

## **Effects of the Learning Opportunities Task Force (LOTF) Programs on Postsecondary Students with Learning Disabilities**

**Allyson G. Harrison**  
**Queen's University**  
**Shaljan Areepattamannil**  
**National Institute of Education, Nanyang Technological University**  
**John Freeman**  
**Queen's University**

### **Abstract**

*This study examined the effects of participation in the Learning Opportunities Task Force (LOTF) programs on postsecondary students with learning disabilities (LDs). Data regarding 969 students from 6 colleges and 4 universities in Ontario were evaluated to investigate rates of academic success and increased self-awareness. Participants had a significantly lower rate of failure or drop out compared with the national average. Comparison of pre- and post-participation data from 450 of these students demonstrated improved understanding of their own LD, ability to explain their disability to others, and ability to self-advocate following participation in the LOTF programs. Overall, the majority of participants reported that participation in the LOTF program contributed significantly to their academic success and would participate again in such a program. Intensive learning supports during the first year of postsecondary studies like those provided by LOTF may increase retention rates and improve key skills for those with LD.*

Learning disabilities (LDs) are the most common type of disability identified in children, adults, and postsecondary students in Canada with 3.2% of children ages 5–14 and 2.5% of adults identified as having a learning disability (LD; Statistics Canada, 2007). The number of actual persons with LD may be even greater when one considers those individuals who have not been assessed and/or who have chosen not to disclose their disability through official channels (Rath & Royer, 2002; Wagner, Newman, Cameto, Garza, & Levine, 2005).

As a result of early identification procedures, coupled with improved technological and educational supports in the younger grades, many students with LDs are encountering greater success at the elementary and secondary school levels and are entering postsecondary institutions in increasing numbers (College Committee on Disability Issues, 2004; Heiman & Precel, 2003; Mull, Sitlington, & Alper, 2001; Sharpe & Johnson, 2001). Indeed, LDs are the most frequently accommodated disabilities at the postsecondary level, affecting from a third

to one half of all students receiving disability support services at Canadian postsecondary institutions (Harrison & Wolforth, 2006).

Despite the strides made with postsecondary access in recent years, students with LD still struggle when transitioning to and successfully completing postsecondary education (Black, Smith, Chang, Harding, & Stodden, 2002; Gregg, 2007; Murray, Goldstein, Nourse, & Edgar, 2000; Nichols, Harrison, McCloskey, & Weintraub, 2002; Wagner et al., 2005). In fact, the majority of students with LD fail to complete the education necessary for transition in the first place, as those with LD drop out of high school two to three times as often as do their non-disabled peers (Young & Browning, 2005). Further, those with LD enroll in postsecondary programs at one-tenth the rate of the general population (Stodden, Jones, & Chang, 2002; Wagner et al., 2005; Young & Browning, 2005).

Even when accepted into college or university, such students continue to face a number of challenges. While the transition from secondary school to postsecondary life is difficult for all students (e.g., Howard, Schiraldi, Pineda, & Campanella, 2006; Martin, Cayanus, Weber, & Goodboy, 2006), it may have an even more profound effect on students with LDs (see Brinckerhoff, McGuire, & Shaw, 2002; Price, Gerber, & Shessel, 2002; Skinner & Lindstrom, 2003; Smith & Young, 2004; Ward, Mallet, Heslop, & Simons, 2003) in that students with LD often move from an environment where they were carefully guided to a setting in which they are expected to achieve on their own (Brinckerhoff, Shaw, & McGuire, 1992; Smith & Young, 2004). Thus, although Disability Services Offices in Ontario currently provide accommodations and learning supports for students with LD who register with their offices, such students must still learn ways to cope with decreased structure, increased autonomy, and develop the ability to self-advocate and choose courses appropriately to succeed at the postsecondary level. The postsecondary graduation rate of students with LD is as low as 3.6%, compared to their non-disabled peers at 62.1% (Murray et al., 2000), and students with LD consistently report lower grades, lower test scores, and lower perceptions of their own academic and intellectual abilities (Heiman & Precel, 2003). These statistics suggest that, in addition to the above issues experienced by all students entering postsecondary education, impairments associated with LD create unique issues that may interfere with the ability of these students to function successfully in the postsecondary environment.

### **Barriers to Success in Postsecondary Education**

Over and above coping with the effects of a disability in general, studies of college students with LD reveal that they have greater difficulty handling academic demands, adjusting to change, dealing with criticism (Mellard & Hazel, 1992), and adjusting to university life (Saracoglu, Minden, & Wilchesky, 1989). Ellis (1993) argued that, in addition to mastering course content information, students must also be self-regulated learners; they need to be “strategic problem solvers who proactively analyze tasks, reflect on their prior experiences and knowledge, set goals, select and employ appropriate strategies for solving the problems, and monitor the effectiveness of their problem-solving behaviors” (p. 359). However, many students with LD lack effective task-approach strategies (Butler, 1995). Typically, they do not understand their disability, lack the skills to be self-regulated learners, and have not had learning strategies instruction to allow skill generalization across contexts (Kovach & Wilgosh, 1999; Nichols et al., 2002). In addition, students with LD continue to have difficulty in academic skills that were not mastered during the school-age years (Gerber, 1998; Smith and Young, 2004); they are often overwhelmed, disorganized, and frustrated in learning situations (Smith, English, & Vasek, 2002; Vaidya, 1999).

While adequate academic and study skills preparation contribute to the success or failure of those with LD at the postsecondary level (Brinckerhoff, 1994; Goldberg, Higgins, Raskind, & Herman, 2003; Gregg, 2007; Mangrum & Strichart, 1988), attention has increas-

ingly been focused on two additional factors that seem to affect postsecondary outcomes of students with LD: self-advocacy and self-understanding with respect to their LDs. Self-advocacy is critical for the success of students with LDs (Troiano, Liefeld, & Trachtenberg, 2010). This advocacy has often resulted in parents meeting the needs of their children, but has not fostered the children's independence (Bryan & Burnstein, 2004; Sitlington & Payne, 2004; Smith et al., 2002), with students with LD usually entering college without knowing how to appropriately advocate for themselves (Harrison, Larochette, & Nichols, 2007; Hitchings et al., 2010; Nichols et al., 2002; Stodden & Jones, 2002).

Adults with LD also must develop a clear and accurate understanding of their own needs, strengths, and limitations, and an ability to efficiently and accurately explain their disorder and how it affects their academic, social, and interpersonal functioning (Nichols et al., 2002; Raskind, Goldberg, Higgins, & Herman, 1999). Without these skills, students with LD may not select courses best suited to their strengths and weaknesses (Harrison et al., 2007; Mangrum & Strichart, 1988), may not understand how their own disability impacts subsequent learning experiences (Brinckerhoff, 1996; DaDeppo, 2009; Harrison et al., 2007; Mangrum & Strichart, 1988), and may not be prepared to explain their learning needs to professors (Hitchings et al., 2001; Lock & Layton, 2001; Nichols et al., 2002). However, despite the importance of self-awareness for postsecondary success, students with LD may not develop an understanding of their disability and its impact upon their learning prior to attending college or university (Nichols et al., 2002; Wehmeyer, Field, Doren, Jones, & Mason, 2004).

### **Development of Programs to Improve Postsecondary Success of Those with LD**

Because of the increasing number of students with LDs in postsecondary institutions and concerns regarding the ability of these students to successfully complete this level of education, the Ontario government established the Learning Opportunities Task Force (LOTF) in 1997 to address concerns regarding the ability of students with LD to transition to and succeed in the postsecondary environment, and to collect and analyze data regarding the most effective ways in which postsecondary institutions could accommodate and assist all students with LD (Nichols et al., 2002).

To actualize these goals, the LOTF commissioned 13 pilot projects at postsecondary institutions across Ontario. Relying on research that suggested strategies likely to improve educational success of those with LD, the LOTF pilot projects implemented intensive learning skills, education, and self-advocacy interventions for students enrolled in such projects. Although the specific delivery methods and time devoted to each project component differed at each institution, all LOTF programs required mandatory participation (at least in the first year of the program) in the following activities or components: (a) having students participate in an up-to-date psychoeducational evaluation; (b) helping students evaluate the appropriateness of their chosen postsecondary program and provide academic advising where appropriate; (c) teaching students about their disability and appropriate compensatory strategies; (d) teaching students to self-advocate; (e) teaching students about their educational rights and responsibilities; (f) encouraging students to self-identify and seek appropriate assistance and to become more independent after first year; (g) teaching students how to organize for living and learning; (h) facilitating a support network; and (i) providing one-to-one learning strategies and assistive technology coaching and support. While other aspects of each pilot project may have differed between sites, these nine components were included in all of the LOTF pilot projects. Students were given the option to continue participating in components of relevance after their first year in the program, but did not have to participate in every component after the initial year.

The purpose of the current study was to examine the effects of participation in these intensive and LD-specific postsecondary education and support programs delivered to students through at least their first year of postsecondary education. This paper reports on the subjective opinions endorsed by students when they began this program as opposed to when they completed or left the program. Objective data regarding overall academic performance were also obtained from participants or pilot project staff.

## Method

### Participants

Students with LD at the pilot institution were aware that a major component of the LOTF project involved research and evaluation. Students were informed that their willingness to complete any surveys for the LOTF was voluntary and would not affect the services or supports they received while in the program.

Of the 1242 students who participated in all of the pilot projects, 1153 agreed to complete the initial intake questionnaire (see Harrison et al., 2007 for information about the initial sample). However, 44 of these were students who participated in a summer transition program only. Their data were not included in this analysis as they did not necessarily go on to complete their postsecondary studies in one of the LOTF projects. An additional 57 students who completed the intake questionnaire were in French-language LOTF projects. Due to inadequate means of assessing for LD in French at that time (Nichols et al., 2002), these pilot projects were discontinued after just over one year of the project and no exit questionnaires were completed. Finally, 52 students completed the intake questionnaire but were subsequently found to not meet the diagnostic criteria for LD; as such, they did not complete exit questionnaires. Overall, there were 969 students (47.2% women and 52.3% men) with confirmed LDs enrolled in the LOTF postsecondary programs who completed the initial intake questionnaire and were eligible to complete an exit questionnaire. Students were asked to complete an exit questionnaire when they graduated, left their postsecondary institution or withdrew from the LOTF program, or when the pilot program funding ended.

Of those initial 969, 450 (47% response rate) from three universities ( $n = 85$ ) and six colleges ( $n = 365$ ) in Ontario completed both the intake and final questionnaires as part of the LOTF program. No significant difference was found in the survey attrition rate between college and university respondents or by sex of respondent.

Additional information concerning 395 students who did not complete the exit questionnaire was obtained via a proxy questionnaire completed by Disability Services staff at the pilot institutions. While not able to comment on specific skills, these proxy questionnaires served to identify graduation status and provide other demographic information of relevance for students who had completed the intake questionnaire. Survey questions pertaining to similar content in both surveys was also evaluated in the present analysis. Cases with missing data were excluded list-wise. The mean age of participants was 24.0 years (participant-completed and proxy).

### Procedure

The LOTF was a 5-year pilot project that ran from 1998 to 2003, with funded programs aimed at improving the postsecondary experiences of students with LD. Ten postsecondary English-language institutions (four universities and six colleges) were chosen to develop and implement these pilot projects. One of these was a summer only orientation program for incoming students. All students applying to participate in the LOTF program at the pilot locations had to meet the LOTF's rigorous diagnostic validation criteria to be deemed eligible for participation. Students had to meet the DSM-IV criteria for a Learning Disorder, demon-

strating a significant discrepancy between measured intellectual functioning and actual academic achievement in someone of least average intelligence and the criteria subsequently adopted by the Learning Disabilities Association of Ontario (2002), as part of its new definition of LD. These criteria demanded clear-cut evidence that any noted academic discrepancy was logically related to measurable deficits in underlying psychological processes (e.g., memory, phonological processing, or processing speed). Students interested in participating were asked to present themselves to their institution's Disability Services Office to meet with a pilot staff member. The nature of the project, including the fact that their participation in certain activities and programs was mandatory, was described. Students were also informed of the research nature of the LOTF project. After being given an opportunity to have any questions answered, students were asked to consent to participate in the research portion of the LOTF project.

All pilot project students participated in program-specific components during at least their first year of study including specific workshops and one-on-one tutoring delivered throughout the entire year, geared towards improving awareness of their disability, ability to self-advocate, and understanding of strategies and technology to compensate for their academic impairments. While other aspects of each pilot project may have differed between sites, the nine essential components were included in all of the LOTF pilot projects. Students were given the option to continue participating in components of relevance after their first year in the program, but did not have to participate in every component after the initial year. Further information regarding the LOTF pilot projects may be found in Harrison et al. (2007).

Staff at all pilot projects administered an intake questionnaire to pilot students within 2 to 4 weeks of their having entered the program. Student progress and satisfaction with the pilot projects were tracked using an exit questionnaire administered when the student left the program or the project ended. To ensure student anonymity and privacy, no identifying information was contained in any questionnaires. Questionnaires were numbered according to the year they were administered, and each envelope was pre-assigned a unique identifier, with the number corresponding to a database kept by the pilot institution staff. The numbering system ensured that the students' privacy was well protected and that the LOTF did not receive identifying information about the students. Completed questionnaires were placed in the envelopes, sealed, and sent to the LOTF office for entry into a specially prepared database, with access limited to the researchers.

Analyses were performed on the mean scores for the dichotomous variables and Bonferroni corrections were made for multiple comparisons. All statistical test results showing significance level at or below .05 are reported but only those comparisons with alpha less than .01 are considered significant.

## **Measures**

When exiting the program, students were asked to report reasons for leaving and academic status, as well as to evaluate the efficacy of the program. Disability Services staff members were asked to complete a proxy exit questionnaire for those initial study participants who did not complete the questionnaire on their own, providing general information about these students. Of those who completed both the intake and exit questionnaires, three questions pertained to students' understanding of their LDs. Students' responses to these questions were the dependent variables in the study. These questions asked students about understanding of their LDs ("How good is your understanding of your learning disabilities?"), ability to explain their LDs to others ("How well can you explain your learning disabilities to other people?"), and ability to advocate for accommodations ("How well can you advocate for the accommodations that you require in order to cope with or compensate for your learning disabilities?"). These items were rated on a 5-point Likert scale ranging

from 1 (*very good*) to 5 (*very poor*). Students were also asked to identify the specific type of LD they believed they had, but since their perceptions could not be verified objectively these data are not reported.

Students were also asked to rate the extent to which the LOTF pilot program had contributed to their academic success using a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*significantly*). They were asked a yes/no question regarding whether they would recommend this program to a friend and whether or not they would participate in such a program again. Open-ended questions regarding current course marks were asked. Questions in both the in-person and proxy questionnaires asked about student educational status (graduated, left program, left school), and their reasons for leaving the program if they had not graduated.

## Results

### Academic Success

Of those who completed the exit survey, 82.9% of respondents stated that the pilot project had contributed significantly to their academic success, 5.4% said it had contributed somewhat to their success, and 11.7% gave no response. In addition, 99.5% said they would recommend participation in such LD-specific support programs to a friend and an equivalent number stated that they would participate again in such a support program. When asked about academic achievement, 53% of respondents had received marks in the A to B range in their courses with only 7% reporting marks below a C.

### Status at Time of Departure from LOTF Program

Data regarding 845 students (395 proxy questionnaires and 450 actual respondents) were available to identify academic status at the time of exiting the LOTF program. As shown in Figures 1–3, no students in the university-based programs had dropped out of school, although a proportion were counselled to leave the program or transferred to another institution. Personal, medical, or financial reasons or getting a job were cited for their departure from the LOTF program. Of all college participants, 10.7% had dropped out of college; significantly more of these students had a proxy questionnaire completed on their behalf (20 people or 5.6% of college respondents had dropped out compared with 42 proxy respondents or 18.4%, likelihood ratio = 27.5,  $p < .001$ ). These figures are still much lower than the national drop-out rate in Canadian postsecondary institutions during this same time period (16% university, 25% college dropout rate reported by Statistics Canada in 1999; Shaienks, Gluszynski, & Bayard, 2008). Overall, almost half of the respondents from both colleges and universities completed the survey because they were graduating, and an additional 31.2% planned to continue studying either at their current institution or somewhere else despite exiting the program.

For those questionnaires that endorsed reason for leaving the LOTF program as being “because the pilot project ended,” there was no difference in the amount of time students had spent in the LOTF program between proxy and self-report. Most of the college students in this situation had completed 1 or 2 years of study (53.6% and 36.4%, respectively). Of the 9 university students who left the LOTF program because the pilot ended, most had completed 3 years of their academic program (55.6%); the rest completed either 2 or 4 years (22.2% each). Further, only 3 students who left because the pilot ended had participated in the LOTF program for less than a full academic year.

When asked to rate the extent to which their LD affected certain aspects of their daily life, almost all participants agreed that academic functioning was affected, with university students endorsing this to a greater extent than those in college,  $F(1, 448) = 19.2, p < .001$ . As shown in Table 1, their belief that LD affected academic performance did not diminish

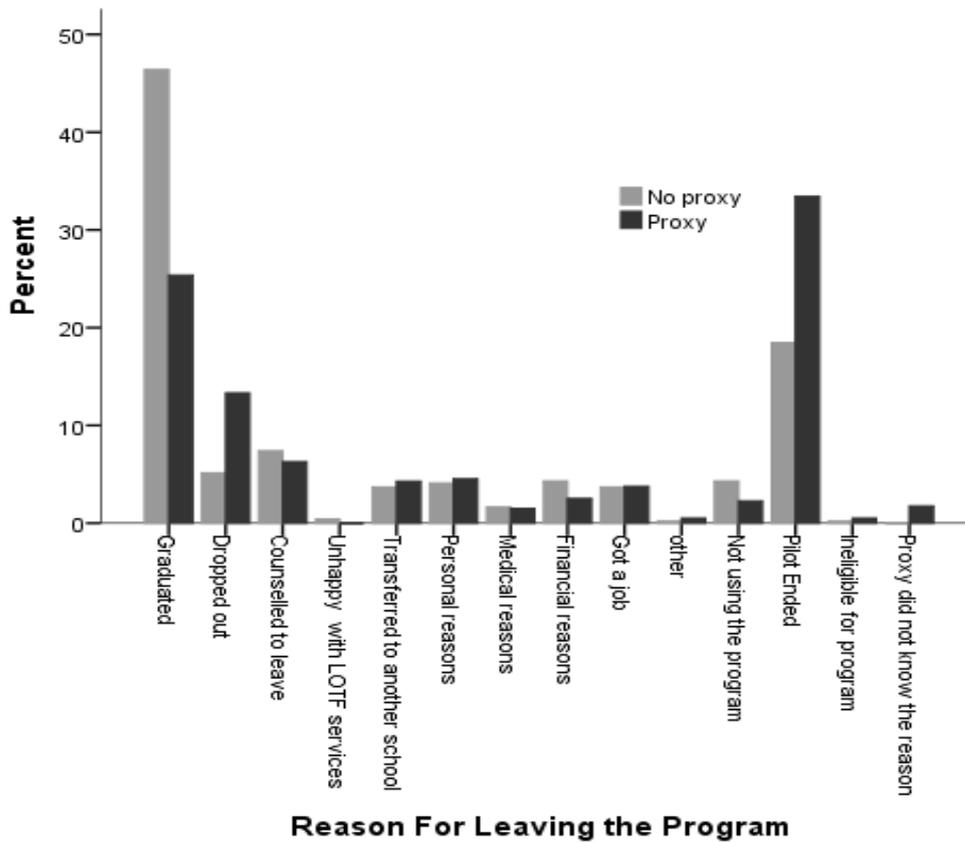


Figure 1. Reasons for leaving the program given by students or by their proxy

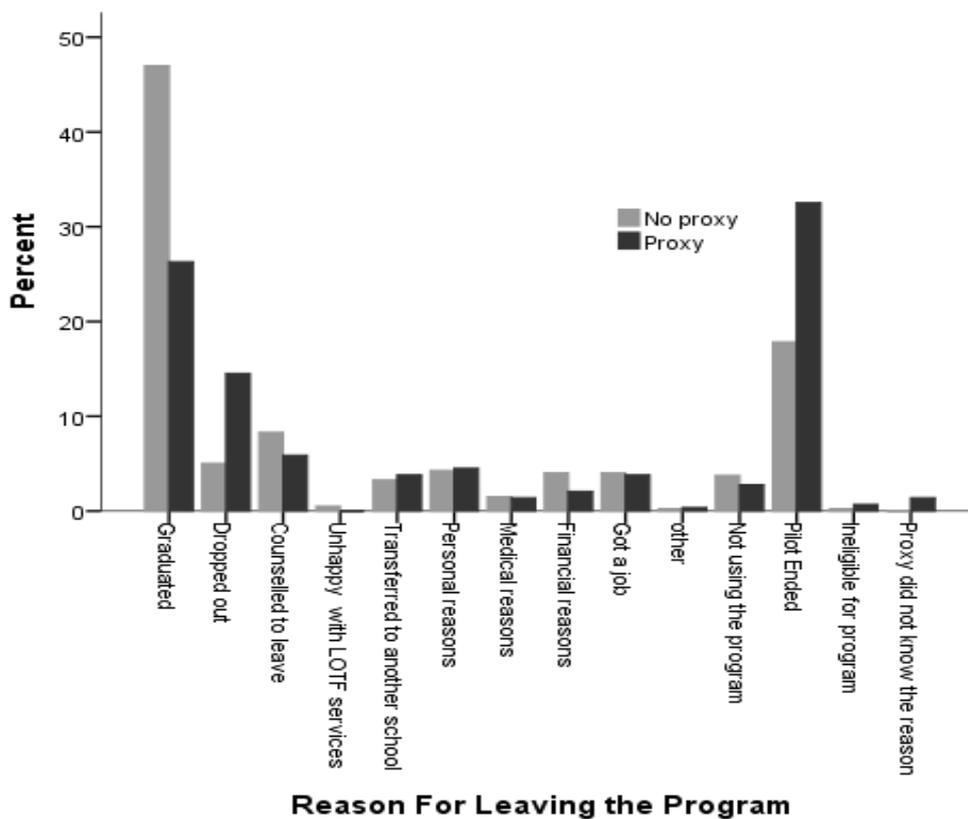


Figure 2. Reasons for leaving the program as endorsed by college students.

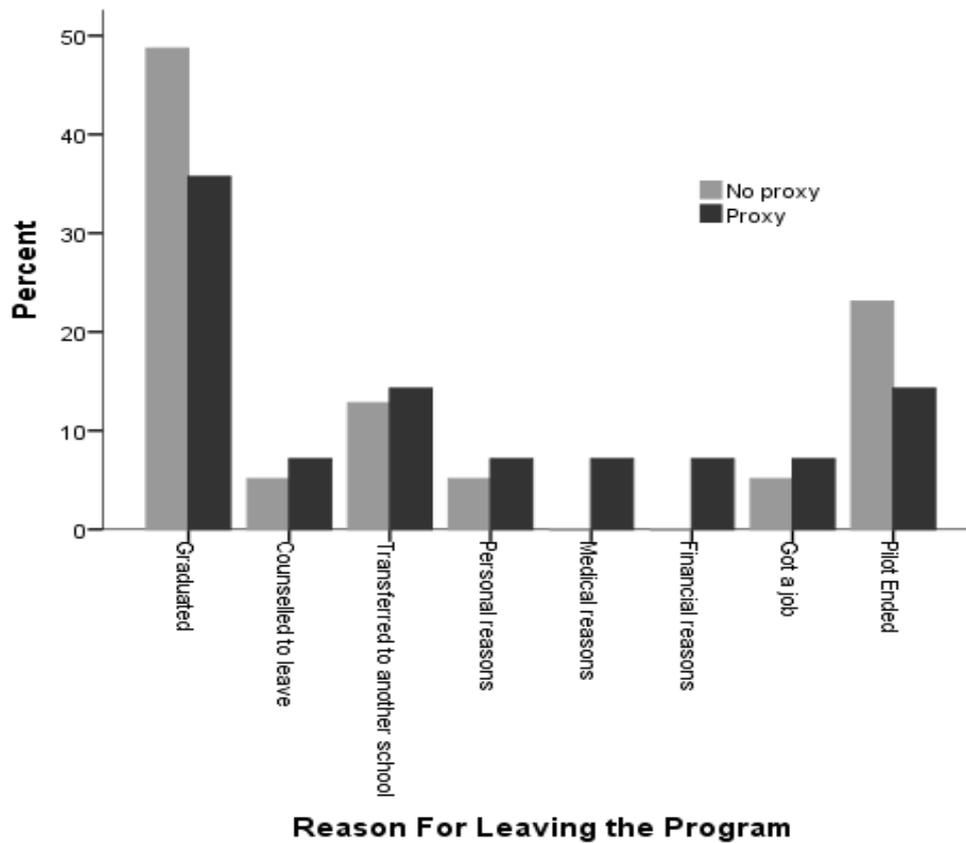


Figure 3. Reasons for leaving the program as endorsed by university students

following participation in the LOTF programs, with almost all students endorsing this question. In fact, as shown on Table 1, university students endorsed this aspect to a greater extent following participation in these programs, although this change was only marginally significant. After participating in these programs, a significantly greater number of university students gained awareness of the effects of their LD on their lives both socially and at work. College students decreased their endorsement on the effect of their LD on their self-esteem after the program, whereas university students did not (see Table 1).

Table 2 shows the changes in students' perception of their understanding of their LD before and after program participation. Results from a repeated-measures ANOVA identified that students report a significant improvement in their ability to (a) understand their own LD; (b) explain their LD to others; and (c) advocate for themselves. Further, as shown in Table 2, the majority of students left the LOTF program rating their skills in these areas as being good or very good. College and university participants both demonstrated significant improvements in these areas, whereas fewer than half of the respondents held these opinions at the start of the LOTF program.

### Discussion

The purpose of this paper was to examine the effects of participation in intensive and LD-specific postsecondary education and learning support programs and to gain greater awareness of the postsecondary outcomes of students with LD. Using survey data, we examined the success of providing students with an updated psychoeducational assessment identifying their learning strengths and weaknesses; self-advocacy training; individualized coaching to improve their self-awareness of their disability; specialized study and learning

**Table 1**  
**The Percentage of Students Endorsing Items Reflecting their Perception of the Impact of their Learning Disability on Daily Living Before and After Completing the LOTF Program**

Aspect affected by LD	All respondents	Students completing both surveys		98% CI	
	Before	Before	After		
College students					
	<i>n</i> = 881	<i>n</i> = 365			
Academic learning and education	82.0	84.7	81.1	-.098,	.027
Social relationships, such as getting along with family or friends	18.8	20.3	21.4	-.044,	.066
Day to day life skills, such as banking, managing home	16.0	15.1	19.2	-.016,	.099
Employment, such as getting and keeping a job	18.6	18.9	20.8	-.036,	.074
Self-esteem	48.2	51.5	43.8	-.143,	-.010**
Other	5.6	5.4	6.8	-.025,	.053
Don't know	6.7	4.4	3.0	-.047,	.020
University students					
	<i>n</i> = 228	<i>n</i> = 85			
Academic learning and education	93.0	94.1	98.8	-.008,	.102*
Social relationships, such as getting along with family or friends	14.9	10.6	28.2	.063,	.290**
Day to day life skills, such as banking, managing home	14.0	11.8	22.4	-.013,	.225
Employment, such as getting and keeping a job	7.9	9.4	18.8	.000,	.188*
Self-esteem	42.5	40.0	47.1	-.066,	.207
Other	5.7	3.5	3.5	-.056,	.056
Don't know	2.2	1.2	2.4	-.037,	.060

Note. CI = confidence interval of the difference between proportions.  
 \**p* < .05, \*\**p* < .01

**Table 2**  
**Self Reported Rating of Students' Perception of their LD Before and After Completing the LOTF Program**

	Mean ratings <sup>a</sup> and statistical tests ( <i>N</i> = 450)						% rating their skills as good or very good	
	<i>n</i>	Before		After		95% CI	Before	After
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Understanding your LD	421	2.54	1.0	2.00	0.8	.430, .639	48.9	87.4
Ability to explain your LD	418	2.87	1.1	2.40	1.0	.364, .592	39.7	78.0
Ability to advocate for your accommodations	406	2.61	1.1	2.24	1.0	.238, .501	46.4	81.6

Note. CI = confidence interval of the difference between means.

<sup>a</sup>Lower scores represent a more positive rating.  
*p* < .001 for all before/after comparisons.

strategies support; and instruction and support in the proper use of assistive technology where appropriate.

Overall, it appears that the majority of respondents felt the program contributed significantly to their academic success. Most respondents reported receiving academic marks that were above average, with very few receiving grades below a C. This finding suggests that educational and learning supports provided to these students may have allowed them to experience success in their chosen academic programs.

Graduation and drop-out rates were available for almost all students who had completed the intake questionnaire. The drop-out rate of students in the LOTF programs was substantially lower than the rate reported for college and university students in general (Shaienks, Gluszynski, & Bayard, 2008). Even those for whom proxy data were provided appear to have had a drop-out rate lower than the national average. This finding speaks to the possible beneficial effects of participation in an intensive and LD-specific program during at least the first year of postsecondary study, and highlights the need for such programs to be available at all institutions. While one could argue that the exit-survey responses were biased towards those students who had graduated and were successful, the proxy data demonstrate that this possibility does not fully explain the findings. Indeed, no university student in the LOTF program dropped out. While more proxy students had dropped out of college compared to respondents, they still appear to have left school at a rate lower than the average for most non-disabled students. It also appears that more of the proxy students had not graduated but were continuing on at their institution because the pilot project had ended.

We know that LDs are lifelong, neurologically-based disorders that affect functioning not only in school, but also in many other activities of daily life (Learning Disabilities Association of Ontario, 2002). As such, it was not surprising to find that the majority of participants not only identify that LD affects them academically, but also that this did not change as a result of the program. In other words, these students identify that their academic functioning is impacted by their LD. What the results do indicate, however, is that with specific training and support these students were still able to be successful academically and that fewer than average students had to drop out of their program due to academic failure.

Of interest was also the fact that participation in these programs seems to have increased awareness of students with respect to other aspects of their lives in which their LD had some influence. For instance, they became more aware of the impact that their LD had on social and interpersonal functioning. Similarly, students at college report a greater awareness of the extent to which their LD interfered with general life skills. While it is possible that simply participating in college-level courses might bring about this understanding, it may also be the case that specific interactions and teaching offered in the LOTF program, including their up-to-date assessment, helped these students better understand the aspects of their lives that were affected by their specific processing impairments.

The findings of the study also suggest that students' LDs continued to substantially affect their self-esteem, although fewer of the college students felt this way at the end of the program relative to when they began. Given the findings of Saracoglu et al. (1989) showing that lower self-esteem is associated with lower self-efficacy and less successful adjustment at university, this finding underlines the need to improve self-esteem of students with LD starting in the younger grades. A substantial body of research demonstrates that students with LD generally tend to report lower self-esteem than their peers without LD (e.g., Conley, Ghavami, VonOhlen, & Foulkes, 2007; Gans, Kenny, & Ghany, 2003). The fact that a large proportion of the LOTF participants (44% of college and 47% of university participants) continue to feel that their LD affects their self-esteem despite their reported academic success speaks to the need for continued attention to self-esteem issues among individuals with LDs.

The results of the study further indicate that participation in the LOTF programs not only improved students' reported ability to explain their own LD to others, but also improved their ability to advocate for their own accommodations. Unfortunately, self-advocacy skills are not explicitly taught in most high schools (Merchant & Gajar, 1997). Therefore, high school teachers, guidance personnel, and parents may need to play a crucial role in teaching self-advocacy skills to students with LD prior to making the transition to college or university. Teaching a variety of academic and self-advocacy skills may not only promote success

in postsecondary settings for students with LD, but also foster independence among students with LD (Brinckerhoff, 1994; Merchant & Gajar, 1997).

In conclusion, because students with LD reach postsecondary settings at a significantly lower rate than their counterparts without LD (Wagner et al., 2005), transition planning and programs may help students with LD in transitioning successfully from high school to postsecondary education. Thus the findings of the present study underscore the importance of effective transition plans and programs for promoting academic and occupational success among students with LD. "Making informed choices and communicating one's needs succinctly can be particularly difficult for students with LD, but with these critical skills, the transition from high school to college will be easier" (Brinckerhoff, 1994, p. 237).

### **Limitations and Future Directions**

Although the current study utilized the largest sample of well-validated students with LDs ever surveyed, it is necessary to identify the limitations that may affect the generalization of the current findings. First, the demographics of the current sample may not be representative of the usual population of students with LD. The ratio of women to men, for example, in the current sample, was almost equal, whereas numerous studies (e.g., Flannery, Liederman, Daly, & Schultz, 2000; Rutter et al., 2004) have shown that identified rates of LD such as reading disabilities is higher in boys than girls (however, see Shaywitz, Shaywitz, Fletcher, & Escobar, 1990, for an alternate explanation for this uneven sex distribution). Given, however, that more women than men are attending postsecondary institutions in general (Statistics Canada, 2009), this finding may simply reflect the female bias present at college and university in general.

A second limitation is the fact that not all respondents were at the same stage academically when they completed the exit questionnaire. Some were completing a 2-year program whereas others a 4-year university program. Additionally, some completed the survey when they were dropping out of school or leaving the LOTF program, and finally a few completed it in the midst of their studies but when the LOTF program ended. As such, one could argue that it is difficult to draw any conclusions from our data. However, all but three participants had completed the first year of the program where the nine essential components were consistently delivered and when the program was likely to have its greatest impact.

Another major limitation of the current report was that almost all of the data gathered relied on self-reported and subjective opinions covering past and present experiences and effects of the LOTF program. Although self-report bias is unavoidable when asking students to rate such items, this method of data collection was the only feasible method of gathering important information on LD students' academic experiences. As well, the pilot staff emphasized to students to report their experiences as best they remembered them and stressed the fact that their responses would not affect their participation in the study or affect their opportunities to receive academic support through the pilot project itself. While students provided us with subjective opinions regarding their actual abilities, we have no triangulation of their perceptions. Finally, it is possible that over time and without the LOTF programs these students might have enjoyed similar outcomes.

However, despite these limitations, it is believed that the large sample size and strict eligibility criteria makes this sample a very good representation of LD students in postsecondary institutions from 1998–2002, and presents a wealth of information that can be applied to other groups of learning disabled students in the country.

Based on the information outlined in the present study, the Ministry of Training, Colleges and Universities of Ontario recognized the need for postsecondary students to have access to appropriate diagnostic assessments, learning and assistive technology training and support, and transition services in order to reach their full potential at the postsecondary level.

In an effort to enhance the number of proper assessments being provided to students throughout their schooling, the LOTF recommended the government of Ontario develop a number of projects, including provincially funded, not-for-profit Assessment Centres. The purpose of these centres was to provide adults with access to affordable and comprehensive psycho-educational assessments, as well as on-site follow-up care and services such as adaptive technology training, learning strategies tutoring, and guidance for the transition to postsecondary learning. Although these programs represent the beginning of a growing trend of services that are becoming available, research into the effectiveness of various transition and assistive programs will also play a key role in advancing the education of students with LD.

Moreover, these findings prompted the Ministry of Training, Colleges and Universities to invest in providing every publically funded college and university in Ontario with two new staff positions: a Learning Strategist and an Assistive Technologies Specialist, through an enhanced services fund (Nichols, 2004). These positions were developed and funded as a direct result of the feedback provided by students in the LOTF pilot projects who identified these services as being key to their academic success. Given that the majority of high school students with LD generally enter postsecondary settings without much knowledge of their LDs and how such disabilities affect their academic learning (Saracolu et al., 1989; Skinner & Lindstrom, 2003), every college and university in Ontario now has funding to provide a transition-to-postsecondary program for students with LD. While these are typically brief programs delivered just before the start of the academic year, they provide students with LD the opportunity to obtain additional information and support when making the transition to postsecondary education.

The research data gathered by the LOTF have continued to inform the provision of postsecondary educational supports to students with LD in Ontario and has had an impact in other provinces in Canada as well as elsewhere. It is the authors' hope that this report will result in some improvements in the way students with LD are supported, given that we now know what they need and how they can be helped to achieve their potential.

## References

- Black, R. A., Smith, G., Chang, C., Harding, T., & Stodden, R. A. (2002). Provision of educational supports to students with disabilities in two-year postsecondary programs. *Journal for Vocational Special Needs Education, 24*, 3–17. Retrieved from <http://www.cew.wisc.edu/jvsne/>
- Brinckerhoff, L. C. (1994). Developing effective self-advocacy skills in college-bound students with learning disabilities. *Intervention in School and Clinic, 29*, 229–237. doi:10.1177 /105345129402900407
- Brinckerhoff, L. C. (1996). Making the transition to higher education: Opportunities for student empowerment. *Journal of Learning Disabilities, 29*, 118–136. doi:10.1177/002221949602900202
- Brinckerhoff, L. C., McGuire, J. M., & Shaw, S. F. (2002). *Postsecondary education and transition for students with learning disabilities*. Austin, TX: PRO-ED.
- Brinckerhoff, L. C., Shaw, S. F., & McGuire, J. M. (1992). Promoting access, accommodations, and independence for college students with learning disabilities. *Journal of Learning Disabilities, 25*, 417–429. doi:10.1177/002221949202500702
- Bryan, T., & Burnstein, K. (2004). Improving homework completion and academic performance: Lessons from special education. *Theory into Practice, 43*, 213–219. doi:10.1207/s15430421tip4303\_7
- Butler, D. (1995). Promoting strategic learning by postsecondary students with learning disabilities. *Journal of Learning Disabilities, 28*(3), 170–190. doi:10.1177/002221949502800306
- College Committee on Disability Issues. (2004). *CCDI submission to the Postsecondary Review*. Retrieved from [http://www.disabilityissues.ca/english/link\\_doc/review\\_docs/Rae\\_Review\\_submission\\_for\\_CCDI\\_final.doc](http://www.disabilityissues.ca/english/link_doc/review_docs/Rae_Review_submission_for_CCDI_final.doc)
- Conley, T. D., Ghavami, N., VonOhlen, J., & Foulkes, P. (2007). General and domain-specific self-esteem among regular education and special education students. *Journal of Applied Social Psychology, 37*, 775–789. doi:10.1111/j.1559-1816.2007.00185.x

- DaDeppo, L. M. W. (2009). Integration factors related to the academic success and intent to persist of college students with learning disabilities. *Learning Disabilities Research & Practice, 24*, 122–131. doi:10.1111/j.1540-5826.2009.00286.x
- Ellis, E. (1993). Integrative strategy instruction: A potential model for teaching content area subjects to adolescents with learning disabilities. *Journal of Learning Disabilities, 26*(6), 358–383. doi:10.1177/002221949302600602
- Flannery, K. A., Liederman, J., Daly, L., & Schultz, J. (2000). Male prevalence for reading disability is found in a large sample of black and white children free from ascertainment bias. *Journal of the International Neuropsychological Society, 6*(4), 433–442. doi:10.1017/S1355617700644016
- Gans, A. M., Kenny, M. C., & Ghany, D. L. (2003). Comparing the self-concept of students with and without learning disabilities. *Journal of Learning Disabilities, 36*, 287–294. doi:10.1177/002221940303600307
- Gerber, P. (1998). Characteristics of adults with specific learning disabilities. In B. K. Lenz, N. A. Sturmski, & M. A. Corley (Eds.), *Serving adults with learning disabilities: Implications for effective practice (n.p.)*. Washington, DC: U.S. Department of Education.
- Goldberg, R. J., Higgins, E. L., Raskind, M. H., & Herman, K. L. (2003). *Life success for children with learning disabilities: A parent guide*. Pasadena, CA: Frostig Centre.
- Gregg, N. (2007). Underserved and underprepared: Postsecondary learning disabilities. *Learning Disabilities Research and Practice, 22*, 219–228. doi:10.1111/j.1540-5826.2007.00250.x
- Harrison, A. G., Larochette, A. C., & Nichols, E. (2007). Students with learning disabilities in postsecondary education: Selected initial characteristics. *Exceptionality Education Canada, 17*, 135–154.
- Harrison, A. G., & Wolforth, J. (2006). *Results from a national survey of disability service providers in the Canadian postsecondary system*. Unpublished manuscript.
- Heiman, T., & Precel, K. (2003). Students with learning disabilities in higher education: Academic strategies profile. *Journal of Learning Disabilities, 36*, 248–258. doi:10.1177/002221940303600304
- Hitchings, W. E., Kophamer Johnson, K., Luzzo, D. A., Retish, P., Hinz, C., & Hake, J. (2010). Identifying the career development needs of community college students with and without learning disabilities. *Journal of Applied Research in the Community College, 18*(1), 22–29. Retrieved from <http://www.ncccrp.org/page.asp?page=981>
- Hitchings, W. E., Luzzo, D. A., Ristow, R., Horvath, M., Retish, P., & Tanners, A. (2001). The career development needs of college students with learning disabilities: In their own words. *Learning Disabilities Research & Practice, 16*, 8–17. doi:10.1111/0938-8982.00002
- Howard, D. E., Schiraldi, G., Pineda, A., & Campanella, R. (2006). Stress and mental health among college students: Overview and promising prevention interventions. In M. V. Landow (Ed.), *Stress and mental health of college students* (pp. 91–123). New York, NY: Nova Science.
- Kovach, K., & Wilgosh, L. R. (1999). Learning and study strategies and performance anxiety in postsecondary students with learning disabilities: A preliminary study. *Developmental Disabilities Bulletin, 27*(1), 47–57.
- Learning Disabilities Association of Ontario. (2002). *Official definition of learning disabilities*. Retrieved from [http://www.ldac-taac.ca/Defined/defined\\_new-e.asp](http://www.ldac-taac.ca/Defined/defined_new-e.asp).
- Lock, R. H., & Layton, C. A. (2001). Succeeding in postsecondary education through self-advocacy. *Teaching Exceptional Children, 34*, 66–71. Retrieved from <http://journals.cec.sped.org/tec/>
- Mangrum, C. T., & Strichart, S. S. (1988). *College and the learning disabled student*. Philadelphia, PA: Grune & Stratton.
- Martin, M. M., Cayanus, J. L., Weber, K., & Goodboy, A. K. (2006). College students' stress and its impact on their motivation and communication with their instructors. In M. V. Landow (Ed.), *Stress and mental health of college students* (pp. 149–169). Hauppauge, NY: Nova Science.
- Mellard, D. F., & Hazel, J. S. (1992). Social competencies as a pathway to successful life transitions. *Learning Disabilities Quarterly, 15*, 251–271. doi:10.2307/1511317
- Merchant, D., & Gajar, A. (1997). A review of the literature on self advocacy components in transition programs for students with learning disabilities. *Journal of Vocational Rehabilitation, 8*, 223–231. doi:10.1016/S1052-2263(97)00005-6
- Mull, C., Sitlington, P. L., & Alper, S. (2001). Postsecondary education for students with learning disabilities: A synthesis of the literature. *Exceptional Children, 68*, 97–118. Retrieved from <http://journals.cec.sped.org/ec/>

- Murray, C., Goldstein, D. E., Nourse, S., & Edgar, E. (2000). The postsecondary school attendance and completion rates of high school graduates with learning disabilities. *Learning Disabilities Research & Practice, 15*, 119–127. doi:10.1207/SLDRP1503\_1
- Nichols, E. (2004). Executive summary of the report on the implementation and evaluation of the pilot enhanced services (ESF) projects at Ontario's publicly funded colleges and universities. Retrieved from <http://www.ontla.on.ca/library/repository/mon/9000/248873.pdf>
- Nichols, E., Harrison, A., McCloskey, L., & Weintraub, L. (2002). *Learning Opportunities Task Force 1997–2002: Final report*. Richmond Hill, ON: Learning Opportunities Task Force.
- Price, L. A., Gerber, P. J., & Shessel, I. (2002). Adults with learning disabilities and employment: A Canadian perspective. *Thalamus: The Journal of the International Academy for Research in Learning Disabilities, 20*, 29–40. Retrieved from [http://www.iarld.com/?page\\_id=39](http://www.iarld.com/?page_id=39)
- Raskind, M. H., Goldberg, R. J., Higgins, E. L., & Herman, K. L. (1999). Patterns of change and predictors of success in individuals with learning disabilities: Results from a twenty-year longitudinal study. *Learning Disabilities Research and Practice, 14*, 35–49. doi:10.1207/sldrp1401\_4
- Rath, K., & Royer, J. (2002). The nature and effectiveness of learning disability services for college students. *Educational Psychology Review, 14*, 353–381. doi:10.1023/A:1020694510935
- Rutter, M., Fergusson, D., Horwood, L. J., Goodman, R., Maughan, B., Moffitt, T. E., ... Carroll, J. (2004). Sex differences in developmental reading disability: New findings from 4 epidemiological studies. *Journal of the American Medical Association, 291*(16), 2007–2012. doi:10.1001/jama.291.16.2007
- Saracoglu, B., Minden, H., & Wilchesky, M. (1989). The adjustment of students with learning disabilities to university and its relationship to self-esteem and self-efficacy. *Journal of Learning Disabilities, 22*(9), 590–592. doi:10.1177/002221948902200913
- Shaiens, D., Gluszynski, T., & Bayard, J. (2008, November). *Postsecondary education – participation and dropping out: Differences across university, college and other types of postsecondary institutions* (Publication No. 81-595-M). Retrieved from <http://www.statcan.gc.ca/pub/81-595m/2008070/6000001-eng.htm>
- Sharpe, M. N., & Johnson, D. R. (2001). A 20/20 analysis of postsecondary support characteristics. *Journal of Vocational Rehabilitation, 16*, 169–177.
- Shaywitz, S. E., Shaywitz, B. A., Fletcher, J. M., & Escobar, M. D. (1990). Prevalence of reading disability in boys and girls. Results of the Connecticut Longitudinal Study. *Journal of the American Medical Association, 264*(8), 998–1002. doi:10.1001/jama.1990.03450080084036
- Sitlington, P. L., & Payne, E. M. (2004). Information needed by postsecondary education: Can we provide it as part of the transition assessment process? *Learning Disabilities: A Contemporary Journal, 2*, 1–14. Retrieved from <http://www.ldworldwide.org/research/learning-disabilities-a-contemporary-journal>
- Skinner, M. E., & Lindstrom, B. D. (2003). Bridging the gap between high school and college: Strategies for the successful transition of students with learning disabilities. *Preventing School Failure, 47*, 132–137. doi:10.1080/10459880309604441
- Smith, J. J., & Young, K. (2004). Issues in transition from school to postsecondary education: Focus on students with learning disabilities. In E. M. Levinson (Ed.), *Transition from school to post-school life for individuals with disabilities: Assessment from an educational and school psychological perspective*. Springfield, IL: Charles C. Thomas Publisher.
- Smith, S. G., English, R., & Vasek, D. (2002). Student and parent involvement in the transition process for college freshmen with learning disabilities. *College Student Journal, 36*, 491–503.
- Statistics Canada. (2007). *Participation and activity limitation survey 2006: Technical and methodological report*. Retrieved from <http://www.statcan.ca/Daily/English/071203/d071203a.htm>
- Statistics Canada. (2009). *Postsecondary enrollment and graduation*. Retrieved from <http://www.statcan.gc.ca/pub/81-599-x/81-599-x2009003-eng.htm>
- Stodden, R. A., & Jones, M. A. (2002, March). *Services, supports, and accommodations for individuals with disabilities: An analysis across secondary education, postsecondary education, and employment*. Paper presented at National Capacity Building Institute, Honolulu, HI.
- Stodden, R. A., Jones, M. A., & Chang, K. B. T. (2002). *Services, supports and accommodations for individuals with disabilities: An analysis across secondary education, postsecondary education, and employment*. Unpublished manuscript, Honolulu, HI.
- Troiano, P. F., Liefeld, J. A., & Trachtenberg, J. V. (2010). Academic support and college success for postsecondary students with learning disabilities. *Journal of College Reading and Learning, 40*(2), 35–44. Retrieved from <http://www.crla.net/journal.htm>

- Vaidya, S. (1999). Metacognitive learning strategies for students with learning disabilities. *Education, 120*(1), 186–189, 81.
- Wagner, M., Newman, L., Cameto, R., Garza, N., & Levine, P. (2005). *After high school: A first look at the postschool experiences of youth with disabilities*. Menlo Park, CA: SRI International.
- Ward, L., Mallet, R., Heslop, P., & Simons, K. (2003). Transition planning: How well does it work for young people with learning disabilities and their families. *British Journal of Special Education, 30*, 132–137. doi:10.1111/1467-8527.00298
- Wehmeyer, M. L., Field, S., Doren, B., Jones, B., & Mason, C. (2004). Self-determination and student involvement in standards-based reform. *Exceptional Children, 70*, 413–425. doi:10.1177/10983007040060010501
- Young, G., & Browning, J. (2005). Learning disabilities/dyslexia and employment—A mythical view. In G. Reed & A. Fawcett (Eds.), *Dyslexia in context: Research, policy and practice* (pp. 25–59). London, England: Whurr Publisher.

### **Authors' Note**

Correspondence concerning this article should be addressed to Dr. Allyson Harrison, Regional Assessment and Resource Centre, Queen's University, Mackintosh-Corry Hall, B100, 68 University Avenue, Kingston, ON K7L 3N6. E-mail: harrisna@queensu.ca

The authors would like to thank Dr. Irene Armstrong for her assistance in editing and revising this manuscript. Funding for this research was generously provided by the Ontario Ministry of Training, Colleges and Universities.