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Physical Disability and Labor Market Discrimination : Evidence from a Field Experiment

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Abstract

We investigate the determinants and extent of labor market discrimination toward people with acute physical disabilities (wheelchair users) using data from a large scale field experiment conducted in the province of Québec (Canada). Applications (cover letters and CVs) were randomly sent to 1477 private firms operating in two urban regions (Montréal and Québec City) advertising open positions requiring various skill levels. The applications were randomly generated to cover a broad spectrum of potential determinants of discrimination (gender, skill level, work history, workplace adjustment costs, *etc.*). We find that average callback rates of disabled and non-disabled applicants is 14.4% and 31%, respectively, yielding a differential callback rate of 46%. We also investigate whether the differential may result from accessibility constraints related to the physical infrastructures where firms are located (floor and access to an elevator, availability of wheelchair, *etc.*). The latter are found to have no explanatory power. In addition, applications which explicitly mention that the candidate is eligible to a government subsidy to cover the cost of workplace adaptations and assistive technology do not yield higher callback rates.

JEL codes: J71, J68

Keywords: Discrimination, disabilities.

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1 Introduction

The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) entered into force in May 2008. Its purpose is to protect the well-being of persons with disabilities, promote equality and eliminate discrimination. Many countries ratified the UNCRPD, including Canada in 2010. Recent evidence suggests that persons with disabilities in Canada face similar problems to what is observed elsewhere in the world. A recent report by the Canadian Humans Right Commission shows that adults with disabilities are currently half as likely to complete a university degree, are more likely to be employed part-time, and are more likely to rely on government transfers as their main source of revenue (Canadian Humans Right Commission, 2012). Such a labor market gap has clear fiscal and economic implications for persons with disabilities, for society at large, but also for policy makers seeking to uphold the UNCRPD's goals.

In the Province of Québec, the *National Strategy for Labour Market Integration and Maintenance of Handicapped Persons* was implemented in 2008 to achieve employment equality and increase labor market participation of people with handicaps. The Strategy aimed at halving the gap within the next decade by providing individuals and firms various tools to enhance their employment prospects. These include wage subsidies and financial assistance to firms to reduce or eliminate costs of adapting the work environment to specific needs. Yet, as of 2012, the employment rates of disabled males and females were still 20 and 24 percentages points lower than those of able bodied individuals, respectively (Gouvernement du Québec, 2013). The ineffectiveness of programs aimed at improving employment outcomes has also been documented in other developed countries (see Acemoglu and Angrist (2001), Bell and Heitmuller (2009)).

Many factors may explain the poor labor market outcomes of persons with disabilities, and the relative ineffectiveness of incentives and programs. Standard supply-side economics focuses on preferences and skills of individuals as determinants of their earnings potential, reservation wages, and labor supply (see Blundell and MaCurdy, 1999). On the demand side, firms are assumed to maximize profits, leading them to hire the most productive workers. However, profit maximization raises some challenges for per-

sons with disabilities if they are unduly perceived as being less productive or more costly to integrate in the workplace. Inaccurate perceptions on the demand side may thus foster discriminatory practices. Indirect evidence suggests that discrimination facing persons with disabilities may be sizable. A recent report stresses that 49% of all discriminatory complaints filed between 2009 and 2013 with the Human Rights Commission and tribunals across Canada were related to disability issues (Canadian Humans Right Commission, 2015). Furthermore, 84.3% of the latter were employment related, suggesting that discrimination may be an important barrier preventing disabled individuals from fully benefiting from the labor market.

In this paper we provide direct evidence on the determinants of labor market discrimination facing people with acute physical disabilities (wheelchair users) using data from a large scale field experiment conducted in Québec (Canada). Applications (cover letter and CV) were randomly sent to 1477 private firms operating in two urban regions (Montréal and Québec City) advertising open positions. Our experimental design targeted positions for which paraplegia is considered to have no bearing on productivity. These include positions for receptionists, secretaries, computer programmers, and accounting clerks. We used the same profile for females applying for secretary and receptionist positions. We further randomized applications for computer programmer and accounting clerk positions on the basis of gender and education level. Overall, applications were sent for positions covering a large range of educational attainments, from post-secondary education to university degrees. Applications for all positions were additionally randomized to vary work history, and whether the applicant was beneficiary of a government subsidy to adapt his work environment at no extra cost to the firm. Randomizing the mention of this subsidy in the cover letter allows to evaluate the effectiveness of one of the main programs of Québec's National Strategy – known as the *Job integration contract*. This program offers firms wage subsidies that can cover up to 85% of wages (depending on the severity of the disability), 50% of the costs to provide physical access to workplaces (wheelchair ramps, automatic doors, *etc.*), and 100% of the costs to adapt the workspace of the disabled employee (tables and disability related equipment). Finally, cover letters varied both the

extensive and intensive margins of disabilities by indicating the year the applicant became disabled.

We find that average callback rates for applications with and without mentions of disabilities are 15% and 31% respectively, which implies that disability reduces callback rates by 48%. We further find that discrimination is significant among three of the four positions targeted in the experiment. Interestingly, we find little significant evidence of discrimination for computer programmers, the most highly skilled position covered by our experimental design. We also find that signaling availability of a subsidy to reduce or eliminate the costs of adapting workplace environments does not significantly reduce measured discrimination. The most straightforward interpretation of our results is that firms simply dislike hiring persons with disabilities. However, this interpretation overlooks the possibility that firms in our experiment may be able to accommodate persons with disabilities only at prohibitive additional costs not covered by the *Job integration contract*. In particular, firms lacking proper amenities (no wheelchairs ramps, offices only accessible by stairways, *etc.*) may find the *Job integration contract* subsidy insufficient for their purposes. To address this issue, we anonymously visited a subsample of firms in our experiment to document the presence of access ramps and elevators. Our results show that callback rates are insensitive to the existence of proper amenities.

Our paper contributes to a small literature measuring discrimination facing persons with disabilities through fictitious randomized applications. Ravaud et al. (1992) sent non-solicited applications to a sample of 2228 firms in France. They varied the mention of a physical deficiency (paraplegia with a wheelchair) and the qualification level of the applicant. Their results support the hypothesis that persons with disability are discriminated against. The closest study to our paper in terms of methodology is Ameri et al. (2017) who measure disability related discrimination by sending 6016 applications in the United States. They focus on highly educated males applying for skilled accounting positions. They consider disabilities related to either Asperger's syndrome or spinal cord injuries. They find that the average callback rates for applications with and without mentions of disabilities are 4.87% and 6.58% respectively, which represents a 26% lower

callback rate for the former. Our paper extends these results by analyzing the effects of a richer set of firm specific characteristics and required skill levels, the latter being a potentially significant determinant of discrimination. Finally, we also address the singular issue of workplace accessibility which may act as a potential confounding factor for measured discrimination.

The paper is organized as follows. Section 2 presents the experimental design and procedures. Section 3 presents the data and empirical results. Section 4 concludes.

2 Experimental Design

Paraplegia is a lesion of the spinal cord that results in paralysis and loss of sensations in some parts of the lower body, making the person unable to walk. The most common mobility device used by paraplegics is a wheelchair. If the work environment is adapted for wheelchairs to circulate properly, paraplegia in itself should not affect productivity for a wide range of jobs, *e.g.* administrative or computer jobs involving office tasks. Our experimental design targets job for which paraplegia should have a minimal impact on productivity such as secretary, receptionist, computer programmer, and accounting clerk. We targeted jobs posted in the metropolitan areas of Montréal and Québec City in Canada. Applications were sent to selected job postings for our target positions within a 100 kilometer radius of both cities.

Our fictitious applications were developed in collaboration with a local community organization (La Croisé, http://www.lacroise.ca/) whose mission is to assist persons with disabilities through their job search. This organization provided us with a set of applications drawn from their archives of persons living with physical disabilities. We used this set of applications to develop representative templates which could be generated using a custom computer program. Our templates were subsequently validated by this organization before being fielded.

Each fictitious application contained two pages: a cover letter and a resume. The computer program allowed to fix specific inputs in each application (target position, spo-

ken and written languages, *etc.*), and allowed to vary other elements on the application randomly including mention of disability, availability of subsidies to firms hiring persons with disabilities, gender (when relevant), and work history (years of experience, unemployment spells). The computer program ensured that the combination of characteristics in a given application was consistent. For example, work experience could not begin before education and training ended. We next describe the content of the cover letter and resumes.

2.1 Cover letters

Appendix A provides an example (translated into English) of a typical cover letter. We used two names for the fictitious job applicants: "Jessica Gagnon" and "Jonathan Gagnon". Gagnon is among the most common last names in the province of Québec, while Jessica and Jonathan are respectively among the most common female and male given names. A name specific phone number was used. Voice mail messages of Jessica and Jonathan were recorded by a female and male responder, respectively. The voice mail messages simply stated: "Hello, this is Jessica (Jonathan) Gagnon. Please leave a message and I will call you back shortly'. Both responders who recorded voice messages for the experiment were in their early thirties, the average age group in our sample of applications (see below). A common e-mail address was used for all applications (i.e. jgagnon35@hotmail.com).

All cover letters first contained a generic presentation that varied with respect to the position sought. This generic presentation highlighted past voluntary work as well as written and spoken fluency in both French and English.

The key elements for this experiment were varied through the cover letter. A subset of applications mentioned a physical disability, and a subset of those also mentioned the availability of government financial assistance to adapt the workplace. Disability was disclosed in a subset of applications by including the following sentence : "*I would like to mention that, following an accident in year X, I am using a wheelchair. Please note that this does not impair the quality of my work in any way*". Year X was randomly selected

under specific logical constraints.[1] Varying X allows to test whether discrimination varies with the duration of the disability. In particular, persons who have spent many years with a disability may be perceived as more able to face possible workplace challenges. Approximately half the applications disclosing a physical disability were randomly chosen to reveal an additional piece of information relating to eligibility of financial assistance to firms. As discussed in the introduction, the government of Québec provides financial assistance through its *Job Integration Contract*. This program offers firms wage subsidies that can cover at most 85% of wages (depending on the severity of the disability), 50% of the costs to provide physical access to workplaces (wheelchair ramps, automatic doors, etc...), and 100% of costs to adapt the workspace of the disabled employee (tables and disability related equipment). The subsidy is available to positions in a standard working environment and ensure proper coaching for the employee. This information was revealed by adding the following sentence : "*Please note that you are entitled to a financial support that covers all expenses necessary to adapt your work environment to my situation*".

2.2 Resumes

For each target position, we generated resumes with relevant and credible academic degrees and work experience. Appendix A provides an example of a typical resume (translated in English). In addition to the name and contact information (also appearing on all cover letters), resumes contained the following information.

Education always appeared at the top of the resume. For all positions, resumes listed both a high school and a post-secondary diploma. Computer programmer applications additionally mentioned either a post-secondary (community college) degree or a university degree, depending on the requirements of the position. They also indicated an internship in a fictitious firm during the last year of education, as this is standard practice in this field. In all cases, diplomas mentioned existing schools names within the target city. The year

[1] Year X is constrained to be greater than the year of birth that could be inferred by the employer from the starting year of high school that appears in the resume (see below). It is also constrained to be smaller than the year the resume is sent.

the last diploma was awarded was randomly generated and all the other years mentioned in this section are determined accordingly as a function of the diplomas' standard completion times.[2] Employers can use these two pieces of information to infer the age of the candidate (It is very uncommon to state one's age in a resume in Québec.) For example, consider a resume sent in 2016. If the resume indicates starting high school in 1999, and considering high school usually starts at age 12, the employer may reasonably infer that the candidate is about 29 years old (2016-1999+12).

Professional experience followed immediately after the education. All resumes indicated one past job experience of relevance to the target position. This experience was in all cases related to past employment with a fictitious firm in the target city. Within a target position, only the years at which the candidate started and finished working in the fictitious firm vary randomly across resumes. Around half the resumes indicated that the candidate was still working the year the resume was sent (i.e. 2016 or 2017). The other resumes indicated that the candidate had not been working the year the resume was sent as well as the previous year. This allows us to test whether callback rates and discrimination vary if the candidate is not currently employed. Furthermore, we also vary randomly the year at which the candidate has stopped working (for those who have stopped). We can therefore test whether the duration of the inactivity period affects callback rates and discrimination. We also vary randomly the year at which the candidate started working at the fictitious firm, thus breaking the collinearity between experience (measured by the number of years worked for the firm) and age (as potentially inferred by the employer from the method explained above) thus allowing us the identify the two effects separately.

Computer skills were indicated near the bottom of each resume. All resumes indicated "Office Suite". Resumes for accounting clerk positions additionally indicated a standard bookkeeping software, while applications for programmers listed a series of standard programming languages and softwares. Resumes concluded by indicating volunteer

[2]For example, take a resume for an accounting clerk with a diploma awarded in 2007. The standard duration of such training includes a five-year high-school diploma and a three-year college diploma. In this example, the resume would state high-school attendance from 1999 to 2004 and community college training from 2004 to 2007.

work experience at the Canada Revenue Agency, French as mother tongue, and advanced written and spoken fluency in English. Hobbies included listening to music and reading.

2.3 Measuring callback rates

1477 applications were sent between May 2016 and April 2017 to positions advertised on on-line job search engines (*Indeed.ca*, *emploiquebec.gouv.qc.ca*). We excluded job offers which has been posted on-line for more than two weeks to focus on employers with potentially unfilled positions. A single resume was sent to each position. Employers could either leave a message on the candidate's voice mail or send an e-mail to invite the fictitious candidate to a formal interview. We consider the application successful whenever it received a request for a formal job interview. Employers having solicited interview requests from fictitious candidates where informed by email within 48 hours that the candidate in question had found another job and was therefore not interested in pursuing matters any further. This was done to limit the inconvenience to the employers.

2.4 Firm characteristics and workplace accessibility

All applications were linked to addresses of firms to which they were sent. We used the provincial public registry of firms operating in the province of Québec to retrieve indicators of firm size, proxied by the number of registered employees.[3] This information was available for 1436 of the 1477 firms in our sample.

An important issue is to separate genuine discrimination (statistical or taste based) from the confounding effects of the lack of proper facilities for employees in wheelchairs which may serve as an explanation for low callback rates of applications indicating a physical disability. We investigated this issue by visiting 611 firms in Québec City and Montréal, documenting whether offices where accessible. To be considered accessible, offices needed to be housed in buildings with an access ramp. Moreover, firms whose offices were situated above the ground floor level required an elevator to be considered accessible.

[3]Registry data can be found at http://www.registreentreprises.gouv.qc.ca/en/.

3 Data and results

3.1 Application and firm characteristics

Table 1 presents characteristics of applications that were sent as well as those of firms in our sample. 62% of applications disclosed a physical disability.[4] Among applications disclosing a disability (923 applications), 48% highlighted that firms were eligible to a government subsidy that would cover the costs of adapting the workplace. Moreover, the year of the accident disclosed through the cover letters indicating a disability varied from 1982 to 2015, with an average of 2004.

28% of all applications were sent to firms operating in the metropolitan area of Québec City, and 72% were sent in the metropolitan area of Montréal. Over 47% of applications indicated the fictitious applicant was not working at the time the application was sent. The number of years of unemployment since the last job varied from 0 to 7, with an average of 1.72. The average implicit age of applicants is 31.86. This age variable is the age the candidate would have had she completed the education profile listed in her resume without any interruption. It corresponds to a measure, albeit imperfect, an employer may have of the age of the candidate given the information available in the resume.

Total number of years of experience varies from 1 to 21 years, with an average of 8.24 years. 23% of fictitious applicants were male. The later reflects our design choice of sending male applications only in response to accounting clerk and computer programmer target positions. Applications were relatively well distributed across the four target positions, with slightly more applications sent to receptionist positions (31%) than to other three positions. The bottom panel of Table 1 presents the characteristics of the firms in our sample. 71% of the 611 firms that were visited were considered accessible to wheelchair employees. Only 6% of firms mentioned in their job postings that they subscribed to a policy of promoting equal access opportunities to everyone. This mention

[4] We chose to generate more than 50% of the applications with disability status in order to have enough observations to allow interactions between disability and the mention of the subsidy or the number of years since the accident.

is purely voluntary – there are no legal requirements in Québec forcing firms to mention they offer equal access opportunities, although it is illegal to discriminate. Finally, firm size proxied using publicly available registry information is relatively diverse. Of the 1436 firms (out of 1477) for which this information was available, we find 41% of firms have 10 employees or less, while 30% of firms have more than 50 employees.

3.2 Callback rates

Column (a) of Table 2 presents baseline callback rates by target position for applications not mentioning a physical disability. We find that callback rates range between 24.5% and 36.9% across the target positions, with a sample average callback rate of 31%. These baseline rates are considerably higher than those reported in related papers who used fictitious applications to measure racial discrimination (see for example Bertrand and Mullainathan, 2004 and Oreopoulos, 2011) and discrimination towards persons with disabilities (Ravaud et al., 1992; Ameri et al., 2017). Several factors may explain why our baseline callback rates are large. First, unemployment rates in Québec City and Montréal were at historically low levels (4.1% and 6.1%, respectively) during the period when applications were sent. Second, applications were only sent to job openings that had been advertised for at most two weeks, thus focusing on vacant job positions. In contrast, Ravaud et al. (1992) sent unsolicited applications, while other studies cited above do not discuss similar restrictions in their experimental design.

Column (b) presents the difference in callback rates relative to baseline for applications disclosing a physical disability. We find that the average callback rate difference is 16.6 percentage points lower relative to baseline, a statistically significant difference. Reductions in callback rates are lowest for programmers (between 6.7 and 8.2 percentage points relative to baseline) and highest for secretaries (23.7 percentage points relative to baseline). Differences are statistically significant at the 1% level (two-sided tests) for all positions save computer programmers. Difference in the latter case is significant at the 10% level (two-sided test), and significant at the 1% level (one-sided test) when pooling data for both programmer skill levels.

Column (c) reports ratios of callback rates of baseline relative to disclosing a disability. We find on average that callback rates under baseline are 2.16 times higher when a physical disability is not disclosed. This ratio varies across target positions – from 1.40 for positions of computer programmers (combined) to 3.93 for positions of secretaries. Interestingly, positions of computer programmers (with college or university degrees) are the highest skilled positions in our experiment. Either discriminatory practices are traditionally limited in the field of computer programming, or education and high skill levels attenuate discrimination in the labor market.

Overall, our data suggest that wheelchair users are much more penalized in their chances of landing a job interview than what is found in the literature regarding race and ethnicity (*e.g.* Bertrand and Mullainathan, 2004; Oreopoulos, 2011), age (e.g. Lahey, 2008, obesity and attractiveness (*e.g.* Rooth, 2009; Ruffle and Shtudiner, 2014) or sexual orientation (*e.g.* Patacchini et al., 2015). Our data also suggest that disabled individuals may face more severe discrimination than what has been previously reported (*i.e.* Ravaud et al., 1992; Ameri et al., 2017; Baert, 2016).[5]

We test whether these discrimination effects may be reduced by programs or firm characteristics aimed at improving prospects for individuals with disabilities. Table 3 focuses on the callback rates for applications with a mention of disability. Column (a) shows the callback rates for applications without the potentially beneficial individual characteristics, while column (b) presents the effect of the characteristic on the callback rates. Within the disabled applications, the callback rate for those sent to firms without an access for wheelchairs is 13.7%. This callback rate increases, not significantly, by only 3.6 percentage points in firms considered accessible for wheelchairs.[6] We also do not find

[5]One exception is Ravaud et al. (1992) who find yet higher odds ratios than ours for some firm sizes, but their differential callback rates are lower than ours.

[6]Note that firms with an access for wheelchairs could in theory differ from those without, which could lead factors other than disability to affect this estimated difference. We tested for this possibility by estimating the effect of accessibility on the callback rates of our applications without a mention of disability. Within our 216 applications without a mention of disability that were sent to firms for which we observe accessibility, the callback rate is 37% for firms without accessibility and decreases, not significantly, by only 2.7 percentage points for firms with accessibility.

a significant impact for applicants mentioning the availability of a subsidy that would cover the costs of adapting the workplace, nor do we find an effect of the firm mentioning a policy of promoting equal access opportunities to everyone.

3.3 Linear Probability Models

Table 4 presents the parameter estimates of a linear probability model which regresses callback status on resume and firm characteristics.[7] Estimates are based on a subsample of 1436 firms for whom information about firm size were available through the provincial registry. From this subsample, Table 4 first reports separate regressions for each of the four target positions (columns (a) to (d)). Note that the two programmer positions (with and without a university degree) are pooled in column (c) in order to have enough observations. The four regressions have a common set of explanatory variables, including a dummy variable indicating whether a disability was revealed through the cover letter, and interactions of this variable with whether a subsidy was mentioned in the cover letter and the number of years since the accident causing the disability. Other covariates (not interacted with disability) include gender, age, labor market experience (in years), whether the application was sent in the metropolitan area of Québec City, whether the applicant currently works, the number of years of unemployment since the last job, and dummy variables to proxy firm size using the number of employees.

We find that disability significantly decreases callback rates on average for all positions but programmers. When significant, the estimated decreases in callback rates are sizeable, ranging from 19.3 percentage points to 24.9 percentage points. Interestingly, programmers are the most highly educated positions covered in our design. While the lack of discrimination may be position specific, we conjecture that the additional education may crowd out or attenuate discrimination. Mention of a subsidy has no significant impact on discrimination in all four positions. For disabled programmers, callback rates decrease

[7]The parameter estimates are very similar in magnitude and significance to the average marginal effects obtained from a probit model (available upon request). The linear probability model has the additional advantage of simplifying the interpretation of interaction effects.

significantly with the number of years since the applicant became disabled, suggesting a form of negative stigma in these cases.

Callback rates tend to be significantly higher in Québec City relative to Montréal (except for accounting clerk positions). The latter reflects the state of the labor market in both cities, with lower unemployment rate in Québec City relative to Montréal (see discussion in previous subsection). We find a significant negative impact of age on callback rates only for programmers. Recall, however, that age is not precisely known by the employer, so its parameter estimate may be plagued with classical measurement errors. We estimate that each year of experience counterbalances the negative effect of one year of age for programmers. For secretaries, we further find a positive effect of not being currently employed (a binary variable that equals one if the candidate is not currently employed and zero otherwise), possibly reflecting a desirability of immediate availability of the candidate.[8] However, we also estimate that this effect is counterbalanced by the number of year since the last employment, so the overall effect of unemployment status is positive only for work interruptions of less than three years. For positions other than secretaries, we find no evidence of such effects. Firm size (proxied by number of employees) has a limited impact on callback rates with one exception – firms with 11 to 25 employees have 16.8 percentage points higher callback rates than firms with 10 or less employees (reference category). Finally, we find no impact of a claim that a firm offers "Equal Access Employment" on callback rates. Column (e) presents estimates from a model pooling data from all four positions together, adding binary variables to control for differences across positions (secretary positions serve as reference group). Results from this specification are largely in line with the previous analysis.

The preceding analysis allowed the discrimination to vary across positions, availability of a subsidy, and years since the applicant became disabled. A richer set of interactions with disability status could reveal further insights on the heterogeneity of discrimination across our population. The last two columns present an extended model that uses the pooled data from all positions and interacts each variable with disability status. Col-

[8]Many positions mentioned that the candidate had to start working relatively quickly.

umn (f) presents this estimation's leading effects (variables not interacted), while column (g) presents the effects of variables interacted with disability status. The leading effect of disability is -16.9 percentage points, capturing discrimination relating to positions of secretaries (reference category). We find no significant differences in discrimination between accounting clerk and receptionists positions, relative to secretaries. Programmer positions on the other hand face significantly less discrimination than secretary positions - the leading effect of discrimination is reduced by 15.9 percentage points. The cumulative effect of discrimination is -0.01 (-0.169 + 0.159), and not significantly different from zero. These results are in line with those produced by splitting our sample across the four positions. There does not appear to be any gender specific discrimination in the data. Furthermore, we find no significant positive effect of any variable interacted with disability. This analysis confirms previous findings and further reasserts that few factors apart from those distinguishing programmer positions can attenuate discrimination facing persons living with physical disabilities. Finally, additional regressions (available upon request) made only on the subsample of firms for which we observe accessibility reveal no effect of accessibility in reducing discrimination.[9]

4 Conclusion

This paper presented direct evidence of discrimination facing persons with physical disabilities. Our design allowed to control for the confounding effects of workplace access for wheelchair users, and highlighted the relative ineffectiveness of programs aimed at lowering or eliminating hiring costs of firms. Together, these results point to a fundamental problem relating to the perception firms have of physical disabilities, even when the latter interfere in a very limited way with job requirements. Our analysis focused on persons with specific mobility restrictions. Yet, local organizations who helped design the current experiment and who support persons with disabilities in their job search efforts firmly

[9] We estimated the two models from column (e) and from columns (f) and (g) only on the 611 firms for which we observe accessibility. Consistently with our results from Table 3, we find no effect of accessibility, even when interacted with disability.

believe that wheelchair users face the fewest hurdles integrating the labor market. We conjecture that discrimination toward other disabilities (*e.g.* mental, visual) is thus no less prominent.

These results have important implications from a public policy perspective. Persons with disabilities in many developed countries lag in employment, and few programs have successfully reduced employment gaps (Acemoglu and Angrist (2001), Bell and Heitmuller (2009)). Discrimination has the potential to crowd out the effectiveness of public programs and incentives. Future work quantifying the extent of the crowding out, for example by estimating equilibrium labor market models taking into account discrimination (e.g. Bowlus and Eckstein (2002), Flabbi (2010)), has clear merit. Such an analysis would help guide efforts either toward different incentive schemes, or toward measures and efforts to change perceptions firms may have about persons living with disabilities.

Application characteristics					
	Mean	SD	Min	Max	N
Disability	0.62	0.48	0	1	1477
Subsidy	0.48	0.50	0	1	923
Year of accident	2004	9.07	1982	2015	923
Quebec City	0.28	0.45	0	1	1477
Not currently working	0.47	0.50	0	1	1477
Nb of years since last job	1.72	2.11	0	7	1477
Age	31.86	5.80	22	44	1477
Experience	8.24	5.62	1	21	1477
Male	0.23	0.42	0	1	1477
Secretary	0.22	0.42	0	1	1477
Accounting clerk	0.22	0.41	0	1	1477
Programmer	0.25	0.43	0	1	1477
Receptionist	0.31	0.46	0	1	1477
Firm characteristics					
	Mean	SD	Min	Max	N
Accessible for wheelchairs	0.71	0.46	0	1	611
Equal access to employment	0.06	0.25	0	1	1477
0 to 10 employees	0.41	0.49	0	1	1436
11 to 25 employees	0.16	0.36	0	1	1436
21 to 50 employees	0.14	0.34	0	1	1436
More than 50 employees	0.30	0.46	0	1	1436

Table 1: Summary statistics

	Reference	Diff. if disabled	Ratio ref./disab.	Observations
	(a)	(b)	(c)	(d)
Secretary	0.318	-0.237*** (0.044)	3.932	327
Receptionist	0.354	-0.184*** (0.041)	2.083	461
Accounting clerk	0.264	-0.190*** (0.041)	3.577	319
Programmer. (College)	0.328	-0.082 (0.071)	1.335	175
Programmer. (University)	0.245	-0.067 (0.065)	1.375	195
Programmer (Combined)	0.291	-0.083* (0.048)	1.401	370
Montreal	0.283	-0.154*** (0.025)	2.197	1059
Quebec City	0.369	-0.180*** (0.044)	1.958	418
Total	0.310	-0.166*** (0.022)	2.155	1477

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1; where p-values are for a test of proportion testing the null hypothesis that the callback rates for applications with and without a mention of disability are equal.

Table 2: Callback rates

	No	Diff. if Yes	Ratio No/Yes	Observations
	(a)	(b)	(c)	
Accessible for wheelchairs	0.137	0.036 (0.041)	0.792	395
Mention of subsidy	0.135	0.019 (0.023)	0.878	923
Equal access to employment	0.142	0.035 (0.054)	0.801	923

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1; where p-values are for a test of proportion testing the null hypothesis that the callback rates for applications with and without a mention of disability are equal.

Table 3: Effects of characteristics on callback rates of applications with disability

	Secretary	Receptionist	Acc. Clerk	Programmer	Total	Total-interactions	
						Main var.	Inter.
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Disability	-0.193***	-0.202***	-0.249***	0.026	-0.164***	-0.169**	-
	(0.058)	(0.055)	(0.052)	(0.065)	(0.029)	(0.068)	
Subsidy × disab.	-0.056	0.032	0.029	0.035	0.020	-	0.015
	(0.042)	(0.045)	(0.037)	(0.051)	(0.023)		(0.023)
Years since accident × disab.	-0.003	0.001	0.004	-0.006**	-0.001	-	-0.002
	(0.002)	(0.003)	(0.003)	(0.003)	(0.001)		(0.001)
Male	-	-	0.001	-0.002	-0.001	-0.058	0.090
			(0.041)	(0.044)	(0.030)	(0.060)	(0.068)
Age - 22	0.018	-0.017	-0.010	-0.019**	-0.009	-0.004	-0.009
	(0.012)	(0.010)	(0.011)	(0.009)	(0.005)	(0.011)	(0.012)
Experience	-0.014	0.016	0.008	0.019**	0.009	0.004	0.009
	(0.012)	(0.011)	(0.012)	(0.009)	(0.005)	(0.011)	(0.012)
Quebec City	0.129***	0.097**	-0.018	0.105*	0.081***	0.083*	-0.008
	(0.048)	(0.046)	(0.043)	(0.061)	(0.025)	(0.044)	(0.053)
Not currently working	0.156*	0.044	-0.006	-0.030	0.040	0.123	-0.157*
	(0.088)	(0.082)	(0.094)	(0.090)	(0.044)	(0.079)	(0.093)
Nb of years since last job	-0.062***	0.014	0.003	-0.011	-0.011	-0.030	0.038
	(0.024)	(0.021)	(0.025)	(0.021)	(0.012)	(0.021)	(0.024)
11 to 25 employees	0.168**	0.072	0.013	0.007	0.060*	0.112*	-0.078
	(0.069)	(0.058)	(0.059)	(0.070)	(0.032)	(0.062)	(0.071)
21 to 50 employees	0.057	-0.002	0.057	0.095	0.045	0.090	-0.071
	(0.070)	(0.059)	(0.056)	(0.082)	(0.033)	(0.063)	(0.073)
More than 50 employees	0.090	0.046	0.081	-0.046	0.036	0.066	-0.052
	(0.055)	(0.049)	(0.050)	(0.048)	(0.025)	(0.050)	(0.057)
Equal access to employment	-0.022	0.024	0.088	0.069	0.047	0.038	0.007
	(0.105)	(0.112)	(0.085)	(0.092)	(0.048)	(0.073)	(0.094)
Receptionist	-	-	-	-	-0.036**	0.028	0.064
					(0.032)	(0.055)	(0.062)
Accounting clerk	-	-	-	-	0.082	-0.034	0.006
					(0.035)	(0.065)	(0.072)
Programmer	-	-	-	-	0.063**	-0.018	0.159**
					(0.029)	(0.068)	(0.078)
Constant	0.208***	0.279***	0.252***	0.307***	0.243***	0.245***	-
	(0.053)	(0.058)	(0.072)	(0.072)	(0.034)	(0.058)	
Observations	312	451	312	361	1436	1436	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Linear probability model of the determinants of callback rates, by target position (Heteroscedasticity robust standard errors between parentheses)

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