Exploring the Predictors of Academic Performance among Postsecondary Students with Learning Disabilities

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Abstract

We examined aspects of the experiences of 126 postsecondary students and 36 recent graduates who identified themselves as having learning disabilities (LD) with the aim of discovering predictors of academic performance. Forty-nine college and university students and 15 recent college and university graduates reported only having LD. Seventy-seven students and 21 recent graduates reported having other disabilities/impairments in addition to LD. Academic performance of students and recent graduates who had LD and other disabilities/impairments was best predicted by stronger course self-efficacy. However, stronger social self-efficacy, along with aspects of students' personal situations that make their studies easier (e.g., financial situation, health, impact of their disability, having friends) were also related to better academic performance. In contrast, none of the variables significantly predicted academic performance of students who only had LD, although, course self-efficacy was modestly related to better academic performance. The results also show that students who had LD and additional disabilities/impairments reported feeling more alienated on campus and had more aspects related to their personal situation that made their academic life harder compared to students who only had LD. The findings from this study suggest that different aspects are related to academic performance for students who only have LD compared to those who have other disabilities/impairments in addition to LD. The findings are discussed in relation to the possible applications and interventions aimed at facilitating better academic performance for each group.

Résumé

Afin de déterminer les prédicteurs de la performance scolaire, nous avons étudié divers aspects des expériences de 126 étudiants postsecondaires et de 36 diplômés récents ayant un trouble d'apprentissage (TA). Quarante-neuf étudiants ainsi que 15 diplômés récents des collèges et des universités ont rapporté n'avoir qu'un TA tandis que 77 étudiants et 21 diplômés récents ont rapporté avoir un TA et une autre situation de handicap. Une auto-efficacité scolaire élevée prédit le mieux la performance scolaire des étudiants et des diplômés récents qui ont un TA et une autre situation de handicap. Par contre, une auto-efficacité sociale élevée et certains facteurs personnels identifiés comme facilitant les études (p. ex. la situation financière, l'état de santé, l'impact d'une situation de handicap, le fait d'avoir des amis) améliorent aussi la performance scolaire. Par contraste, ces variables ne prédisent pas significativement la performance scolaire chez les étudiants n'ayant qu'un TA, quoique l'auto-efficacité scolaire soit modérément corrélée à une meilleure performance scolaire. Comparés aux étudiants qui n'ont qu'un TA, les étudiants ayant un TA et une autre situation de handicap ont rapporté se sentir plus seuls ou exclus sur le campus ainsi qu'un nombre plus élevé de facteurs personnels qui nuisent à leurs études. Les conclusions de cette recherche laissent entendre que les facteurs liés à la performance scolaire sont différents pour les étudiants qui n'ont qu'un TA comparés à ceux qui ont un TA et une autre situation de handicap. La discussion des résultats se fait dans un cadre d'application et d'intervention visant à améliorer la performance scolaire de chaque groupe.

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Exploring the Predictors of Academic Performance among Postsecondary Students with Learning Disabilities

Individuals with learning disabilities (LD) comprise the largest population of students with disabilities in postsecondary institutions in Canada; for example, these students receive between 33% and 50% of all academic accommodations that are provided to students with disabilities (Harrison & Holmes, 2012). Despite their large number, little is known about the factors that facilitate academic performance of these students (Murray & Wren, 2003).

Learning disabilities are lifelong, and are characterized as impairments in neurological processes that interfere with typical learning (Harrison & Holmes, 2012). Individuals with LD have either average or above average cognitive abilities and their level of impairment ranges in severity (American Psychiatric Association, 2013). These disabilities manifest differently from person to person and may interfere with use and acquisition of one or more of the following: oral language, reading, written expression, and mathematics (Learning Disabilities Association of Canada, 2002). In addition, learning disabilities often co-occur with other disabilities/impairments (e.g., attention deficit-hyperactivity disorder, anxiety, depression) (Willcutt & Pennington, 2000). Having additional disabilities/impairments may alter the expression and severity of LD, and may contribute to different experiences and to additional or different challenges in comparison to individuals who only have LD. However, despite the individual differences among those with LD, underachievement in school is a common occurrence (Learning Disabilities Association of Canada, 2002).

Because of the nature and the manifestation of LD, students tend to have difficulties throughout their academic careers (Hall, Spruill, & Webster, 2002). For example, students with LD in postsecondary school may have many difficulties when compared to peers without

disabilities in areas such as test-taking and preparation, note-taking, and listening comprehension (Skinner, 2004). In addition, postsecondary students with LD are found to have difficulties with organization, social skills, reading, written expression, mathematics, and self-esteem (Skinner, 2004).

Due to the inherent academic difficulties associated with LD, it is unsurprising that these students have been found to have low postsecondary school attendance rates (Murray, Goldstein, Nourse, & Edgar, 2000). As found by Wagner et al. (1991) and Murray et al. (2000), Students with LD were less likely to attend postsecondary school than their peers without disabilities and were more likely to be enrolled in vocational/trade programs than 4-year college programs. In addition, students with LD were less likely to graduate from 4 year programs than their peers without disabilities (Murray, et al., 2000).

Comorbid Conditions Associated with LD

It has been well documented that individuals with LD often have comorbid disabilities/impairments (e.g., Heiervang, Stevenson, Lund, & Hugdahl, 2001). For instance, Willcutt and Pennington (2000) found that 60% of children with reading disabilities have at least one other comorbid condition. Previous studies have found that individuals with LD have high prevalence rates of anxiety (Hoy et al., 1997; Margalit & Zak, 1984; Willcutt & Pennington, 2000), depression (Boetsch, Green, & Pennington, 1996; Cohen, 1992; Goldstein, Paul, & Sanfilippo-Cohn, 1985; Hall, Rouse, Bolen, & Mitchell, 1993; Maag & Behrens, 1989; Maughan, Rowe, Loeber, & Stouthamer-Loeber, 2003; Willcutt & Pennington, 2000; Wright-Strawderman & Watson, 1992), attention deficit-hyperactivity disorder (ADHD) (Boetsch et al., 1996; Willcutt & Pennington, 2000), and conduct disorder (Willcutt & Pennington, 2000), in comparison to their peers without disabilities. While these early articles are informative, they

may not generalize to current issues related to comorbidity, as the diagnostic criteria for many disorders changed with the implementation of the DSM-IV-TR (American Psychiatric Association, 2000) and the DSM-5(American Psychiatric Association, 2013). For this reason, recent literature examining comorbid disabilities/impairments among youth who have LD are discussed below.

Individuals with LD are more likely than their peers to have co-occurring emotional and/or behavioral disorders (Capozzi et al., 2008). Capozzi and colleagues (2008) examined the comorbid psychiatric disorders among 56 children with learning disabilities by using the Child Behavior Checklist (CBCL). Sixty percent of the sample obtained clinical scores for an emotional and/or behavior disorder. The researchers found that 46.5% of the sample had pathological scores on the Attention/Hyperactivity scale, 31.5% had pathological scores on the Anxiety/Depression scale, 18% had pathological scores on the Aggressive Behavior scale, and 15% had pathological scores on the Rule Breaking scale (assessing delinquent behavior).

While Capozzi and colleagues (2008) examined the comorbid psychiatric disorders among children with LD, Margari and colleagues (2013) found a similar rate of comorbidity among a sample of 448 children and adolescents with LD. The researchers found that 62.2% of their sample met criteria for at least one additional disorder. In addition, 24.7% of the sample was found to have ADHD, 19.1% was found to have an anxiety disorder, 16.7% was found to have a language disorder, and 4.9% was found to have a mood disorder. From these studies, it is apparent that many children and adolescents with LD have comorbid psychological/psychiatric conditions.

Attention deficit-hyperactivity disorder (ADHD) has been found to co-occur in approximately 31% to 45% in individuals who have LD (DuPaul, Gormley, & Laracy, 2013).

Due to its high comorbidity rate, the combination of LD and ADHD has received much attention throughout the literature. DuPaul, et al. (2013) reviewed the literature pertaining to the comorbidity between LD and ADHD between 2001 and 2011 and found a mean comorbidity rate of 45.1%. Having both LD and ADHD may lead to increased negative outcomes compared to individuals who only have LD (Willcutt, et al., 2007). For example, Willcutt and colleagues (2007) compared adolescents who had combined LD and ADHD to adolescents who only had LD and found that the combined group had significantly lower grades, weaker academic skills, and were more likely to be held back at least one grade. In addition, the combined group had higher prevalence rates of oppositional defiance disorder (ODD), early-onset conduct disorder (CD), alcohol use, marijuana use, major depressive disorder (MDD), and general anxiety disorder (GAD) (Willcutt, et al., 2007).

The co-occurrence of LD and anxiety disorders has also been documented in the literature. For example, Carroll and Iles (2006) examined the types of anxiety experienced by postsecondary students with learning disabilities in comparison to students without learning disabilities. The researchers found that students with learning disabilities had significantly more anxiety related to academic and social areas in comparison to their peers without disabilities.

Given the high rates of comorbidity among LD and other psychological/psychiatric conditions, it is important to consider these additional disabilities/impairments when determining the types of supports these students may need. The presence of additional disorders may alter the expression and severity of an individual's difficulties, compared to the difficulties of individuals who only have one disability/impairment. In addition, individuals who have comorbid conditions are more likely to have negative academic experiences, social outcomes, and lower treatment responses compared to those who only have LD (Margari, et al., 2013).

Transitions in School: Elementary, Secondary, and Postsecondary Education

It should be noted that much of literature reviewed below describes educational transitions in American samples. Although Canadian policies and practices related to disability identification, school service delivery, and transition plans may differ from American policies and practices, there is a paucity of literature from a Canadian perspective.

Students with LD make up the largest group of students with disabilities who receive disability-related services in postsecondary education in Canada (Harrison & Holmes, 2012). However, the supports students with LD receive in primary, middle, and secondary school are significantly different from those students receive in postsecondary settings (DaDeppo, 2009).

During the transition from elementary school to middle school, children with and without LD experience major contextual changes (Forgan & Vaughn, 2000) including: increase in school and class size, increased exposure to different teachers, and lower support from teachers and principals (Barber & Olsen, 2004). They also receive whole class instruction with little individualized instruction (Vaughn & Schumm, 1994). Thus, during transition to middle school, students with LD receive less specialized supports (Forgan & Vaughn, 2000) but are required to cope with the increased demands (Lackaye & Margalit, 2006). Many of the skills these students developed in elementary school are not necessarily sufficient or functional to address the demands in middle school (Lackaye & Margalit, 2006). Consequently, students with LD often experience a decrease in their self-competence and an increase in loneliness and alienation (Kotzer & Margalit, 2007; Lackaye & Margalit, 2006; Pavri & Monda-Amaya, 2000).

During secondary school (both middle and high school) students with LD usually receive an individualized education plan (IEP) and accommodations. An IEP includes student-specific goals, objectives, and specific services/modifications that must be implemented to help the

student meet their goals (DaDeppo, 2009; Madaus, 2005). The development and implementation of an IEP usually includes the participation of the student, parents, teachers (DaDeppo, 2009; Madaus, 2005; Martin, Marshall, & Sale, 2004), special educators, and other school administrators (Martin et al., 2004). Thus, during secondary school, students should have direct communication with their teachers due to the IEP (DaDeppo, 2009). Students with LD can also obtain accommodations: supports aimed at changing the delivery of instruction or the way in which students demonstrate their knowledge/skills without changing the level of difficulty of the task (Prater, Redman, Anderson, & Gibb, 2014).

When transitioning to postsecondary school, all students must face new challenges (Madaus, 2005), such as having less student-teacher contact, larger class sizes (Lerner, 1997), long-range projects, infrequent evaluations, and more unstructured time (Janiga & Costenbader, 2002). Although all students incur these changes, students with LD have a greater risk for failure due to their learning difficulties (Lerner, 1997).

When students begin postsecondary school, there is a reversal of parent/school and student responsibility (Madaus, 2005). In order for students with LD to obtain supports, namely accommodations, they must self-identify to the school and provide documentation of their disability (Madaus, 2005). In order to receive accommodations, they must advocate for themselves (Brinckerhoff, 1994; DaDeppo, 2009; Janiga & Costenbader, 2002; Madaus, 2005; Prater et al., 2014), which requires an understanding of their own strengths and needs, awareness of the accommodations that are necessary and available to them, and the skills for asking for the accommodations (Test, Fowler, Wood, Brewer, & Eddy, 2005). Understanding and communicating their needs is often difficult for students with LD as their needs were often addressed for them in secondary school by parents, teachers, and other school professionals

(Brinckerhoff, 1994). For example, in secondary school, parents must sign the IEP and often talk about their child's disability to his/her teachers, administrators, and support staff (Brinckerhoff, 1994). In addition, when these students are still in secondary school but are soon to begin postsecondary studies, parents often contact the disability service providers at the postsecondary institution about the services they offer for their child thus, removing the student from the planning phase (Madaus, 2005).

Background Literature: Postsecondary Education

Since these students are often removed from their disability planning or advocating process, they often begin postsecondary education unable to describe their disability or speak for themselves about their accommodation needs (Madaus, 2005). Consequently, students with LD may begin their postsecondary studies without having the self-advocacy skills that can foster independence (Brinckerhoff, 1994; Madaus, 2005) and provide them access to the available services and accommodations (Brinckerhoff, 1993). Many of these students may not be prepared for the required amount of diligence, self-control, self-evaluation, and decision-making that are necessary in postsecondary settings (Field, Sarver, & Shaw, 2003).

The current literature examining facilitating factors of academic performance is inconsistent and imprecise. Researchers routinely explain factors that contribute to academic performance in strictly academic (i.e., high school GPA, and SAT scores), cognitive (e.g., IQ), and behavioral terms (i.e., accommodations, and study habits) (DaDeppo, 2009). Yet, academic and cognitive competencies have been shown to be inadequate predictors of college performance (Murray & Wren, 2003). Thus, researchers are now broadening their foci. Some constructs of interest are self-efficacy (Baird, Scott, Dearing, & Hamill, 2009; Hampton & Mason, 2003; Lackaye & Maragalit, 2006), social support (DaDeppo, 2009; Heiman, 2006), social integration

(DaDeppo, 2009), learning strategies (Heiman & Precel, 2003; Ruban, McCoach, McGuire, & Reis, 2003), self-regulation (Ruban et al., 2003), motivation, and attitudinal factors (Hall et al., 2002), school environment (Fichten, Jorgensen, Havel, & Barile, 2006; 2010; Fichten et al., 2014b; Wolforth & Roberts, 2009) and personal situation (Fichten et al., 2006; 2010; 2014b; Wolforth & Roberts, 2009). These are reviewed below.

Self-regulation and learning strategies. The constructs associated with academic performance for students with LD in postsecondary environments have breadth but little depth. One construct that has been of interest is academic self-regulation, a key variable in explaining academic performance (Ruban et al., 2003). In this context, "…academic self-regulation refers to the process by which students activate and sustain cognitions, behaviors, and affects that are specifically oriented toward the attainment of academic goals" (Ruban et al., 2003, p. 271).

Self-regulation has been associated with allowing students with LD to develop and use compensatory learning strategies as they go through their academic career (Ruban et al., 2003). Students develop these strategies by using self-regulation techniques to create study strategies, environmental accommodations, counseling, self-advocacy, and developing plans that focus on metacognition and executive functions (Ruban et al., 2003).

Ruban et al., (2003) examined the perceived usefulness as well as the actual use of self-regulation learning strategies and compensatory strategies in relation to GPA among students with and without LD. Using structural equation modelling, the researchers found that students with LD who reported using more self-regulation learning strategies and fewer compensatory strategies had higher GPAs. Paradoxically, students with LD had higher ratings of perceived usefulness of compensatory strategies than self-regulation learning strategies. To explain this

finding, the researchers suggested that students with LD who have lower GPAs may use more compensatory strategies to obtain higher grades (Ruban, et al., 2003).

Heiman and Precel (2003) examined the academic profile of students with and without LD in university. Specifically, students' differences in academic studies, learning strategies, and methods of coping during examinations were explored. The researchers found that while students with LD reported more academic difficulties than students without LD, there were no differences in GPA between the two groups. Students with LD also used different learning strategies than those without LD. To help students remember information, more students with LD reported using unusual "tricks" (e.g., singing, imaginative associations) than those without LD. More students without LD reported rewriting/summarizing information than those with LD, however. To help students understand material, more students with LD reported having additional oral and visual explanations than their peers without LD. To learn faster, more students with LD reported that nothing could help them learn faster and more students without LD reported that rewriting information, being more motivated, and being more pressured for time can help them learn faster.

Heiman and Precel (2003) also found noticeable differences in coping styles during examinations between students with and without LD. In terms of thoughts during exams, more students with LD reported concerns about having limited time and having difficulty concentrating. In regards to feelings during exams, more students with LD reported feelings of emotional stress while more students without LD reported physical complaints (e.g., headache). When students in both groups reported what helps them overcome stress, more students with LD reported having special test conditions and more students without LD reported having a mastery over the material.

In terms of aspects that help students succeed in their academic studies (academic success), Heiman and Precel (2003) found that students with and without LD differed. Students with LD reported that having tape recorded lectures and studying with a private teacher facilitated their academic success. Students without LD reported that writing summaries, having a good tutor, and being well rested facilitated their success. From the results of this study, it can be concluded that while students with and without LD obtained similar grades, the two groups differed in the learning strategies they use, the factors that facilitate academic success and their coping styles during examinations.

Motivation and attitudinal factors. Other constructs that have been examined in relation to academic performance among students with LD are motivation, attributions, self-esteem, self-monitoring, and appropriate affective responses (Hall et al., 2002). These aspects have been found to be impaired in individuals with LD. Thus, Hall and colleagues (2002) examined differences in emotional resiliency (autonomy, initiative, and trust), locus of control, and motivation between college students with and without LD. The results indicate that students with LD reported higher levels of initiative in everyday problem solving compared to students without LD. In addition, students with LD were more motivated by the need to achieve than those without LD. No differences were found for locus of control, autonomy and trust between the groups. The findings suggest that motivation to succeed may be an important factor in aiding students with LD to persevere in school (Hall et al., 2002).

Personal situations. Aspects related to students' personal situation were evaluated to determine if aspects of their personal situation made their academic studies easier or harder (Fichten, et al., 2006; 2010). Wolforth and Roberts (2009) examined the personal situation of college students with LD, ADHD, and combined LD and ADHD and found that students'

financial situation, health, ability to find paid employment and complete tasks expected from their employers rarely made their studies harder. They also found that understanding their disability, previous education experiences, and the impact of their disability in their daily life occasionally makes their studies harder. In addition, the students reported that their study habits and skills (e.g., time management, organizational skills) and their level of personal motivation often makes their studies harder.

Fichten et al. (2006) examined aspects of the personal situation of college students with LD and/or ADHD that made their studies easier or harder. The researchers found that students' impact of their disability, financial situation, paid employment, and study habits made their studies harder. The researchers also found that students' family situation, level of personal motivation, health, and previous education experiences made their studies easier.

While no studies have examined the relationship between personal situation and grades for students with LD, both Fichten, et al. (in press b) and Jorgensen, Fichten, and Havel (2009), found that for large samples of students with various disabilities, those who self-reported having higher grades also had more facilitating factors in their personal situation.

School environment. Aspects related to postsecondary students' school environment have been evaluated to determine if they make their academic studies easier or harder (Fichten, et al., 2006; 2010). Wolforth and Roberts (2009) found that for students with LD and/or ADHD the training on general use software and specialized software, availability of adapted course materials, and the opportunity to participate in extracurricular activities rarely made students'' studies harder. In addition, the researchers found that the availability of general use software for school work (e.g., Microsoft Office), availability of campus disability services, and knowledge about campus disability services occasionally made students' studies harder. The students also

reported that their course load, course schedule, and the courses themselves in made their studies harder. The researchers also found that students had neutral to positive ratings about the attitudes their teachers, peers, and non-teaching staff have towards their disability.

Fichten et al. (2006) examined aspects of the school environment of college students with LD and/or ADHD that made their studies easier or harder. The researchers found that students' course load, course schedule, and the level of difficulty of their courses made their studies harder. In addition, students reported that the attitudes of their professors, peers, and non-teaching staff, availability of computers, course materials, and campus disability services made their studies easier.

Social support. Social support has been an area of focus in recent research involving postsecondary students with LD. Social support can be described as an "…individual's perception that he or she can be helped or can attain the understanding, cooperation, assistance, and appraisal of close or significant persons" (Heiman, 2006, p. 463). Social support is important for students with LD as these individuals often report needing more support from friends and campus services than their peers without disabilities (Cosden & McNamara, 1997; Ryan, Nolan, Keim, & Madsen, 1999).

Heiman (2006) examined the perceived social support, stress, sense of coherence, and academic success and struggles between university students with and without LD. The results indicate that students with LD reported having less social support and more academic stress than students without LD. In terms of academic success, students without LD rated study skills and academic characteristics as being more facilitating for academic success than students with LD. In relation to lack of academic success, students with LD attributed their lack of academic success to external factors (e.g., good/bad luck) (Heiman, 2006).

Social and academic integration. Social integration is the "…interaction between the individual and the social systems of the institution, including peer groups, faculty and administrators, and extracurricular activities" (DaDeppo, 2009, p. 124). Thus, according to DaDeppo, what constitutes social integration includes the student's perceptions of whether others on campus care about him/her, and whether they have interest in him/her (DaDeppo, 2009).

It has been proposed that factors related to social integration are important for academic success among students with LD (DaDeppo, 2009). For example, Siperstein (1998) stated that difficulties establishing relationships with faculty members and feelings of isolation in academic settings may be barriers to success for students with LD in college. For this reason, DaDeppo (2009) examined the relationship between academic and social integration with the college GPA of students with LD.

Academic integration examines the satisfaction of students' experiences with the academic system in their institution and their perceived intellectual development. Specifically, it includes students' views about whether their relationships with faculty and peers promotes intellectual growth and influences their attitudes, beliefs, and values (DaDeppo, 2009). The researchers found that academic and social integration was not related to GPA. The only factors that were significantly related to college GPA were participants' gender and high school GPA.

Academic self-efficacy. Academic self-efficacy, refers to "…judgments about how well one is able to execute a specific academic behavior in a given context" (Baird et al., 2009, p. 882). Students who have high self-efficacy beliefs tend to be more persistent (Bouffard-Bouchard, Parent, & Larivee, 1991; Schunk, 1984), create more challenging goals, use more effective cognitive strategies, and ultimately perform better in learning situations (Schunk, 1984). These beliefs about achievement are rooted in past achievement, difficulties, and personal

history (Lackaye & Margalit, 2006). It has been well documented that students with LD tend to have lower self-efficacy beliefs than their peers without LD (Baird et al., 2009; Hampton & Mason, 2003; Klassen, 2002; Lackaye & Margalit, 2006). Since beliefs are partly based on past achievement, it is not surprising that many students with LD have a low sense of academic self-efficacy (Baird et al., 2009). Lackaye and Margalit (2006) explored the differences in academic achievement and perceptions of academic self-efficacy, academic achievement, effort, loneliness (social alienation), mood, and hope between students with and without LD. The researchers found that students with LD had significantly lower grades than students without LD. In addition, students with LD had lower ratings of academic self-efficacy, effort, positive mood, hope, and had higher ratings of social alienation and negative mood than students without LD. The researchers also found that academic achievement (grades), academic self-efficacy, negative mood, and hope were significant predictors of effort in students with LD. For students without LD, academic self-efficacy, positive mood, and hope were predictors of effort.

Butler (2011) examined the relationship between academic self-efficacy and academic performance (self-reported GPA on a 5-point scale) among postsecondary students with LD. Significant positive correlations were found between 1) GPA and academic self-efficacy, 2) GPA and current college year, 3) academic self-efficacy and current college year, and 4) academic self-efficacy and semesters completed. Furthermore, the researcher found that academic self-efficacy was a significant predictor in self-reported GPA by using regression analyses. Thus, having more academic self-efficacy predicted higher self-reported GPAs among students with LD.

In contrast to Butler's (2011) findings, Exner (2010) failed to find any relationship between GPA and academic self-efficacy. Exner's (2010) lack of findings may be due to a small sample size (n = 31) and the fact that the sample includes students who had LD and/or ADHD.

Findings on Students without Disabilities

Richardson, Abraham, and Bond (2012) conducted a meta-analysis to determine the psychological factors that correlate with postsecondary students' GPA. The researchers reviewed 13 years of literature and examined 7,167 articles. They grouped 42 psychological factors into five research domains; 1) personality traits, 2) motivation factors, 3) self-regulatory learning strategies, 4) students' approach to learning, and 5) psychosocial contextual influences (see Table 1, p. 355, Richardson et al., 2012). Within motivation factors, two measures of self-efficacy were included: academic self-efficacy and performance self-efficacy. Academic self-efficacy was defined as individuals' "general perceptions of academic capability" (Table 2, p. 356, Richardson et al., 2012) while performance self-efficacy was defined as "perceptions of academic performance capability" (Table 2, p. 356, Richardson et al., 2012). The meta-analysis revealed that psychosocial factors were low correlates of GPA, however, academic self-efficacy, grade goal, and effort regulation were medium correlates of GPA. Large correlations were found between performance self-efficacy and GPA. In addition, high school GPA, SAT, and American College Test (ACT) and General Certificate of Education Advanced Level (A Level) scores had medium correlations with GPA. Thus, of all the psychological factors that were explored within the literature, academic and performance self-efficacy beliefs had the highest correlations with GPA. Therefore, among postsecondary students without disabilities, academic and performance self-efficacy are important contributors related to academic success (Richardson et al., 2012). The findings related to academic performance for students without disabilities is somewhat

comparable to the research that been conducted on students with LD (i.e., academic self-efficacy).

The Current Study

The purpose of the present study is to explore the contributors to academic performance between two groups of postsecondary students and recent graduates with learning disabilities: those who do and those who do not have additional disabilities/impairments. With the increase in academic demands and the transition to a different set of available services that come along with postsecondary education, students with LD may face unique challenges (DaDeppo, 2009; Troiano, Liefeld, & Trachtenberg, 2010). The current literature that examines the factors associated with student success at the postsecondary level is particularly inconsistent around the notion of LD. Different constructs and methodologies are emphasized in an attempt to best capture what contributes to academic performance among postsecondary students with LD.

The present study will explore factors related to academic performance among postsecondary students and recent graduates with learning disabilities and among postsecondary students and recent graduates with learning disabilities who have additional disabilities/impairments (e.g., attention deficit-hyperactivity disorder, chronic medical/health problems, and psychological/psychiatric disabilities). The variables that will be examined are: background characteristics, course and social self-efficacy, social alienation, and perceptions of postsecondary experiences. As there is a dearth of research in the area, this study is aimed at being a step in the direction of better predicting and promoting the academic success of postsecondary students with learning disabilities.

The main variables that of interest are: self-efficacy, social alienation, and students' personal situations.

Hypotheses

1. Do students who only have LD report better self-efficacy, personal situations, school environments, and fewer feelings of social alienation in comparison to students who have LD and additional comorbid disabilities/impairments? Students with LD often have comorbid disorders which may alter the expression and severity of their difficulties. These individuals are more likely to have negative academic experiences and social outcomes (Margari, et al., 2013). Because of this, I examined whether students with LD who have and those who do not have additional disabilities/impairments differ in relation to academic and social self-efficacy, social alienation, personal situation, and school environment. I predicted that students with LD who do not have comorbid disabilities/impairments will have better academic and social self-efficacy, a more positive personal situation and school environment, and will report feeling less social alienation on campus in comparison to students who only have LD.
2. Does stronger course self-efficacy predict academic performance for students and recent graduates with LD? Based on the literature (e.g., Butler, 2011), I predicted that course self-efficacy will be the strongest contributor to academic performance for both groups of students with LD.
3. Do fewer feelings of social alienation on campus predict academic performance for students and recent graduates with LD? In relation to DaDeppo's (2009) findings, I examined whether feelings of social alienation on campus predicted academic performance among students with LD. DaDeppo (2009) found that social integration was unrelated to academic performance. The relationship between feelings of engagement and inclusion on campus and academic performance remains unexamined, however. I predicted that feelings of social inclusion will

contribute to the academic performance of both groups of students with LD.

4. Do facilitating personal situations predict academic performance for students and recent graduates with LD? I predicted that such aspects would make their academic studies easier (e.g., financial situation, impact of their disability, study skills) will be important contributors to academic performance among students with LD.

Method

Survey Design

Using a survey methodology allowed me to gather large samples by attracting target groups from across Canada. The current study is a portion of a larger study (Fichten, et al., 2014a) aimed at predicting intention to graduate or to leave postsecondary studies prematurely among postsecondary students with diverse disabilities. The large study included three different samples (current students, recent graduates, and premature leavers - those who left before completing their program. Here I selected only current students and recent graduates with LD.

The purpose of the current study was to explore the predictors of academic performance among current students with learning disabilities. A sample of recent graduates with learning disabilities was used to replicate the findings on students.

Justification for Self-Report

Self-report was used to determine which students had learning disabilities. While self-report is not always reliable, it was the best method for data collection in this context. There are several reasons for this. One is based on the inconsistency of diagnosing LD across Canada. Currently, no standard or consistent method of assessing and diagnosing learning disabilities is being used in practice (Harrison & Holmes, 2012). For example, many clinicians are not consistent with the diagnostic criteria they choose to use when assessing for LD within their own practice and among other clinicians. In other scenarios, some clinicians fail to adhere to any one

definition when diagnosing LD and the existing definitions vary from province to province (Harrison & Holmes, 2012).

Currently, three main theories guide practitioners' diagnoses; 1) the IQ-Achievement Discrepancy Model, 2) the Academic Impairment Model, and 3) the Three Component Combined Model (Harrison & Holmes, 2012). Therefore, had we assessed students for a learning disability, or used their assessment reports to check for the presence of LD, we would have had to adopt one theory, thereby excluding a large portion of our sample. By using this approach to self-report we were able to recruit individuals with LD from across Canada in different colleges and universities. Thus, instead of recruiting students from only one institution or city, we were able to obtain a large pan-Canadian sample of students from different colleges and universities. In addition, by using self-report, we were able to include students who were not registered for disability related services from their schools. Fichten et al. (2013) found that 59% of a random sample of two-year college students who self-reported learning disabilities, were not registered to receive disability services. Thus, using self-report for identification allowed for the broadest sample and having participants self-identify with the label of learning disability was deemed the most efficient route to capture these complexities inherent to the characterization of this sample. To ensure that students who experienced difficulties learning for reasons other than LD, we inserted the phrase "such as dyslexia" when asking students to self-identity.

Participants

Students with LD. One-hundred and twenty-six English speaking postsecondary students (college and university) who indicated they had a learning disability were included in the study (88 females, 38 males). The gender difference does not reflect the distribution of gender among students with LD; instead it is consistent with findings which indicate that survey

respondents are more likely to be female than male (Woosley, 2005). The students had a mean age of 28 (*SD* = 9.6, range 19 to 64); no significant difference in age between the sexes was found.

In total, participants were attending school in 9 of the 10 Canadian provinces and were enrolled in 45 different Canadian universities and colleges. Thirty-five percent were attending college and 65% were attending a university. When examining whether university and college students differed significantly in age, the Levene's test for equality of variances was found to be violated $F(1,124) = 5.28$, $p = .023$. Thus, a *t* statistic not assuming homogeneity of variance was computed. It was found that university students ($n = 81$, $M = 29.9$, $SD = 10.2$) were significantly older than college students ($n = 45$, $M = 24.8$, $SD = 7.58$), $t(114) = -3.14$, $p = .002$, $d = 0.57$.

At the time of their participation, students had, on average, completed 56% of their program of study ($n = 106$, $SD = 25.8\%$, range 4% to 98%). Indexes of skew and kurtosis were generated in order to assess normality of students' percent of program completed. The variable showed minimal skew (index < 3) and kurtosis (index < 10), as described by Kline (2009).

The students with learning disabilities were separated into two groups; 1) students who self-reported only having a learning disability (LD Only), and 2) students who self-reported having at least one other disability/impairment in addition to having a learning disability (LD Plus).

Students with LD Only. This group consisted of 49 students (29 female, 20 male) who had a mean age of 24.4 (*SD* = 3.73, range 20 to 41). No significant differences in age were found between the sexes. The participants were attending 26 different Canadian universities and colleges in 7 out of the 10 Canadian provinces. Of these students, 17 were attending a college

and 32 were attending a university. We found that university students (M = 25.4, SD = 3.7) were significantly older than college students (M = 22.8, SD = 3.23), $t(47) = -2.45$, $p = 0.02$, $d = 0.75$.

Students with LD Plus. This group includes 77 students (59 female, 18 male) of which, 53% self-reported 2 disabilities/impairments, 18% reported 3 disabilities/impairments, 22% reported 4 disabilities/impairments, and 7% reported 5 disabilities/impairments. Participants could report up to 14 different disabilities/impairments. See Table 1 for the breakdown of disabilities/impairments for all students. The participants had a mean age of 30.36 (SD = 11.36, range 19 to 64). No significant differences in age were found between the sexes.

The participants were enrolled in 34 different Canadian universities and colleges in 8 of the 10 Canadian provinces. When examining whether or not university and college students differed significantly in age, the Levene's test for equality of variances was found to be violated, $F(1,75) = 5.43$, $p = .022$. Thus, a t statistic not assuming homogeneity of variance was computed. We found that university students (n = 50, M = 32.8, SD =11.76) were significantly older than college students (n = 27, M = 25.8, SD = 9.11), $t(65.63) = -2.92$, $p < .001$, $d = 0.67$.

Replication sample of graduates with LD. Thirty-six participants (21 females, 15 males) who self-reported LD and who recently completed their last program of study (Graduates) were examined in relation to the students with LD. The Graduates had a mean age of 33.11 (SD = 9.7, range 22 to 52); no significant difference in age between the sexes was found.

The Graduates with learning disabilities were separated into two groups; 1) Graduates who only self-reported having a learning disability (LD Only), and 2) Graduates who reported having at least one other disability/impairment in addition to LD (LD Plus).

Graduates with LD Only. Fifteen Graduates (8 female, 7 male) had a mean age of 29.8 (SD = 6.33, range 25 to 51). Two participants had graduated from college and 13 from

university. In total, participants had been enrolled in 12 different Canadian universities and colleges in 4 of the 10 Canadian provinces.

Graduates with LD Plus. Twenty-one Graduates (13 female, 8 male) had a mean age of 35.5 (*SD* = 11.14, range 22 to 52) and had been enrolled in 16 different Canadian universities and colleges in 5 of the 10 Canadian provinces. Eight participants graduated from college and 13 from university. Sixty-eight percent self-reported 2 disabilities/impairments, 19% reported 3, and 14% reported 4. See Table 3 for the breakdown of disabilities/impairments of the Graduates. Comparison of Students and Graduates showed that the two groups did not significantly differ on the number of disabilities reported (see Table 4).

Measures

The questionnaire battery used in Fichten et al. (in press a) includes items that examine demographics, school related information, academic standing, perceptions of postsecondary experiences (i.e., personal situation, school environment), self-efficacy, and feelings of alienation on campus.

Test-retest reliability. The questionnaire battery (Fichten et al., 2014a) was administered twice to evaluate test-retest reliability. The interval for those who completed test-retest had a range of 3 to 16 weeks with a mean and median of 5 weeks. All the measures had high test-retest correlations, with most having positive correlations of .8 or above.

Demographic questions. The demographic questions related to participants' sex, age, parental education and disabilities/impairments. We provided a list of 14 disabilities/impairments and asked participants to self-identify as many that applied. The list included; totally blind, visual impairment (that is not adequately corrected by wearing glasses or contact lenses), Deaf, hearing impairment, speech/communication impairment, learning disability (e.g., dyslexia),

attention-deficit hyperactivity disorder, mobility impairment (wheelchair/scooter user), mobility impairment (use of cane/crutch/walker), limitation in the use of hands/arms, chronic medical/health problem, psychological/psychiatric disability, neurological impairment, pervasive developmental disorder (PDD), other (specify) and, "I have no disability". Only those who selected a learning disability were of interest in this study.

School related questions. Twelve questions asked students about a number of aspects related to school. These questions were objective and asked about full-time/part-time status, registration for campus disability related services, field of study, type of institution (college or university), whether participants were enrolled in their first choice program, whether their program included an internship, the number of hours they worked per week, and the percentage of their program that they had completed. Students also indicated their program of study; and their answers were coded using a validated coding manual (Martiniello, Budd, Tibbs, & Ferraro, 2008).

Academic performance. Two questions were created to determine students' academic performance. One asked students to describe themselves as an A, B, C, or D or less student. The second question asked participants to rank themselves against the rest of the students in their program of study: in the top, middle, or bottom third (modified from Statistics Canada, 2008). Both questions included an option for participants to respond with "I don't know." The correlation between the measures for the total sample of students with learning disabilities was high, $r(113) = .690$, $p < .001$, as was the correlation for students who reported only having a learning disability, $r(42) = .602$, $p < .001$, and those who reported at least one other disability in addition to LD, $r(69) = .715$, $p < .001$. For the total sample of Graduates with learning disabilities, the correlation between the two questions was also high, $r(31) = .688$, $p < .001$. This

was also the case for Graduates who only reported having LD, $r(12) = .566$, $p < .05$ and for Graduates who reported at least one other disability in addition to LD, $r(17) = .751$, $p < .001$. I used the question that asks students to describe themselves as an "A, B, C, D or less student" as a proxy to measure academic performance because fewer participants answered "I don't know".

Justification for using self-reported grade. College and university grade point averages (GPA) were not used in this study. First, these are not equivalent across institutions and programs. GPAs can differ based on the scale (e.g., 0 to 4.3, 0 to 4.0, 0-50), program competencies, postsecondary institutions, and professors. Moreover, some schools do not use GPA to describe their students' academic performance. Therefore, it was impossible to equate the GPAs for participants in the study. In fact, due to the problems that arise with GPA, Statistics Canada used a 4-item question that they developed as a proxy for grades in the National Graduates Survey- Class of 2005 Release Questionnaire (Statistics Canada, 2008). Moreover, the purpose of using grades in this study was not to evaluate how closely these resemble school records but to compare groups.

College / University Experience Questionnaire (CEQ) (Fichten, Jorgensen, Havel, & Barile, 2006; 2010). This measure examines aspects related to postsecondary education that act as facilitators or barriers to academic success. It includes three subscales that evaluate whether rated aspects made participant's postsecondary studies easier or harder. In this study only two of the three subscales were included: Personal Situation (9 items – e.g., study habits, financial situation) and School Environment (14 items – e.g., level of difficulty of courses, availability of computers on campus). Each item is rated on a 6-point Likert-type scale: 1 (Much harder), 2 (Moderately harder), 3 (Slightly harder), 4 (Slightly easier), 5 (Moderately easier), 6 (Much

easier). Higher scores indicate facilitating conditions (i.e., made academic life easier), and lower scores indicate barriers (i.e., made academic life harder). See Appendix A for the CEQ.

The CEQ was found to have good internal consistency (Cronbach's alpha) with alphas ranging from .737 to .891 on the subscales (Fichten, et al., 2006). A study that used this questionnaire found that the scores on this measure were related to the quality of academic supports that students with LD and ADHD reported receiving (Wolforth & Roberts, 2009; 2010). Another study (Jorgensen, Fichten, & Havel, 2011), found that scores on both the personal situation and school environment subscales were related to academic satisfaction of students with and without disabilities. In addition, higher scores on the personal situation subscale was related academic retention of students with disabilities.

College Self-Efficacy Questionnaire (Solberg, et al., 1998). This measure examines how confident participants are that they could successfully perform certain behaviors (see Appendix B for the questionnaire). We used two subscales from this measure: Course self-Efficacy and Social Self-Efficacy. For all items, participants rated how confident they are that they could perform certain behaviors successfully on a 10-point scale with 0 being "not at all confident" and 9 meaning "very confident". Therefore, higher scores on each of the subscales indicate stronger self-efficacy beliefs. The Course Self-Efficacy subscale includes seven items that participants rate such as "research a term paper" and "write a course paper." The Social Self-Efficacy subscale includes six items where participants rate statements such as "participate in class discussion" and "talk to your professors/instructors." The Course Self-Efficacy measure was shown to have strong internal consistency (Cronbach's alpha coefficient of .85) for a sample of undergraduate in which 70% was comprised of students with LD and/or ADHD (Lombardi, Murray, & Gerdes, 2012). This measure was shown to have good internal consistency reliability

estimates (Cronbach's alphas) that ranged from .83 to .88 for 1st year-college students and the scores were positively correlated with adjustment, academic persistence, and social integration (Gore, 2006).

Campus Climate (Wiseman, Emry, & Morgan, 1988). See Appendix C for the questionnaire. From this tool we used only the four item Social Alienation Subscale that measures participants' feelings of social alienation on campus. Participants rated the items on a 6-point Likert scale (strongly agree to strongly disagree) where higher scores indicate greater feelings of social alienation. Examples of the items include, "I find myself lonely and lost on this campus" and "My disability prevents me from having more contact with my professors."

Procedure

The measure (Fichten et al., 2014a) was piloted between November 20 and November 25, 2009. On February 10, 2010 the online survey was launched and remained open until July 6 2010, (5 months). For the larger study, invitations were sent to current and former postsecondary students with disabilities who had participated in our previous research and who indicated that we may contact them for future studies. Announcements were also emailed to discussion lists focusing on Canadian postsecondary education and to project partners (mainly student and campus disability service provider groups). The announcement indicated that the project was seeking college and university students currently enrolled in a program (i.e., diploma, certificate or degree program), recent graduates (past 2.5 years), and those who had recently dropped out prior to completing their program. Participants were informed that the online questionnaire would take approximately 20 minutes to complete and that there was a $20 honorarium.

Individuals who wished to participate were directed to a website where they could read information about the study and the consent form. The entire protocol was approved by Dawson

College's Research Ethics Board. Participants clicked on the "continue" button which indicated they were over 18 years old and that they agreed to participate. This brought the participants to the online survey. There, participants could select their current status (student, recent graduate, recent premature leaver (dropped-out)) and they proceeded to answer the questions.

Once participants completed the questionnaire, the final screen requested permission to contact them for future studies and to provide contact information for the honorarium. Four weeks after they completed the survey, those who gave permission to be contacted at a later time were emailed and asked to complete the same questionnaire again (test-retest). The email included a statement that informed participants that they would receive an additional $20 honorarium for completing the survey a second time.

Results

The results section is organized as follows: sample characteristics, group comparisons on the questionnaire subscales, correlations within all samples on the variables of interest, and regression analyses.

Sample Characteristics

Students with LD Only (*n* = 49).

Parental education. Students were asked how many years of education their mother and their father had completed. Students who self-reported having LD and no other disabilities/impairments indicated that, on average, their mother had attended 14.70 years of school ($n = 49$, $SD = 3.41$, range 4 to 25), and that their father had attended 14.24 years of school ($n = 47$, $SD = 3.56$, range 4 to 24).

School related questions. Table 5 reports on participants' responses to whether or not they were registered for campus disability services, whether they were enrolled in their first

choice program, and if their program included an internship. In relation to full or part-time status, 87.5% of respondents considered themselves full-time students, while 12.5% considered themselves part-time students. Students were asked to indicate the number of hours they worked at a job per week during the academic year. On average, 47% of participants (n = 23) worked 18.43 hours per week (SD = 11.98, Mdn = 15, range: 3 to 40) and the remaining 53% (n = 26) did not work during the school year. At the time they completed the questionnaire, participants had, on average, completed 56% of their program (n =44, SD = 25.2%, range 4% to 97%). Table 6 shows a breakdown of students' field of study and Table 7 shows a breakdown of the programs that students were pursuing.

Academic performance. The variable used to measure academic performance asked whether students considered themselves as an A, B, C, or D or less student (scored as 1 through 4, respectively). Table 8 provides a breakdown of students' responses. Students with LD Only had mean score of 1.82 (SD = .6) (i.e. a "B" student).

Students with LD plus other disabilities (n = 77).

Parental education. Students were asked how many years of education their mother and their father had completed. Students who self-reported having at least one other disability/impairment in addition to having LD indicated that, on average, their mother had attended 13.84 years of school (n = 74, SD = 3.56, range 1 to 20), and that their father had attended 13.73 years of school (n = 73, SD = 3.6, range 1 to 20).

School related questions. Table 9 reports on participants' responses to whether or not they were registered for campus disability services, whether they were enrolled in their first choice program, and if their program included an internship. In relation to full or part-time status, 76.7% of respondents considered themselves full-time students, while 23.3% considered

themselves part-time students. Students were also asked to indicate how many hours they worked at a job per week during the academic year. On average, 55% of participants (n = 42) worked 17.78 hours per week (SD = 12.02, Mdn = 15, range: 2 to 40) and the remaining 46% (n = 35) did not work during the school year. At the time they completed the questionnaire, participants had, on average, completed 56.17% of their program (n = 62, SD = 26.48%, range 5% to 98%). Table 6 shows a breakdown of students' field of study and Table 7 shows a breakdown of the programs that students were pursuing.

Academic performance. The variable used to measure academic performance asked whether students considered themselves as an A, B, C, or D or less student (scored as 1 through 4, respectively). See Table 8 for the breakdown of students' responses. Students with LD Plus had a mean of 1.99 (SD = 0.84) (i.e. a "B" student).

Students with LD Plus vs. students with LD Only. To ascertain whether students with LD and other disabilities (n = 77) and those who only had LD (n = 49) differed significantly from each other, t-tests were computed to compare the two groups' scores on parental education and hours worked at employment per week. As seen in Table 10, no significant differences were found between the two groups. In addition, students with LD Only and LD Plus did not differ significantly on self-reported grades (see Table 8).

College vs. university students. To ascertain whether college (n = 44) and university (n = 82) students differed significantly from each other, t-tests were computed to compare the two groups' scores on parental education and hours worked at employment per week. The LD Only and LD Plus groups were combined because no significant differences were found between them on these variables. As seen in Table 11, no significant differences were found between college

and university students. In addition, college and university students' self-reported grades did not significantly differ (see Table 12).

Graduates with LD Only (*n* = 15).

***Parental education*.** Graduates indicated that, on average, their mother had attended 13.3 years of school (*n* = 15, *SD* = 3.35, range 8 to 19), and that their father had attended 13.5 years of school (*n* = 15, *SD* = 3.44, range 6 to 17).

School related questions. Table 13 reports on participants' responses to whether or not they were registered for campus disability services, whether they were enrolled in their first choice program, and if their program had included an internship. In relation to full or part-time status, 87% of respondents had been full-time students, while 13% had been part-time students. Table 14 shows a breakdown of Graduates' field of study.

Academic performance. The variable used to measure academic performance asked whether graduates had considered themselves as an A, B, C, or D or less student (scored as 1 through 4, respectively). See Table 15 for the breakdown of Graduates' responses. Graduates with only LD had mean score of 1.73 (*SD* = 0.70) (i.e. a "B" student).

Graduates with LD Plus (*n* = 21).

***Parental education*.** Graduates indicated that, on average, their mother had attended 12.81 years of school (*n* = 21, *SD* = 3.4, range 4 to 17), and that their father had attended 12.95 years of school (*n* = 21, *SD* = 3.6, range 4 to 17).

School related questions. Table 16 reports participants' responses as to whether or not they were registered for campus disability services, whether they were enrolled in their first choice program, and if their program had included an internship. In relation to full or part-time status, 81% of respondents had been full-time students, while 19% had been part-time students.

Academic performance. The variable used to measure academic performance asked whether Graduates had considered themselves as an A, B, C, or D or less student (scored as 1 through 4 respectively). See Table 15 for the breakdown of graduates' responses. Graduates with LD Plus had mean score of 1.76 (*SD* = 0.77) (i.e. a "B" student).

Graduates with LD Plus vs. Graduates with LD Only. To ascertain whether Graduates with LD Plus (*n* = 21) and LD Only (*n* = 15) differed significantly from each other, *t*-tests were computed to compare the two groups' scores on parental education. As seen in Table 17, no significant differences were found between the two groups. In addition, the self-reported grades of Graduates with LD Only and Graduates with LD Plus did not differ significantly (see Table 15).

Comparison Between Groups - Questionnaire Subscales

All participants completed subscales from the College Experience Questionnaire (CEQ), the Self-Efficacy Questionnaire, and the Campus Climate questionnaire. The following ANOVAs were carried out to compare scores of the following samples: 1) students with LD Only and LD Plus (see Table 18), 2) graduates with LD Only and LD Plus (see Table 19), 3) university and college students (see Table 20) , and 4) students and graduates with LD (see Table 21).

College Experience Questionnaire (CEQ). The CEQ examines aspects of postsecondary experiences that act as facilitators or barriers to academic success. The CEQ directly measured whether or not students' personal situation (e.g., study habits, financial situation) and school environment (e.g., level of difficulty of courses, availability of computers on campus) made postsecondary studies easier or harder.

***Personal Situation*.** The results from the ANOVA indicate that students with LD Plus and LD Only differ significantly from each other, with the LD Only group reporting significantly higher scores than the LD Plus group. Consistent with this finding, Graduates with LD Only reported significantly higher scores than the LD Plus group. No significant differences were found between 1) university and college students, and 2) Graduates and Students.

School Environment. No significant differences were found on whether or not their school environment makes their studies easier or harder on any of the comparisons.

Self-Efficacy Questionnaire. The Self-Efficacy Questionnaire examines how confident participants are that they could successfully perform certain behaviors. Higher scores suggest greater confidence in ability to perform specific behaviors related to course work (Course Self-Efficacy) and communicating with others (Social Self-Efficacy). For both subscales, no significant differences were found between any of the groups on how confident they were that they could perform the specified behaviors.

Campus Climate. From this tool we only used the 4-item Social Alienation Subscale measuring participant's feelings of social alienation on campus. The results from the ANOVA indicate that students with LD Plus reported significantly more feelings of social alienation compared to those with LD Only. The comparison between Graduates with LD Only and LD Plus, although in the same direction, was not significant. No significant differences were found between 1) Graduates and Students and 2) university and college students.

Correlations among the Subscales, Participants' Age, and Number of Disabilities Reported

To examine the relationship between the variables of interest in this study, Pearson correlations were conducted. See Table 22 for students with LD and see Table 23 for Graduates with LD. The results of these correlations are described below.

Students with LD Only. For students with LD Only, higher self-reported grades were moderately correlated with Course Self-Efficacy. Higher ratings of students' Personal Situation were associated with having greater Social Self-Efficacy and Course Self-Efficacy. Lower ratings of students' Personal Situation were associated with higher ratings of Social Alienation and with older Age. Higher ratings Of School Environment were associated with higher ratings of Social Self-Efficacy. Lastly, higher ratings of Social Self-Efficacy were associated with lower ratings of Social Alienation.

Students with LD Plus. For students with LD Plus, higher self-reported grades were associated with higher ratings of students' Personal Situation, Course Self-Efficacy, and Social Self-Efficacy. Higher ratings of students' Personal Situation were associated with higher ratings of Course Self-Efficacy and Social Self-Efficacy. In addition, lower ratings of students' Personal Situation were associated with higher ratings of Social Alienation, older Age, and with having More Disabilities/Impairments. Higher ratings of students' School Environment was associated with higher Course Self-Efficacy and Social Self-Efficacy, while lower ratings of School Environment were associated with more feelings of Social Alienation. Lastly, older Age was associated with having more Disabilities/Impairments and having more feelings of Social Alienation.

Predicting Academic Performance

To determine which variables best predict academic performance among students and Graduates with LD, hierarchical multiple regression analyses were conducted. Separate analyses were conducted for the four groups; (1) Students with LD Only, (2) Students with LD Plus, (3) Graduates with LD Only, and (4) Graduates with LD Plus.

A binary variable was created to measure academic performance, since a regression must be conducted with either a dichotomous or a continuous variable (Tabachnick & Fidell, 2012). The academic performance variable that was used in the questionnaire is a categorical 4-item variable. Thus, it is neither continuous nor dichotomous. Instead of using the 4-item variable, we created a new variable where students either self-reported an "A" or a grade "worse than A" (i.e., B, C, D or less). Since the majority of students fell within the "B" category, it was more appropriate to separate the "A" students from the "B" students. Because few students reported being in the "C" and "D or less" group, they were added to the group of "B" students. This created a new variable that allowed for the use of a regression analysis. See Table 24 for the breakdown of the binary variable among students and Table 25 for the breakdown among the Graduates.

I used a hierarchical multiple regression, thus, the order of variables entered in to the regression equation is based on theory (Tabachnick & Fidell, 2012). The literature examining the variables that best predict academic performance for students with LD is inconsistent. The variable that has gathered the most support thus far has been academic self-efficacy (e.g., Butler, 2011). Therefore, Course Self-Efficacy was entered into the regression analyses in the first step to examine the other predictors after controlling for Course Self-Efficacy. DaDeppo (2009) found that social integration was unrelated to students' academic performance, however, the relationship between feelings of social alienation/engagement and academic performance has yet to be examined. For this reason, I entered Social Alienation in the second step of the regression analyses to determine its individual contribution to academic performance. The relationship between students' Personal Situation and academic performance has never been examined, thus,

it was entered in the third step. See Table 26 for the results of the regression for students and Table 27 for the Graduates.

Social Self-Efficacy was not included in the regression equation because it is highly correlated with Course Self-Efficacy and they measure very similar constructs (See Table 22 and Table 23). While these correlations are not high enough to be considered multicollinear (Tabachnick & Fidell, 2012), they were not entered in to the regression as a precaution.

Students with LD Only. See Table 26 for the results of the regression analysis. The results of step 1 indicate that Course Self-Efficacy alone accounts for only 3.6% of the variance in academic performance; this is not statistically significant, $R = .190$, $F\ (1, 47) = 1.763$, $p = .191$. When Social Alienation was added in step 2, an additional 9.5% of the variance in academic performance was accounted for; this was statistically significant, $F\Delta(2, 46) = 5.057$, $p = .029$. Social Alienation was the strongest predictor of academic performance and was statistically significant, Standardized $\beta = -.321$, $t(47) = -2.249$, $p = .029$ while Course Self-Efficacy was not a significant predictor of academic performance. Personal Situation was added in the third step and accounted for an additional 1.5% of the variance in academic performance; this is not statistically significant, $F\Delta(3, 45) = .790$, $p = .379$. In this step, Course Self-Efficacy became the strongest predictor of academic performance and was statistically significant, Standardized $\beta = -.341$, $t(47) = -2.132$, $p = .039$. Social Alienation was the second strongest predictor of academic performance, however, it was no longer a significant predictor. Personal Situation was not a significant predictor of academic performance. Because of the shared variance of Course Self-Efficacy and Personal Situation, upon entry of Personal Situation into the model, Social Alienation was no longer significant.

Students with LD Plus. See Table 26 for the results of the regression analysis. The results of step 1 indicate that Course Self-Efficacy alone accounts for 12% of the variance in academic performance; this is statistically significant, $R = .346$, $F\ (1, 75) = 10.224$, $p < .001$. When Social Alienation was entered in the second step, the model was significant, $F\ (2, 74) = 5.044$, $p < .001$. It did not add to the variance explained in academic performance, however, $R = .346$, $F\Delta(1, 74) = .000$, $p = .998$. Course Self-Efficacy was the largest predictor of academic performance and was statistically significant, Standardized $\beta = -.347$, $t(75) = -3.039$, $p < .001$. Social Alienation was not a significant predictor of academic performance. When Personal Situation was entered in the third step, the model remained significant, $R = .348$, $F\ (3, 73) = 3.359$, $p = .023$, however, it did not significantly add to the variance explained in academic performance, $F\Delta(1, 73) = .111$, $p = .740$. Only Course Self-Efficacy was a significant predictor of academic performance, Standardized $\beta = -.334$, $t(75) = -2.765$, $p < .001$.

Graduates with LD Only. See Table 27 for the results of the regression. The results of step 1 indicate that Course Self-Efficacy alone accounts for only 3.6% of the variance in academic performance; this is not statistically significant, $R = .190$, $F\ (1, 12) = .451$, $p = .515$. When Social Alienation was entered in the second step, it accounted for an additional 10.9% of the variance in academic performance. This was not statistically significant either, $F\Delta(1, 11) = 1.399$, $p = .262$, and neither was the model, $R = .381$, $F\ (2, 11) = .933$, $p = .423$. Neither of the predictors was statistically significant. When Personal Situation was entered in the third step, an additional .2% of the variance in academic performance was accounted for; this was not statistically significant, $F\Delta\ (1, 10) = .018$, $p = .896$. In addition, the model was not statistically significant, $R = .383$, $F\ (3, 10) = .572$, $p = .646$, and neither were any of the predictor variables.

Graduates with LD Plus. See Table 27 for the results of the regression. The results of step 1 indicate that Course Self-Efficacy alone accounts for 57.6% of the variance in academic performance; this is statistically significant, $R = .759$, $F\ (1, 19) = 25.785$, $p < .001$. When Social Alienation was entered into the second step, an additional 1.4% of the variance was accounted for in academic performance; this was not statistically significant, $F\Delta(1, 18) = .596$, $p = .450$. Thus, step two accounts for 58.9% of the variance in academic performance, $R = .768$, $F\ (2, 18) = 12.917$, $p < .001$. Course Self-Efficacy was the only significant predictor of academic performance, Standardized $\beta = -.726$, $t(19) = -4.632$ $p < .001$. When Personal Situation was entered in the third step, the model remained significant, $R = .784$, $F\ (3, 17) = 9.050$, $p < .001$, however, this did not significantly add to the variance explained in academic performance, $F\Delta(1, 17) = 1.130$, $p = .303$. In this step, only Course Self-Efficacy was a significant predictor of academic performance, Standardized $\beta = -.708$, $t(19) = -4.501$, $p < .001$.

Discussion

This study explored variables which contribute to academic performance among postsecondary students with learning disabilities. Scores of students who only self-reported LD and those who self-reported at-least one comorbid condition in addition to LD were examined separately to control for the effects of additional disabilities/impairments. A sample of students with LD who have recently graduated from their program of study was used to replicate the findings on the students. As with the sample of students, scores of the graduates who only self-reported LD and those who self-reported at-least one comorbid condition in addition to LD were examined separately. The results of the four hypotheses are discussed below.

Comparing Students with LD Only and LD Plus another Disability/Impairment

To test the first hypothesis I examined differences between students who only have LD and students who have LD and at least one other disability/impairment. I predicted that students who only have LD would have higher scores on course self-efficacy, social self-efficacy, personal situation, and school environment and would have lower scores on social alienation.

Consistent with Hypothesis 1 the results show that students who only had LD and students who had LD and additional disabilities/impairments had scores that differed regarding their personal situation. Here I found that aspects of their personal situations (e.g., paid employment, family situation, personal motivation, study habits, previous education experiences, health, and the impact of their disabilities/impairments) made the academic lives of students with LD and other disabilities/impairments more difficult in comparison with students with LD only. In addition, for students with LD and additional disabilities/impairments, personal situation was moderately correlated with academic performance; this was not the case for students with LD only. Thus, students who have another disability/impairment in addition to LD have more difficult personal situations and this may negatively impact their academic lives. Since this finding is correlational, additional research is needed to ascertain the possible causal role of personal factors in determining academic performance.

Also as predicted in Hypothesis 1, students who only had LD and students with LD and additional disabilities/impairments also differed on feelings of social alienation on campus. Students who had LD and at least one other disability/impairment reported significantly more feelings of social alienation on campus than students who only had LD. While students with LD and additional disabilities/impairments reported more feelings of social alienation campus, this scale was not correlated with academic performance.

Comparisons of other variables were conducted as well. Contrary to expectations stated in Hypothesis 1, students' scores on school environment, course self-efficacy, and social self-efficacy did not differ between the groups.

Students who only have LD and students who have LD and at least one other disability/impairment did not differ on self-reported grades or in the number of hours of employment they worked per week. Indeed, students with LD only reported working an average of 8.7 hours per week and students with multiple disabilities/impairments reported working an average of 9.7 hours per week. In addition, approximately half of the students who only had LD and those who had LD and at least one other disability/impairment did not work during the school year.

Predicting Academic Performance

Course Self-Efficacy. Hypothesis 2 stated that course self-efficacy would be the biggest contributor to academic performance for students with LD. Correlational information suggests that for students who only have LD, course self-efficacy is only moderately associated with academic performance. To predict grade, when course self-efficacy was entered in the regression first, it was not a significant predictor of academic performance. When social alienation was entered in to the regression, course self-efficacy became significant. Despite this, when personal situation was added, the regression model was no longer significant. These results suggest that contrary to the prediction enunciated in Hypothesis 2, higher course self-efficacy, does not necessarily contribute to better academic performance.

In the replication sample of graduates who only have LD, only course self-efficacy was significantly and highly correlated with academic performance. It was not, however, a

significant predictor in the regression analysis. The different findings between these groups may be due to the small sample of Graduates who only have LD.

For students who self-reported LD and at least one other disability/impairment, course self-efficacy was highly correlated with academic performance. Thus, having higher course self-efficacy was associated with having higher grades. In addition, course self-efficacy contributed the most variance to academic performance in the regression analysis. Therefore, course self-efficacy was the best predictor of academic performance for students with LD and at least one other disability/impairment. These findings were replicated with Graduates with LD who have at least on other disability/impairment. For these Graduates, course self-efficacy was highly correlated with academic performance and contributed the most variance to academic performance in the regression analysis.

Students with LD are often found to have low academic self-efficacy (Hen & Goroshit, 2014; Lackaye & Margalit, 2006). This is not consistent with our findings as both students who only have LD and those who have additional comorbid conditions reported being moderately confident (i.e., scores resemble the means for various nondisabled populations reported by Solberg et al., 1998), with being able to complete course related tasks. My findings are consistent with those of Butler (2011), who found that self-reported GPA was related to academic self-efficacy, although in my investigation, this relationship was stronger for students who had at-least one other disability/impairment in addition to LD (e.g. ADHD). Nevertheless, Exner (2010) failed to find any relationship between GPA and academic self-efficacy among postsecondary students with LD and/or ADHD. Thus, the relationship between academic performance and course self-efficacy for students with LD is still unclear. My results, however, indicate that the relationship between course-self efficacy and academic performance is stronger in the case of

students with LD have additional disabilities/impairments. In many studies on LD and academic performance, the presence or absence of additional disabilities/impairments is not specified. Given the high comorbidity rate that is associated with students with LD, further studies are needed to take these additional conditions in to consideration.

Social Alienation. The third hypothesis stated that feelings of social inclusion on campus would contribute to the academic performance of students with LD. For both students with only LD and students with LD and at least one other additional disability/impairment, social alienation on campus was not related to academic performance and was not significant in the regression equation. This finding was replicated in the sample of Graduates who only had LD and also in Graduates with LD who had at least one additional disability/impairment; social alienation was not related to academic performance and was not significant in the regression equation.

DaDeppo (2009) examined the effects of social integration on academic success of students with LD and found that social integration did not predict academic performance. Our findings support those of DaDeppo (2009), as social alienation and social integration measure similar constructs. Thus, our findings add to the literature which shows that there is no predictive relationship between social alienation and academic performance for students with LD.

Personal Situation. The fourth hypothesis stated that students' personal situations would be an important contributor to academic performance for students with LD. Correlational information suggests that for students who have LD and additional disabilities/impairments, personal situation has a small relationship with academic performance. For both students who only have LD and students with LD and additional disabilities/impairments, personal situation

was not significant in the regression analyses. This finding was replicated in both samples of graduates.

While personal situation was not significant in the regression analyses, it was significantly related to academic performance for students with LD with other disabilities/impairments. This finding is similar to Fichten et al. (2014b), who found that in a large sample of postsecondary students with various disabilities, those who self-reported having higher grades also had more facilitating factors in their personal situation.

Relationship among the variables. For students with LD and other disabilities/impairments, course self-efficacy had the strongest relationship with academic performance, followed by a moderate relationship with social self-efficacy, and a small relationship with personal situation. Thus, it seems as if personal situation, school environment, and social alienation have little to no relationship with academic performance. My findings suggest, however, that this may not be the case as each of these variables had a moderate to strong relationship with course self-efficacy. It seems as if having higher course self-efficacy is related to having a good personal situation and school environment, having more social self-efficacy, and having fewer feelings of social alienation. These variables are important as they may influence course self-efficacy, the only significant predictor of academic performance. In addition, social self-efficacy may also be important for academic performance as it was strongly related to course self-efficacy, social alienation, and was moderately related to personal situation and school environment.

For students who only have LD, course self-efficacy had the strongest relationship with academic performance. In contrast to students who had LD plus another disability/impairment, only personal situation and social self-efficacy were related to course self-efficacy, although

these were strong correlations. It is interesting to note that while social self-efficacy was not related to academic performance, it was strongly related to personal situation, course self-efficacy, and social alienation, and it was moderately related to school environment.

From these findings it can be seen that while course self-efficacy has the strongest relationship with students' academic performance, all the other variables of interest were related to course self-efficacy or social self-efficacy. Further research is needed to clarify the relationships among the variables and with academic performance.

Other Findings of Interest

Comorbid disabilities/impairments with LD. Of the total sample of students with learning disabilities, 61% self-reported having at least one other disability/impairment. This finding is similar to Margri et al. (2013), Willcutt and Pennington (2000) and Capozzi et al. (2008) who found that at least 60% of children with a learning disability in their samples had at least one other comorbid condition. Our study adds to the literature by replicating this statistic with and adult sample.

In the present study, the most frequently reported comorbid condition was ADHD. Indeed, 40% of the total sample of students with LD self-reported having ADHD. This finding is similar to DuPaul, et al. (2013), who found a mean comorbidity rate of 45.1% within the last decade of literature. Our findings support this high rate of comorbidity in an adult sample.

Willcutt and colleagues (2007) found that students who have both LD and ADHD have more negative outcomes than students who only have LD. For instance, the researchers found that students who have both LD and ADHD had lower grades than students who only have LD. This was not supported in our study as self-reported grades of students who only had LD and those who had LD and at least one other disability/impairment did not differ significantly.

The second most frequently reported comorbid condition was a psychological/psychiatric disability, as self-reported by 26% of the total sample of students with LD. While psychological/psychiatric disabilities often co-occur among children with LD (Capozzi, et al., 2008), the evidence to support this for postsecondary students has been inconsistent. For example, both Hoy and colleagues (1997) and Carroll & Iles (2006) found that postsecondary students with LD had increased anxiety-related symptoms in comparison to students without LD. Conversely, Nelson and Gregg (2012) found that college students who had LD, ADHD, or comorbid LD and ADHD did not significantly differ in anxiety or depressive symptoms when compared to college students without LD or ADHD. My finding adds support to the literature that psychological/psychiatric disabilities often co-occur among students with LD at the postsecondary level.

Fields/qualifications of study. In this study I also examined the fields and qualifications of study that students were attending when they completed the questionnaire.

Field of study. Thirty-five percent of students who only have LD and 44% of students who have LD and at least one additional disability/impairment were completing their studies in the field of social sciences. For students who only have LD, 24% were enrolled in professional programs (i.e., programs that prepare you for professional work, most of which end with certification or entry into a professional body; see Martiniello, et al., 2008). Only 14% were enrolled in science and engineering programs, 8% were enrolled in arts and humanities, 8% were enrolled in business, and 6% were enrolled in career/technical programs. For students who have LD and at least one other disability/impairment, 19% were enrolled in arts and humanities, 17% were enrolled in professional programs, 10% were enrolled in business, 4% were enrolled science and engineering, 4% were enrolled in computer and information technology, and none

were enrolled in career/technical programs. Clearly, social sciences were the field of choice for these students.

Program of study. The majority of students with LD in our sample were enrolled in either a Bachelor's degree or a college certificate or diploma. Specifically, 55% of students who only have LD and 47% of students who have LD and at least one additional disability/impairment were pursuing Bachelor's degree. Thirty-one percent of students who only have LD and 32% of students who have LD Plus were pursuing a college certificate or diploma. In addition, 12% of students in each group reported pursuing a Master's degree. Lastly, only 2% of students who only have LD and none of the students with LD and at least one other disability/impairment were pursuing a trade/vocational certificate or diploma.

My findings differ from Wagner et al. (1991) and Murray et al. (2000), who found that postsecondary students with LD were more likely to be enrolled vocational/trade programs than 4-year college programs, as the majority of our sample were enrolled in 4-year programs and few students were enrolled in career/technical programs. The differences between the findings may be due to differences in sampling techniques, as our sample was not random. Despite this, our findings were similar with more recent studies. In Heiman and Precel (2003), the majority of the sample of postsecondary students with LD were enrolled in social science programs. In addition, of students with LD who completed high school in the National Longitudinal Transition Study-2 (Wagner, Newman, Cameto, Garza, & Levine, 2005), 5% were enrolled in vocational/technical school, 21.5% were enrolled in 2-year community college programs, and 9.7% were enrolled in 4-year college programs.

Grades. Self-reported grades of students who only have LD and those who have LD and at least one additional disability/impairment did not differ. Over half of the students with LD in

my study considered themselves to be a "B" student and over a quarter considered themselves to be an "A" student. These findings were unexpected as students with LD are often characterized by academic underachievement (Learning Disabilities Association of Canada, 2002). For example, Murray and Wren (2003), Ruban et al. (2003), and DaDeppo (2009) found that the average GPAs of students with LD fell within the "C" range.

Our findings may be related to the fact that most students were registered to receive campus disability services. While the evidence indicating that accommodations improve academic performance for students with LD has been inconsistent (Fletcher et al., 2006), Trammell (2003) found that using accommodations improved the academic performance of postsecondary students who have both LD and ADHD. In addition, students with learning disabilities have been found to overestimate their abilities on academic tasks (Klassen, 2007; Job & Klassen, 2012), thus, it is possible that their estimation of grades in terms of letter grades was inaccurate. These findings may also be due to the fact that the majority of students were enrolled in their first choice program. Thus, the sample may not have included students with LD who are doing poorly in school. Indeed, the characteristics of survey respondent suggest that those who answer surveys have better academic performance (Woosley, 2005).

Comparison of college and university students. Students who only have LD and those who have LD and at least one other disability/impairment were combined to examine the differences between college and university students. Unsurprisingly, university students were significantly older than college students. The two groups did not differ significantly on course self-efficacy, social self-efficacy, social alienation, school environment, or personal situation. In addition, students' self-reported grades and the number of disabilities reported did not differ based on the institution. College and university students did not differ in the number of hours of

employment they worked per week. Indeed, college students reported working an average of 7.7 hours per week and university students reported working an average of 10.2 hours per week.

Comparison of current students and students who have recently graduated (graduates). We combined both groups of current students and both groups of graduates to examine differences between the two groups. The two groups did not significantly differ on course self-efficacy, social self-efficacy, social alienation, school environment, or personal situation. In addition the number of disabilities reported did not differ between the students and graduates.

Limitations

It should be noted that there are some limitations that may impact the interpretation and generalizability of the findings. For instance, the sampling method was not random nor fully representative of the populations studied. The use of e-mail discussion lists as a main form of recruitment may have led to a biased sample. In addition, because the recruitment strategy included asking disability service providers to help recruit participants, the majority of students had registered for disability related services in their institution. Thus, students who do not register for campus disability services are under-represented. In addition the sample size of some of the groups was very small.

Another limitation of the study is the use of self-report. When using self-report, there is always the possibility of error due to participant biases. In addition, the study used self-report of grades in the form of a four-item question. This item may not have been a good representation of students' actual grades. For example, students may not have known which letter grade their grades correspond to.

Another limitation is the use of a binary variable in the statistical analyses of academic performance. A continuous variable would have been better to use for academic performance in the regressions.

In addition, participants had higher course self-efficacy than expected possibly due to volunteer effects (better students volunteer – Woolsey, 2005). This is not consistent with Lackaye and Margalit (2006), who found that students with LD reported having very low academic self-efficacy.

Practical Implications

This study compared students who only have LD and those who have LD and at least one other disability/impairment and found a number of similarities and a few significant differences. Students' did not differ in age, program/field of study, self-reported grades, course self-efficacy, social self-efficacy, or their perceptions of their school environment. Despite this, students who have LD and at least one other disability/impairment reported having personal situations which make their academic life difficult and also reported more feelings of social alienation on campus and in comparison to students who only have LD. Lastly, the variables which relate to academic performance also differ among the groups, with course self-efficacy being important for students with LD plus at least one other disability/impairment, but not as much for students who only have LD.

Students with LD plus other disabilities/impairments may have had more academic supports provided to them throughout their lives. One possibility for why differences were found in predicting academic performance between the two groups may be that students with LD plus other disabilities/impairments may have had more academic supports provided to them throughout their lives. Students who only have LD may not have received, or needed, as many

supports (depending on the severity of their disability) because they do not have added difficulties due to a another disability/impairment. Thus, aspects that contribute to academic performance may reflect previous academic experiences (i.e., supports).

Since individuals' self-efficacy beliefs related to achievement are rooted in past achievement, difficulties, and personal history (Lackaye & Margalit, 2006), it is possible that students who have received more support in the past have more favorable self-efficacy beliefs in the future. Since my sample consisted of students with higher grades than what has been reported in the literature (e.g., Murray & Wren, 2003), it is possible that these students may have received better supports throughout their lives. This could help explain the difference in the role that course self-efficacy played between the groups and the high ratings of course self-efficacy overall.

Help students improve their skills and feelings of efficacy. While the relationship between course self-efficacy and academic performance differed between the two groups, ratings of course self-efficacy did not. When examining the individual items on the Course Self-Efficacy scale (see Appendix D), students expressed confidence in their ability to research a term paper, write a course paper, understand their textbooks, and do well on exams. Students' rated feeling less confident about taking good class notes, keeping up with schoolwork, and managing their time effectively.

To help students improve their skills and feelings of efficacy, schools' learning/academic skills center can assist students, and specifically target their areas of concern (e.g., taking good class notes). In addition, schools can provide targeted workshops on effective studying, paper writing, and time management skills for students who generally have difficulty with these.

Improving social self-efficacy skills. Students who only have LD and those who have LD and at least one other disability/impairment did not significantly differ in their ratings of social self-efficacy. Despite this, social self-efficacy was shown to be important for students with LD as it was significantly related personal situation, course self-efficacy, social alienation, and school environment. Students with LD reported feeling confident in their ability to participate in class discussions, ask questions in class, talk to professors/instructors, ask professors/instructors a question outside of class, talk with academic and support staff, and make new friends at school. Since having higher social self-efficacy ratings was related to have higher scores on personal situation, school environment, course self-efficacy, and lower scores on social alienation, these skills should be fostered and improved for all students with LD. One possibility to improve these would be for schools to offer workshops or mentoring programs that specifically target these skills.

Help the personal situation of students. Since the two groups' scores differed significantly on their personal situation and feelings of social alienation, an in-depth examination of the scales was conducted. See Appendix E for the individual means for the two groups. An exploration of individual items on the Personal Situation scale for students with LD and at least one other disability/impairment suggest that the following aspects make their academic life harder: financial situation, having paid employment, family situation, study habits, health, and the impact of their disability. In contrast, students expressed that the following items made their academic life easier: having friends, level of personal motivation, and previous education experiences. For students who only have LD, only financial situation, having paid employment, and the impact of their disability made their studies harder, however, these ratings were not as negative as those reported by students with LD who have other disabilities/impairments.

Based on these findings certain steps may be taken to help the personal situation of students with LD. Students in both groups reported that their financial situation has made their studies harder, thus the introduction of functional bursary programs could improve students' personal situations by lessening their financial burdens. Students who have LD and at least one other disability/impairment also reported that their study habits made their academic life harder. Thus, these students may benefit from having extra support (e.g., tutors, workshops) to help them develop more effective study habits.

Schools could take certain steps to help prevent feelings of alienation. An exploration of individual items on the Social Alienation scale (see Appendix F for the individual item means of the two groups) found that while both groups of students were not feeling especially alienated on campus, students who have LD and at least one other disability/impairment reported more feelings of alienation on all the items on the scale. The items include: feeling lonely and lost on campus, having little communication with students without disabilities, not communicating well with faculty and students without disabilities, and whether students' disabilities prevent them from having contact with their professors.

Since students who have LD and at least one other disability reported having more feelings of social alienation on campus, schools could take certain steps to help prevent feelings of alienation. For example, campus disability service providers and faculty members could help ensure that students' disabilities do not prevent them from having needed contact with their professors, and that course activities encourage interaction for all students (with and without disabilities). In addition, access coordinators and faculty should encourage all students with LD to get involved in campus life outside of the classroom. This may help alleviate feelings of alienation.

The results of this study can help guide individuals who work with students with LD in elementary and secondary schools to improve their course and social self-efficacy to prepare them for the postsecondary environment. These transition preparations can include academic skills training, tutoring, coaching, and mentoring to help students build the skills needed for postsecondary education, such as writing papers, taking notes, and time management. In addition, these individuals can also help students with LD (who may or may not have other disabilities/impairments) learn to self-advocate to improve social self-efficacy and to reduce the likelihood of feeling alienated on campus.

Conclusions and Summary

We examined aspects of the experiences of postsecondary students who identified themselves as having learning disabilities with the aim of discovering predictors of academic performance. Students who self-reported only having a learning disability (n = 49) and students who self-reported having a learning disability and at least one additional disability/impairment (n = 77) were examined separately.

For students who had learning disabilities and other disabilities/impairments, only course self-efficacy significantly predicted academic performance. However, course self-efficacy was related to students' personal situations, school environment, social self-efficacy, and feelings of social inclusion. These findings suggest that for students who have learning disabilities and other disabilities/impairments, higher ratings of course self-efficacy may predict higher academic performance. However, many other important variables may contribute to having high course self-efficacy.

None of the variables significantly predicted academic performance among the students who only had LD. Course self-efficacy was only moderately related to academic performance,

and was also related to students' personal situation and social self-efficacy. The findings suggest that while students' perceptions of course self-efficacy do not differ, the importance of the variable differs between the groups.

Students who only had LD and those who had LD and other disabilities/impairments were different on few factors. Those who had LD and additional disabilities/impairments reported feeling more alienated on campus than students who only have LD. In addition, students with LD who have additional disabilities/impairments reported having a personal situation that made their academic studies harder in comparison with students who only have LD. The findings from this study suggest that different variables are related to academic performance for students who only have LD compared to those that LD and other disabilities/impairments.

Future Directions

The relationship between course self-efficacy and academic performance needs to be clarified. In this study, course-self-efficacy was related to academic performance among students with LD, a finding consistent with Butler (2011) but not with Exner (2010). Thus, the inconsistency in the relationship between academic performance and course self-efficacy requires further investigation. The use of the same measurement tools would be a good first step.

Students with LD only and those with LD and another disability differed significantly on several variables of interest. The differences between postsecondary students who only have LD and those who have LD and other disabilities/impairments are not well delineated in the literature. Since my findings indicate that there are differences among the two groups, it would be beneficial to examine these differences in further research.

Future research should include larger random samples including students without disabilities and evaluate models based on course and social self-efficacy and compare academic

performance between individuals with and without disabilities. It would also be beneficial to use a continuous variable of academic performance to determine whether the results found in the current study still holds when not using a dichotomous variable. Variables identified in this study related to academic performance can help identify strategies and best practices that could help these students succeed in postsecondary education.

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Table 1

Types of Disabilities/Impairments Reported by the 126 Students with LD

Type of disability/impairment	*n*	%
Learning disability (e.g., dyslexia)	126	100%
Attention-deficit hyperactivity disorder (ADHD)	51	40%
Psychological / psychiatric disability	33	26%
Chronic medical / health problem	17	13%
Mobility impairment: use of a cane / crutches / walkers	6	5%
Limitation in the use of hands / arms	6	5%
Hearing impairment	5	4%
Speech / communication impairment	5	4%
Mobility impairment: wheelchair / scooter user	5	4%
Visual impairment	4	3%
Neurological impairment	4	3%
Pervasive developmental disorder (PDD)	4	3%
Total	266	

Note: A total of 126 students reported 226 disabilities/impairments. Forty-nine students self-reported only a learning disability.

Table 2

Chi-Square Comparing the Type of Institution Attended between Students and Graduates

	Students		Graduates		Total				
Type of institution	*n*	%	*n*	%	*n*	%	X^2	*df*	*Sig.*
Institution							0.643	1	0.423
College	44	35%	10	28%	54	33%			
University	82	65%	26	72%	108	67%			
Total	126	100%	36	100%	162	100%			

Table 3

Types of Disabilities/Impairments Reported by the 36 Graduates with LD

Type of disability/impairment	*n*	%
Learning disability (e.g., dyslexia)	36	100%
Attention-deficit hyperactivity disorder (ADHD)	10	28%
Psychological / psychiatric disability	10	28%
Chronic medical / health problem	5	14%
Speech / communication impairment	2	6%
Hearing impairment	1	3%
Mobility impairment: use of a cane / crutches / walkers	1	3%
Limitation in the use of hands / arms	1	3%
Pervasive developmental disorder (PDD)	1	3%
Total	67	

Note: A total of 36 graduates reported 67 disabilities/impairments. Fifteen Graduates self-reported only a learning disability.

Table 4

Chi-Square Comparing the Number of Disabilities/Impairments Reported by Students and Graduates

Number of disabilities	Students		Graduates		Total				
	n	%	*n*	%	*n*	%	X^2	*df*	*Sig.*
Number of disabilities							2.419	4	0.659
1	49	39%	15	42%	64	40%			
2	41	33%	14	39%	55	34%			
3	14	11%	4	11%	18	11%			
4	17	13%	3	8%	20	12%			
5	5	4%	0	0%	5	3%			
Total	126	100%	36	100%	162	100%			

Table 5

Frequencies of School Related Questions for Students with LD Only

Items	Total *n*	Yes		No	
		n	*%*	*n*	*%*
Are you registered to receive disability related services or academic accommodations from your school?	49	46	94%	3	6%
Are you currently enrolled in your first choice program of study?	49	45	92%	4	8%
Does your program of study include an internship, co-op, practicum, apprenticeship, field or work placement component?	49	24	49%	19	39%

Note: 6 participants reported "I don't know" to whether or not their program of study included an internship.

Table 6

Field of Study for Students with LD

	LD Only		LD Plus		Total	
Field of study	*n*	%	*n*	%	*n*	%
Social sciences	17	35%	34	44%	51	40%
Professional programs	12	24%	13	17%	25	20%
Arts and humanities	4	8%	15	19%	19	15%
Business	4	8%	8	10%	12	10%
Science and engineering	7	14%	3	4%	10	8%
Computer and information technology	1	2%	3	4%	4	3%
Career and technical program	3	6%	0	0%	3	2%
Other	1	2%	1	0%	2	1%
Total	49	100%	77	100%	126	100%

Table 7

Students Qualifications Pursued

Qualifications	LD Only		LD Plus		Total	
	n	%	*n*	%	*n*	%
Bachelor's degree	27	55%	36	47%	63	50%
College certificate or diploma	15	31%	24	31%	39	31%
Master's degree	6	12%	9	12%	15	12%
Doctoral degree	0	0%	3	4%	3	2%
Graduate professional degree	0	0%	3	4%	3	2%
Trade / vocational certificate or diploma	1	2%	0	0%	1	1%
University graduate certificate or diploma	0	0%	1	1%	1	1%
Total	49	100%	77	100%	126	100%

Note: One student in LD Plus did not report the qualification of study he/she was pursuing.

Table 8

Chi-Square Comparing Students' Self-Reported Grades by Group Membership

	LD Only		LD Plus		Total				
Self-reported grades	*n*	%	*n*	%	*n*	%	X^2	*df*	*Sig.*
Grades							4.186	3	0.242
A student	14	29%	22	29%	36	29%			
B student	30	61%	39	51%	69	55%			
C student	5	10%	11	14%	16	13%			
D or less student	0	0%	5	6%	5	4%			
Total	49	100%	77	100%	126	100%			

Note: Percentages do not sum to 100 because of rounding errors.

Table 9

Frequencies of School Related Questions for Students who have LD Plus

Items	Total *n*	Yes		No	
		n	*%*	*n*	*%*
Are you registered to receive disability related services or academic accommodations from your school?	77	72	94%	5	6%
Are you currently enrolled in your first choice program of study?	77	66	86%	11	14%
Does your program of study include an internship, co-op, practicum, apprenticeship, field or work placement component?	77	24	31%	48	62%

Note: 5 participants reported "I don't know" to whether or not their program of study included an internship.

Table 10

Independent Samples t-test for Parental Education and Employment (Hours per Week) for Students with LD Only and LD Plus

	LD Plus			LD Only						
Variables	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*df*	*Sig.*	*d*
Years of mothers' education	74	13.80	3.56	49	14.70	3.41	1.35	121	.181	.26
Years of fathers' education	73	13.73	3.59	47	14.24	3.56	.76	118	.446	.14
Employment hours/week	42	17.77	12.02	23	18.43	11.98	.212	63	.833	.06

Table 11

Independent Samples t-test for Parental Education and Employment (Hours per Week) for College and University Students

	College			University						
Variables	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*df*	*Sig*	*d*
Years of mothers' education	44	14.65	3.76	79	13.92	3.36	1.097	121	.275	.204
Years of fathers' education	43	13.93	3.95	77	13.94	3.37	-.007	118	.994	.002
Employment hours/week	20	16.90	10.87	45	18.50	12.43	-.497	63	.621	.137

Table 12

Chi-Square Comparing Students' Self-Reported Grades by Type of Institution

	College		University		Total				
Self-reported grades	*n*	%	*n*	%	*n*	%	X^2	*df*	*Sig.*
Grades							4.578	3	.205
A student	10	23%	26	32%	36	29%			
B student	27	61%	42	51%	69	55%			
C student	7	16%	9	11%	16	13%			
D or less student	0	0%	5	6%	5	4%			
Total	44	100%	82	100%	126	100%			

Note: Percentages do not sum to 100 because of rounding errors.

Table 13

Frequencies of School Related Questions for Graduates with LD Only

Items	Total *n*	Yes		No	
		n	*%*	*n*	*%*
Did you register to receive disability related services or academic accommodations from your school?	15	14	93%	1	7%
Were you enrolled in your first choice program of study?	15	15	100%	0	0%
Did your most recent program of study include an internship, co-op, practicum, apprenticeship, field or work placement component?	15	5	33%	10	67%

Table 14

Field of Study for Graduates with LD

Field of study	LD Only		LD Plus		Total	
	n	%	*n*	%	*n*	%
Professional programs	2	13%	8	38%	10	28%
Social sciences	5	33%	2	10%	7	19%
Business	0	0%	6	29%	6	17%
Arts and humanities	2	13%	4	19%	6	17%
Science and engineering	3	20%	0	0%	3	8%
Career and technical program	2	13%	1	5%	3	8%
Computer and information technology	1	7%	0	0%	1	3%
Total	15	100%	21	100%	36	100%

Table 15

Chi-Square Comparing Graduates' Self-Reported Grades by Group Membership

	LD Only		LD Plus		Total				
Self-reported grades	*n*	%	*n*	%	*n*	%	X^2	*df*	*Sig.*
Grades							0.343	2	0.842
A student	6	40%	9	43%	15	42%			
B student	7	47%	8	38%	15	42%			
C student	2	13%	4	19%	6	17%			
Total	15	100%	21	100%	36	100%			

Note: Percentages do not sum to 100 because of rounding errors.

Table 16

Frequencies of School Related Questions for Graduates with LD Plus

Items	Total *n*	Yes		No	
		n	*%*	*n*	*%*
Did you register to receive disability related services or academic accommodations from your school?	21	20	95%	1	5%
Were you enrolled in your first choice program of study?	21	20	95%	1	5%
Did your most recent program of study include an internship, co-op, practicum, apprenticeship, field or work placement component?	21	10	48%	10	48%

Note: 1 participant reported "I don't know" to whether or not their program of study included an internship.

Table 17

Independent Samples t-test for Parental Education and Employment (Hours per Week) for Graduates with LD Only and LD Plus

	LD Plus			LD Only						
Variables	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*df*	*Sig.*	*d*
Years of mothers' education	21	12.81	3.4	15	13.30	3.35	.43	34	.670	.15
Years of fathers' education	21	12.95	3.56	15	13.50	3.44	.46	34	.647	.17

Table 18

Means, Standard Deviations, and F Scores for ANOVAs between Students With LD Plus and LD Only

	LD Only (n = 49)		LD Plus (n = 77)				
Variables	*M*	*SD*	*M*	*SD*	*F*(1,124)	*Sig.*	η2
College Experience							
Personal Situation	4.30	0.82	3.50	1.04	21.13	.000	.146
School Environment	4.15	0.94	3.93	0.91	1.83	.178	.015
College Self-Efficacy							
Course self-efficacy	6.20	1.70	5.72	1.7	2.33	.129	.018
Social self-efficacy	6.98	1.72	6.52	1.75	2.13	.147	.017
Campus Climate							
Social Alienation	2.02	0.89	2.62	1.19	9.33	.003	.070

Note: Items on the College Experience Questionnaire were rated from 1 to 6; higher scores depict that their personal situation/school environment made their academic success easier. Items on the Self-Efficacy Questionnaire were rated from 0 to 9; higher scores reflect higher confidence in ability to perform the behaviors. Items on the Social Alienation scale were rated from 1 to 6; higher scores suggest more feelings of social alienation on campus.

Table 19

Means, Standard Deviations, and F Scores for ANOVAs between Graduates With LD Plus and LD Only

	LD Only (n = 14)		LD Plus (n = 21)				
Variables	*M*	*SD*	*M*	*SD*	*F*(1,33)	*Sig.*	η2
College Experience							
Personal Situation	4.29	0.88	3.64	0.93	4.29	.046	.115
School Environment	4.26	1.09	3.69	1.12	2.26	.142	.064
College Self-Efficacy							
Course self-efficacy	6.02	1.78	5.97	1.59	0.01	.934	.000
Social self-efficacy	7.42	1.54	6.22	1.96	3.67	.064	.100
Campus Climate							
Social Alienation	1.63	1.36	2.06	0.77	3.78	.060	.103

Note: Items on the College Experience Questionnaire were rated from 1 to 6; higher scores depict that their personal situation/school environment made their academic success easier. Items on the Self-Efficacy Questionnaire were rated from 0 to 9; higher scores reflect higher confidence in ability to perform the behaviors. Items on the Social Alienation scale were rated from 1 to 6; higher scores suggest more feelings of social alienation on campus.

Table 20

Means, Standard Deviations, and F Scores for ANOVAs between College and University Students With LD

	College (n = 44)		University (n = 82)				
Variables	*M*	*SD*	*M*	*SD*	*F*(1,124)	*Sig.*	η2
College Experience							
Personal Situation	3.92	1.09	3.76	1.00	0.71	.401	.006
School Environment	4.16	0.94	3.94	0.91	1.68	.197	.013
College Self-Efficacy							
Course self-efficacy	5.93	1.59	5.90	1.78	0.01	.910	.000
Social self-efficacy	6.84	1.62	6.63	1.82	0.42	.520	.003
Campus Climate							
Social Alienation	2.19	1.22	2.49	1.05	2.10	.150	.017

Note: Items on the College Experience Questionnaire were rated from 1 to 6; higher scores depict that their personal situation/school environment made their academic success easier. Items on the Self-Efficacy Questionnaire were rated from 0 to 9; higher scores reflect higher confidence in ability to perform the behaviors. Items on the Social Alienation scale were rated from 1 to 6; higher scores suggest more feelings of social alienation on campus.

Table 21

Means, Standard Deviations, and F Scores for ANOVAs between Students and Graduates with LD

	Students (n = 126)		Graduates (n = 35)				
Variables	*M*	*SD*	*M*	*SD*	*F*(1,159)	*Sig.*	η2
College Experience							
Personal Situation	3.81	1.03	3.90	0.95	0.22	.642	.001
School Environment	4.02	0.92	3.91	1.12	0.30	.584	.002
College Self-Efficacy							
Course self-efficacy	5.91	1.71	5.99	1.64	0.07	.797	.000
Social self-efficacy	6.70	1.75	6.70	1.88	0.00	.999	.000
Campus Climate							
Social Alienation	2.38	1.11	2.21	1.37	0.63	.429	.004

Note: Items on the College Experience Questionnaire were rated from 1 to 6; higher scores depict that their personal situation/school environment made their academic success easier. Items on the Self-Efficacy Questionnaire were rated from 0 to 9; higher scores reflect higher confidence in ability to perform the behaviors. Items on the Social Alienation scale were rated from 1 to 6; higher scores suggest more feelings of social alienation on campus.

Table 22

Correlations of Variables for Students with LD Only and LD Plus

Variables	1	2	3	4	5	6	7
Academic Performance	—	-.027	.166	-.301*	.118	-.190	.058
Personal Situation	-.235*	—	.480**	.491**	.519**	-.313*	-.294*
School Environment	-.181	.489**	—	.209	.344*	-.200	-.155
Course Self-Efficacy	-.505**	.409**	.355**	—	.506**	-.272	-.279
Social Self-Efficacy	-.369**	.346**	.261*	.461**	—	-.552**	-.211
Social Alienation	.171	-.521**	-.410**	-.295**	-.444**	—	.030
Age	.002	-.225*	-.195	-.018	.082	.223	—
Number of disabilities	-.208	-.301**	-.188	.061	.143	.245*	.529**

Note: Students with LD Only (n = 49) are above the diagonal and students with LD Plus (n = 77*)* are below the diagonal. Number of disabilities is not along the variable list as number 8 as students with LD Only do not have more than 1 disability, thus, this variable does not apply to them.

*$p < .05$, **$p < .001$.

Table 23

Correlations of Variables for Graduates with LD Only and LD Plus

Variables	1	2	3	4	5	6	7
Academic Performance	—	-.391	-.522	-.563*	-.422	.336	-.221
Personal Situation	-.103	—	.714**	.585*	.580*	-.597*	-.336
School Environment	-.268	.303	—	.703**	.669**	-.429	.047
Course Self-Efficacy	-.695**	.098	.407	—	.735**	-.530	-.198
Social Self-Efficacy	-.633**	-.091	.458*	.662**	—	-.467	-.100
Social Alienation	.253	.036	-.405	-.268	-.482*	—	.043
Age	-.243	.142	.086	.185	.421	.111	—
Number of disabilities	-.488*	-.145	.033	.449*	.220	-.317	-.052

Note: Graduates with LD Only (n = 15) are above the diagonal and Graduates with LD Plus (n = 21) are below the diagonal. Number of disabilities is not along the variable list as number 8 as Graduates with LD Only do not have more than 1 disability, thus, this variable does not apply to them.

*$p < .05$, **$p < .001$.

Table 24

Binary Variable for Academic Performance for all Students with LD

	LD Plus		LD Only		Total	
Academic performance	*n*	%	*n*	%	*n*	%
A student	22	29%	14	29%	36	29%
Worse than A student	55	71%	35	71%	90	71%
Total	77	100%	49	100%	126	100%

Table 25

Binary Variable for Academic Performance for all Graduates with LD

	LD Plus		LD Only		Total	
Academic performance	*n*	%	*n*	%	*n*	%
A student	9	43%	6	40%	15	42%
Worse than A student	12	57%	9	60%	21	58%
Total	21	100%	15	100%	36	100%

Table 26

Hierarchical Multiple Regression Analysis on Students' Academic Performance

Variables	*B*	*SE B*	*β*	*t*	R^2
LD Only (*n* = 49)					
Step 1					.036
Course Self-Efficacy	-.051	.038	-.190	-1.328	
Step 2					.132*
Course Self-Efficacy	-.075	.038	-.277	-1.943	
Social Alienation	-.166	.074	-.321	-2.249*	
Step 3					.147
Course Self-Efficacy	-.091	.043	-.341	-2.132*	
Social Alienation	-.151	.076	-.293	-2.001	
Personal Situation	.080	.090	.144	.889	
LD Plus (*n* = 77)					
Step 1					.120**
Course Self-Efficacy	-.093	.029	-.346	-3.197**	
Step 2					.120**
Course Self-Efficacy	-.093	.030	-.347	-3.039**	
Social Alienation	-.001	.044	-.002	-.015	
Step 3					.121*
Course Self-Efficacy	-.089	.032	-.334	-2.765**	
Social Alienation	-.008	.050	-.021	-.166	
Personal Situation	-.020	.059	-.045	-.333	

*$p < .05$, **$p < .001$

Table 27

Hierarchical Multiple Regression Analysis on Graduates' Academic Performance

Variables	*B*	*SE B*	*β*	*t*	R^2
LD Only (*n* = 14)					
Step 1					.036
Course Self-Efficacy	-.053	.079	-.190	-.671	
Step 2					.145
Course Self-Efficacy	.004	.092	.016	.049	
Social Alienation	.199	.168	.389	1.183	
Step 3					.146
Course Self-Efficacy	.010	.105	.036	.095	
Social Alienation	.188	.194	.368	.970	
Personal Situation	-.030	.224	-.053	-.133	
LD Plus (*n* = 21)					
Step 1					.576**
Course Self-Efficacy	-.242	.048	-.759	-5.078**	
Step 2					.589**
Course Self-Efficacy	-.231	.050	-.726	-4.632**	
Social Alienation	.041	.053	.121	.772	
Step 3					.615**
Course Self-Efficacy	-.226	.050	-.708	-4.501**	
Social Alienation	.045	.053	.132	.843	
Personal Situation	-.088	.083	-.161	-1.063	

**$p < .001$

Appendix A: College/University Experience Questionnaire

COLLEGE/UNIVERSITY EXPERIENCE QUESTIONNAIRE (CEQ)

Using the following scale, indicate in what way each of the items below has affected your studies by making them:

1 - Much Harder

2 - Moderately Harder

3 - Slightly Harder

4 - Slightly Easier

5 - Moderately Easier

6 - Much Easier

Personal Situation

Financial situation

Having a paid employment

Family situation

Having friends

Level of personal motivation

Study habits

Previous education experiences

Health

Impact of my disability

School Environment

Level of difficulty of courses

Course load

Course schedule

Attitudes of professors

Attitudes of non-teaching staff (e.g., registration staff, financial aid staff)

Attitudes of students

Availability of computers on campus

Training on computer technologies on campus

Availability of course materials

Opportunity to participate in school extracurricular activities (e.g., clubs, sports, social activities)

Willingness of professors to adapt courses to my needs

Accessibility of building facilities (e.g., doorways, classrooms, labs)

Accessibility of school physical education courses

Availability of disability related services at the school

Appendix B: College Self-Efficacy Questionnaire

COLLEGE SELF-EFFICACY

For each statement below, indicate how confident you are that you could complete each task, on a scale of 0 to 9 with 0 meaning "Not at all confident" and 9 meaning "Very confident".

How confident are you that you could successfully:

Course Self-Efficacy

Research a term paper

Write a course paper

Do well on your exams

Manage your time effectively

Take good class notes

Keep up to date with your school work

Understand your textbooks

Social Self-Efficacy

Participate in class discussions

Ask a question in class

Talk to your professors/instructors

Ask a professor/instructor a question outside of class

Talk with academic and support (e.g., advising) staff

Make new friends at college

Appendix C: Campus Climate – Social Alienation Scale

CAMPUS CLIMATE

For each statement below, rate your level of agreement using the following scale:

1- Strongly disagree

2- Moderately disagree

3- Slightly disagree

4- Slightly agree

5- Moderately agree

6- Strongly agree

Social alienation

My disability prevents me from having more contact with my professors.

I find myself lonely and lost on this campus.

I do not have much communication with nondisabled students.

I communicate well with nondisabled students and faculty. (Reversed scoring)

Appendix D: Course Self-Efficacy – Individual Item Means

Individual Item Means and Standard Deviations for Students with LD Only and LD Plus on the Course Self-Efficacy Scale

Items	LD Only		LD Plus	
	M	*SD*	*M*	*SD*
Research a term paper	6.37	2.59	7.00	2.21
Write a course paper	6.22	2.46	6.70	2.44
Do well on your exams	6.69	1.54	5.69	2.51
Manage your time effectively	6.31	2.30	5.14	2.68
Take good class notes	4.84	3.00	4.42	2.57
Keep up to date with your school work	6.76	2.37	5.29	2.52
Understand your textbooks	6.20	2.25	5.83	2.38

Note: Items were rated on a scale of 0 to 9 with 0 meaning "Not at all confident" and 9 meaning "Very confident".

Appendix E: Personal Situation – Individual Item Means

Individual Item Means and Standard Deviations for Students with LD Only and LD Plus on the Personal Situation Scale

Items	LD Only		LD Plus	
	M	*SD*	*M*	*SD*
Financial situation	3.24	1.64	2.56	1.76
Having a paid employment	3.67	1.77	3.33	1.70
Family situation	4.44	1.67	3.70	1.86
Having friends	5.17	1.08	4.70	1.42
Level of personal motivation	5.08	1.15	4.10	1.62
Study habits	4.71	1.29	3.64	1.76
Previous education experiences	4.69	1.36	4.20	1.71
Health	4.54	1.60	3.43	1.84
Impact of my disability	2.60	1.16	1.83	1.02

Note: Items were rated on a 6-point scale with 1 meaning “Much harder” and 6 meaning “Much easier”.

Appendix F: Social Alienation – Individual Item Means

Individual Item Means and Standard Deviations for Students with LD Only and LD Plus on the Social Alienation Scale

Items	LD Only		LD Plus	
	M	*SD*	*M*	*SD*
My disability prevents me from having more contact with my professors.	1.88	1.20	2.83	1.77
I find myself lonely and lost on this campus.	2.56	1.56	3.40	1.81
I do not have much communication with nondisabled students.	2.08	1.57	2.22	1.71
I communicate well with nondisabled students and faculty. (Reversed scored)	5.45	0.96	4.97	1.22

Note: Items were rated on a 6-point scale with 1 meaning “Strongly disagree” and 6 meaning “Strongly agree”.