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**PAY DISCRIMINATION AGAINST PERSONS WITH DISABILITIES:
CANADIAN EVIDENCE FROM PALS**

By

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Abstract

The objective of the study is to estimate the extent of pay discrimination against persons with a disability in Canada. The methodology involves decomposing or partitioning the pay gap between persons with disabilities and a comparison group of persons without disabilities into a portion due to differences in the pay determining characteristics and a portion due to the differences in pay when they have the same characteristics – commonly attributed to discrimination. We further control for differences in performance by restricting the analysis to persons with a disability that does not limit their performance at work. The data is from the 2006 Participation and Activity Limitation Survey (PALS) linked to the 2006 Census. We find that persons with a disability that does not affect their performance at work are still paid about 10 percent less than a comparison group with no disability but with the same pay determining characteristics.

PAY DISCRIMINATION AGAINST PERSONS WITH DISABILITIES: CANADIAN EVIDENCE FROM PALS

Issues associated with pay discrimination against persons with a disability are of increased importance for a variety of reasons. Persons with disabilities have the second highest rate of long-term poverty amongst those that have been labelled “vulnerable groups” in Canada (Hatfield 2004, p. 25; Kapsalis and Tourigny 2007).¹ The long-term poverty rate for persons with a disability is almost 8 times the poverty rate of 3.4% for the non-vulnerable groups (Hatfield 2004, p. 19). The importance of the pay of persons with disabilities is furthered by the fact that paid employment is the most important factor enabling them to escape long-term poverty (Hatfield 2004, p. 19).

Paid employment is important not only because it can mitigate poverty and reduce reliance on income support programs from government, but also because it fosters workplace networks and a perception of self-worth amongst persons with disability who work (Schur 2002). In that vein, a discriminatory pay gap can foster a self-fulfilling productivity gap and deter investment in human capital in such forms as education, training, job search and mobility. If such investments are not rewarded, the incentive to invest is obviously deterred. This can compound the effect of barriers that persons with a disability may face in accessing education and training as well as engaging in job search and mobility.

Disability issues will become more prominent given that the workforce is aging and living longer, and disability is more prominent amongst older persons (Cosette and Duclos, 2002; Statistics Canada 2006) and individuals tend to be working longer (Schirle 2008). The number

¹ The long-term poverty rates for the different vulnerable groups are: unattached individuals age 45-64 (29.2%); persons with a disability (26.1%); recent immigrants (25.6%); lone parents (21.8%), and Aboriginal persons living off-reserve (15.7%) (higher for those living on-reserve, but data not available).

of disabled persons coming into the labour force is increasing because of accommodations in educational institutions and in transportation (HRDC, 2009, p. 19-29). Persons with a disability can more easily be accommodated in the workforce because of the shift from arduous physical labour towards the knowledge and information economy. Also, the increase in non-standard employment in such forms as part-time work, telecommuting, self-employment, flexible working hours, as well as the increase in technology at the workplace can facilitate their accommodation (Schur 2003; Blanck et. al 2007; and Campolieti, Gomez and Gunderson 2009).

Discrimination against persons with a disability is of increased importance given the emphasis on human rights and combating discrimination. Facilitating the employment of persons with disabilities is regarded as a crucial aspect of their integration into society, and is a rationale behind disability policy initiatives in Canada and the U.S. (Campolieti and Lavis 2000, Gunderson 2006, Burkhauser and Daly 1996, 2002, and Burkhauser and Stapleton 2003). Persons with a disability are increasingly regarded as a potential source to fill labour shortages in part because it can be cheaper to utilize the skills and human capital already embodied in disabled persons, rather than engaging in the costly procedure of producing new skills and human capital (Canada, House of Commons, 2012, p. 48, 49). Moreover, firms may not be taking advantage of this labor pool due to stereotypes of disabled persons which may not be accurate (Colella et al., 1998; Lengnick-Hall, 2008). Clearly, pay discrimination against persons with a disability is an important and growing issue. Determining the extent of such discrimination, however, is a very difficult task for reasons outlined subsequently.

The purpose of this paper is to provide evidence of the extent of pay discrimination against persons with a disability in Canada. To our knowledge this is the first study to do so for Canada. Our contribution to the literature is basically empirical, responding to the concern expressed by

Colella and Stone (2005 p. 235) that “There is a great deal of theory that explains discrimination against persons with disabilities. Indeed the empirical work on workplace discrimination lags behind the theoretical work.”² Our study also uses a decomposition procedure that decomposes (partitions or breaks- down) the overall pay difference between persons with a disability and a nondisabled comparison group into two component parts: one is due to differences in their pay-determining characteristics; the other component is due to difference in pay that they receive when they have the same pay-determining characteristics. The technique is close to unknown in the management literature (and hence outlined in detail here) although it is common in the labour economics literature on discrimination in general. With respect to discrimination against persons with disabilities, Baldwin and Johnson (2006) in their comprehensive review indicate that there are six studies that use this decomposition technique to analyse earnings discrimination against persons with a disability. To our knowledge, ours is the first Canadian study to use this procedure in the disability area.

We also sub-decompose those two components to portray the relative importance of each of the separate variables in contributing to the portion of the gap explained by the different pay-determining characteristics and the portion attributable to different returns that disabled and non-disabled persons receive for the same pay-determining characteristics. To our knowledge this is the first study in the disability literature to do such a sub-decomposition. Lastly, we have information on the extent to which the disability affected performance at work so as to enable controlling for the effect of the functional limitations on work performance and pay. This is

² The theoretical perspectives emphasised in economics are outlined in more detail, for example in Baldwin and Johnson (2006) and Gunderson (2006). The perspectives emphasised in organization behaviour and psychology are discussed in various chapters in Dipboye and Colella (2005) with the two perspectives contrasted in Harcourt et. al (2005)

important given the difficulty of estimating discrimination on a group whose performance can be affected by functional limitations, as discussed subsequently.

Colella and Stone (2005 p. 230) indicate: “In order to assess workplace discrimination, a study must include a non-disabled control group, hold performance constant, and measure a work-related dependent variable.” Our empirical analyses satisfies those three requirements in that we have a non-disabled control group, we hold performance constant by controlling for a range of pay-determining factors and more importantly by also doing the analysis separately for those who indicate that their disability does not affect their performance at work, and our work-related dependent variable is earnings.

METHODOLOGY

Our methodology involves first estimating a conventional earnings equation with the individual’s disability status represented by a dummy variable coded 1 if the individual has that particular disability status, with the omitted reference category being the comparison group of non-disabled persons, coded 0 (presented in Table 1). That is:

$$(1) Y = X\beta + \alpha D$$

Where the dependent variable Y is the log of annual earnings; X is a vector of conventional pay determining characteristics used as control variables (detailed subsequently), β is a vector of estimated regression coefficients showing the effect of each of the characteristics on earnings, D is a dummy variable that reflects the individual’s disability status (detailed subsequently) and α is a

coefficient estimate that gives the effect of the disability status on earnings. For simplicity of exposition, the individual subscripts and the error terms are omitted.

The control variables used in all of the regressions are common ones used in explaining variance in pay in the discrimination literature (reviewed in Baldwin and Johnson (2006), where their rationale is also discussed). They are listed in Table 2 and include: age, marital status, gender, Aboriginal status, visible minority status, immigrant status, education, region, rural-urban status and hours worked. The control variables do not include industry or occupation since it is not appropriate to net-out or control for the effect of such variables which are mechanisms through which disability status can affect earnings. Controlling for their impact would inappropriately eliminate the effect of an important channel through which discrimination can occur.

A difficulty in estimating the extent to which an individual's disability status reflects discrimination is that a disability by definition is a "functional limitation" and such a functional limitation could affect performance at work and hence pay even after controlling for the effect of other pay determining factors. This is highlighted by the World Health Organization (WHO) defining disability as "a restriction of functional ability and activity caused by an impairment (e.g., loss of hearing, reduced mobility)" (HRDC 1997, p. 11). They also define a handicap, however, as "A social or environmental disadvantage resulting from impairment or disability." This highlights that a disability need not result in a handicap or disadvantage *at work* (e.g., Baldwin and Johnson 2006, Gunderson 2006, HRDC 1997 and WHO 2001).

Many of the common disabilities such as those that involve pain or restricted mobility or agility may make work more difficult but need not affect performance. Workers are often quite capable of adapting to any limitations they have at the workplace (Campolieti 2007; Daly and

Bound 1996). Workers with a disability may also compensate in other dimensions such as care, diligence, loyalty and effort. Their disability may also be easily accommodated by appropriate policies on the part of human resource managers so that any functional limitation may not affect their performance and productivity at work.³ Campolieti (2009), however, indicates that there is still an unmet demand for accommodations on the part of persons with disabilities.

Nevertheless estimating discrimination against persons with a disability is made difficult by the fact that a disability is a functional limitation and that the limitation *may* affect performance at work and hence pay. We try to circumvent, or at least minimize, this issue by also comparing persons without a disability to persons with a disability who self-report that their disability does not affect their performance at work, as done in DeLeire (2001) and Longhi et al. (2012). We also compare persons without a disability to persons who self-report their disability as not affecting their performance at work *and* as not severe (i.e., as mild or moderate). Adding that additional criteria of the disability not being severe, should enhance the likelihood that the disability does not affect their performance at work and hence should not be associated with a wage penalty. If there is a remaining pay gap after also controlling for other pay determining factors, we interpret that gap as potentially reflecting discrimination, recognizing the possibility (as is always the case in the discrimination literature) that it can also reflect unobservable factors that differ between the two groups.

Legitimate concern can arise over the accuracy of self-reported indicators of disability status. External evidence, however, indicates that such self-reported measures of disability are highly correlated with objective measures of health (Bjorner et al, 1996, Bound 1991, Ferraro

³ The importance of workplace accommodations are emphasised, for example, in Burkhauser, Butler and Kim (1995), Burkhauser et al. (1999), Campolieti (2005, 2007, 2009) and De Leire (2000a, 2000b).

and Farmer 1999, Ferraro, Farmer and Wybraniec1997, Idler and Benyamini1997 and Stern 1989) and self-reported measures of work limitations are highly correlated with functional limitations (Burkhauser and Daly 1996).

The second aspect of our methodology (presented in Table 2) involves the Blinder-Oaxaca decomposition or partitioning technique commonly used in the labour economics literature (Blinder 1973, Oaxaca 1973) but that is close to unknown in the management literature. The first step is to use regression analysis to estimate separate earnings equations for workers with no disability (subscript n) and for workers with a disability (subscript d). Specifically,

$$(2) Y_n = X_n\beta_n \text{ for workers with no disability}$$

$$(3) Y_d = X_d\beta_d \text{ for workers with a disability}$$

Our variables are defined as previously.

In regression analysis, the mean of the dependent variable equals the regression coefficients times the mean values of the explanatory variables. That is (where the over-bar denotes the mean):

$$(4) \bar{Y}_n = \bar{X}_n\beta_n \text{ for workers with no disability,}$$

$$(5) \bar{Y}_d = \bar{X}_d\beta_d \text{ for workers with a disability.}$$

The hypothetical earnings that persons with a disability would earn if they had their own pay-determining characteristics (i.e. \bar{X}_d) but received the same non-discriminatory returns β_n as persons with no disability for those same characteristics, can be denoted as:

$$(6) \bar{Y}^*_d = \bar{X}_d \beta_n$$

Subtracting equation (6) from equation (4) yields:

$$(7) \bar{Y}_n - \bar{Y}^*_d = \bar{X}_n \beta_n - \bar{X}_d \beta_n = (\bar{X}_n - \bar{X}_d) \beta_n$$

This is the portion of the pay gap between persons without a disability and with a disability that is due to differences in their endowments of pay-determining characteristics or explanatory variables in the regression equations, $(\bar{X}_n - \bar{X}_d)$, evaluated according to the returns or regression coefficients, β_n , that persons without a disability received for those characteristics.

Subtracting equation (5) from equation (6) yields:

$$(8) \bar{Y}^*_d - \bar{Y}_d = \bar{X}_d \beta_n - \bar{X}_d \beta_d = (\beta_n - \beta_d) \bar{X}_d$$

This is the portion of the pay gap between persons without a disability and with a disability that is due to differences in the pay or returns, $(\beta_n - \beta_d)$, that they receive when they have the same pay-determining characteristics, \bar{X}_d .

Adding equations (7) and (8) yields

$$(9) \bar{Y}_n - \bar{Y}_d = (\bar{X}_n - \bar{X}_d) \beta_n + (\beta_n - \beta_d) \bar{X}_d.$$

That is, the average pay differential between non-disabled workers and workers with a disability can be decomposed into two components. The first or “explained” component is due to differences in the average value of the pay determining characteristics or explanatory variables, $(\bar{X}_n - \bar{X}_d)$, evaluated according to the returns (regression coefficients in the earnings equations) that non-

disabled workers receive for those characteristics, β_n , since those returns reflect the non-discriminatory norm.⁴ The second component is differences in the pay or returns, $(\beta_n - \beta_d)$, that non-disabled workers and workers with disabilities receive for the same wage-determining characteristics, \bar{X}_d .

When we estimate this on the sample of workers with no disability and those with a disability that does not affect their performance at work, we interpret this pay difference as attributable to discrimination against disabled persons since their disability does not affect their performance at work and yet there is a pay gap between them and persons with no disability.

In the decomposition procedure we also *sub-decompose* both the *endowment* component and the *coefficients* or “discrimination” component to show the relative contribution of each variable to each of those components (Jann 2008, Yun 2005). To our knowledge, this is the first study to do such a sub-decomposition in the literature on discrimination in general.

The third component of our analysis (presented in Table 3) involves examining the effect of the type of limitation and medical condition on the subsample of persons with a disability that does not affect performance at work, after controlling for other variables that affect earnings. The variables representing the type of limitation are all dummy variables where the omitted reference category is not having that limitation. The medical conditions are all interpreted relative to the omitted reference category of musculoskeletal soft tissue disability which is the most common category.

⁴ As is well known in the decomposition literature, different concepts of non-discriminatory pay can be used to evaluate or weight the endowment differences (Baldwin and Johnson 2006, p. 132; van der Muelen Rogers 2006; Jann 2008). Our results are not sensitive to the use of alternative weights, so we report those based on the wages of non-disabled persons on the grounds that they reflect a non-discriminatory norm.

DATA

Our subsequent analysis is based on the confidential master files of the 2006 Participation and Activity Limitation Survey (PALS), conducted by Statistics Canada and described in Statistics Canada (2006). Access to this confidential data is only through a Canada Research Data Center (RDC). The statistical analysis has to be done at the RDC after approval of the project and the researchers. As well, release of the output is vetted by Statistics Canada personnel to ensure confidentiality of the data. The 2006 survey is the latest PALS conducted, with the only previous PALS done in 2001. It is a survey of persons whose everyday activities are limited because of a medical condition or health problem.

PALS is a post-censal survey which used the 2006 Census as a sampling frame to identify its population. It is based on a sample of person who first answered “yes, often” or “yes, sometimes” to any component of either of the following filter questions in the 2006 Census. Do you have any difficulty hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing any similar activities? Does a physical condition or mental condition or health problem reduce the amount or the kind of activity you can do at home, or at work, or at school or in other activities, for example, transportation or leisure?

From this frame who responded “yes” to any component of either of these questions, a sample of individuals was selected for the PALS interview. In order to be categorized as a person with a disability, a second filter was also applied; the respondent must *also* report that they have a disability or activity limitation in the PALS survey itself. In essence, to be considered as a person with a disability there is a two-part filter – one in the Census to be part of PALS, and a confirmatory filter of a disability or activity limitation in PALS. Persons who passed the disability filter in the Census but did not confirm that they had a disability or activity

limitation in PALS would not be considered as persons with a disability. In that vein, potentially “false positives” from the Census are excluded by the subsequent PALS filter. The dual filter suggests a stringent self-reported disability status.

Approximately 39,000 adults and 9,000 children in the 10 provinces and 3 territories were selected to participate in the survey in Canada. Statistics Canada excluded persons if they lived on First Nations reserves, military bases, Canadian Armed Forces vessels, merchant vessels and coast guard vessels, as well as campgrounds and parks, because of difficulties in surveying such persons. The interviews were conducted by telephone with the interviewers using a computer assisted collection methodology. The overall response rate was 75.0%.

The PALS concept of disability as an activity limitation or participation restriction associated with a physical or mental condition or health problem is a multi-dimensional classification based on both a medical and a social model of disability encompassing the relationship between body structures and functions, daily activities, social participation and environmental factors. It recognizes that a functional limitation arising from a disability need not be a functional limitation at work if physical and attitudinal barriers do not make it such a limitation. The PALS concept is based on the World Health Organization’s (WHO) framework of disability provided by the International Classification of Functioning (ICF).

Being a subsample of the Census data, we were also able to link the PALS data to a comparison group of non-disabled persons from the Census data. The link to the census data also enabled us to include detailed information for both disabled and non-disabled persons on such factors as their earnings and other pay determining characteristics such as age, marital status, gender, Aboriginal status, visible minority status, immigrant status, education, province, urban vs. rural location and hours worked.

Since our focus is on pay gaps between persons with and without disabilities, we restrict our analysis to employed persons between the ages of 20-64 who were working for wages, salary, tips or commissions. We excluded the self-employed because of the difficulty of obtaining meaningful earnings measures for such persons. We also excluded Quebec, because of uncertainty about the accuracy of the disability measure in that province. Specifically, the proportion of disabled workers in Quebec (about 14%) was much lower than the proportion of non-disabled workers in that province (about 25%), while it was similar across other provinces. We do not know if this is due to a lower likelihood to self-report a disability in Quebec perhaps because of the translation of the survey question into French, or to a lower tendency for disabled persons to work in the labour market, or some other factor in that province. The Atlantic provinces were merged into the Atlantic region because of confidentiality concerns with too few observations in the smaller provinces.

RESULTS

Our results are presented in a sequential fashion to illustrate the effect of different status of disability as well as the relative importance of different factors to the disability pay gap. First, we present the results of estimating earnings equations with different dummy variables that indicate the disability status of the individual reflecting varying degrees of work limitation and severity of disability (Table 1). Second, we decompose the disability pay gap into differences in their endowments of pay determining characteristics and differences in the returns they receive for the same characteristics, and we examine the relative contribution of the different factors that contribute to that gap (Table 2). Third, we examine the importance of different medical conditions and disability limitations in affecting the pay of persons with disabilities (Table 3).

Disability Dummy Variable Results with Comparisons to Non-Disabled

Table 1 presents our results where disability status is represented by a dummy variable that reflects different degrees of work limitation and severity of the disability. In panels 1 and 2, the disability dummy is simply coded 1 if the respondent reported they had a disability or activity limitation in the PALS survey. In panel 3, the disability dummy is coded 1 if they reported they had a disability that was not work-limiting, and in panel 4 it is coded 1 if they reported they had a disability that was not work-limiting, and not severe. In all cases, the comparison group is non-disabled persons, coded 0. All of the regressions include the control variables outlined previously. The results are presented sequentially with different degrees of controlling for factors that should affect pay.

As indicated in the first panel, persons with a disability earn 20.6 percent less than persons with no disability before controlling for the effect of other pay determining factors. This is the gross or unadjusted pay gap before controlling for the effect of any other observable determinants of pay.

The second panel indicates that persons with a disability earn 21 percent less than persons with no disability after controlling for the effect of the other pay determining factors. The fact that this net disadvantage is almost identical to the gross or unadjusted gap of 20.6 percent highlights that controlling for the effect of the other pay determining factors does not alter the magnitude of the pay gap.

The third panel endeavors to control for the effect of functional limitations by restricting the disabled group to persons who indicate that their disability does not limit their performance at work. As indicated in the third panel this disability pay gap is cut in half (to 10.3 percent)

when comparisons are made between persons with no disability and those with a disability that does not limit their performance at work. This suggests that about half of the overall pay gap reflects the work limiting effect of the functional limitations and the remaining gap of 10.3 percent reflects discrimination or unobservable factors.

The fourth panel restricts the disabled group to those who indicate that their disability does not affect their performance at work *and* their disability is not severe (i.e., it is mild or moderate). As indicated, adding that additional criteria of the disability not being severe should enhance the likelihood that the disability does not affect their performance at work and hence should not be associated with a wage penalty. The disability pay gap does fall, but only to 8.7 percent, highlighting that the severity of the disability does not matter much in cases where the disability does not affect performance at work.

In all of the above regressions the control variables behave in the expected manner and are consistent with the results of empirical studies on the determinants of earnings.⁵ For example, the conventional age-earnings profile prevails where earnings increase with age, peaking in the older age bracket, then levelling off or declining slightly. Earnings are highest for persons who are married or live common law. Males earn substantially more than females even after controlling for the effect of other wage determining characteristics. Earnings are lower for Aboriginal persons, visible minorities and immigrants compared to their non-group counterparts. Earnings rise monotonically with each higher level of education. The well-known regional wage differences prevail with Alberta, Ontario and British Columbia being the higher paying regions and the Atlantic provinces being the lower paying ones. Persons who work in urban areas earn

⁵ The full regressions with the control variables are available on request for each specification. They are illustrated subsequently in Table 3 for persons with no disabilities and those with disabilities that are not work limiting.

more than those who work in rural areas. The reasonableness of the effect of the control variables adds credence to the main variable of interest – the disability indicator that estimates the disability pay gap.

Decomposition Results for Non-Disabled vs. Disability Not Work Limiting

Table 2 presents the results of our decomposition and sub-decomposition analysis where we drill deeper into the relative contribution of different factors to the disability pay gap. Our decompositions are based on comparing the non-disabled with disabled persons who indicate that their disability does not affect their performance at work. As discussed, if this self-assessment is correct there should be no pay gap since the disability does not affect performance at work. The estimation of separate equations for persons with a disability and with no disability allows the coefficients to differ for each group.

As indicated in the top row, the overall disability pay gap indeed is very small at only 0.023; that is, non-disabled persons earn only 2.3 percent more than persons with a disability that does not affect their performance at work. At face value, this would suggest that there is substantially no pay discrimination against persons with a disability after controlling for the effect of their functional limitation on their work performance since they are paid almost the same. However, the negative magnitude of -0.079 in column 1, highlights that persons with a disability that does not affect their performance at work have greater endowments of pay determining characteristics that positively affect pay (i.e., $X_d > X_n$ so that $(X_n - X_d)B_n < 0$). If the value of those endowments were factored in, their pay would be about 8 percent higher, and therefore greater than the pay of persons with no disabilities.

Conversely, the magnitude of the unexplained pay gap of 0.102 (column 2) highlights that persons with a disability that does not affect their performance at work are paid 10.2 percent less than those with no disability even after controlling for the effect of the various pay determining characteristics as well as any effect that functional limitations may have on work performance. This is a measure of the pure or adjusted pay gap that remains after controlling for the effect of the various pay determining characteristics and functional limitations that may impact on work performance. As indicated, that unexplained pay gap is commonly taken to reflect discrimination.

The unexplained or discriminatory pay gap of 10 percent is in the range of estimates based on the six studies using the decomposition methodology as documented by Baldwin and Johnson (2006) in their comprehensive review.⁶ Longhi et al. (2012) (published since their review) also use that comparison and essentially found no pay discrimination except for persons with a mental illness.

The sub-decompositions highlight the relative importance of the different variables in contributing to both the explained and unexplained components. With respect to the explained component of -0.079, virtually all of that is due to the fact that persons with disabilities are in the older age brackets where pay tends to be higher, and fewer are in the youngest age bracket where pay tends to be lower. The only other factors that matter in terms of contributing to the explained component are education and hours of work. Non-disabled persons are more likely to be university graduates than are persons with a disability and they are less likely to have less than high school. The former contributes 0.015 positively and the latter 0.014 positively to the

⁶ The discriminatory components in those studies were 17% for males in Johnson and Lambrinos (1985), 15% for males in Baldwin and Johnson (1994), 5% for females in Baldwin and Johnson (1995), 7% for males and 5% for females in Baldwin (1994), 12% for males in Baldwin and Johnson (2000) and 5% for all persons in DeLeire (2001). The studies often had a range of estimates corresponding to different estimation procedures and groups, so the numbers cited above should be regarded as generalizations.

gap. Similarly, non-disabled persons work longer hours than do persons with a disability, and those longer hours contribute 0.017 to the gap.

In essence, differences in the composition of the disabled and non-disabled workforces are such that persons with a disability have greater endowments of pay determining characteristics. Specifically, they are disproportionately older where pay is higher and this more than offsets the fact that they tend to have less education and work fewer hours so that on net the small overall pay gap of 0.023 would be considerably larger if differences in the age distribution were not substantial. Differences in the other pay determining factors do not contribute much to the pay gap.

With respect to the unexplained portion of the gap of 0.102, a larger number of factors contribute to that gap which is often labelled as reflecting discrimination when it is due to the higher returns (coefficients) that non-disabled persons receive for the same pay determining characteristics even when the disability does not affect performance at work. For example, non-disabled person receive higher wage premiums associated with being in the age groups 25-34 and 45-54, and these contribute 0.017 and 0.024 respectively to the gap of 0.102. Non-disabled persons receive a higher premium to being male compared to female than do persons with a disability, and this contributes 0.030 to the gap of 0.102. This illustrates the “double-handicap” from being both disabled and female (Schur, 2004). The non-disabled receive a much higher premium to working in an urban environment than do persons with a disability and this contributes 0.080 to the gap. This may reflect the possibility that mobility and job search are more restricted in an urban environment for persons with a disability compared to persons without a disability, giving employers the power to exploit that immobility by paying lower

wages to persons with a disability. (Black 1995; Blackaby, Booth and Frank, 2005; Bowlus 1997).

While non-disabled persons tend to receive a higher wage premium for these pay determining characteristics (hence contributing positively to the unexplained or “discriminatory” pay gap) persons with a disability get a higher premium for obtaining a trade/community college diploma or a university or graduate degree. These contribute negatively, respectively -0.021 and -0.014 to the unexplained gap of 0.102. That is, the unexplained gap would be even larger were it not for the greater premium to these forms of higher education for persons with a disability. This highlights the importance of education for persons with a disability. They are less likely to acquire a university or graduate degree and are about as likely to acquire a trade/community college diploma, but if they do, they benefit more from them.

Effect of Type of Limitation and Medical Conditions for Persons with Disabilities

The previous analysis compared persons with no disabilities to persons with various degrees of disability related to how they would affect performance at work, with a focus on persons with disabilities that were not work limiting and hence that should have no effect on pay. The dummy variable specifications and the decompositions required the same variables for both the persons with no disabilities and those with disabilities. Table 3 presents the results for the subsample of persons with disabilities that do not affect performance at work where the effect of the type of limitation and the medical conditions are also included. The variables representing the type of limitation are all dummy variables coded 1 if the individual has that particular limitation and coded 0 if they do not have that limitation. Multiple limitations are possible, and this is captured by a dummy variable coded 1 if the respondent has multiple limitations, 0

otherwise. The medical conditions are all interpreted relative to the omitted reference category of musculoskeletal soft tissue disability which is the most common category.

As indicated, the types of limitation generally do not have a statistically significant effect on earnings, as would be expected if they did not affect performance at work. The exceptions are mobility limitations, memory limitations and emotional limitations which have negative and statistically significant effects on pay. Even if mobility limitations do not affect performance at work, they may limit the job search and threat of leaving on the part of such persons, giving employers a degree of power to exploit that immobility by paying lower wages to persons with such disabilities (Black 1995; Blackaby, Booth and Frank, 2005; Bowlus 1997). Similarly, even if emotional limitations do not have an effect on the work performance of the disabled person, at least as self-reported, they may still have a negative effect on co-workers or customers, and this can affect pay.⁷ The negative effect of memory limitations is a little more puzzling. If the self-reporting is accurate and these memory limitations do not affect the person's performance at work, they should not have such a large negative effect on pay. One possible explanation is that the memory limitations do affect the person's performance at work as well as their self-evaluation of that effect; that is, their self-reporting of it not having an effect is simply wrong and related to their memory limitation. Or, as with emotional limitations, memory limitations may not affect the person's performance at work, but may affect co-workers or customers in a negative fashion and this does not get perceived by the respondent as affecting their performance at work. It is also possible that memory limitation may be associated with a

⁷ The importance of discrimination against persons with disabilities on the part of customers is documented in Baldwin (2006). The importance of co-workers in providing a hospitable or a hostile work environment is discussed in Mesmer-Magnus and C. Viswesvaran (2009). The negative perception of emotional instability can arise from the fact that it can lead to danger or peril as well as disruptiveness, which are characteristics that can foster negative reactions on the part of co-workers or customers (Stone and Colella, 1996).

mental disability and since discrimination against mental disabilities is greater than other types of disabilities, this may be a reflection of this discrimination.

The different medical conditions also generally do not have a statistically significant effect on pay as may be expected for those whose condition does not affect their performance at work. The exceptions are for the large negative effect for nervous disorders and especially congenital malformations. As with the emotional limitations discussed previously, nervous disorders and congenital malformations can have a negative effect on co-workers and customers (and hence pay) and this may not be regarded in the self-reporting by the individual as having a negative effect on work performance.

As indicated previously, the control variables have effects that are in the expected direction and consistent with the literature on the determinants of earnings. This is further illustrated for the equations for both persons with no disability and those with a disability that is not work-limiting.

Differences in some of the coefficients between persons with no disability and those with a disability that is not work limiting are worthy of note. The effect of those differences show up in the unexplained portion of the decomposition that reflects the different returns (coefficients) for the two groups as discussed previously. For example, the negative effect of being an Aboriginal person is much larger for those with a disability (-0.265) compared to those with no disability (-0.092). The positive effect of each higher level of education is much greater for persons with a disability than for persons with no disability, highlighting the importance of education for persons with a disability. The urban wage premium is 12.5% for persons with no disability but statistically insignificant for persons with a disability, perhaps reflecting the

reduced mobility and job search possibilities for persons with a disability in an urban environment.

DISCUSSION

We link data from the 2006 Participation and Activity Limitation Survey (PALS) to the 2006 Census to analyse pay discrimination against persons with a disability in Canada when compared to a non-disabled comparison group. Our contributions to the literature are threefold. First, this is the first study to examine the extent to which there is discrimination against persons with a disability in Canada. Second, it is the first study in the discrimination literature in general to sub-decompose both the explained and unexplained portion of the disability pay gap to highlight the relative importance of each of the separate variables in contributing to the portion of the gap explained by the different wage determining characteristics and the portion attributable to different returns that disabled and non-disabled persons receive for the same wage determining characteristics. Third, we have information on the extent to which the disability affected performance at work so as to enable controlling for the effect of the functional limitations on work performance and pay.

Our analysis yields four main empirical generalizations. First, persons with a disability earn about 21 percent less than persons without a disability, and this disability pay gap is similar whether or not one controls for the effect of other conventional determinants of pay. Second, persons with a disability that does not affect their performance at work are paid about 10 percent less than those with no disability because they receive lower returns to their pay determining characteristics – commonly taken as a measure of discrimination. Third, the pay- determining characteristics for which they tend to receive *lower returns* include age, being female and

working in an urban environment where their mobility and job search may be more restricted compared to non-disabled persons. Persons with a disability, however, do get a higher premium for obtaining a trade/community college diploma or a university or graduate degree. Fourth, the types of *health limitation* that negatively affect pay are mobility limitations, memory limitations and emotional limitations. The *medical conditions* that have a substantial negative effect on pay are nervous disorders and especially congenital malformations.

A number of practical implications flow from this analysis. Acquiring higher education in the form of a trade/community college degree or university or graduate degree is particularly important for persons with a disability since they receive higher returns to such education than do persons without a disability, and those returns are high for all groups. It is possible that the negative stereotype associated with disabled persons is overcome by a higher level of education, thereby explaining these high returns to educations for persons with a disability.

Combatting gender discrimination is important in general, but particularly so for females with a disability since they receive a greater pay “penalty” for being female than do persons without a disability. To the extent that the lower returns that persons with a disability receive for working in an urban environment reflects restrictions on their mobility and job search, then fostering such mobility and job search can help overcome this disadvantage.

The negative effects of emotional limitations, nervous disorders and congenital malformations, even when they do not affect performance at work, are more difficult to deal with from a workplace perspective. To the extent that their negative effect emanates from prejudice and stereotypes on the part of co-workers and customers, then workplace initiatives to combat such prejudice can facilitate acceptance. This, of course, is easier said than done. To the extent that such prejudice arises because of a discomfort around a lack of familiarity of how to interact

with persons with such disabilities, then fostering such interaction, perhaps through workplace accommodations or conscious recruiting and hiring decisions as discussed in the human resource management literature, can help break down stereotypes about the performance of such individuals (Schur, Kruse and Blanck 2005; Ren, Paetzold and Colella, 2008; various chapters in Dipboye and Colella 2005).

Finally, a full-employment economy generating labour shortages is likely to disproportionately benefit persons with a disability, as is the case with disadvantaged persons in general. For persons with a disability this is especially the case since they already embody their human capital, and it is more cost effective to utilize existing human capital than to engage in the costly process of producing new human capital. In that vein, persons with a disability can be an untapped source when labour market conditions create the incentive to tap such sources.

In a related vein, fostering competitive markets can help dissipate discrimination since such discrimination should not survive in the face of market forces because non-discriminating employers should out-perform discriminating employers because they should have lower cost since they are willing to hire the cheaper but equally productive workers (Becker 1957; Heckman 1998; Wright et. al 1995). As aptly stated by Gelfand et. al (2012, p. 89) in the context of human resource practices: “discriminating firms may have less talented and committed workforces, high operating costs because of turnover, absenteeism and job dissatisfaction, poor reputations with diverse customers, and/or lower organizational adaptability.” Empirical evidence suggests this is the case.⁸ We agree with Dipboye and Colella (2005, p. 447) that “there are limits to the

⁸ Evidence that competitive market forces dissipate discrimination is given in Ashenfelter and Hannan (1996), Black and Brainerd (2004), Black and Strahan (2001), Hellerstein, Neumark and Troske (2002), Meng (2004) and Wright et. al (1995).

business case [for workforce diversity] and dangers in overemphasizing it.” The limits include the possibility that employers may still find it in their profit maximizing interests to cater to the discriminatory preferences of customers and co-workers to avoid negative interactions (Ren, Paetzold and Colella 2008), and to exploit any immobility of workers with disabilities. A danger in overemphasising the business case includes the possibility that it implies nothing needs to be done except to inform employers of the fact that they can reduce costs by hiring discriminated-against groups who can be paid less than equally productive groups that are not discriminated against. Nevertheless, there may be some mileage in fostering the competitive forces that dissipate discrimination and in informing employers that non-discriminating employers outperform those that discriminate.

While the evidence presented here provides some insights into practical implications, there are limitations to our analysis. The survey data used in this study has information on variables that enable controlling for conventional determinants of pay as outlined in the labour economics literature. It does not, however, enable getting inside the “black box” of prejudices, stereotyping, social exclusion, biases, stigma and other factors as emphasised in the psychology/ organization behaviour/ human resource management literature as outlined in Dipboye and Colella (2005). Nor does the survey data upon which our analysis relies, provide information on the specific human resource and organizational factors that contribute to discrimination against persons with disabilities. This severely limits its ability to provide implications for changes in human resource practices to dissipate such discrimination, such as those outlined in Arthur and Doverspike (2012b) dealing with recruitment, selection, training, performance appraisals and compensation. In that vein, the labour economics literature and the psychology/ organization behaviour/ human resource management literature are somewhat like two ships crossing in the

night – largely impervious to each other. More interaction across these areas could yield insights into appropriate practical initiatives to help dissipate discrimination against persons with disabilities, and foster their integration into the labour market and society.

Table 1: Dummy Variable Specification for Various Disability Status vs. No Disability

	Coefficient	P-value	Sample size
1. Disability vs. No Disability, No Controls			
(No disability reference) Disability dummy	-0.206**	0.000	N=37,200
2. Disability vs. No Disability, With Controls			
(No disability reference) Disability dummy	-0.210**	0.000	N=37,200
3. Disability Not Work Limiting vs. No Disability, With Controls			
(No disability reference) Disability dummy	-0.103**	0.000	N=34,600
4. Disability Not Work Limiting and Not Severe vs. No Disability, With Controls			
(No disability reference) Disability dummy	-0.087**	0.000	N=34,400

Note: The disability dummy represents the disability status as given in the heading for each panel, and is coded 1 if the respondent reports that status. The “no disability reference” is the omitted reference category and is coded 0 to represent no disability. Includes controls for age, marital status, gender, Aboriginal status, visible minority status, immigrant status, education, province, rural-urban status and hours worked.

Significance is denoted by ** at the 0.01 level and * at the 0.05 level.

The full regression output is available on request from the authors. In addition, summary statistics are not displayed due to Statistics Canada RDC confidentiality requirements, but general summary statistics are available from the authors on request.

As per the confidentiality requirements of the RDC all N’s are rounded to the nearest 100.

Table 2– Decomposition of Pay Gap Between Persons with No Disability and Persons with a Disability that is Not Work Limiting

	Amount Explained by Differences in Pay Determining Characteristics	Amount Unexplained or Differences In Pay for Same Characteristics
	$(\bar{X}_n - \bar{X}_d)\beta_n$	$(\beta_n - \beta_d)\bar{X}_d$
	(1)	(2)
Total Pay Gap Yn-Yd = 0.023	-0.079	0.102
(Age 20-24)	-0.043	-0.002
Age 25-34	-0.008	0.017
Age 35-44	0.007	-0.016
Age 45-54	-0.023	0.024
Age 55-64	-0.027	-0.023
(Single)	-0.007	-0.014
Married or common law	-0.001	-0.012
Separated, widowed, divorced	-0.002	0.015
(Female)		
Male	-0.002	0.030
(Not Aboriginal or Vis Minority)	-0.009	-0.024
Aboriginal person	0.000	0.003
Visible minority	-0.010	-0.011
(Non-immigrant)		
Immigrant	-0.006	-0.011
(Less than high school graduate)	0.014	0.019
High school graduate	-0.002	-0.001
Trade, community college	-0.001	-0.021
University or graduate degree	0.015	-0.014
(Atlantic)	0.000	-0.005
Ontario	-0.001	-0.027
Manitoba	0.000	0.005
Saskatchewan	0.000	-0.002
Alberta	0.000	0.007
British Columbia	0.001	0.003
(Rural)		
Urban	0.008	0.080
Hours worked	0.017	-0.073
Sample size N	34600	

As per the confidentiality requirements of the RDC all N's are rounded to the nearest 100.

Table 3 – Regression Coefficients, Separate Equations for Workers With a No Disability vs. Disability Not Work Limiting, Including Type of Limitation and Medical Condition, Dependent Variable Ln Annual Employment Income: PALS 2006.

Variable	Coefficient		P-value	
	No Disability	Disability Not Work Limiting	No Disability	Disability Not Work Limiting
	(1)	(2)	(3)	(4)
(Age 20-24)				
Age 25-34	0.529**	0.380**	0.000	0.000
Age 35-44	0.786**	0.828**	0.000	0.000
Age 45-54	0.892**	0.765**	0.000	0.000
Age 55-64	0.796**	0.839**	0.000	0.000
(Single)				
Married or common law	0.162**	0.098*	0.000	0.034
Separated, widowed or divorced	0.121**	-0.047	0.000	0.395
(Female)				
Male	0.354**	0.286**	0.000	0.000
(Not Aboriginal or vis min)				
Aboriginal person	-0.092**	-0.265*	0.002	0.015
Visible minority	-0.215**	-0.131*	0.000	0.047
(Non-immigrant)				
Immigrant	-0.138**	-0.057	0.000	0.251
(Less than HS graduate)				
High school graduate	0.184**	0.321**	0.000	0.000
Trade certificate, community college	0.348**	0.527**	0.000	0.000
University or graduate degree	0.639**	0.818**	0.000	0.000
(Atlantic)				
Ontario	0.303**	0.303**	0.000	0.000
Manitoba	0.177**	0.036	0.000	0.676
Saskatchewan	0.137**	0.140	0.000	0.136
Alberta	0.349**	0.255**	0.000	0.000
British Columbia	0.258**	0.200**	0.000	0.002
(Rural)				
Urban	0.125**	0.050	0.000	0.218
Hours worked	0.013**	0.015**	0.000	0.000

(Table 3 cont'

... Table 3 continued) Disability Related Variables	Coefficient		P-value	
	No Disability	Disability Not Work Limiting	No Disability	Disability Not Work Limiting
	(1)	(2)	(3)	(4)
<i>Type of Limitation</i>				
Agility limitation	n.a.	0.071	n.a.	0.143
Hearing limitation	n.a.	0.040	n.a.	0.399
Seeing limitation	n.a.	-0.044	n.a.	0.460
Communication limitation	n.a.	-0.069	n.a.	0.382
Mobility limitation	n.a.	-0.095*	n.a.	0.038
Pain limitation	n.a.	-0.014	n.a.	0.747
Learning limitation	n.a.	-0.038	n.a.	0.526
Memory limitation	n.a.	-0.235*	n.a.	0.011
Developmental limitation	n.a.	-0.043	n.a.	0.729
Emotional limitation	n.a.	-0.272**	n.a.	0.000
(Single limitation)				
Multiple limitations	n.a.	0.038	n.a.	0.574
<i>Medical Condition/Disease (ICD10)</i>				
(Musculoskeletal soft tissue disease)				
Neoplasms	n.a.	0.055	n.a.	0.865
Endocrine disease	n.a.	0.195	n.a.	0.100
Mental disability	n.a.	0.007	n.a.	0.946
Nervous disorder	n.a.	-0.152*	n.a.	0.033
Eye diseases	n.a.	0.169	n.a.	0.118
Ear diseases	n.a.	-0.038	n.a.	0.556
Heart and circulatory disease	n.a.	-0.020	n.a.	0.848
Respiratory disease	n.a.	0.174	n.a.	0.060
Digestive disease	n.a.	0.092	n.a.	0.615
Congenital malformations	n.a.	-0.882**	n.a.	0.000
Injury/ consequences from external causes	n.a.	-0.051	n.a.	0.484
Other conditions or diseases	n.a.	0.019	n.a.	0.803
Not Stated	n.a.	-0.182**	n.a.	0.008
(Single Medical Condition)				
Multiple Medical Conditions	n.a.	-0.012	n.a.	0.732
Constant	8.244**	8.230**	0.000	0.000
R-squared	0.30	0.34		
Sample size total N =	32400	2200		

Note: Column 1 represents the subsample of persons with no disability, and column 2 the subsample who reported they had a disability that was not work limiting.

Significance is denoted by ** at the 0.01 level and * at the 0.05 level.

As per the confidentiality requirements of the RDC all N's are rounded to the nearest 100.

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