(3, 12335) = 2.37$, $p = .069$.

The main effect of group was significant for academic, $F(3, 12335) = 66.61$, $p < .001$, partial $\eta^2 = .016$, creative, $F(3, 12335) = 18.43$, $p < .001$, partial $\eta^2 = .004$, and psychosocial, $F(3, 12335) = 35.12$, $p < .001$, partial $\eta^2 = .008$, self-ratings. With regard to the main effect of academic self-ratings, individual Bonferroni pairwise comparisons revealed that comparison participants rated themselves highest, followed by participants in the ADHD group, followed by participants in the LD and the ADHD+LD groups, who were not significantly different from one another ($p = .954$; all other comparisons significant at $p < .001$). For the main effect of group on creativity, participants in the ADHD group self-reported higher creativity than all other groups (all comparisons significant at $p < .01$). The ADHD+LD group did not differ significantly from the LD ($p = .259$) or comparison ($p > .999$) groups. Last, with regard to psychosocial self-ratings, participants in the comparison group had significantly higher ratings than any other group ($ps < .001$), whereas none of the other groups differed significantly from one another ($ps > .999$).

The main effect of race was also significant for academic, $F(3, 12335) = 24.71$, $p < .001$, partial $\eta^2 = .002$, creative, $F(3, 12335) = 58.43$, $p < .001$, partial $\eta^2 = .005$, and psychosocial, $F(3, 12335) = 35.12$, $p < .001$, partial $\eta^2 = .008$, ratings. Individual Bonferroni comparisons showed that non-White students rated themselves significantly higher in all three areas ($p < .001$ in all three areas).

Last, the main effect for sex was significant for academic, $F(1, 12335) = 297.62$, $p < .001$, partial $\eta^2 = .024$), creative, $F(1, 12335) = 96.50$, $p < .001$, partial $\eta^2 = .008$, and psychosocial, $F(1, 12335) = 81.53$, $p < .001$, partial $\eta^2 = .007$, ratings. Male academic and psychosocial self-ratings were significantly higher than female self-ratings, while females rated themselves as significantly more creative than males.

Acts in the Past Year

The overall multivariate test failed to find a three-way group interaction between race, group, and sex, Wilks's $\Lambda = .999$, $F(12, 32392.23) = 0.93$, $p = .520$. The group-by-sex, Wilks's $\Lambda = .999$, $F(12, 32392.23) = 0.68$, $p = .769$, and race-by-sex, Wilks's $\Lambda = 1.000$, $F(4, 12243) = 1.19$, $p = .314$, interactions were not significant, but there was a significant group-by-race interaction, Wilks's $\Lambda = .998$, $F(12, 32392.23) = 2.50$, $p = .003$, partial $\eta^2 = .001$. There were also main effects for group, Wilks's $\Lambda = .949$, $F(12, 32392.23) = 54.17$, $p < .001$, partial $\eta^2 = .017$, race, Wilks's $\Lambda = .990$, $F(4, 12243.000) = 30.81$, $p < .001$, partial $\eta^2 = .010$, and sex, Wilks's $\Lambda = .964$, $F(4, 12243) = 54.17$, $p < .001$, partial $\eta^2 = .036$.

At the univariate level, there was a significant group-by-race interaction for substance use, $F(3, 12246) = 5.02$, $p = .002$, partial $\eta^2 = .001$. Individual comparisons for substance use demonstrate that, within all of the White students in the sample, students in the ADHD and ADHD+LD

Table 3. Means and Standard Deviations (in Parentheses) for Dependent Measures by Group, Sex, and Race.

		Group				Sex		Race	
Variable	Scale	ADHD	LD	ADHD+LD	Comparison	Male	Female	White	Non-White
Self-ratings	Academic	10.51 (1.98)	9.84 (1.96)	9.94 (2.13)	9.84 (1.96)	10.91 (2.00)	10.00 (1.84)	10.43 (1.97)	10.46 (1.97)
	Creative	6.55 (1.66)	6.09 (1.68)	6.30 (1.72)	6.09 (1.68)	6.25 (1.68)	6.55 (1.58)	6.36 (1.64)	6.52 (1.61)
	Psychosocial	46.54 (6.94)	45.97 (7.01)	46.06 (7.23)	45.97 (7.01)	47.75 (7.14)	45.98 (6.64)	46.60 (6.72)	47.49 (7.43)
Acts in the past year	School disengagement	9.03 (2.04)	8.27 (1.90)	8.81 (2.15)	8.27 (1.90)	8.82 (2.04)	8.45 (1.94)	8.57 (1.97)	8.76 (2.06)
	Substance use	4.70 (1.71)	4.24 (1.48)	4.71 (1.72)	4.24 (1.48)	4.51 (1.64)	4.26 (1.53)	4.46 (1.60)	4.13 (1.49)
	Assistance	6.02 (1.36)	6.14 (1.34)	6.18 (1.37)	6.14 (1.34)	5.98 (1.36)	6.24 (1.35)	6.05 (1.34)	6.29 (1.42)
	Emotional	3.96 (1.10)	3.84 (1.06)	4.06 (1.12)	3.84 (1.06)	3.60 (1.05)	4.06 (1.03)	3.82 (1.05)	3.89 (1.10)
Hours per week of various activities	Studying and homework	4.16 (1.59)	4.48 (1.65)	4.43 (1.72)	4.48 (1.65)	4.08 (1.60)	4.59 (1.59)	4.34 (1.59)	4.37 (1.67)
	Socializing with friends	5.56 (1.61)	5.27 (1.61)	5.43 (1.73)	5.27 (1.61)	5.47 (1.64)	5.37 (1.55)	5.48 (1.56)	5.26 (1.66)
	Talking with teachers outside of class	2.73 (1.12)	2.94 (1.21	2.96 (1.30)	2.94 (1.21)	2.68 (1.14)	2.85 (1.14)	2.72 (1.10)	2.88 (1.25)
	Partying	3.10 (1.88)	2.79 (1.76)	3.12 (1.91)	2.79 (1.76)	3.07 (1.86)	2.75 (1.73)	2.90 (1.80)	2.91 (1.81)
	Student clubs and groups	2.88 (1.72)	2.96 (1.74)	2.97 (1.75)	2.96 (1.74)	2.77 (1.73)	3.19 (1.68)	2.94 (1.70)	3.13 (1.76)
	Watching TV	3.64 (1.60)	3.62 (1.54)	3.61 (1.68)	3.62 (1.54)	3.77 (1.64)	3.51 (1.50)	2.94 (1.70)	3.62 (1.68)
	Playing video and computer games	2.83 (1.87)	2.41 (1.72)	2.56 (91.86)	2.41 (1.72)	3.41 (1.85)	1.76 (1.25)	3.64 (1.53)	2.59 (1.82)
	Online social networks	3.84 (1.61)	3.66 (1.63)	3.84 (1.74)	3.66 (1.63)	3.62 (1.63)	3.88 (1.57)	3.71 (1.54)	3.90 (1.75)
Reasons to attend	Career	10.45 (1.64)	10.49 (1.59)	10.47 (1.68)	10.49 (1.59)	10.48 (1.61)	10.60 (1.55)	10.45 (1.60)	10.81 (1.51)
	Education or learning	7.98 (1.21)	8.06 (1.16)	8.05 (1.18)	8.06 (1.16)	7.84 (1.26)	8.19 (1.06)	7.98 (1.18)	8.13 (1.15)
Future acts	Major or career change	5.07 (1.71)	4.89 (1.74)	5.02 (1.78)	4.89 (1.74)	5.01 (1.64)	5.01 (1.76)	5.04 (1.70)	4.91 (1.73)
	Academic activities	10.17 (1.59)	10.17 (1.66)	10.03 (1.77)	10.17 (1.66)	9.97 (1.67)	10.45 (1.46)	10.23 (1.57)	10.21 (1.61)
	Challenges	9.91 (2.05)	10.06 (2.11)	10.34 (2.20)	10.06 (2.11)	6.68 (2.10)	9.97 (2.05)	9.69 (2.04)	10.24 (2.13)

Note. ADHD = attention-deficit/hyperactivity disorder; LD = learning disabilities.

groups reported significantly more substance use than their counterparts in the LD and comparison groups (*p*s = .001); differences between ADHD and ADHD+LD and between LD and comparison were not significant (*p*s > .999). Next, among all non-White participants, those in the ADHD+LD group reported more substance abuse than the ADHD (p = .010), LD ($p < .001$) and comparison groups ($p < .001$). The ADHD and LD groups each reported significantly more substance use than the comparison group ($p < .001$), but were not significantly different from one another ($p = .098$).

The main effect of group was significant for school disengagement, $F(3, 12246) = 91.96$, $p < .001$, partial $\eta^2 = .022$. Individual Bonferroni comparisons revealed that the ADHD and ADHD+LD groups, which were not significantly different from one another ($p = .193$), both reported significantly greater disengagement than the comparison and LD groups (*p*s < .001), which, in turn, were not significantly different from one another ($p > .999$). The main effect of group was also significant for substance use, $F(3, 12246) = 98.29$, $p < .001$, partial $\eta^2 = .024$. Individual comparisons found that ADHD and ADHD+LD, which did not differ significantly ($p = .110$) reported significantly more substance abuse than other groups, and that the LD group reported significantly more substance abuse than the comparison group (*p*s < .001). There was a main effect of group on assistance, $F(3, 12246) = 4.80$, $p = .002$, partial $\eta^2 = .001$. The LD and ADHD+LD groups, which did not differ significantly ($p = .049$) sought significantly more assistance than the ADHD group (*p*s < .001). The comparison group was not significantly different from any of the other three groups (*p*s > .01). Finally, there was a main effect of group on emotional difficulties, $F(3, 12246) = 103.480$, $p < .001$, partial $\eta^2 = .025$. Individual comparisons revealed that ADHD and ADHD+LD participants, who did not differ from each other ($p = .079$), reported significantly more emotional difficulties than the other groups, and that participants in the LD group also reported significantly more difficulties than those in the comparison group (all *p*s < .001).

Next, the main effect for race was significant for school disengagement, $F(1, 12246) = 46.29$, $p < .001$, partial $\eta^2 = .004$, assistance, $F(1, 12246) = 52.72$, $p < .001$, partial $\eta^2 = .004$, and emotional difficulties, $F(1, 12246) = 14.02$, $p < .001$, partial $\eta^2 = .001$, ratings. Non-White students reported significantly higher levels of school disengagement, more use of assistance, and more emotional difficulties than White students.

Finally, the main effect for sex was significant for all types of acts: school disengagement, $F(1, 12246) = 35.453$, $p < .001$, partial $\eta^2 = .003$, substance use, $F(1, 12246) = 10.25$, $p < .001$, partial $\eta^2 = .001$, assistance, $F(1, 12246) = 68.11$, $p < .001$, partial $\eta^2 = .006$, and emotional difficulties, $F(1, 12246) = 308.04$, $p < .001$, partial $\eta^2 = .025$. Individual comparisons showed that males reported significantly higher school disengagement and substance use than females, while females reported seeking out significantly more assistance and experiencing more emotional difficulties than males.

Hours per Week of Various Activities

The overall multivariate test for hours per week of various activities showed that the three-way interaction among group, race, and sex was not statistically significant, Wilks's $\Lambda = .997$, $F(24, 34928.97) = 1.62$, $p = .027$. There was a significant two-way interaction between group and race, Wilks's $\Lambda = .996$, $F(24, 34928.97) = 1.63$, $p = .003$, partial $\eta^2 = .001$; however, none of the follow-up univariate tests met the threshold for statistical significance.

The overall multivariate test showed a significant main effect for group, Wilks's $\Lambda = .964$, $F(24, 34928.97) = 18.72$, $p < .001$, partial $\eta^2 = .012$. Follow-up univariate tests revealed significant group main effects for studying/homework, $F(3, 12050) = 42.59$, $p < .001$, partial $\eta^2 = .010$, socializing with friends, $F(3, 12050) = 9.56$, $p < .001$, partial $\eta^2 = .002$, talking with teachers outside of class, $F(3, 12050) = 34.15$, $p < .001$, partial $\eta^2 = .008$, partying, $F(3, 12050) = 25.60$, $p < .001$, partial $\eta^2 = .006$, playing video and computer games, $F(3, 12050) = 23.81$, $p < .001$, partial $\eta^2 = .006$, and online social networks, $F(3, 12050) = 12.91$, $p < .001$, partial $\eta^2 = .003$. There were no significant main effects of group on hours spent watching TV, $F(3, 12050) = 2.42$, $p = .064$, or participating in student clubs/groups, $F(3, 12050) = 3.29$, $p = .020$.

Individual Bonferroni comparisons for the main effect of group on hours studying and doing homework revealed that participants in the ADHD group spent the least time studying (*p*s < .001). The LD group spent significantly more time studying compared to the comparison group ($p < .001$). The ADHD+LD group was not significantly different from the LD group ($p = .075$) or the comparison group ($p > .999$).

Individual Bonferroni comparisons for the main effect of group on hours socializing with friends revealed that students with ADHD spent significantly more hours socializing compared to the other groups (*p*s < .001), which did not differ significantly from one another (*p*s > .01).

Individual Bonferroni comparisons for the main effect of group on hours talking with teachers outside of class revealed that students with ADHD+LD and LD, which were not significantly different from one another ($p > .999$), spent significantly more time compared to comparison and ADHD participants (*p*s < .001).

Individual Bonferroni comparisons for the main effect of group on hours partying revealed that students in the ADHD and ADHD+LD groups reported spending significantly more time partying than individuals in the LD ($p < .001$ for ADHD; $p = .005$ for ADHD+LD) and comparison groups (*p*s < .001). There were no significant differences for the ADHD versus ADHD+LD groups or the LD versus comparison group (*p*s > .999).

Individual Bonferroni comparisons for playing video and computer games showed that students in the ADHD group reported spending significantly more time playing video and computer games compared to the LD and comparison groups ($p < .001$). There were no other significant differences between groups for playing video and computer games ($ps > .01$).

Last, individual Bonferroni comparisons for the main effect of group on hours spent on online social networks showed that students with ADHD reported spending significantly more time on online social networks than students in the comparison ($p < .001$) or LD ($p < .001$) groups. Also, students in the ADHD+LD group reported spending significantly more time on online social networks than students in the LD group ($p = .010$). The remaining differences were not significant ($ps > .01$).

The overall multivariate test also showed a significant main effect for race, Wilks's $\Lambda = .989$, $F(8, 12043) = 18.72$, $p < .001$, partial $\eta^2 = .011$. Follow-up univariate tests showed that there were significant differences between race groups for studying and doing homework, $F(1, 12050) = 80.06$, $p < .001$, partial $\eta^2 = .003$, socializing with friends, $F(1, 12050) = 11.97$, $p = .001$, partial $\eta^2 = .001$, talking with teachers outside of class, $F(1, 12050) = 41.58$, $p < .001$, partial $\eta^2 = .003$, participating in student clubs and groups, $F(1, 12050) = 18.07$, $p < .001$, partial $\eta^2 = .001$, and spending time on online social networks, $F(1, 12050) = 19.51$, $p < .001$, partial $\eta^2 = .002$. Non-White participants reported themselves as spending more hours per week studying and doing homework, fewer hours socializing with friends, more time talking with teachers outside of class, more time in student clubs and groups, and more time on online social networks than White participants.

Finally, the overall multivariate test also showed a significant main effect for sex, Wilks's $\Lambda = .861$, $F(8, 12043) = 242.40$, $p < .001$, partial $\eta^2 = .139$. Follow-up univariate tests revealed significant differences for studying and doing homework, $F(1, 12050) = 183.45$, $p < .001$, partial $\eta^2 = .015$, talking with teachers outside of class, $F(1, 12050) = 34.10$, $p < .001$, partial $\eta^2 = .003$, partying, $F(1, 12050) = 20.38$, $p < .001$, partial $\eta^2 = .002$, participating in student clubs and groups, $F(1, 12050) = 106.09$, $p < .001$, partial $\eta^2 = .009$, watching TV, $F(1, 12050) = 49.33$, $p < .001$, partial $\eta^2 = .004$, playing video and computer games, $F(1, 12050) = 1569.71$, $p < .001$, partial $\eta^2 = .115$, and using online social networks, $F(1, 12050) = 23.37$, $p < .001$, partial $\eta^2 = .002$. Female participants rated themselves as spending significantly more hours per week studying and doing homework, more hours talking with teachers outside of class, fewer hours partying, more hours in student clubs and groups, fewer hours watching TV, fewer hours playing video and computer games, and more hours on online social networks than male participants.

Reasons for Attending College

The overall multivariate test failed to find a significant three-way interaction among group, race, and sex, Wilks's $\Lambda > .999$, $F(6, 24148) = 0.76$, $p = .603$. There was also no significant two-way interaction between sex and group, Wilks's $\Lambda > .999$, $F(6, 24148) = 0.88$, $p = .876$, or sex and race, Wilks's $\Lambda > .999$, $F(2, 12074) = 0.21$, $p = .810$. Alternatively, there was a significant two-way interaction between group and race, Wilks's $\Lambda = .998$, $F(6, 24148) = 3.41$, $p = .0012$, partial $\eta^2 = .001$.

Follow-up univariate analyses for the group-by-race interaction found a significant interaction for career, $F(3, 12075) = 4.21$, $p = .007$, partial $\eta^2 = .001$, but not education/learning, $F(3, 12075) = 3.66$, $p = .012$. Individual Bonferroni comparisons within career reasons to attend found that, for White students, those in the comparison group were significantly more likely to report career-related reasons than students in the ADHD ($p = .007$) and LD ($p < .001$) groups. There were no other significances within the White students for career reasons for attending college. For non-White participants, the only significant difference found was that comparison students reported significantly more career-related reasons for attending college than students in all other groups ($p = .001$ for ADHD; $p < .001$ for LD and ADHD+LD).

There was an overall multivariate main effect of group, Wilks's $\Lambda = .995$, $F(2, 24148) = 10.99$, $p < .001$, partial $\eta^2 = .003$. Follow-up univariate tests demonstrated that there was a main effect of group for career, $F(3, 12075) = 20.41$, $p < .001$, partial $\eta^2 = .005$, but not education/learning, $F(3, 12075) = 0.915$, $p = .433$. Individual Bonferroni comparisons demonstrated that participants in the comparison group rated career significantly higher than any other group ($ps < .001$). No other significant group differences were obtained ($ps > .01$).

There was also an overall multivariate main effect of race, Wilks's $\Lambda = .995$, $F(2, 12074) = 15.171$, $p < .00$, partial $\eta^2 = .003$. Follow-up univariate tests demonstrated that there was a main effect of race for both career, $F(1, 12075) = 14.44$, $p < .001$, partial $\eta^2 = .001$, and education/learning, $F(1, 12075) = 20.83$, $p < .001$, partial $\eta^2 = .002$. Non-White participants rated career significantly higher than White participants ($p < .001$).

Finally, there was an overall multivariate main effect of sex, Wilks's $\Lambda = .988$, $F(2, 12074) = 72.80$, $p < .001$, partial $\eta^2 = .012$. Univariate tests demonstrated that there was a main effect of sex as applied to education/learning, $F(1, 12075) = 144.90$, $p < .001$, partial $\eta^2 = .012$, but not career, $F(1, 12075) = 1.37$, $p = .243$. Female participants rated education and learning significantly higher as a reason to attend college than did male participants.

Future Acts

The overall multivariate test for future acts did not reveal a significant three-way interaction for group, sex, and race,

Wilks's $\Lambda = .998$, $F(9, 28654.97) = 2.07$, $p = .029$. In addition, the two-way interactions for group-by-sex, Wilks's $\Lambda = .999$, $F(9, 28654.97) = 1.148$, $p = .324$, group-by-race, Wilks's $\Lambda = .999$, $F(9, 28654.97) = 1.21$, $p = .283$, and sex-by-race, Wilks's $\Lambda > .999$, $F(3, 11774.00) = 0.96$, $p = .409$, were all nonsignificant.

The overall multivariate test showed a significant main effect for group, Wilks's $\Lambda = .981$, $F(9, 28654.97) = 5.88$, $p < .001$, partial $\eta^2 = .006$. Follow-up univariate tests indicated that this difference was significant for future acts in academic activities, $F(3, 11776) = 9.36$, $p < .001$, partial $\eta^2 = .002$, and challenges, $F(3, 11776) = 51.80$, $p < .001$, partial $\eta^2 = .013$, but not major or career change, $F(3, 11776) = 0.07$, $p = .975$, partial $\eta^2 < .001$. Post hoc Bonferroni comparisons demonstrated that comparison students reported significantly more plans for future academic activities acts than students in the ADHD ($p < .001$) or ADHD+LD ($p < .001$) groups. Furthermore, students in the comparison group reported expecting fewer future challenges than students in the ADHD or LD group ($p < .001$ for both). The ADHD, LD, and comparison participants all reported expecting fewer challenging acts in the future than participants in the ADHD+LD group ($p < .001$ for ADHD and comparison; $p = .001$ for ADHD+LD).

The overall multivariate test also indicated a significant main effect for sex, Wilks's $\Lambda = .984$, $F(3, 11774) = 64.87$, $p < .001$, partial $\eta^2 = .016$. The follow-up univariate tests found that this difference was significant for future acts in academic activities, $F(1, 11776) = 194.38$, $p < .001$, partial $\eta^2 = .016$, and challenges, $F(1, 11776) = 12.90$, $p < .001$, partial $\eta^2 = .001$, but not major or career change, $F(1, 11776) = 0.17$, $p = .681$, partial $\eta^2 < .001$. Females reported significantly more plans for academic activities and future challenges than males.

Last, the overall multivariate test found a significant main effect for race, Wilks's $\Lambda = .994$, $F(3, 11774) = 21.84$, $p < .001$, partial $\eta^2 = .006$. Follow-up univariate tests found that this difference was significant for future challenges, $F(1, 11776) = 61.44$, $p < .001$, partial $\eta^2 = .005$, but not academic activities, $F(1, 11776) = 4.34$, $p = .037$, partial $\eta^2 < .001$, and major or career change, $F(1, 11776) = 0.00$, $p = .950$, partial $\eta^2 < .001$. Non-White participants had anticipated significantly more future challenges than White participants.

Discussion

First-year college students with ADHD, LD, and ADHD+LD differed from their peers without disabilities with respect to core self-evaluation in several areas of functioning. As hypothesized, self-ratings of academic and psychosocial status were significantly lower for the three disability groups. Interestingly, students with ADHD alone rated themselves higher than other disability groups for academics and higher than all three groups in creativity. It is possible that college students with ADHD exhibit a positive illusory bias (i.e., inflated perceptions of ability and performance) as has been found for children and adolescents (Hoza, Pelham, Dobbs, Owens, & Pillow, 2002). In partial support of hypothesized outcome, students with ADHD+LD reported significantly lower self-concept in academics and creativity relative to those with ADHD alone; however, students with ADHD+LD did not differ from those with LD alone in any area nor were there differences among disability groups with respect to self-ratings of psychosocial functioning. Thus, the degree to which the self-perceptions of students with both ADHD and LD are compromised relative to core self-evaluation of students with either disability alone is relatively small.

Students in the three disability groups also differed from their peers without disabilities with respect to engagement in academic preparation activities (i.e., conscientiousness) and experiences in high school. Specifically, students with ADHD, LD, or ADHD+LD reported significantly greater school disengagement, substance use, and emotional difficulties relative to peers during their last year of high school. As hypothesized and consistent with the findings of Kent et al. (2011), the two groups with ADHD reported significantly more school disengagement, substance use, partying, online social networking, and emotional difficulties than did students with LD alone. Also consistent with expectations, students with ADHD alone spent significantly less time studying or doing homework and more time socializing than the other groups; students with ADHD alone also spent more time playing video or computer games than LD alone or comparisons. Thus, having comorbid ADHD may increase risk for substance use and emotional difficulties for students with LD. Conversely, the two groups with LD reported seeking more assistance and talking more with teachers than did students with ADHD alone or comparison peers. Similarly, students with LD alone spent more time studying and doing homework than comparison peers. It is likely that students with LD receive more academic support services than do students with ADHD and therefore may be more likely to study, complete assignments, and seek assistance when necessary. As such, comorbid LD may be "protective" for college students with ADHD at least when it comes to seeking academic assistance.

First-year students with disabilities also differed from peers regarding reasons for attending college as well as for anticipated activities while on campus. Specifically, students with ADHD and/or LD placed more importance on career aspirations for attending college than did peers without disabilities. The emphasis on career goals as a reason for college attendance for students with ADHD+LD was significant only for students from racial minority backgrounds. The importance of career goals for attending college is not surprising for students who may be relatively less prepared for academic pursuits (in the case of students

with disabilities) or are facing socioeconomic pressures (as may be the case for at least some students from minority backgrounds). Students in the two groups with ADHD anticipated engaging in fewer academic activities than peers without disabilities and expected more challenges than students with LD alone or without disabilities. Furthermore, students with LD alone expected more college-related challenges than did comparison peers. These findings reinforce the notion that having ADHD negatively impacts engagement in academic activities (i.e., conscientiousness), perhaps more so than does having LD; however, students with one or both disabilities are probably realistic in expecting college to present significant challenges.

In general, the interpretation of main effects for disability group was not impacted by interactions of group with any other independent variable. Although there were a few statistically significant group-by-race interactions, follow-up tests of group effects within race did not provide appreciably different findings than what was obtained for the main effect of group. Nevertheless, there were several interesting results regarding main effects for race. Non-White students reported higher self-ratings in all areas relative to White students. Furthermore, non-White students reported more academic preparation behaviors in the last year of high school along with higher levels of school disengagement and emotional acts. Non-White students placed greater importance on career aspirations for attending college, expected more challenges, and anticipated seeking greater levels of assistance during college. Race effects were relatively small in magnitude, particularly in relation to effect sizes for group or gender.

It is not surprising that significant main effects for gender were also obtained. Men reported higher self-ratings in academics and psychosocial functioning along with more substance use, school disengagement, partying, TV viewing, and playing video and computer games in the last year of high school. Alternatively, women reported higher self-ratings in creativity, more seeking of teacher assistance and emotional acts in high school, more time studying and doing homework, talking with teachers, participating in student clubs and online social networks during the last year of high school. Women were more likely to place importance on education as a reason for attending college and report greater expectations to engage in academic activities on campus. Effect sizes for the impact of gender were similar for the most part to group effects (i.e., accounting for about 1% to 2% of the variance in the dependent variables).

Limitations

Several factors may limit conclusions based on these findings. First, all data were collected via self-report and thus may be subject to inaccuracies inherent to this methodology (i.e., self-reported diagnostic status may not match clinical diagnosis). Furthermore, even if students accurately report being diagnosed with either ADHD or LD, previous research has demonstrated both a wide range in the quality of information used for diagnosis by professionals, and legitimate concerns regarding students feigning a disorder (Handler & DuPaul, 2005; Sansone & Sansone, 2011; Sollman, Ranseen, & Berry, 2010; Sparks & Lovett, 2009, 2014). Nevertheless, group differences in self-report data are noteworthy even if not completely accurate because these provide important insights into how students with self-reported ADHD and/or LD view themselves and their academic experiences and may best represent the population of students who present themselves to offices of disability services. Ultimately, college disability service providers must determine the accuracy of reported diagnoses and either confirm or disconfirm student disability status. Second, the large sample size increased the probability that even trivial effects would be found statistically significant. This limitation is tempered by the fact that although effect sizes for group main effects were small (i.e., accounting for 1% to 2% of the variance); in most cases, these were equivalent to the effects of gender and larger than the effects of race (i.e., demographic characteristics typically associated with educational outcomes). In addition, a conservative alpha level of .01 was used for all analyses. Third, these findings are based on cross-sectional data from the beginning stages of the college experience and, as such, more likely reflect the status of high school students transitioning to college rather than college students per se. Finally, ADHD and LD status were based on self-report and not confirmed by external data or respondents (e.g., parents). College students have been found to be relatively reliable in reporting their ADHD diagnostic status (Ranby et al., 2012), and many studies have used parent-reported diagnoses in examining functioning and outcomes among individuals with ADHD (e.g., Visser et al., 2014).

Implications for Practice and Research

The findings obtained in the current study have several important implications for practitioners working with college students with ADHD and/or LD. First, university faculty and student support personnel should be aware that students with ADHD and/or LD enter college with lower intrapersonal competencies, most notably lower levels of engagement (i.e., conscientiousness) and lower self-evaluations of academic and psychosocial functioning than other students. These lower levels of engagement and core self-evaluations may place them at higher risk for transition difficulties and may negatively impact persistence with postsecondary education (Butler, 2011; Shaw-Zirt et al., 2005). Second, university personnel need to account for differences in psychosocial functioning and academic preparation among disability groups such that students with LD (regardless of ADHD

status) perceive themselves as more prepared and focused academically than students with ADHD alone. Alternatively, students with ADHD (regardless of LD status) report taking more risks in the psychosocial area (including substance use). Thus, practitioners should be aware that students with ADHD+LD may be worse off than those with LD alone in psychosocial functioning, while better off than those with ADHD alone in willingness to seek academic assistance. The latter is somewhat counterintuitive and may just represent student perceptions of academic status; however, it is important for personnel of these differences in self-perceptions among disability groups. Third, interventions and support strategies may need to be differentiated for those with ADHD alone versus LD alone versus ADHD+LD given differences in perceived preparation and risk. Specifically, students with ADHD (regardless of LD status) may require both academic and psychosocial support given their self-reported lesser academic preparation and greater engagement in risk behaviors. Finally, mental health and educational professionals working with high school students with ADHD and/or LD need to help students adopt strategies that will allow the latter to feel prepared for and ready for success in college. Although these students are strong enough academically to be accepted to college, they are still entering at a disadvantage in intrapersonal competencies relative to students without ADHD and/or LD.

Research regarding the functioning of college students with ADHD and/or LD is in its infancy relative to the many investigations of these disabilities in the K–12 population. It is imperative that future college studies employ multiple measures of academic, psychological, and social functioning both prior to and during first year of college to more fully understand the transition to college among students with ADHD and/or LD. Second, the degree to which self-reported ADHD and LD diagnoses are accurate (i.e., are confirmed by objective clinical evaluation) should be investigated. Third, longitudinal studies of functioning across the college years should be conducted to identify student subgroups based on trajectories of academic, social, and psychological functioning as well as to discover possible predictors of these trajectory classifications within and across disability groups. Finally, to the extent that predictors of college functioning trajectories are malleable, researchers should design and evaluate interventions that may alter functional trajectories such that successful academic, psychological, and social outcomes are achieved.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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