

Psychosocial Status of Adolescents with Learning Disabilities With and Without Comorbid Attention Deficit Hyperactivity Disorder

John K. McNamara, Teena Willoughby, Heather Chalmers, and YLC-CURA

Brock University

Some researchers suggest that having a learning disability (LD) may act as a risk factor, increasing the likelihood that adolescents experience more negative outcomes in many areas of their lives. However, researchers have yet to examine in one study how having LD with and without attention deficit hyperactivity disorder (ADHD) is related to a comprehensive set of psychosocial variables across a diverse set of domains (e.g., peer, family, school, intrapersonal). The purpose of the present study was to address that limitation by comparing the perceptions of adolescents with LD ($N = 230$), with comorbid LD/ADHD ($N = 92$), and without LD or ADHD ($N = 322$) regarding their academic orientation, temperament, well-being, loneliness, parental relationships, victimization, activities, and friendships. Results are consistent with the hypothesis that LD may indeed act as a risk factor increasing the likelihood of more negative outcomes. The results also indicate that for some psychosocial variables this likelihood may be increased in adolescents with comorbid LD/ADHD. The findings have important implications for stakeholders concerned about supporting adolescents with LD with and without comorbid ADHD.

Adolescence is a challenging time for parents, educators, and adolescents themselves. This may be particularly true for adolescents with learning disabilities (LD). Research over the past two decades has demonstrated that adolescents with LD typically experience academic (Bender, 2004; Blackorby & Wagner, 1997; Gregory, Shanahan, & Walberg, 1986; Lerner, 2003) as well as psychosocial difficulties (Margalit & Al-Yagon, 2002; Sorensen et al., 2003; Tur-Kaspa, 2002; Werner, 1993; Wiener, 2003). Cosden, Brown, and Elliot (2002), as well as Wiener (2003), suggest that it may be LD itself that poses a risk factor, increasing the likelihood that adolescents with LD experience more negative outcomes in many areas of their lives. However, researchers have yet to examine in one study how having LD is related to a comprehensive set of psychosocial variables across a diverse set of domains (e.g., peer, family, school, intrapersonal). Furthermore, researchers have yet to develop a thorough understanding of how having LD comorbid with attention deficit hyperactivity disorder (ADHD) may further impact adolescents' psychosocial status. To date, researchers exploring adolescents with ADHD suggest that although the primary characteristics of ADHD include inattention and hyperactivity, secondary problems associated with ADHD often include academic underachievement, conduct problems, difficulties in interacting with peers and adults, poor self-esteem, higher incidence of depression, and lower self-reported perceptions of general well-being (Hoza, Owens, & Pelham, 1999; Klassen, Miller, & Fine, 2004; Quay & Hogan, 1999). However, very few studies have explored the differences in psychosocial status between adolescents with LD, adolescents with comorbid

LD/ADHD, and adolescents without LD. As such, the purpose of this study is to compare these three groups of adolescents in their academic orientation, temperament, well-being, loneliness, parental relationships, victimization, activities, and friendships. Exploring such between-group differences is an important first step in understanding more thoroughly the inter- and intrapersonal characteristics of adolescents with LD/ADHD, which in turn further enables us to accomplish the goal of successfully teaching and working with all adolescents to ensure that they become well-adjusted adults (Larkin & Ellis, 1998).

One of the constructs explored in this study is academic orientation, which includes variables such as grades achieved, school goals, and academic planning. Research into the academic skills of adolescents with LD suggests that these students show deficits in many academic areas when compared to adolescents without LD. For example, Gregory et al. (1986), in a large-scale study of secondary school adolescents, found that students who identified themselves as having LD demonstrated academic deficits in reading and math that persisted throughout high school and were even apparent as late as the last year of school. Similar findings were demonstrated by Blackorby and Wagner (1997), who found that approximately one out of three adolescents with LD fails general education high school courses. Larkin and Ellis (1998) summarized conclusions drawn from this research and posited five academic characteristics of adolescents with LD. Generally, adolescents with LD lack the basic skills necessary to meet academic demands, possess knowledge of a variety of basic skills but fail to use them systematically in problem-solving situations, are not likely to use effective or efficient learning/performance strategies, are not likely to have sufficient knowledge in order to learn the level of new content information presented in secondary school, and frequently

fail to take advantage of learning enhancers in the environment. Rieth and Polsgrove (1994) suggested that the academic difficulties experienced by adolescents with LD may be caused by passive academic involvement and inadequate interpersonal skills. The same findings are true for adolescents with behavioral difficulties such as those with ADHD (Kauffman, 2005; Walker, Ramsey, & Gresham, 2004). Collectively, research in this area has found that most adolescents with ADHD are achieving academically at least a year below grade level.

Beyond academic outcomes, this study explores a host of inter- and intrapersonal psychosocial variables. Two of the more primary psychosocial constructs explored in this study are temperament and well-being. Temperament is often referred to as individual differences in behavioral style (Thomas & Chess, 1977). An individual's temperament consists of behaviors such as rhythmicity (i.e., the regularity of physiological functions), approachability, adaptability, mood, persistence, and distractibility. Keogh (1983) and Keogh, Pullis, and Cadwel (1982) explored temperament in children with LD and found generally that children with LD were less persistent and demonstrated less social flexibility than children without LD. The present study examines persistence and flexibility but also extends this research to explore sleep patterns, adaptability, and approach to new situations. There is little research exploring temperament differences between youth with and without ADHD. Most of the research in this area has explored the belief that temperament may play a role in the development of behavioral disorders (Kauffman, 2005). That is, a more negative temperament may put a child at risk for developing a behavioral disorder. This study explores self-reported perceptions of temperament characteristics of adolescents with comorbid LD/ADHD. Such perceptions are important to consider in view of the idea that adolescents' insights about their own temperament characteristics such as mood, activity level, persistence, and their approach to tasks will play an important role in how they function in other areas of their life.

Related to temperament is the construct of well-being. Well-being may be seen as a set of factors that are less stable than temperament and more directly related to an individual's reactions to her/his life situation. Previous research in this area is limited, but the few researchers exploring well-being in youth with LD have found that these children are more prone to depression and lower self-esteem when compared to youth without LD (Bender & Wall, 1994; Margalit & Levin-Alyagon, 1994; Palladino, Poli, Masi, & Marcheschi, 2000). Researchers exploring well-being in youth with ADHD have found similar results suggesting that the primary and secondary characteristics associated with ADHD (e.g., hyperactivity and disruptive behavior) put youth with ADHD at risk for higher levels of depression and lower self-esteem (Kauffman, 2005; Klassen et al., 2004).

This study also explores differences between adolescents with and without LD/ADHD in their relationships with parents and friends. Previous research into family relationships and dynamics suggests that families that include a child with LD/ADHD experience more stress between parents, are more disjointed, and are less communicative compared to families that do not have a child with LD (Dyson, 1996; Green, 1990;

Margalit & Almough, 1991; Mrud, Hoza, & Gerdes, 2001). Specifically, Dyson (1996) found that families of children with LD were more prone to parental stress, which in turn may lead to more negative relationships between parents and children. Also, Green (1990) found that families of children with LD evidenced more disjointed communication among family members, whereas Margalit and Almough (1991) found that families of children with LD tended to be less supportive when compared to families without children with LD. Research into the peer relationships of children with ADHD suggests that these children are more susceptible to difficulties in forging and maintaining effective friendships. For example, Mrud et al. (2001) found that as a result of their non-compliant, disruptive, and aggressive behavior, children with ADHD are overwhelmingly rejected by their peers. Such findings also appear with respect to within-family relationships. Klassen et al. (2004) found that there was less family cohesion in families including children or adolescents with ADHD. In general, research in this area indicates that the presence of LD or ADHD within a family may negatively influence family dynamics. The current study attempts to explore further the nature and strength of the relationship between adolescents with LD/ADHD and their parents. Other constructs explored in our study include loneliness, peer friendships, victimization, and involvement in school and extracurricular activities. These variables add to the comprehensive exploration of inter- and intrapersonal factors possibly affecting adolescents with LD/ADHD.

In general, this study builds on Wong's (2003) suggestion that one necessary and important line of research concerning children and youth with LD needs to be the search for potential risk and protective factors. In this study, adolescents with LD may be seen as "at risk" because of the presence of LD per se. We hypothesize that, indeed, LD may act as a risk factor affecting outcomes in academic and psychosocial domains. An important first step in understanding the relationship between LD and academic and psychosocial adjustment is exploring the difference in such functioning between adolescents with and without LD. By including a diverse set of variables across family, peer, school, and intrapersonal domains, this study provides a comprehensive examination of the relation of LD to important academic and psychosocial factors. As such, this study compares adolescents with and without LD on a wide range of inter- and intrapersonal variables. Specifically, we ask: Are there differences between adolescents with and without LD or comorbid LD/ADHD on constructs such as academic orientation, temperament, well-being, loneliness, parental relationships, peer victimization, participation in structured and unstructured activities, and friendships?

METHOD

Participants

Students from 25 high schools encompassing a school district in a southern Ontario region in Canada took part in the study. The overall participation rate was 76 percent of students

enrolled in participating schools ($N = 7,290$). Nonparticipation was due to student absenteeism (17 percent), student refusal (4 percent), and parental refusal (3 percent). The sample from the present study consisted of three subgroups from the larger sample: The LD group consisted of 230 students (3.2 percent of the sample population) (121 males) who reported being diagnosed with LD; the LD/ADHD group consisted of 92 students (1.3 percent of sample population) (54 males) who reported being diagnosed with comorbid LD/ADHD; and the non-LD group consisted of a random selection of 322 respondents (175 males) who were matched on age, gender, and parental education to those respondents in the LD and LD/ADHD groups. In total, the analysis sample consisted of 644 respondents (350 males).

The students in the LD and LD/ADHD groups self-reported that they had been diagnosed as having LD. Specifically, the students were asked, "Have you ever been diagnosed with learning disabilities?" and further, "If yes, what type of disability?" Only students who answered yes and stated that they had a specific reading disability, dyslexia, or LD were included in the LD group. When answering the question about the type of disability, students who indicated that they had been diagnosed with LD *and* ADHD or attention deficit disorder were included in the LD/ADHD group. Although the validity of self-reporting a disability may be disputed, the prevalence of LD within this study's sample is consistent with the district prevalence estimates of 4–5 percent. District guidelines mandate that classification of LD is decided upon by a multidisciplinary team, including a registered school psychologist, who participated in the child's diagnosis and resulting educational placement. To qualify for LD status, a student had to have severe difficulties in the acquisition of basic academic skills and/or overall school performance that persisted after classroom-based remedial interventions, curricular adaptations, and learning assistance support, as well as a discrepancy of 2 standard deviations between estimated learning potential and academic orientation, as measured by norm-referenced instruments in grades 3–12. These difficulties could not be the result of other disabling conditions or external influences.

Participants ranged in age from 13 to 18 years ($M = 15.78$ years, $SD = 1.38$ years). Ninety-one percent of the adolescents were born in Canada, and the most common ethnic backgrounds reported other than Canadian were British (18.1 percent), German (15.0 percent), French (12.7 percent), and Italian (10.5 percent), consistent with the broader Canadian population (Statistics Canada, 2001). Data on socioeconomic status indicated a mean of 3.1 for both mothers' and fathers' level of education, with 3 indicating some college, university, or apprenticeship program and 4 indicating completion of a college/apprenticeship/technical program. Further, 69 percent of participants were living in two-parent households (57 percent with both birth parents, 12 percent with one birth parent and one step-parent), 15 percent reported living with a single parent (usually mother), and the remaining adolescents reported living with relatives, foster parents, guardians, adoptive parents, in group homes, or on their own. Preliminary analyses of the sample characteristics revealed no statistically significant between-group dif-

ferences for age $F(2,641) = 1.21$, $p = 0.498$, or gender, $F(2,641) = 0.498$, $p = 0.613$.

Procedure

A 23-page self-report questionnaire about lifestyle choices was administered by trained research staff to students within classrooms. The questionnaire used in this study was part of a larger study conducted by the Brock University Youth Lifestyle Choices-Community University Research Alliance (YLC-CURA). The YLC-CURA study was designed to examine comprehensively issues related to resilience and youth lifestyle choices. The YLC-CURA is a long-term strategic partnership between a number of Brock University faculty and Canadian community agencies designed to better understand youth resilience and lifestyle choices. By examining factors that enhance resilience, the YLC-CURA team focuses on minimizing risk behaviors to a responsible moderate level while protecting youth from adverse consequences. The primary focus of the YLC-CURA project is promoting health rather than limiting risk, thereby encouraging strategies and interventions that promote positive lifestyle choices in children and youth.

In the current study, students were asked to report on inter- and intrapersonal issues in the domains of neighborhood, school, family, and peers. To ensure that all students could participate regardless of their literacy level, the survey was read to students with literacy difficulties. Students were informed that their responses were completely confidential. Researchers have demonstrated that when students are assured of confidentiality, self-report measures of risk behaviors have good validity (e.g., Murray & Perry, 1987; White, 1991). Further, researchers examining aggression and victimization indicate that self-reports yield similar results to peer reports (Crick & Bigbee, 1998).

Measures

In this study, we included measures found to be significant predictors from past research examining adolescent risk behaviors (e.g., peer victimization—Haynie et al., 2001; substance use—Petraitis, Flay, Miller, Torpy, & Greiner, 1998). In total, we included 32 variables encompassing eight constructs (academic orientation, temperament, well-being, loneliness, parental relationships, victimization, structured and unstructured activities, and friendships). The 32 variables were grouped based on conceptual overlap. For example, five variables were grouped as "well-being" measures (depression, social anxiety, self-esteem, life satisfaction, and daily hassles). Within the questionnaire, items related to each construct were clustered into sections. Constructs and variables, number of questions, scale, and example questions are illustrated in Table 1.

Academic orientation was assessed in terms of typical school grades (1—*A+* to 6—*below 50 percent*), academic goals (1—*don't know* to 6—*obtaining professional training*), frequency of planning ahead (1—*almost always/always* to

4—*never/almost never*), and frequency of being bored at school (1—*all the time* to 4—*never or almost never*). One additional item, adapted from Jessor and Jessor (1977), assessed how important it is to the respondents that they do well

in school, using a 5-point scale (1—*very important* to 5—*not at all important*).

Temperament was assessed by items from the Dimensions of Temperament Scale–Revised (Windle & Learner,

TABLE 1
Description of Measures

<i>Construct and Measure</i>	<i>Number of Questions</i>	<i>Scale</i>	<i>Example of Questions</i>
<i>Age</i>	1 item	9-point scale (1 = 10 to 9 = 18 or over)	How old are you?
<i>Gender</i>	1 item	<i>Male or female</i>	Are you male or female?
<i>Academic orientation</i>			
Grades	1 item	6 pt (1 = A+ to 6 = below 50 percent)	
School goals	1 item	6 response items (1 = don't know to 6 = obtaining professional training (e.g., masters, Ph.D., physician))	How far do you plan to go in school?
Planning	1 item	4 pt (1 = almost always or always to 4 = almost never or never)	Do you plan ahead for the things that you have to do each day?
Bored at school	1 item	4 pt (1 = all the time to 4 = never or almost never)	How often are you bored in school?
Important to do well	1 item	5 pt (1 = very important to 5 = don't know)	How important is it to your friends that you do well in school?
<i>Temperament</i>			
Activity	3 items ($\alpha = 0.79$) ^a	4 pt (1 = almost always or always to 4 = almost never or never)	I have a hard time sitting still.
Distractibility	4 items ($\alpha = 0.53$) ^a	4 pt (1 = almost always or always to 4 = almost never or never)	I stay with an activity for a long time.
Sleep/rhythmicity	4 items ($\alpha = 0.58$) ^a	4 pt (1 = almost always or always to 4 = almost never or never)	I wake up at different times.
Affect/mood	4 items ($\alpha = 0.85$) ^a	4 pt (1 = almost always or always to 4 = almost never or never)	I laugh and smile at a lot of things.
Persistence	3 items ($\alpha = 0.68$) ^a	4 pt (1 = almost always or always to 4 = almost never or never)	Once I start something, I finish it.
Approach	5 items ($\alpha = 0.68$) ^a	4 pt (1 = almost always or always to 4 = almost never or never)	I like trying new things.
<i>Well-being</i>			
Depression	20 items ($\alpha = 0.92$) ^a	5 pt (1 = none of the time to 5 = most of the time)	I felt that I was just as good as other people.
Social anxiety	14 items ($\alpha = 0.93$) ^a	4 pt (1 = almost never or never to 4 = almost always or always)	I only talk to other people of my age that I know really well.
Self-esteem	10 items ($\alpha = 0.90$) ^a	5 pt (1 = strongly agree to 5 = strongly disagree)	I feel that I have a number of good qualities.
Daily hassles	25 items ($\alpha = 0.72$) ^a	3 pt (1 = almost never bothers me to 3 = often bothers me)	How often does it bother you to have problems with classmates?
Life satisfaction	1 item	4 pt (1 = almost always or always to 4 = almost never or never)	I am happy with my life.
<i>Loneliness</i>			
Aversion to being alone	8 items ($\alpha = 0.89$) ^a	4 pt (1 = almost always or always to 4 = almost never or never)	If I am alone, I feel unhappy.
Affinity for being alone	8 items ($\alpha = 0.90$) ^a	4 pt (1 = almost always or always to 4 = almost never or never)	To think something over, I want to be alone.
<i>Parental relationship</i>			
Relationship with mother	17 items ($\alpha = 0.87$) ^a	4 pt (1 = almost always or always to 4 = almost never or never)	My father trusts my judgment.
Relationship with father	17 items ($\alpha = 0.89$) ^a		My mother can tell when I am upset about something.
<i>Victimization</i>			
Direct aggression	4 items ($\alpha = 0.81$) ^a	5 pt (1 = every day to 5 = never)	How often in the last school year have you been pushed and shoved?
Indirect aggression	4 items ($\alpha = 0.72$) ^a	5 pt (1 = every day to 5 = never)	How often in the last school year have you received hurtful and unsigned notes?

continued

TABLE 1
Continued

Construct and Measure	Number of Questions	Scale	Example of Questions
<i>Structured activities</i>			
Clubs–Community	1 item	5 pt (1 = <i>every day</i> to 5 = <i>never</i>)	How often in the last month have you participated in clubs outside of school?
Sports–Community	1 item	5 pt (1 = <i>every day</i> to 5 = <i>never</i>)	How often in the last month have you participated in sports outside of school?
Clubs–School	1 item	5 pt (1 = <i>every day</i> to 5 = <i>never</i>)	How often in the last month have you participated in clubs at school?
Sports–School	1 item	5 pt (1 = <i>every day</i> to 5 = <i>never</i>)	How often in the last month have you participated in school sports?
<i>Unstructured activities</i>			
Skipping class	1 item	5 response items (1 = <i>6 or more times</i> to 5 = <i>never</i>)	During a typical month of school, how often do you skip class?
Dating activity	1 item	5 response items (1 = <i>6 or more times</i> to 5 = <i>never</i>)	How often in the last month have you gone on a date?
Hanging out with friends	1 item	5 response items (1 = <i>6 or more times</i> to 5 = <i>never</i>)	How often in the last month have you hung out with friends?
Partying	1 item	5 response items (1 = <i>6 or more times</i> to 5 = <i>never</i>)	How often in the last month have you gone to parties?
<i>Friendships</i>			
Best friend quality	18 items ($\alpha = 0.91$) ^a	4 pt (1 = <i>almost always or always</i> to 4 = <i>almost never or never</i>)	My best friend and I spend all our free time together.
Friendship quality	18 items ($\alpha = 0.94$) ^a	4 pt (1 = <i>almost always or always</i> to 4 = <i>almost never or never</i>)	My friends understand me.

^aAverage composite was created.

1986) using a 4-point scale (1—*almost always/always* to 4—*almost never/never*) to measure six dimensions: activity level (3 items, $\alpha = 0.79$), distractibility (4 items, $\alpha = 0.53$), sleep rhythmicity (4 items, $\alpha = 0.58$), affect/mood (4 items, $\alpha = 0.85$), persistence (3 items, $\alpha = 0.68$), and approach/avoidance (5 items, $\alpha = 0.68$). Higher scores indicated higher activity level, less sleep rhythmicity, less approach orientation, poorer affect, more distractibility, and less persistence. For temperament variables, higher scores indicated a generally less positive predisposition.

Well-being was measured using five scales. Depression-related symptoms were measured using the Center for Epidemiologic Studies Depression Scale (National Institutes for Mental Health, 1972), which comprises 20 items ($\alpha = 0.92$) using a 5-point scale (1—*none of the time* to 5—*most of the time*). Social anxiety-related symptoms were assessed based on 14 items ($\alpha = 0.92$) from Ginsberg, LaGreca, and Silverman (1998) using a 4-point scale (1—*almost never/never* to 4—*almost always/always*). Self-esteem was measured using the Rosenberg self-esteem scale (Rosenberg, 1965), which comprises 10 items ($\alpha = 0.90$) using a 5-point scale (1—*strongly agree* to 5—*strongly disagree*). Daily hassles were assessed based on the frequency of experiencing 25 potential life stressors/hassles ($\alpha = 0.72$), including finances, friends and peers, and schoolwork. Self-image was assessed using a 3-point scale (1—*almost never bothers me* to 3—*often bothers me*), and satisfaction with life was assessed using one item, “I am happy with my life,” using a 4-point scale (1—*almost always/always* to 4—*almost never/never*). For well-being, higher scores indicated less positive psychological well-being.

Adolescents’ feelings about loneliness were measured using two subscales from the Louvain Loneliness Scale for Children and Adolescence, adopted from Marcoen, Goossens, and Caes (1987). The first subscale comprised eight items ($\alpha = 0.89$) measuring a person’s aversion to being alone (negative feeling when alone), and the second subscale comprised eight items ($\alpha = 0.90$) measuring a person’s affinity for being alone (prefer to be alone at times). Affinity for being alone is an important measure for discerning the difference between those students who prefer to spend time alone and those students who have not chosen to be alone.

Relationship with one’s parents was assessed in several ways. Maternal and paternal attachment was measured separately, each with 17 items ($\alpha = 0.89$ and 0.87 , respectively) from the Inventory for Parent and Peer Attachment (Armsden & Greenburg, 1987). Both maternal and paternal relationship measures comprised factors related to adolescents’ level of trust *for* their parents, their level of trust *from* their parents, concern about well-being from their parents, expectations from their parents, and in general, adolescents’ level of positive relationship with both their mother and father. Each question used a 4-point scale (1—*almost always/always* to 4—*almost never/never*).

Victimization was assessed using eight items from Marini, Spear, and Bombay (1999) related to the frequency of experiencing direct (4 items, $\alpha = 0.81$) and indirect (4 items, $\alpha = 0.72$) forms of bullying in the past year, using a 4-point scale (1—*almost always/always* to 4—*almost never/never*).

Frequency of involvement in school and community with unstructured and structured activities was assessed using four items for each type of activity: for structured activities (clubs

outside of school, sports outside of school, clubs in school, and sports in school), using a 5-point scale (1—*every day* to 5—*never*); for unstructured activities, skipping classes (1—*6 or more times* to 5—*never*), dating (1—*every day* to 5—*never*), hanging out with friends (1—*every day* to 5—*never*), and attending parties (1—*every day* to 5—*never*). Higher scores indicated less activity involvement in unstructured and structured activities, respectively.

Relationships with friends were assessed using two scales. The first comprised 18 items ($\alpha = 0.91$) adapted from Gauze, Bulowski, Aquan-Asse, and Sippola (1996) relating to the quality of companionship, support, security, closeness, and conflict with one's "best friend," using a 4-point scale (1—*almost always/always* to 4—*almost never/never*). The second scale comprised 18 items ($\alpha = 0.94$) adapted from Armsden and Greenburg (1987) related to trust, communication, and alienation from one's friends, using a 4-point scale (1—*almost always/always* to 4—*almost never/never*). Higher scores indicated weaker friendship attachments.

Data Analysis

Composite (average) scores were computed for participants who responded to at least 50 percent of the items within a scale. For students who did not give a sufficient number of responses within a scale, composite scores were imputed. In total, 7 percent of the data was missing due either to non-response or an insufficient number of responses on a given scale. The amount of missing data was directly related to survey length, that is, missing values were greatest toward the end of the survey. Missing data were imputed using the EM (expectation maximization) algorithm in SPSS. EM is an iterative maximum likelihood procedure in which a cycle of calculating means and covariances followed by data imputation is repeated until a stable set of estimated missing values is reached. Methodological research has demonstrated that the maximum likelihood estimation of missing data is preferable to more common methods such as pair-wise deletion, list-wise deletion, or mean substitution (Allison, 2002; Enders, 2001; Schafer & Graham, 2002).

RESULTS

We explored between-group differences for adolescents from three groups on 32 variables encompassing 8 constructs. In order to explore the most meaningful differences related to the LD construct, all analyses were controlled for age, gender, and school. Means and standard deviations for each of the measures are illustrated in Table 2. We used MANCOVAs (multiple analysis of covariance) to explore the differences between adolescents with LD, with comorbid LD/ADHD, and without LD across each of the eight constructs. Univariate analyses of variance along with Sheffé post hoc tests were utilized when the multivariate model was significant. Given the number of analyses, combined with our desire to explore the most noteworthy between-group differences, a Bonferroni correction was applied to each analysis.

Academic Orientation

A MANCOVA was used to assess differences across the three groups for academic orientation. LD status was entered as the independent variable, and the five measures of academic orientation were entered as dependent variables. A statistically significant between-group difference was found, $F(6,637) = 5.80, p < 0.001$, reflecting a moderate difference between groups, $\eta^2 = 0.10$ (Stevens, 1986). As such, univariate analyses were explored. Only one measure, students' grades, produced a significant effect, $F(2,641) = 31.64, p < 0.001$, MSE 31.98. Scheffé post hoc analysis revealed that all three groups were significantly different from one another in their reported grades. Specifically, adolescents without LD reported having higher marks compared to adolescents with LD, who in turn reported having higher marks than adolescents with comorbid LD/ADHD.

Temperament

Using a MANCOVA, LD status was entered as the independent variable, and the six measures of adolescents' temperament were entered as dependent variables. A statistically significant between-group difference was found, $F(6,636) = 4.21, p < 0.001$, reflecting a moderate difference between groups, $\eta^2 = 0.07$. The largest univariate between-group difference was found for activity level, $F(2,641) = 8.56, <0.001$, MSE 8.36. A Scheffé post hoc analysis revealed that the adolescents without LD reported being less fidgety and active while in school than both adolescents with LD and those with comorbid LD/ADHD. A second significant difference was found for persistence, $F(2,641) = 7.36, p < 0.001$, MSE 5.66. Post hoc analysis indicated that the adolescents without LD reported being more persistent when engaging in tasks or activities compared to both adolescents with LD and those with comorbid LD/ADHD. Finally, a significant between-group difference was found for adolescents' mood, $F(2,641) = 6.92, p < 0.001$, MSE 3.17. Post hoc analysis revealed that the adolescents without LD reported having a generally better mood than both adolescents with LD and those with comorbid LD/ADHD. Also, it is important to note that although the above-mentioned analyses did not produce statistically significant differences between adolescents with LD and comorbid LD/ADHD, the adolescents with comorbid LD/ADHD reported more negative temperament characteristics in all cases, a finding that holds important implications.

Well-Being

Well-being was assessed by exploring five constructs; self-esteem, depression, daily hassles, life satisfaction, and social anxiety. When comparing the three groups, a statistically significant between-group difference was found, $F(5,637) = 2.43, p = 0.001$, reflecting a small effect size, $\eta^2 = 0.03$. Results of the univariate analyses indicated that adolescents differed significantly in the reporting of feelings of depression, $F(2,641) = 7.61, p < 0.001$, MSE = 2.90. Post hoc analyses suggest that the adolescents without LD reported feeling less depressed when compared to both adolescents

TABLE 2
Group Mean Ratings and Standard Deviations for the 32 Psychosocial Variables

	<i>Adolescents with Learning Disabilities</i>		<i>Adolescents with Comorbid Learning Disabilities/ Attention Deficit Hyperactivity Disorder</i>		<i>Adolescents without Learning Disabilities</i>		<i>F Value</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
<i>Academic orientation</i>							
Grades	3.45	1.05	3.98	1.00	2.14	0.97	31.64*
School goals	1.88	0.97	2.01	1.04	1.79	0.94	0.69
Planning	2.73	0.87	2.96	0.84	2.73	0.91	2.62
Bored at school	2.06	0.96	2.09	0.98	2.06	0.96	0.44
Important to do well	3.03	1.23	3.19	1.18	3.06	1.20	1.95
<i>Temperament</i>							
Activity	2.31	0.83	2.13	0.79	3.15	0.80	8.56*
Distractibility	2.71	0.57	2.90	0.58	2.67	0.55	5.90
Sleep/Rhythmicity	2.71	0.66	2.71	0.73	2.53	0.62	6.10
Affect/Mood	2.06	0.71	2.08	0.75	1.67	0.63	6.92*
Persistence	2.31	0.64	2.19	0.61	2.75	0.63	7.36*
Approach	2.07	0.57	2.13	0.54	2.06	0.57	0.58
<i>Well-being</i>							
Depression	2.17	0.61	2.23	0.76	2.00	0.57	7.61*
Social anxiety	1.82	0.60	1.83	0.56	1.75	0.55	1.68
Self-esteem	2.82	0.71	2.76	0.76	2.29	0.71	7.47*
Daily hassles	1.85	0.37	1.80	0.38	1.77	0.36	3.06
Life satisfaction	2.27	0.89	2.27	0.95	1.83	0.83	6.20*
<i>Loneliness</i>							
Aversion to being alone	2.68	0.68	2.69	0.66	2.78	0.61	4.32
Affinity for being alone	2.61	0.62	2.71	0.59	2.70	0.56	1.79
<i>Parental relationships</i>							
Relationship with mother	2.18	0.57	2.42	0.58	1.87	0.53	5.03*
Relationship with father	2.28	0.61	2.52	0.59	2.10	0.57	4.96*
<i>Victimization</i>							
Direct aggression	2.17	0.97	2.26	1.11	1.72	0.85	7.33*
Indirect aggression	1.54	0.63	1.62	0.84	1.19	0.49	6.95*
<i>Structured activities</i>							
Clubs–Community	4.31	1.02	4.43	0.98	4.23	1.15	1.19
Sports–Community	4.06	1.33	3.88	1.38	4.32	1.24	4.17
Clubs–School	4.46	1.01	4.46	0.99	4.29	1.12	2.03
Sports–School	4.23	1.30	3.93	1.40	4.36	1.25	5.10
<i>Unstructured activities</i>							
Skip classes	4.08	1.12	3.75	1.38	4.03	1.14	2.60
Dating activity	3.50	1.37	3.61	1.35	3.56	1.33	0.23
Hanging out with friends	2.19	1.17	2.03	1.07	2.18	1.06	0.79
Partying	3.60	1.14	3.57	1.02	3.60	1.03	0.03
<i>Friendships</i>							
Best friend quality	1.85	0.46	1.84	0.49	1.79	0.44	2.31
Friendship quality	0.21	0.95	0.08	0.92	0.26	1.01	1.01

* $p < .01$.

with LD and those with comorbid LD/ADHD. A significant difference was also found for adolescents' feeling of self-esteem, $F(2,641) = 7.47, p < 0.001, MSE = 3.81$. Post hoc analyses suggest that adolescents without LD reported having a generally higher self-esteem than both adolescents with LD and those with comorbid LD/ADHD. Also, a significant between-group difference was found for adolescents' feelings of general life satisfaction, $F(2,641) = 6.20, p = 0.002, MSE = 4.69$. Here again, post hoc analyses indicated that

adolescents without LD reported having a higher sense of life satisfaction than both adolescents with LD and those with comorbid LD/ADHD.

Loneliness

Loneliness was assessed using questions that addressed adolescents' aversion to being alone and their affinity for being

alone. No between-group difference was found, suggesting that adolescents with LD, comorbid LD/ADHD, and without LD were comparable in their perceived loneliness.

Relationship with Parents

Adolescents' relationship with their parents was measured through a series of questions exploring their general level of positive relationship with both their mother and father. In general, a significant between-group difference emerged in adolescents' relationship with their parents, $F(5,639) = 2.75$, $p = 0.012$, reflecting a small effect size, $\eta^2 = 0.03$. When exploring adolescents' specific relationship with their mother or mother figure, a significant between-group difference was found, $F(2,641) = 5.03$, $p = 0.007$, $MSE = 4.96$. Post hoc analyses indicated that adolescents without LD had a stronger relationship with their mother compared to adolescents with LD, who in turn reported having a stronger maternal relationship than adolescents with comorbid LD/ADHD.

Similarly, a significant between-group relationship was found for paternal relationships, $F(2,641) = 5.03$, $p = 0.007$, $MSE = 4.96$. Post hoc analyses indicated that adolescents without LD had a stronger relationship with their father compared to adolescents with LD, who in turn reported having a stronger paternal relationship compared to adolescents with comorbid LD/ADHD.

Victimization

Victimization was a construct measured by two components, being a target of direct victimization and being a target of indirect victimization. A significant between-group difference was found for the general model of victimization, $F(2,640) = 4.55$, $p < 0.001$, $\eta^2 = 0.03$. Univariate analyses suggested a significant between-group difference for direct victimization, $F(2,641) = 7.33$, $p < 0.001$, $MSE = 6.45$. Post hoc analysis indicated that of all three groups, adolescents with comorbid LD/ADHD reported most often that they were pushed or shoved, sworn at and called names, and teased and ridiculed. The second largest number of reports of direct victimization came from adolescents with LD, and the least number of reports was made by the group of adolescents without LD. A similar finding emerged for acts of indirect victimization, $F(2,641) = 6.95$, $p < 0.001$, $MSE = 2.52$. This included receiving hurtful and unsigned notes, being excluded from joining an activity, having rumors and untrue stories about them spread around, and having another student dare someone to hurt them. Of the three groups, adolescents with comorbid LD/ADHD reported most often being targets of indirect victimization, followed by adolescents with LD, and then by adolescents without LD.

Engagement in School and Community Activities

No statistically significant between-group differences were found for adolescents' engagement in structured and unstructured activities. Specifically, adolescents with and with-

out LD/ADHD reported similar engagement patterns in school sporting activities, outside-of-school sporting activities, schools' clubs, skipping classes, going to parties, hanging out with friends, and going on dates.

Friendships

Students were asked about their friendships and their best friend. Friendship quality was measured with a series of questions pertaining to friendships and engagement patterns with friends. No statistically significant between-group differences were found, suggesting that adolescents with and without LD/ADHD were similar in their relationship with friends and best friends.

DISCUSSION

In our study, many important findings emerged reflecting differences and similarities in self-reported inter- and intrapersonal characteristics between adolescents with and without LD or comorbid LD/ADHD. The first and perhaps least surprising between-group difference was academic orientation. Secondary school students with LD often struggle to maintain academic orientations commensurate with those of their non-LD counterparts (Lerner, 2003). The results here are consistent with Lerner's (2003) summary of research findings that adolescents with LD reported having lower academic grades when compared to adolescents without LD. However, the results here indicate also that adolescents with comorbid LD/ADHD reported having lower grades than adolescents with LD alone. This latter finding adds to Lerner's (2003) suggestion by illustrating that adolescents with comorbid LD/ADHD may require even more extensive academic support compared to adolescents with LD. This may be particularly true in secondary school, where sustained attention is critical in academic lessons that can last up to an hour or more.

In addition to academic orientation, this study explored between-group differences across a host of inter- and intrapersonal variables including temperament, well-being, loneliness, parental relationships, peer victimization, participation in structured and unstructured activities, and friendships. Compared with academic orientation, the similarities and differences between adolescents with and without LD or comorbid LD/ADHD in such areas are far less well understood. The first construct we explored was temperament. Significant between-group differences emerged for three temperament variables, activity level, persistence, and mood. For all three variables, adolescents without LD reported more positive outcomes when compared to both adolescents with LD and adolescents with comorbid LD/ADHD. Unlike academic grades, there was no significant difference between adolescents with LD and those with comorbid LD/ADHD. In general, the results here suggest that adolescents with LD and comorbid LD/ADHD were significantly different from their non-LD peers in their self-reported activity level (i.e., their ability to sit still for longer periods of time), affect or mood, and persistence in staying with a task.

It may be useful first to think about differences in temperament in the context of how or why these differences occur. Temperament is often seen as a set of stable inherent constructs (Thomas & Chess, 1977). However, it is possible that temperament characteristics such as mood may be affected by an adolescent's frustration with an academic task rather than being exclusively related to a personality trait. This may be particularly true for adolescents with LD. It is difficult to uncover causal connections for constructs such as temperament, and although exploring causal connections may be important, the between-group findings in this study deserve attention. Specifically, adolescents with LD and comorbid LD/ADHD reported more negative outcomes in activity level, persistence, and mood; hence, these students require school- and home-based support in the above areas. It is important also to think about the between-group differences for temperament in combination with the between-group differences in academic orientation. The risk created by the presence of LD as well as a more negatively reported activity level, persistence, and mood may set in motion compounded risk factors that put adolescents with LD and comorbid LD/ADHD at risk for decreased psychosocial adjustment.

We also compared adolescents with and without LD/ADHD on measures of well-being. Two of the between-group differences found in this study were consistent with previous research on LD/ADHD and well-being (Kauffman, 2005; Klassen et al., 2004; Margalit & Levin-Alyagon, 1994; Palladino et al., 2000). When compared to their non-LD peers, both adolescents with LD and with comorbid LD/ADHD reported higher depressive symptoms and lower self-esteem. The current study extends this work and indicates that adolescents with LD and comorbid LD/ADHD also reported less general life satisfaction. These results are important because research in the area of developmental health has been robust, demonstrating that intrapersonal feelings such as self-esteem, depression, and life satisfaction are important predictors of healthy adult development (Keating & Hertzman, 1999). As such, it becomes a priority to attend to adolescents with LD/ADHD who may be at risk for developing unhealthy patterns of well-being. This is particularly true in secondary schools as many educators begin to prepare students for postsecondary life by promoting independence and encouraging students to commence navigating independently through their academic career. As such, it becomes a real possibility that adolescents with LD and comorbid LD/ADHD, who, as demonstrated in this study, tend to report a lower sense of well-being, may slip through the cracks and leave high school without the necessary self-wellness skills to promote strong developmental health in adulthood. However, by establishing a personal connection with students with LD early in their high school career, school personnel (i.e., teachers, counselors, and school administration) can monitor students' academic as well as intrapersonal growth and intervene when they feel that students begin to show symptoms of becoming at-risk.

An important between-group difference emerging from these data is victimization. Specifically, adolescents with comorbid LD/ADHD reported most that they were the targets of direct and indirect acts of aggression, including being

pushed or shoved, sworn at and called names, teased and ridiculed, being the targets of rumors, and excluded from joining activities. An interesting finding here was that adolescents with comorbid LD/ADHD reported being such targets more so than adolescents with LD. These findings may be particularly alarming given the current trends around inclusive schools and classrooms. As Bender (2004) points out, in order to receive the full benefits of inclusive school placements, children with LD must be supported to become meaningful participants in the classroom. Given the results of this study, it is important that schools support adolescents with LD/ADHD, who may be at risk for being targets of acts of aggression.

This study also explored parental relationships. Parenting during adolescence can be challenging, and this may be particularly true for parents of adolescents with LD and ADHD. The results here are consistent with previous research suggesting that families including a child with LD/ADHD may be more disjointed compared to families without a child with LD/ADHD (Dyson, 1996; Green, 1990; Margalit & Alrough, 1991; Mrud et al., 2001). However, the current study extends this work by exploring individual relationships between adolescents and their mother and father. Specifically, these data indicate that adolescents without LD report a stronger relationship with both their mother and father compared to adolescents with LD and LD/ADHD. This finding invites an important question—why does this difference emerge? One answer might be that LD places a strain on the adolescent–parent relationship during an already challenging period. Certainly, dealing with LD may be challenging for both adolescents with LD/ADHD as well as their parents, and the data from this study suggest that the parent–adolescent relationship may indeed be affected by the presence of LD. As such, it becomes important for parents of adolescents with LD/ADHD to recognize the turbulence associated with adolescence and to be particularly supportive of their children as they navigate through this difficult time. Support may include extra vigilance in setting time to talk with adolescent children, planning family evenings or outings, and keeping in touch with adolescents' schooling experiences.

One may become discouraged when considering the implications of the between-group differences described above. However, our results are also encouraging in that there were many nondifferences that may potentially serve as protective factors for adolescents with LD and LD/ADHD. For example, no significant between-group difference was found for social anxiety. In other words, adolescents with LD and LD/ADHD were similar to adolescents without LD in their comfort level of relating to others with whom they are not familiar. In all three groups, adolescents felt fairly comfortable in such situations. Recognizing this finding may enable school personnel to capitalize on students' strengths in these areas as protective factors against other risk factors, such as the tendency for adolescents with LD/ADHD to feel a lower sense of self-esteem. In other words, it is possible that a higher risk of developing a lower self-esteem can be buffered by students' recognition of their strength in relating to others. Other areas of comparable self-ratings that might serve as protective factors are approach orientation to tasks, stress experienced

during daily tasks, feelings about being alone, engagement in school and extracurricular activities, and friendships.

It is important to note the limitations of this study. First, some of the construct subscales included only one item or question. The questionnaire used in this study was part of a larger study designed to measure a vast number of different constructs. As such, time constraints made it necessary to restrict some subscales to only one item. Many of these individual questions were factual (e.g., school grades), but others (e.g., school goals) might benefit from further research using multiple items. Related to this first limitation, it is important to note that the four temperament subscales had less-than-optimal reliability coefficients. This problem tends to be present in many scales attempting to measure temperament (Thomas & Chess, 1977). In general, temperament is difficult to study. Within the literature on temperament there is often confusion about what is meant by personality, temperament, and/or behavioral characteristics, and it is this confusion that may lead to less-than-optimal reliability coefficients when designing effective temperament measures.

It is important to note as a second limitation that many analyses produced relatively small to moderate effect sizes (Stevens, 1986). These results were not entirely unexpected. In this study we matched our samples for age, gender, and school in an attempt to explore how LD affects inter- and intrapersonal characteristics of adolescents. However, by controlling for such variables, we were also likely removing some of the explanatory variance and in turn, decreasing effect sizes.

A third limitation is that the present study relied on self-report protocols. Although self-reports have been shown to be reliable (Murray & Perry, 1987; White, 1991), corroborating reports from peers, parents, and teachers would be useful. Finally, it is important to acknowledge that the present study is limited by the cross-sectional research design. As such, it is impossible to infer causal relations regarding the influence of LD itself. Longitudinal data are needed. At the same time, however, the lack of clarity around causation does not negate the importance of the differences found in this study. Rather, it points to the complexity of inter- and intrapersonal variables at play within the lives of adolescents with LD/ADHD. Regardless of these complexities, the between-group differences point to the reality that adolescents with LD/ADHD require support in many inter- and intrapersonal areas in their lives.

In general, the findings here invite a hypothesis consistent with an idea introduced by Cosden et al. (2002) as well as Wiener (2003): that is, the presence of LD may be a risk factor that increases the likelihood that adolescents will experience more negative outcomes in other psychosocial areas. In general, the relationships between variables within this study reflect the complexity of human nature, albeit this complexity does not translate into easily prescribed treatments or interventions. We should take from these findings the notion that in some psychosocial areas, adolescents with LD or with comorbid LD/ADHD report not functioning at levels on par with their school mates who do not have LD. Following this, it is imperative that parents, educators, and professionals work with these adolescents to set into place protective factors that will act as buffers against the presence of LD

and facilitate healthy development. School- and home-based tactics and strategies may include supporting adolescents' relationships with parents and friends, assisting students to set school goals and plans, recognizing students' strengths, and generally supporting adolescents with LD and comorbid LD/ADHD to develop positive outlooks about their own lives. Supporting adolescents who are at risk in many intra- and interpersonal areas will indeed promote a more healthy development in an already turbulent time.

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About the Authors

John K. McNamara is Associate Professor in the Department of Child and Youth Studies at Brock University. He received his Ph.D. in Educational Psychology from Simon Fraser University. He is an educational psychologist whose research and teaching interests focus on the developmental health of children and youth with learning disabilities. He also serves as a theme leader of the Brock Research Institute for Youth Studies.

Teena Willoughby is Professor in the Department of Child and Youth Studies at Brock University. She received her Ph.D. in Developmental Psychology from the University of Waterloo. Her major research interests include adolescent risk taking and resilience, including academic underachievement, and media/technology influences on lifestyle choices and learning.

Heather Chalmers is Assistant Professor in the Department of Child and Youth Studies at Brock University. She received her Ph.D. in Developmental Psychology from Brock University. Her research interest is youth risk-taking behavior, particularly with regard to gambling. In addition, she is interested in the larger issue of youth resilience and the factors that influence lifestyle choices.