

## Equal Education, Unequal Jobs: College and University Students with Disabilities

## Égalité face à l'éducation, inégalité face aux emplois : étudiants handicapés de niveau collégial et universitaire

## Igualdad educativa, desigualdad de empleo: estudiantes de nivel colegial y universitario con discapacidades

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Résumé de l'article

Les étudiants affectés d'un handicap permanent sont-ils plus susceptibles d'abandonner leurs études postsecondaires que les étudiants sans incapacité permanente? Une fois leurs études postsecondaires terminées, leurs expériences sur le marché du travail diffèrent-elles? Des réponses à ces questions sont nécessaires pour évaluer les politiques actuelles et en élaborer de nouvelles.

Cet article aborde ces deux questions en utilisant un ensemble de données unique qui combine des dossiers administratifs du *Programme canadien de prêts aux étudiants* avec les réponses à une enquête. Notre mesure du handicap permanent est une mesure objective nécessitant le diagnostic d'un médecin. Les données de l'enquête fournissent des informations sur le niveau de scolarité de ces étudiants ainsi que leur statut sur le marché du travail.

Les statistiques descriptives simples suggèrent que, comparativement aux étudiants sans incapacité permanente, les étudiants ayant une incapacité permanente sont tout aussi susceptibles d'abandonner leurs études postsecondaires, mais moins susceptibles de se retrouver sur le marché du travail et plus susceptibles d'être sans emploi. Nous utilisons l'analyse d'appariement par score de propension pour réduire le biais potentiel de sélection dans le groupe d'étudiants avec un handicap documenté. Ces résultats sont cohérents avec les statistiques descriptives.

Notre histoire est celle d'un succès méconnu — un nombre croissant d'étudiants avec un handicap qui fréquentent les établissements postsecondaires et leurs chances égales d'obtenir un diplôme —, versus un problème persistant — les difficultés que ces derniers rencontrent, même ceux ayant le même niveau de scolarité que les personnes non handicapées, une fois sur le marché du travail.

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# Equal Education, Unequal Jobs: College and University Students with Disabilities

Jennifer M. Stewart and Saul Schwartz

**The proportion of students at postsecondary institutions reporting a permanent disability has greatly increased in recent decades. Using a nationally representative sample of Canadian students who were offered government student financial aid, we use propensity score matching models to compare the educational and labour market outcomes of students with permanent disabilities to those without such disabilities. Our results indicate that a student with a permanent disability is as likely to complete their postsecondary education as one without a permanent disability. Despite similar success at school, their labour market outcomes after completing their education are distinctly different. Students with permanent disabilities are less likely to participate in the labour market and more likely to be unemployed. We summarize available policy options to address this issue.**

**KEYWORDS:** postsecondary education, disability, labour market outcomes, unemployment, dropout.

## Introduction

The proportion of students with disabilities who graduate from high school, enroll in postsecondary education and obtain a postsecondary credential has markedly increased in recent decades (Madaus, 2011; McCloy and DeClou, 2013; Newman *et al.*, 2010). While welcome, this increase in educational attainment does not imply that all is smooth sailing for people with disabilities. They may still face higher costs—in terms of time, effort and money—and, as a result, they may drop out of postsecondary schools more frequently than people without disabilities (Chambers, Bolton and Sukhai, 2013). Perhaps more importantly, if greater educational attainment does not lead to greater labour market success, the underutilization of the talents of this group will persist.

Using a unique, large, and nationally representative survey conducted on behalf of the *Canada Student Loans Program* (CSLP) in 2009, we examine the

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educational attainment and labour market experience of college and university students who documented a permanent disability in order to be eligible for a grant from the CSLP. Those surveyed included students with and without documented permanent disabilities, all of whom had first enrolled in a postsecondary institution between 2002 and 2004 and received a loan or grant from the CSLP. Because they were surveyed in 2009, five to seven years after first enrolling, we can assess their educational attainment and their early post-schooling labour force experience.

We address two questions in this paper. First, we ask whether students with a permanent disability are more likely to drop out of postsecondary education. Second, we ask how they fare in the labour market once out of postsecondary education. We find that the dropout rates among respondents with and without permanent disabilities are roughly the same. Using propensity score matching, we show that matching on other observable variables does not change that result.

The labour market outcomes for those with and without disabilities, however, are not the same. For this group of former students with disabilities, whose educational attainment is roughly equal to former students without disabilities, labour force participation is lower and unemployment higher.

## Background

In many ways, it has become easier for people with disabilities to succeed in higher education. Modern technology—computers that translate speech into text, electronic textbooks with changeable fonts, methods for representing material in non-textual ways—has made learning more accessible (Goldrick, Stevns and Christensen, 2014; Lang *et al.*, 2014). Additional support in the form of extra time on tests, or quiet rooms in which to take those tests, has also helped to level the playing field (Lindstrom, 2007). Colleges and universities have set up offices devoted to providing appropriate services for students with different disabilities; these offices not only provide advice but also liaise directly with faculty to ensure that student needs are met (Madaus, 2011).

The increase in educational attainment for students with permanent disabilities has been observed both in the United States and in Canada. In the United States, a comparison of the two cohorts of the *National Longitudinal Transition Study* indicated that the postsecondary enrolment rate among American students with disabilities rose by 19 percentage points, from 26.3 to 45.6 percent, between 1990 and 2005 (Newman *et al.*, 2010:22). Madaus (2011: 10) notes that 11% of American students reported a disability in 2007 whereas only 3% reported a disability in 1978. Turning to graduation, McCloy and Declou (2013: 10) report that, in Ontario, “the percentage of college and university graduates who reported a

disability has been increasing since the 1980s, rising from 3 per cent of certificate/diploma graduates and 2.2 per cent of bachelor's degree graduates in 1986 to 8.7 per cent and 6.6 per cent, respectively, for the 2005 graduating class."

An important factor in this welcome development was the adoption of "inclusive education" in elementary and secondary schools (Lipsky and Gartner, 1997; Thomas, 2013). Inclusive education has dramatically increased the extent to which those with disabilities are integrated into mainstream classrooms (Mitchell, 2014; Mittler, 2012). The proportion of young people with physical disabilities who have graduated from high school is now about the same as the proportion among young people without any disabilities; however, the proportion of high school graduates among young people with non-apparent disabilities, including severe cognitive disabilities, remains lower (Newman *et al.*, 2012).

At least some of the observed increase in the proportion of graduates with disabilities is the result of increased reporting of disabilities. For example, because it is now more likely that elementary and secondary school students are diagnosed with learning disabilities (Hallahan, 1992; Hallahan and Mercer, 2001), more may identify themselves as having a disability when they get to college or university. In addition, the growth in campus-based services has increased the incentive for students with cognitive disabilities to self-identify because they can now receive meaningful assistance (Cole, 2012: 28-31; Lynch and Gussel, 1996). Finally, the existence of significant government financial aid for students who document permanent disabilities may also have increased the likelihood that such students will self-identify.

Studies of the educational attainment of students with disabilities, conditional on enrolling in a college or university, are rare. Two of the most recent studies analyzed students from a single institution. Jorgenson *et al.* (2007) found similar dropout rates for students with and without disabilities at Dawson College in Quebec. Wessel *et al.* (2009), studying a group of students with and without disabilities at a public university in the American Midwest, also found similar dropout rates.

Two recent qualitative studies have explored the labour market experience of Canadian postsecondary graduates with learning disabilities (Goodfellow, 2014; Holmes and Silvestri, 2011). These authors were particularly interested in the graduates' experiences on the job. Goodfellow (2014) emphasized the dilemma created when workers with learning disabilities must either: a- risk stigmatization if they disclose their disability in order to receive accommodation; or b- avoid stigmatization by not disclosing their disability but then work without any accommodation. The workers interviewed by Goodfellow avoided disclosing until they felt they had demonstrated their on-the-job competence. Until then, they developed and used strategies to "pass" as not having a disability.

Holmes and Silvestri (2011) studied Canadian postsecondary graduates with learning disabilities. They surveyed postsecondary graduates who had been formally classified as having a learning disability according to a standard definition, and then followed up with in-person interviews of 49 of the 125 individuals in their sample. With the caveat that the survey had a very low response rate — the 125 respondents represented about 20 percent of those they attempted to survey — the survey revealed that most respondents (72 percent) felt that their disability affected their on-the-job performance. Perhaps they were slower than colleagues to process information, slower to read and write, or less adept at spelling; nonetheless, only 38 percent had disclosed their disability to their employers. Thus, the majority did not seek any accommodation that might have helped them deal with their disabilities. Instead, they adopted low-visibility strategies, often learned from disability services offices, such as arriving at work early and using time management strategies.

While exploring the lived experience of people with disabilities is invaluable, sample sizes are necessarily small and therefore perhaps unrepresentative of broader populations. Survey questions, on the other hand, do not typically allow in-depth responses but can provide much larger and more representative samples and still allow for the exploration of important questions. Fichten *et al.* (2012) surveyed a sample of about 1,500 graduates from three large two-year colleges in Canada. The employment rates for graduates with disabilities (about 12 percent of the respondents) were roughly the same as the employment rates for graduates without disabilities.<sup>1</sup> Similarly, results from the *2012 Canadian Survey on Disability* suggests that, among people with mild or moderate disabilities, those with a postsecondary degree have labour force outcomes that are comparable to those without disabilities. For example, Turcotte (2014: 4) writes: “Among university graduates, the employment rate of those with a moderate disability (adjusted for age differences) was 77%, compared with 78% among those with a mild disability and 83% among those without a disability.”

The labour market returns to education for individuals with a disability have been examined for the broader population, not limiting the sample to students in postsecondary education. Aakvik (2003) found that a general training program in Norway had no impact on the employment of “partly disabled” workers. Hollenbeck and Kimmel (2008: 721) found that American males with “early onset” disability (i.e. a disability that was present before they made education decisions) did not experience a significant return to education. The authors hypothesize that: “the quality and quantity of education received by individuals who are disabled at the time of their educational decisions ... are not serving them well in terms of finding productive job matches.”

## Theoretical Framework

In this paper, we estimate statistical models of the decision to drop out of postsecondary education and of the determinants of labour market outcomes. We briefly review the theoretical basis for such models in this section.

### Models of Dropout

In the literature, two broad theories of postsecondary persistence vie for attention. One, based in the sociological and psychological literatures, emphasizes a psychological commitment to degree attainment (Tinto, 1993). That commitment exists prior to beginning a degree program and is then affected by the extent of the student's academic and social integration into the college or university. The second theory, based in the economic literature, is about the economic incentives to continue in school until graduation (McGee, 2011). Education is treated as an investment whose likely rate of return drives decisions about enrolment and persistence.

We adopt the economic model to predict the impact of having a permanent disability on the likelihood of dropping out, assuming that students will decide to drop out of postsecondary education when the costs of remaining in school are greater than the benefits.<sup>2</sup> The benefits of being in school includes the joy of learning, as well as expected higher earnings when students enter the labour market. The costs of being in school include the wages that might be foregone by not working while in school, tuition fees, the effort students must exert in their studies, and the stress they experience. These costs and benefits are expected to be different for students with a permanent disability than they are for students without a permanent disability (Hollenbeck and Kimmel, 2008).

The expected impact of a permanent disability on the costs of remaining in school is not clear. On the one hand, the expected costs may be higher for these students because their disability creates challenges as they seek to complete their postsecondary educations. On the other hand, if it is true that those with a permanent disability receive a lower wage in the labour market, their foregone wages will be lower causing the costs of remaining in school to be lower. If the lower foregone wages more than offset the higher costs arising from facing more challenges in school then the costs will be lower for students with a permanent disability. This basic framework thus provides an ambiguous prediction of the impact of a permanent disability on the likelihood of dropping out of postsecondary education.

### Models of Labour Market Outcomes

Outcomes in the labour market can also be framed as a choice based on the costs and benefits of different employment states. However, models of the

labour market also need to consider the role of employers in making employment offers.

A search framework provides the opportunity to consider the role of individuals and employers in determining labour market outcomes (Ehrenberg and Smith, 2017: 503). In this framework, individuals make a decision to accept a job offer based on the expected value of accepting the offer versus continuing to search for employment. The costs of accepting a job offer include the value of lost leisure and the fixed costs of working, such as transportation and equipment, while the benefits include higher income, not having to continue searching for employment, and the satisfaction workers derive from their jobs. A job offer will be accepted if the value of the offer is greater than the value of remaining unemployed. For students with a permanent disability, the costs of working may be high, compared to students without permanent disabilities, if transportation or equipment costs are higher or if the cost of “passing” as not having a disability are substantial. Such costs will decrease the value of any employment offer and therefore decrease the likelihood of accepting an offer.

There are at least two models for firm behaviour with respect to employees with disabilities. First, firms may discriminate. Following Black (1995), employers may be divided into those that discriminate against individuals with a permanent disability and those that do not. The existence of prejudiced employers results in individuals with a permanent disability receiving fewer offers of employment than individuals without a permanent disability and, therefore, having a lower probability of being employed.<sup>3</sup> Second, firms may expect that the cost of hiring an employee with a disability outweighs the benefit. Firms may expect higher costs of hiring an employee with disabilities because they expect the cost of accommodating the employee to be high or they may expect a lower level of productivity (Acemoglu and Angrist, 1998). In this case, firms would be less likely to make offers to people with disabilities; therefore, people with disabilities will receive fewer employment offers and be less likely to be employed.

The combination of differences in the value of employment to the employee and the lower number of offers from employers leads to the prediction that students with a permanent disability will be less likely to enter the labour market and, if they do enter the labour market, will be more likely to be unemployed.<sup>4</sup>

## Selection

In addition to considering the costs and benefits that individuals in our sample face, we need to consider the selection into our sample. Our sample is composed only of students who have applied for a student loan. To be eligible for a loan, students must meet several conditions. They must have been accepted into a

postsecondary institution and they must demonstrate that their financial needs exceed their financial resources.

Students with a permanent disability face more barriers to finishing high school. Overcoming these substantial barriers may demonstrate above average determination and commitment. We might, therefore, expect that the students with a permanent disability who are accepted into postsecondary education will be more likely to succeed in education and in the labour market because of their unobserved higher levels of determination and commitment. Considering the possible impact of the selection process is important because policies that aim to expand further the number of students with a permanent disability participating in postsecondary education may not attract students with the same level of determination or commitment and, therefore, may not lead to the same results as observed in our sample.

## Data and Methods

### The Canadian Context

In Canada, education and labour standards are the responsibility of provincial governments. Each province funds its education system (including postsecondary education), creates and manages education policy, and maintains education standards. Labour standards are also a provincial responsibility and policies surrounding the employment of persons with a permanent disability vary across the provinces. The *Canadian Charter of Rights and Freedoms* and provincial statutes, such as the *Ontario Human Rights Code*, require postsecondary institutions to accommodate students with permanent disabilities. The federal government operates the *Canadian Student Loans Program (CSLP)*, which provides loans and grants to students enrolled in postsecondary education whose needs are beyond their available resources (generally, students from lower income families).

### Data

In this paper, we use data from the *Canada Student Loan and Grant Recipient Survey* administered by the CSLP.<sup>5</sup> The survey data were merged with the *CSLP's Needs Assessment Reports (NARS)* administrative database. Each of these sources of data is described below.

Between April and July 2009, the CSLP conducted a survey of a representative sample of people who had first received a CSLP loan or grant for the first year of a postsecondary program, in one of three loan years (2002-2003, 2003-2004 or 2004-2005).<sup>6</sup> The number of completed responses was 8,027 with 635 disability grant recipients and 7,392 non-recipients. After merging the survey data with the administrative data described below, the number of completed responses



was 6,977 with 544 disability grant recipients and 6,433 non-recipients. Survey weights, based on a comparison of the survey respondents to the population of loan recipients, were created by CSLP researchers to adjust for nonresponse and the stratified sampling procedure. We use those weights when reporting summary statistics to provide estimates representative of the population of loan recipients.

The CSLP has long had a number of targeted programs for students who face various financial barriers to postsecondary education. When our survey respondents applied for financial aid in the first part of the 2000s, students with permanent disabilities were eligible for loans based on full-time attendance under a definition of “full-time” that requires fewer courses than required for students without disabilities. They were also eligible for two grants aimed at students with permanent disabilities who qualified for a CSLP loan—the *Canada Study Grant for High-Need Students with Permanent Disabilities* (CSG-PDHN) and the *Canada Student Grant for Services and Equipment for Persons with Permanent Disabilities*. The CSG-PDHN provided up to \$2,000 per year and was given only to those students whose assessed need exceeded the maximum amount they could borrow. Because it is a “last dollar” grant, only students who had received the maximum possible loan amount and who still had demonstrated need could receive a CSG-PDHN. The *Canada Student Grant for Services and Equipment for Persons with Permanent Disabilities* provided up to \$8,000 per year to pay for specific supports that particular students might need. Students had to document their need for the services and equipment and provide estimates of the cost.<sup>7</sup>

Our administrative data source is *CSLP’s Needs Assessment Reports* (NARS) database that is generated using information provided by each potential aid recipient at the time they apply for aid, usually in the spring prior to the start of the subsequent loan year. The NARS information is not as complete as one might hope. For example, we know which respondents received a grant from one of the disability grant programs, which in turn implies that they had provided evidence of a permanent disability; however, that evidence was provided to the provinces and not to the CSLP. The nature of the disability (as opposed to its existence) is, therefore, not contained in the NARS data held by the CSLP. We know only that documentation from a medical expert must have been provided.<sup>8</sup>

It is likely that most survey respondents had relatively low family income because family income must generally lie in the the lower half of the income distribution in order for students to be eligible for the *Canada Student Loans Program*. We do not, however, have data on family income, either before or after postsecondary education. Nonetheless, information on parental education will capture some of the influence of socio-economic status on the outcomes.

## Measures

Our key independent variable is an indicator for having a permanent disability, which comes from the NARS files and indicates whether the student applied for a disability grant. Because the application for a disability grant must be accompanied by documentation from a medical practitioner, it is more reliable than a self-reported measure. Note that this variable is not simply whether or not the respondent has a disability; it is whether or not the respondent chose to document a permanent disability in order to be eligible for a CSLP disability grant.<sup>9</sup>

We analyze three dependent variables: 1- whether or not the respondent dropped out of college or university; 2- whether or not the respondent was in the labour force in 2009; and 3- whether or not the respondent was employed, conditional on being in the labour force. Based on a series of survey questions that track students through their various postsecondary experiences, we define respondents as having dropped out if they left their initial program and did not return to school before the survey date, five to seven years later.

For the respondents who were not enrolled in school in 2009, we define two categories of labour market outcomes based on responses to questions in the survey: 1- in or out of the labour force, and 2- unemployed or employed, among those who are in the labour force.<sup>10</sup> These definitions are the usual ones adopted by economists (Ehrenberg and Smith, 2017: 495). That is, we use the full sample to distinguish between those in and out of the labour force. Then, for those in the labour force, we analyze unemployment, defined as unemployed but looking for job. We examine labour force participation to capture any people who become discouraged with the labour market and decide not to be part of it. If persons with a permanent disability face persistent negative outcomes in the labour market, they may be more likely to leave the labour market.

Table 1 presents summary statistics for the three dependent variables used in our analysis. The results are presented for men and women separately and for students with and without a permanent disability.

The overall dropout rates are higher for men than women (11.9 percent to 10.1 percent). For both men and women, students with permanent disabilities have *lower* dropout rates than those with no disabilities, although the differences are not statistically significant. Nonetheless, our expectation was that students with a disability would have *higher* dropout rates; to find no statistical difference is therefore surprising. This result then is the starting point for our analysis in the sense that we want to see if this lack of difference remains once we control for other variables.

**TABLE 1**  
**Dropout and Workforce Status, by Gender and Disability Status (percentage)**

<b>Women</b>	<b>Full Sample</b>	<b>Disability Grant</b>	<b>No Disability Grant</b>
Dropout	10.07	8.95	10.09
Workforce Status			
Unemployed	9.05	18.11	8.95
Not in Labour Force	9.35	15.35	9.28
Number of observations	4384	327	4057
<b>Men</b>	<b>Full Sample</b>	<b>Disability Grant</b>	<b>No Disability Grant</b>
Dropout	11.86	11.14	11.87
Workforce Status			
Unemployed	14.61	25.54	14.45
Not in Labour Force	4.49	6.46	4.46
Number of observations	2593	217	2376

Differences in dropout between those with a disability grant and those without are not statistically significant. All differences in labour status are statistically significant at 95% confidence level.

The differences in labour force outcomes between former students with and without a permanent disability are as we expected. For both men and women, those with a permanent disability are less likely to be in the labour force and, if in the labour force, more likely to be unemployed. These differences are all statistically significant at a 95% confidence level. Unemployment rates are higher for men than for women, regardless of disability status. The percentage out of the labour force is higher for women than for men, again regardless of disability status.

Table 2 presents the summary statistics for our independent variables. Age, dependent on parent, Ontario resident, and year of first loan were based on information contained in the administrative records. All other variables are calculated based on respondent responses to questions in the *CSLP Survey*. One immediate difference in the independent variables is that about 63 percent (4057/6433) of those without disabilities are women, compared to only 60 percent (327/544) of those with documented permanent disabilities. Those who documented permanent disabilities are far more likely—by about 10 percentage points for both men and women—to have been born in Canada than in some other country. But we do not know whether this difference is because those not born in Canada are less likely to disclose disabilities or whether immigrants are healthier on average compared to native born students. It has been hypothesized

**TABLE 2**  
**Means for Independent Variables**

Independent Variable	Full Sample	Men		Women		
		Disability Grant	No Disability Grant	Full Sample	Disability Grant	No Disability Grant
Age (years)	22.71	23.41	22.72	23.41	23.88	23.41
Visible Minority	26.44	23.94	26.40	21.28	19.70	21.26
Aboriginal	4.88	4.23	4.87	6.37	6.82	6.37
Not Born in Canada	29.46	18.25	29.29	25.11	13.93	24.97
Dependent on Parents	56.99	60.45	57.05	52.63	60.12	52.72
<b>Institution Type</b>						
College	47.14	50.40	47.19	44.29	51.83	44.39
University	39.50	45.83	39.60	38.47	45.92	38.56
Private Vocational	13.36	3.78	13.21	17.24	2.25	17.05
Ever studied Part-time	7.14	7.80	7.15	6.31	16.46	6.44
Working While in School	44.68	38.85	44.59	48.64	39.08	48.52
<b>Mother's Education</b>						
No PS Degree	49.72	42.07	49.60	49.52	54.75	49.59
College	21.69	28.07	21.79	27.17	24.90	27.14
University	2.52	20.35	21.50	17.90	15.98	17.87
Missing	7.08	9.51	7.11	5.41	4.37	5.40
<b>Father's Education</b>						
No PS Degree	45.02	35.91	44.89	48.58	46.81	48.55
College	19.13	24.18	19.21	21.14	25.05	21.19
University	27.83	26.61	27.81	20.48	17.67	20.44
Missing	8.02	13.30	8.10	9.80	10.47	9.81
<b>Grades in First Program</b>						
A's	28.68	22.41	28.59	38.51	21.97	38.30
B's	48.14	48.29	48.14	44.81	57.60	44.97
C's	12.48	19.71	12.59	8.25	11.42	8.29
D's	1.24	0.95	1.23	1.03	1.75	1.04
Other	0.54	1.66	2.95	1.56	2.15	1.57
Missing	6.49	6.98	6.50	5.84	5.10	5.83
Ontario Resident	51.46	69.49	51.74	50.08	68.40	50.31
<b>Year of First Loan</b>						
2002-03	34.24	19.40	34.01	32.58	26.01	32.50
2003-04	33.73	27.71	33.64	35.07	30.55	35.01
2004-05	32.03	52.89	32.34	32.35	43.44	32.49
Number of Observations	2593	217	2376	4384	327	4057

that a “healthy immigrant effect” exists, that immigrants at time of migration tend to be healthier compared to native-born individuals; however, as the time since migration increases, their health approaches the native-born average. Evidence on whether this effect exists is mixed for Canada (Macdonald and Kennedy, 2004).

A far greater proportion of those with documented disabilities were from Ontario than were those without documented disabilities (70 percent to 50 percent). We do not know if this difference is the result of Ontario’s progressive policies toward people with disabilities or an artifact of the sampling strategy used. Because we think that disabilities (as opposed to documenting a disability when applying for financial aid) are distributed randomly through the population regionally, differences such as these suggest some sort of self-selection on the basis of observable and unobservable characteristics.

### Estimation strategy

We are concerned that unobserved differences between the students who documented a permanent disability and the students who did not might explain the Table 1 differences in education and labour force outcomes. As mentioned above, students with a permanent disability face more barriers to finishing high school and entering postsecondary education. Overcoming these substantial barriers demonstrates the higher level of determination and commitment of these students that is not measured and would influence their subsequent success in education and the labour market. In addition, students with disabilities who actively seek to be categorized as having a permanent disability in order to benefit financially from grants or to benefit from the available accommodations may be better informed than other students. Students who are better informed about the postsecondary education system may also be better informed about the labour market. Both of these scenarios would cause students to perform better in the education system and labour market than expected based on their observed characteristics and may mask a significant difference in outcomes.

To address this selection problem and estimate the effect of having a permanent disability on education and labour market outcomes, we use propensity score matching models (Caliendo and Kopeinig, 2008; Rosenbaum and Rubin, 1985). Propensity score matching attempts to recreate an experimental design that allows the outcomes of similar students to be compared. In principle, we want to measure the effect of having a disability on the outcomes:

$$E[Y_1 - Y_0 \mid D = 1] = E[Y_1 \mid D = 1] - E[Y_0 \mid D = 1] \quad (1)$$

where  $Y_1$  is the outcome when the individual has the disability,  $Y_0$  is the outcome when the individual does not have the disability and  $D$  indicates that the stu-

dent has a permanent disability. The difficulty is that we cannot observe  $E(Y_0 | D = 1)$ , the outcome that would have occurred if a student with a documented permanent disability did not have permanent disability. We estimate this value by finding a likely match for each student with a documented permanent disability from the group of students without a permanent disability. To perform this matching, each student is assigned a propensity score that is their predicted likelihood of being a student with a documented permanent disability, given their observed characteristics. Students with a documented permanent disability are matched to students without a documented permanent disability who have the nearest propensity scores. The average treatment effect on the treated (ATT) is estimated as the difference in outcomes between matched pairs:

$$ATT^{PSM} = E_{P(X)|D=1} \{[Y_1 | D = 1, P(X)] - E[Y_0 | D = 0, P(X)]\} \quad (2)$$

where  $P(X)$  is the propensity score.

An advantage of this approach is that limited assumptions about the functional form of the relationship are necessary. However, it relies on the assumption that outcomes and selection are independent, conditional on observed variables. In our case, the possible sources of selection discussed above are assumed to be random once we control for the covariates used to estimate the propensity score. Propensity score matching is not, therefore, a panacea for all problems in the data.

We estimate the propensity score using mother's education, father's education, age, visible minority status, not being born in Canada, province, and year of loan as covariates in a probit model. We report the results from a nearest-neighbour matching method, which matches each respondent with a permanent disability to the four respondents without disabilities who have the closest propensity scores.<sup>11</sup> Only variables that are expected to influence both the likelihood of documenting a permanent disability and the outcomes are included in a propensity score matching model.<sup>12</sup>

## Results

Table 3 shows the ATT estimates for our three dependent variables, estimated using propensity score matching.

### Dropout

For both males and females, the estimated difference in dropout rates between students with a documented permanent disability and those without is negative, indicating that students with a permanent disability have lower dropout rates. This difference, however, is not statistically significant. For males, students with a permanent disability have a lower dropout rate by 1.4 percentage

**TABLE 3**  
**Effects on Dropout and Workforce Status, by Gender**

		Average Effect of the Treatment on the Treated
<b>Men</b>	Dropout	-0.014 (0.024)
	Workforce Status	
	Labour Force Participation	-0.025 (0.019)
	Unemployment	0.107 *** (0.032)
<b>Women</b>	Dropout	-0.005 (0.018)
	Workforce Status	
	Labour Force Participation	-0.067 *** (0.023)
	Unemployment	0.097 *** (0.025)

\*\*\* Significant at 99%, \*\*Significant at 95%, \*Significant at 90%. Standard errors appear in parentheses and were calculated in STATA 14 following.

points (95% CI -0.061; 0.033). For females, students with a permanent disability have a lower dropout rate by 0.5 percentage points (95% CI -0.039; 0.030). These results mirror the differences reported in Table 1 and indicate that, after controlling for differences in characteristics, there is no difference in dropout rates between the two groups of students.

### Labour Force Participation

The estimated difference in labour force participation between students with a documented permanent disability and those without is negative and statistically significant for females but not significant for males. Female students with a permanent disability have a lower labour force participation rate by 6.7 percentage points (95% CI -0.112; -0.022). Men with a permanent disability have a lower labour force participation rate by 2.5 percentage points (95% CI -0.063; 0.013). Said differently, male students with a permanent disability are as likely as those without a permanent disability to participate in the labour market, while female students with a permanent disability are less likely to participate in the labour force than those without a permanent disability.

### Unemployment

For both men and women, former students with a permanent disability were more likely to be unemployed than former students without a permanent disability.

For males, those with a permanent disability have a higher unemployment rate by 10.7 percentage points (95% CI 0.045; 0.170). For females, those with a permanent disability have a higher unemployment rate by 9.7 percentage points (95% CI 0.048; 0.145). That is, students with a permanent disability, conditional on being in the labour market, are more likely to be unemployed than students without a permanent disability.

## Discussion

Our results confirm earlier studies that found similar dropout rates for students with disabilities and those without.<sup>13</sup> Those studies used institutional data from a small number of institutions. Drawing on a unique data set collected by the *Canadian Student Loans Program* on a sample of postsecondary students from across Canada, we provide evidence that this result is broadly applicable.

The success of people with disabilities in postsecondary education is partly the result of public policies. One such policy encouraged inclusive education in elementary and secondary schools; another provided funding that allowed colleges and universities to establish disability services offices that help students with disabilities succeed academically. Another factor may be that, while the costs of attending postsecondary education—physical challenges for those with physical disabilities and intellectual challenges for those with learning disabilities—are higher for students with permanent disabilities, the lost wages from not working may be lower. If the net effect is zero, then similar dropout rates to students without disabilities would not be surprising.

If we think efforts to level the playing field for people with disabilities have achieved some success in elementary and secondary schools, and in postsecondary education, then the next part of the process is clearly to consider the labour force. In an economic system where the productivity of workers determines wages, employers will need to be convinced that it is profitable to hire employees who require accommodations.

How then do people with disabilities who have made it into the postsecondary system fare in the labour market? We find that they are more likely to be out of the labour force and, if in the labour force, more likely to be unemployed. For a variety of reasons, previous research has not led to a consensus on the extent to which people with disabilities are disadvantaged in the labour market. For example, because there is little or no incentive to identify oneself as having a disability if it is not already apparent, general labour market surveys may not correctly identify workers with disabilities. Surveys like the *Canadian Survey on Disability*, and therefore studies like Turcotte (2014), identify people with disabilities as those who self-identify on general population surveys.



Another way to study their labour market outcomes is to follow students who identified themselves as having a disability while in school, as done by Fichten *et al.* (2012). Compared to Fichten *et al.*, our data are not only wider in scope but also examine labour force outcomes some years after the students left school. Where Fichten *et al.* found few differences in the labour force outcomes of their sample, suggesting that success in school leads to success in the labour market, we find that students with documented permanent disabilities fared worse in the labour market than comparable students without documented permanent disabilities. Qualitative studies of the labour market experience of people with disabilities who have postsecondary qualifications tend to document their ongoing difficulties, which may be a reason that a difference in labour market outcomes is observed over a longer time span.<sup>14</sup>

Our measure of disability status has both strengths and weaknesses. Jorgenson *et al.* and Wessel *et al.* use the records of campus disability services offices to identify students with disabilities, while Fichten *et al.* use a self-reported measure based on a survey distributed to all graduates. Students registering with disability services offices must document their disabilities, but not all students with disabilities register. In our data, students with disabilities had documented a disability as part of their application to the *Canada Student Loans Program*, but not all students with disabilities apply for aid from the CSLP.

With either source of information on disability status, there is a potential selection bias issue. Students choose to identify themselves to disability services offices and, in our sample, choose to document their disabilities. The students who choose to identify themselves in either manner may be systematically different from those who do not identify themselves; that is, unobserved systematic differences may be what is driving empirical results rather than the actual presence of disability. For example, we may not find a difference in dropout rates because students who document their disability are more motivated or organized than other students. Where previous studies did not address this selection issue, we deal with it by using propensity score matching to identify a group of students without disabilities who are as similar as possible to students with documented disabilities. This approach has the advantage of a more flexible functional form than a regression approach and, if the unobservable variables are correlated with the observable variables, providing unbiased results.

There is also a question about whether our results vary among students with different types of disability. While we had limited information about the type of disability experienced by the survey respondents, we had self-reported information on whether the respondents indicated that they had a learning problem. Of those with a permanent disability, 21 percent reported a learning problem, while only 1 percent of those without a permanent disability reported

a learning problem. That is, having a learning disability was far more prevalent in the group of students with a permanent disability.

The seeming success of policies aimed at increasing the educational attainment of people with disabilities begs the question of what policies can increase their success in the labour market. The relevant policies fall into two major categories: legislation that prohibits discrimination in employment and incentives that influence employers to hire those with disabilities.

### Anti-discrimination legislation

Several Canadian provinces have enacted legislation that prohibits labour market discrimination against people with disabilities. Ontario led the way with its *2005 Accessibility for Ontarians with Disabilities Act* (AODA) that extended previous human rights legislation and promised to “benefit all Ontarians by developing, implementing and enforcing accessibility standards in order to achieve accessibility for Ontarians with disabilities with respect to goods, services, facilities, accommodation, employment, buildings, structures and premises on or before January 1, 2025.”<sup>15</sup> The AODA regulations include an Employment Standard that requires organizations to provide accessibility in both recruitment and retention. For example, as of January 1, 2016, large organizations must accommodate the needs of job applicants with disabilities throughout the recruitment, application and hiring processes.<sup>16</sup> But progress has been slow. A 2015 review found that “... the AODA has made little difference on the employment front. ... the Review was told that managers frequently overestimate how much accommodation will cost and conclude they can’t afford to hire someone with a disability” (Moran, 2014, p. 24).

Anti-discrimination legislation also exists in the United States (the *1990 Americans with Disabilities Act*) and in the United Kingdom (the *1995 Disability Discrimination Act*). There are both theoretical and empirical reasons to believe that such legislation could either improve or worsen the labour force status of people with disabilities. Several statistical analyses comparing the employment outcomes of people with disabilities before and after the introduction of this legislation have been published (Acemoglu and Angrist, 1998; DeLeire, 2000; Jones, 2008). None document great improvements and some conclude that the net result has thus far been negative.

The intended effect of such legislation is to make employment opportunities accessible to those with disabilities by requiring that accommodations be provided before and after hiring and by sanctioning both discrimination and the refusal to provide appropriate accommodation. The unintended effect, however, might be to discourage hiring people with disabilities because it increases the expected

costs borne by employers—the cost of accommodation and the cost of potential future legal action against the employers by the workers (Acemoglu and Angrist, 1998). The net impact of these opposing forces is ambiguous.

On the empirical side, the central issue is that the legislation can change the composition of the group of people who consider themselves to have a disability, even holding constant the underlying conditions (Kruse and Schur, 2003: 35-37). One clear illustration of this point occurs when the survey questions used to define those who have disabilities is a “work disability” question, one that asks survey respondents if they have a disability that limits the kind of work they can do. Consider workers who faced such a limitation prior to the enactment of the legislation; in the wake of the legislation, employers might provide the requisite accommodation and a comparison of two cross-sections of workers, one before and one after the legislation, would not be an “apples to apples” comparison. The empirical studies of the effect of the legislation are affected by the compositional changes described above; Kruse and Schur (2003: 61-62) use multiple definitions of disability and show that the definition strongly affects the outcomes of such studies.

### **Incentives to hire employees with disabilities**

In other countries, governments have required employers to hire employees with disabilities by establishing hiring quotas. Among countries with a quota, the policies vary in the size of the quota, the types of employers covered, the definition of a disabled worker, and the penalties imposed. For example, in Austria, employers must hire one worker with a disability for every 25 workers that they employ (a four percent quota); if they do not, they face a fine. The size of the quota ranges from a low of two percent in Spain and Korea to a high of seven percent in Italy. Public firms are usually covered; private firms may be covered depending on the number of employees they employ. Italy requires private firms with more than 15 employees to meet the quota, while in Korea only private firms with more than 300 employees are required to meet the quota (OECD, 2003).

Such quotas are not without issues. For example, an employer can have existing employees seek diagnoses of disability, thus meeting the quota without any change in their workforce. In that case, the quota would change the composition of the group of people who have disabilities, without changing the actual underlying conditions of the workforce. Lalive *et al.* (2009) nonetheless find that the Austrian policy has promoted the employment of individuals with a disability. More research in this area—both qualitative and quantitative—is clearly needed if we are to assess the adequacy of policies aimed at fostering the labour market success of people with disabilities.

Rather than imposing an obligation on firms, governments could encourage firms to hire employees with a disability by offering a wage subsidy. A wage subsidy reduces the cost of hiring employees with a disability and would be expected to increase their employment. In Norway and Austria, the amount of the wage subsidy is close to the wage received by the employee but is phased out over time. Korea combines the use of a quota and a wage subsidy. Firms who have more employees with a disability than required by the quota receive a subsidy at least equal to the minimum wage. The subsidy is maintained for the duration of employment.

## Conclusion

In this paper, we analyze a unique survey conducted in 2009 by the *Canada Student Loans Program (CSLP)*. The survey contains information on the completed educational attainment and early labour market experience of a broad cross-section of students who used the *Canada Student Loans Program* while in school. The sample includes a relatively large number of former students who had also qualified for a CSLP grant because they had documented a permanent disability. Our results are the first to be based on a large, nationally-representative sample.

Overall, our story is one of an underpublicized success—the rising number of students with disabilities in postsecondary institutions and their equal likelihood of graduation—and a persistent problem—the continued disadvantage that people with disabilities, even those with the same educational attainment as people without disabilities, face in the labour market.

The development of policies to assist students with a permanent disability would be aided by more research on this issue. For example, future research could look at the entire population of postsecondary students, not just those who received student financial aid. Research that generated results that vary by the type of disability would help develop a targeted policy.

The equality of educational attainment should not be seen as a rationale for cutting back support for students with disabilities. It is likely that the support provided by campus-based disability offices plus the financial support provided by government has allowed students with disabilities to feel more comfortable on campuses. Their success is probably due in part to those supports and in part to the far superior technological aids that are now available. The challenge now is how to achieve equivalent success in the labour market.

## Notes

- 1 An important question is how educational and labour market outcomes vary among people with many different kinds of disabilities. Fichten et al. (2012, 924) collected information on disability type but did not analyze the effects of differing disability types. Despite surveying 1,500 graduates, the sample sizes with any one disability type were too small.
- 2 The rationale for choosing the economic model over the sociological model lies largely in the fact that our survey data are not optimal for measuring some of the key variables (e.g. academic and social integration) proposed by the sociological model.
- 3 Black (1995) demonstrates that the existence of prejudiced firms would cause wages to be lower for the minority workers.
- 4 The existence of a “benefit trap”—a situation in which recipients of government financial assistance face high marginal tax rates—might also decrease employment rates.
- 5 The stated purpose of the survey was to provide CSLP with information on educational and labour market outcomes in order to develop policies to assist future loan recipients.
- 6 A “loan year” runs from August 1 to July 31 and is the year in which the borrower intends to study. Thus, the 2002-2003 loan year runs from August 1, 2002 to July 31, 2003; students borrowing in order to study during that period are classified as having borrowed in that loan year. A number of measures were taken to achieve high response rates but the overall response rate remained slightly below 50 percent (49.43 percent).
- 7 Similar programs currently exist for students with permanent disabilities. In addition, programs that help loan recipients repay their student loans have been enhanced.
- 8 The regulations of the program do not specify a type of medical expert and can include a medical certificate, psycho-educational assessment, or receipt of federal or provincial permanent disability assistance.
- 9 Disability status can change over time. We define disability status at the time of application but it is possible that some people developed a permanent disability after that point. We can compare our measure of disability to the disability status reported on the survey. That comparison shows a high level of agreement between the two measures.
- 10 Respondents were considered to be out of the labour force if they were not employed and were not looking for work. Respondents were considered to be unemployed if they were not employed, were looking for work, and would have taken a job if offered in the last 4 weeks. They were also considered unemployed if they were not employed, not looking for work, and waiting to hear from an employer, but would have taken a job in the last 4 weeks.
- 11 To test the sensitivity of our results to the method of matching, we used two other matching methods in addition to nearest-neighbour matching: a kernel-based matching method and a matching method constraining matches to within a specified radius. The results are similar regardless of which approach is used.
- 12 Propensity score matching models perform better when the treated and matched samples are similar or, in the language of the PSM literature, balanced. The results comparing the balance of the two samples are available from the authors on request. In short, we find that the propensity scores overlap, the fit of the propensity score models improves when estimated on the matched sample, and the number of covariates with a statistically significant difference decreases when matched.
- 13 Our sample includes only students who applied for a student loan, who are likely to be different from the rest of the student population. Parkin and Baldwin (2009) propose an

overall dropout rate of 15% across all PSE sectors. Finnie *et al.* (2014) show that 18% of college students and 10% of university students drop out and that dropout rates vary by family income, with the lower family income students having higher dropout rates. These dropout rates are similar to the rates found in our sample.

- 14 See the work of Goodfellow (2014) and Holmes and Sylvestri (2011) discussed in the background section above.
- 15 See <http://www.aoda.ca/the-act/> for the text of act. The quoted text appears in Part 1, Section 1.
- 16 See <http://rudnermacdonald.com/employment-standards/aoda-hang-your-stockings-with-employment-standards-care/>.

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## SUMMARY

### Equal Education, Unequal Jobs: College and University Students with Disabilities

Are students with a permanent disability more likely to drop out of postsecondary education than students without a permanent disability? Once they are out of postsecondary education, do their experiences in the labour market differ? Answers to these questions are necessary to evaluate current policies and to develop new policies.

This paper addresses these two questions using a unique data set that combines administrative records from the *Canada Student Loans Program* with survey responses. Our measure of permanent disability is an objective one that requires a physician's diagnosis. The survey data supply information on the students' education and labour market status.

Simple descriptive statistics suggest that, compared to students without a permanent disability, students with a permanent disability are equally likely to drop out of postsecondary education, but less likely to be in the labour force and more likely to be unemployed. We use propensity score matching to address potential selection into the group of students who documented their disability. The results using propensity score matching are consistent with the descriptive statistics.

Our story is one of an underpublicized success—the rising number of students with disabilities in postsecondary institutions and their equal likelihood of graduation—and a persistent problem—the continued disadvantage that people with disabilities, even those with the same educational attainment as people without disabilities, face in the labour market.

**KEYWORDS:** postsecondary education, student with disability, dropout, labour market outcomes, unemployment.

## RÉSUMÉ

### Égalité face à l'éducation, inégalité face aux emplois : étudiants handicapés de niveau collégial et universitaire

Les étudiants affectés d'un handicap permanent sont-ils plus susceptibles d'abandonner leurs études postsecondaires que les étudiants sans incapacité permanente? Une fois leurs études postsecondaires terminées, leurs expériences sur le marché du travail diffèrent-elles? Des réponses à ces questions sont nécessaires pour évaluer les politiques actuelles et en élaborer de nouvelles.

Cet article aborde ces deux questions en utilisant un ensemble de données unique qui combine des dossiers administratifs du *Programme canadien de prêts aux étudiants* avec les réponses à une enquête. Notre mesure du handicap

permanent est une mesure objective nécessitant le diagnostic d'un médecin. Les données de l'enquête fournissent des informations sur le niveau de scolarité de ces étudiants ainsi que leur statut sur le marché du travail.

Les statistiques descriptives simples suggèrent que, comparativement aux étudiants sans incapacité permanente, les étudiants ayant une incapacité permanente sont tout aussi susceptibles d'abandonner leurs études postsecondaires, mais moins susceptibles de se retrouver sur le marché du travail et plus susceptibles d'être sans emploi. Nous utilisons l'analyse d'appariement par score de propension pour réduire le biais potentiel de sélection dans le groupe d'étudiants avec un handicap documenté. Ces résultats sont cohérents avec les statistiques descriptives.

Notre histoire est celle d'un succès méconnu — un nombre croissant d'étudiants avec un handicap qui fréquentent les établissements postsecondaires et leurs chances égales d'obtenir un diplôme —, versus un problème persistant — les difficultés que ces derniers rencontrent, même ceux ayant le même niveau de scolarité que les personnes non handicapées, une fois sur le marché du travail.

MOTS-CLÉS: éducation postsecondaire, handicap, décrochage scolaire, situation sur le marché du travail, chômage.

## RESUMEN

### Igualdad educativa, desigualdad de empleo: estudiantes de nivel colegial y universitario con discapacidades

¿Es más probable que los estudiantes con una discapacidad permanente abandonen la educación postsecundaria que los estudiantes sin discapacidad permanente? Una vez que están fuera de la educación postsecundaria, ¿difieren sus experiencias en el mercado laboral? Las respuestas a estas preguntas son necesarias para evaluar las políticas actuales y desarrollar nuevas políticas.

Este artículo aborda estas dos preguntas utilizando un conjunto único de datos que combina los registros administrativos del *Programa de préstamos estudiantiles de Canadá* con las respuestas de la encuesta. Nuestra medida de discapacidad permanente es objetiva y requiere un diagnóstico médico. Los datos de la encuesta proporcionan información sobre la educación de los estudiantes y el estado del mercado laboral.

Las simples estadísticas descriptivas sugieren que, en comparación con los estudiantes sin una discapacidad permanente, los estudiantes con una discapacidad permanente tienen la misma probabilidad de abandonar la educación postsecundaria, pero es menos probable que formen parte de la fuerza laboral y es más probable que estén desempleados. Usamos el apareamiento de puntajes de propensión para encarar el riesgo de selección en el grupo de estudiantes que documentaron su discapacidad. Los resultados que utilizan el apareamiento de puntajes de propensión son consistentes con las estadísticas descriptivas.

Se trata de una historia de éxito poco publicitado — la cantidad creciente de estudiantes con discapacidad en instituciones postsecundarias y su probabilidad igual de graduación —, y de un problema persistente: la continua desventaja en el mercado de trabajo que afecta a las personas con discapacidades, incluso aquellas con el mismo nivel educativo que las personas sin discapacidades.

**PALABRAS CLAVES:** educación postsecundaria, estudiantes con discapacidades, abandono escolar, situación del mercado laboral, desempleo.