



# JOB MOBILITY AND PROMOTION IN THE FEDERAL PUBLIC SERVICE

A JOINT PROJECT WITH:  
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Canada 

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## **Executive Summary**

### **Goal of the study**

The goal of the study is to assess the degree to which there are differences in the rate at which employment equity group members either change jobs or are promoted as compared to the non-equity group (white males without a disability). The current study represents a first attempt at examining differential promotions rates for employment equity groups while taking into consideration differences in the demographic profile of employment equity groups.

### **Methodology**

To answer these questions we analyse a database of all indeterminate internal appointments, external recruitment and separations covering the period of March 31, 1986 through April 1, 1998. In the first part of the study, all indeterminate job moves are analysed. In the second part, the analysis is restricted to indeterminate promotions. For each analysis (job moves and promotions), a comparison is made between all indeterminate public servants active during the observation period and recent entrants (public servants recruited on or after March 31, 1986). Also, the analyses are conducted while controlling for the differences in the demographic profile of employment equity groups (e.g., length of tenure, age, first official language, region vs NCR, salary quartile, occupational category, gender).

### **Highlights**

#### Demographic Profile:

Results of the demographic profile of the federal public service show a substantial degree of employment equity segmentation with respect to key demographic factors such as length of tenure, age, first official language, and occupational category. The distribution of employment equity groups across salary quartiles, depicts a clear concentration of employment equity groups in the two lower salary quartiles. This suggests that employment equity groups are generally found in the lower echelons of the public service hierarchy.

#### Odds of a promotion:

The analysis conducted on promotion data were carried out in light of differences across employment equity groups on the demographic factors. Overall, the analysis demonstrates that if these demographic factors are “controlled for”, systematic lower odds of a promotion for employment equity groups are revealed with the exception of the operational category factor where results are mixed (see figure 7).

A separate analysis conducted on the promotion data of recent entrants (public servants recruited on or after March 31<sup>st</sup>, 1986, show little change in the overall pattern of results. This suggests that lower odds of promotions for employment equity groups remain to this day, this despite taking into considerations key demographic variables (see figure 8).

## **Conclusion**

The current study demonstrates that promotion rate comparisons across employment equity groups can not be made without taking into consideration key population differences on demographic factors which are known to affect overall promotion rates. By taking into consideration these variables, the current study revealed systematic lower odds of a promotion for employment equity groups in all but one (Operational) occupational category. More importantly, restricting the analysis to new entrants (public servants entering after 31<sup>st</sup>, March 1986) resulted a similar pattern of results. This suggests that barriers to the career progression of employment equity members remain to this day.

## **Introduction**

Defining the degree to which there are differences in the career trajectories and promotion rates of employment equity and non-employment equity group members in the public service has been a question of interest for some time. Studies undertaken in the 1990s, for example, suggest that the career patterns, promotion rates and departure rates may differ substantially by gender, aboriginal, visible minority and disability status. A 1991 study by the Public Service Commission on Aboriginal retention, suggested that restricted opportunities for promotion may contribute to the high departure rates of Aboriginal peoples. A Treasury Board Secretariate study, conducted in 1993, concluded that a glass ceiling existed for visible minorities which effectively excluded them from management positions (TBS, 1993).

Studies at the departmental level have drawn similar conclusions. A 1996 report based on a survey of employees from the Department of Canadian Heritage indicated that members of visible minorities felt they faced barriers to promotion not experienced by non-equity group members (Multicom, 1996). The report revealed that the barriers confronted by equity group members ranged from a lack of understanding on the part of managers to an inability to obtain training or secondments. Further to this, 40 percent of respondents of the Multicom survey reported that their lack of promotion was a direct product of discrimination in the workplace.

Consistent with these findings, a report commissioned by the Canadian Human Rights Commission, based on results of interviews and questionnaires of senior managers from fourteen federal departments, suggested that 'racial discrimination against visible minorities is prevalent in the public service' (Samuel, 1996:3).

The studies mentioned above provide a great deal of detail and depth about barriers to advancement but are based largely on non-random sample interviews. It is difficult to determine, therefore, the degree to which the findings can be generalized to the entire public service population. Data does exist however, to examine the intersection of issues related to opportunity, advancement and equity status in the federal public service.

## Goal of the Study

The goal of this study is to assess the degree to which there are differences in the rate at which employment equity group members either change jobs or are promoted as compared to white males without a disability.

## Population Studied

To answer this question, we analyzed a unique database built from administrative records held by the Public Service Commission using a combination of tabular and survival analysis techniques.

The database contains information on the career paths of all indeterminate federal public servants<sup>1</sup> working at any time during the period March 31, 1987 through to April 1, 1998. The database is a cumulative record of all indeterminate internal appointments, external recruitments, and separations, which occurred over the surveyed time period. All indeterminate public servants active during the period are captured regardless of whether they left midway through the period, or entered during the period. Information is captured on an employee's age, department, location, years of service, language, occupational category, group and level, equity group status, as well as each of his/her indeterminate appointment.

In all, the database contains information on 600,527 transactions experienced by 279,485 indeterminate employees who were active during the eleven-year observation period. Because the population database also includes the date at which each transactions occurred, it is possible to describe dynamically the mobility patterns of the indeterminate employee population of the Federal Public Service over the observation period.

An administrative data set such as the one we are using, brings with it a number of analytical challenges. Primary among these are issues related to entrants and dropouts as people enter and leave the public service. Standard cross-sectional analytical techniques such as tabular analysis or regression are not suitable because the denominator (in this case the number of public servants in any given time period) is constantly changing. We approach this challenge by using techniques based on survival analysis which can handle such changes to the size and structure of the population.

Another challenge concerns data quality. Unlike many data sets where there is extensive data checking on input, verification of administrative records tends to be minimal.<sup>2</sup> In order to avoid coding errors associated with data input and to ensure that we were working with comparable populations, we made the following population selections:

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<sup>1</sup> *Indeterminate federal public servants* refers to people appointed to the Federal Public Service whose tenure in the position is of an unspecified duration. These people are commonly referred to as *indeterminate employees or permanent Public Service employees*.

<sup>2</sup> Some miscoding is a result of keystroke punching errors. An example is the case of a record in which the individual started his (or her) civil service career before their date of birth. There are also cases where records indicate a public servant has worked in excess of sixty years which although within the realm of possibility, seems somewhat harsh.

- S people who entered the public service prior to 1962 were dropped.
- S an age restriction was used which dropped people who were either born prior to 1930 or after 1976.
- S people who were coded as entering the public service prior to their date of birth were dropped.<sup>3</sup>

The selection served to censor 37,874 people, reducing the database to 549,202 transactions and 241,611 indeterminate employees. It is important to note again that the 241,611 individuals included in the database represent a cumulative tally of all indeterminate employees who were active at any time during the eleven-year observation period.

## **Job Mobility Patterns**

For the purposes of this research, job mobility is defined in two ways. First we look at the number of permanent job moves made by a civil servant over the eleven-year data capture period. Every permanent job move is counted regardless of the direction (up, down or lateral). Second, we look at promotions. The rationale for this organization has both a theoretical and operational explanation. First, theoretically, a job move should result in a broader range of experience for any given worker. Thus career movement can be treated as a proxy for experience which may result in promotions. Second, there are far more job moves than there are promotions. Limiting the discussion to promotions would hide much of the mobility in the system.

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<sup>3</sup> We tried a number of different selections on age and tenure including:

S year of birth after 1922, 1925, 1930

S entry into the public service after 1952, 1957 and 1962

Varying the selections did not change the Cox Regression results to any great degree because age and period of entry were included in the model as covariates. The direction and levels of significance remained the same for all the variables.

Table 1 shows the number of people by the number of job moves. Although the information presented in the table does not control for entrant and dropout effects, it does provide an overall picture of job mobility within the public service. Of the 241,611 valid observations in the dataset, almost 86,000 people stayed in the same job over the eleven-year period of the survey data.

**Table 1**  
**Number of job moves by number of people**

Moves	total population	did not move	Moved
Starting population	241,611	85,643	155,968
1 job move	155,968	70,020	85,948
2 job move	85,948	45,962	39,986
3 job move	39,986	23,677	16,309
4 job move	16,309	10,230	6,079
5 job move	6,079	3,946	2,133
6 job move	2,133	1,396	737
7 job move	737	488	249
8 job move	249	165	84
9 or more job moves	84	56	28

Almost 156,000 people (65% of the total population) experienced at least one job move and 86,000 (35,6 % of the total population) experienced at least 2 job moves. Only 7% of the population experienced more than 4 job moves. Thus, while most people had at least one job move, few had more than 4. On average, people experienced 2.27 job moves each over the 11-year period.

At least part of the ability to move from one job to another is a product of the nature of the occupation itself. Certain occupational categories are characterized by greater chances for mobility than others. People in executive, administration support and administration and foreign occupations, experience, on average, more moves than people working in either the scientific and professional, technical, or operational categories (see Table 2).

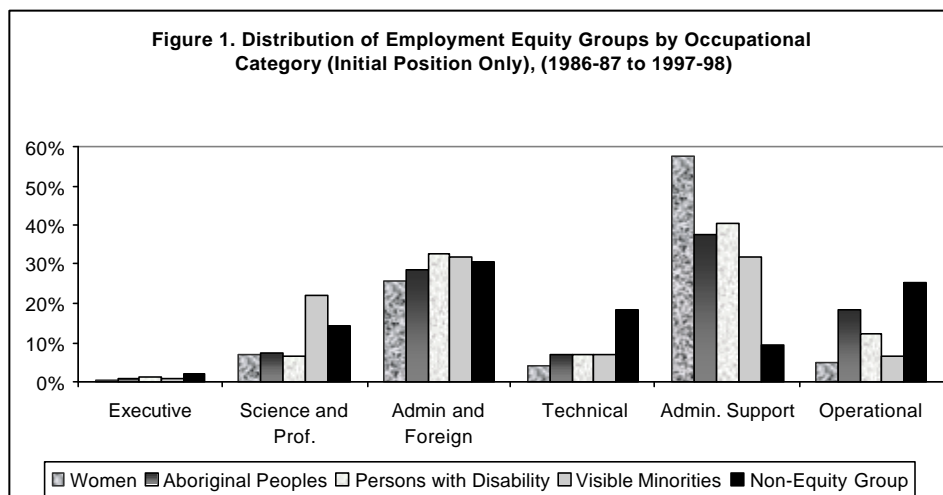
**Table 2**  
**Average number of Moves by Initial Occupational Category**

occupational category	Mean	Number
Total	2.27	241,611
Executive	2.62	3,185
Science and Professional	2.18	26,696
Admin and Foreign	2.38	69,054
Technical	2.13	27,631
Admin support	2.45	77,760
Operational	1.85	37,285



If members of equity groups are concentrated in occupations with low mobility rates (such as those in the operational category), then they may also be less likely to experience a job move than others working in the public service. However this will be a product of the job characteristics rather than a sign of any substantive difference between groups. If, on the other hand they are concentrated in occupational categories with high mobility rates, they may be more likely to experience a job move but, once again, this could be a product of job characteristics rather than a difference in rates between groups.

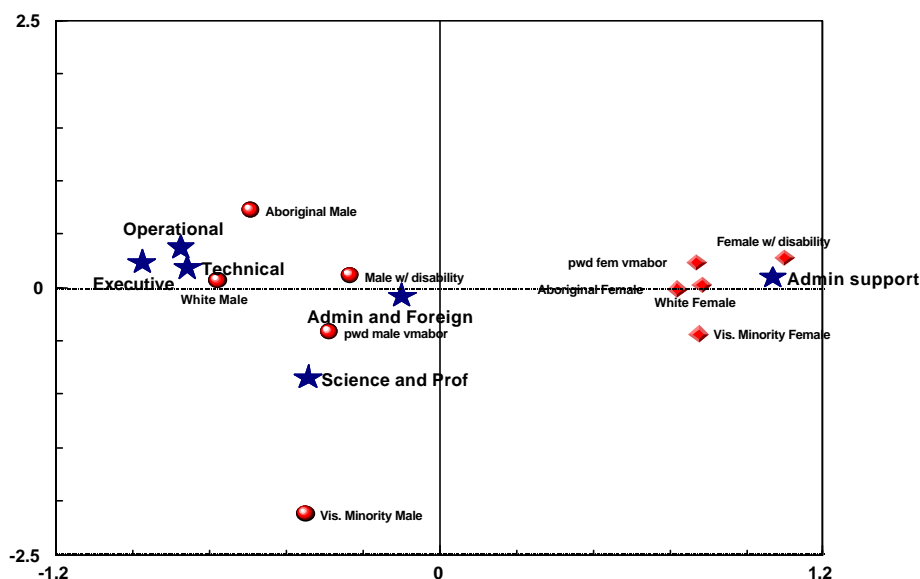
Figure 1 depicts the distribution of each employment equity group across occupational categories compared to that of the non-equity group (i.e. white males without a disability). It illustrates that the distributional profile of employment equity groups across occupational categories is different not only when compared to the non-equity group but also when compared to each other. Overall, all employment equity groups tend to be over-represented in the Administrative Support Category when compared to the non-equity group. This trend however is far more important in women where 58



percent of the labor force is found in this category. Visible Minorities are over-represented in the Scientific and Professional Category (22 percent compared to 14 percent for the non-equity group) and under-represented in the Operational, Technical, Executive Categories. Except for the Administrative Support Category where they are over-represented, Women and Aboriginal Peoples are under represented in every category. The profile for Persons with Disability is slightly different with over-representation in the Administration and Foreign Service and Administrative Support Categories.

Figure 1 points to differences in concentration across occupational categories, but does not delve further into the degree to which these differences may be gender based. For example, although all employment equity groups are over-represented in the administrative support category, there is no indication as to the degree to which the concentration of visible minorities in the category is restricted to females.

Figure 2 First Occupation Category by Group



In order to assess this possibility, Figure 2 portrays information on concentration of equity groups by gender in terms of proximity to an occupational category on a bi-plot.<sup>4</sup> Figure 2 suggests that there are important gender-based differences in the distribution of employment equity groups across categories. Women, regardless of group membership are located on the right-hand side of the chart, clustered around the administration and support category. White males are located close to three sectors – executive, technical and operational. Males from other groups are located closer to the science and professional or administration and foreign categories.

Three conclusions can be drawn from preceding discussion. First a strong segmented labor force based on gender exists in the public service with women heavily concentrated what could be considered traditional clerical jobs. Second, white males without a disability dominate positions with both low and high levels of job moves. The executive category, a category with relatively few people is characterized by high rates of movement while the technical and operational categories, both of which have fairly high populations are categorized by low rates of movement. This suggests that the average number of moves for white males without a disability is probably on the low side. On the other hand, the average number of moves is quite high for women because the opportunities for job moves are much higher in the administration support sector where they are concentrated. Third, all else being equal, the average number of moves for males who are members of an employment equity group should be somewhere in the middle because they are concentrated in positions which are not characterized by either high or low rates of job moves.

<sup>4</sup> The figure uses Correspondence Analysis (CA) to summarize information and relationships between group membership and occupational category in order to identify concentrations. CA, is multivariate technique based on dual scaling procedures, which allows examination of relationships between two nominally scaled variables in a multidimensional space. By determining departures from the independence model through the  $P^2$  statistic, CA expresses relationships between variables and groups as points in a bi-plot (Weller and Romney, 1990). A description of CA can be found in Appendix 1.

## Methodology

### Survival Analysis

The above analysis suggests that there are differences in mobility opportunities across occupational categories and that there are differences in the attraction of different equity groups to different categories. One would expect therefore, that there will be differences in the rate at which different groups may experience job moves. Thus, measuring the propensity to change jobs by equity group within any given occupational group should yield an understanding as to the degree to which differences exist.

However, measuring the differences in career mobility using the data we have is complicated by the fact that the public service population changes over time. People enter as jobs open, people leave through retirement and people move from one job to another. Another problem is related to the fact that for many individuals, we do not have complete work histories. Many of the work histories are 'truncated' because employees started their careers before the data capture begins (before 31, March 1987) or continue to work after the data capture period ends (April 1, 1998). Thus, they may already have experienced a job move before the data capture period or may experience a job move after the data capture period.

The combination of movement and changes in composition leave us with no clear cohort of individual work histories to measure and compare over any given period of time. Such information poses problems for analysis because typically used techniques such as regression, or tabular analysis generally presuppose a stable, comparable population. For this reason, while we can talk about the overall profile of an occupational category or propensities to be attracted to a category, it is more difficult to explore deeper by looking at patterns of mobility by category and equity group.

A solution lies in using survival analysis techniques which are designed to measure the occurrence of events based on time dependent variables, and which allow for such changes in population composition.<sup>5</sup>

Within survival analysis changes to the composition of the population (people entering or leaving within the data capture period), as well as truncated work histories are treated as censored cases. Left and right censoring occurs when individuals who might experience an event either entered or were lost during the observation period. Survival techniques correct such problems in estimation with a high degree of success.<sup>6</sup>

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<sup>5</sup> Survival analysis can be broadly divided into three techniques: life tables, Kaplan Meier survival estimates and Cox Regression. Each uses a time-to-event variable in the analysis. Life tables are the simplest form of survival analysis and estimate the time to an event, but do not allow covariates. Kaplan Meier estimates provide descriptive information and allow comparison of the survival functions between groups. Cox Regression is an explanatory technique which uses a time variable to determine the likelihood of an event occurring and allows for the inclusion of a large number of covariates. Cox Regression is similar to logistic regression in that it is iterative, it asks 'did an event occur' and allows for covariates to be built into the model.

<sup>6</sup> One of the assumptions of Cox regression analysis is that the hazard function for any given group is proportionally related to the comparison group (the baseline hazard). In other words, the method assumes that

## Cox Regression

Cox regression applied to the job survival data allows us to identify the most important determinants of mobility observed for employment equity groups. Within Cox regression, the relationship between the *risk* of a job move or promotion and its individual and structural determinants is approximated in a linear fashion by a multivariate model with the following functional form:

$$h(t) = [h_0(t)]^{-e} (B_1 X_1 + B_2 X_2 + \dots B_p X_p)$$

Where

$h(t)$  = the expected risk of job movement or promotion in time  $t$ .

$h_0(t)$  = the baseline hazard function when covariates are set to zero.

$B_1 X_1$  = the effect of weighted combinations of selected covariates.

This is a *Cox proportional hazards model* which estimates the relative risk an event occurring within a time unit given that the case has survived in the position until that instant (SPSS 1999: 256). In this case, Cox Regression is used to estimate the conditional odds of a job move or a promotion of equity members as compared to non-equity members based on a number of covariates. Cox regressions are run for each occupational classification and each job move or promotion. For example, a Cox regression is used to estimate the conditional odds of different equity groups working in the administration and support category getting a first job move or promotion.

Cox regressions require three elements: a time variable which measures the time to an event, a status variable which identifies the event and covariates. The time studied is the eleven- year period between March 31, 1987 and April 1, 1998. The time variable used is the approximate number of months in a position before either moving to another position or leaving the public service. In the case of people who have a job move or a promotion, it is calculated by subtracting the date of the second job from the first job and then dividing by 30.25 days (as a proxy for a calendar month). In the case of people who do not experience a job move, it is calculated by subtracting either the maximum date of the dataset (April 1, 1998) from the position start date, or in the case of people who separate, the separation date from the position start date and then dividing by 30.25.

The status variable we wish to assess is the odds of getting a job move or promotion in any given month during the period. Four job move times are calculated (months to job 2, months to job3, months to job 4 and months to job 5). People who do not obtain a first job move are not included in the analysis of subsequent job moves. Thus, number of months before getting job 3 is only calculated for people who have had a second job and the months before getting job 4 is only calculated for people who have had at least 3 jobs.

Three promotion variables are calculated (months to promotion 1, months to promotion 2 and months to promotion 3). As was the case for job moves, people who do not get a promotion are not

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time effects all groups in roughly the same way. We tested for proportional hazards both graphically and through the examination of partial residuals of the model correlated with each covariant. In the same way, we tested for the independence of the hazards with respect to time periods and found no evidence of dependence.

included for analysis of the second promotion.

Four status variables are used for measuring job moves (got a 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> or 4<sup>th</sup> job) and three status variables are used for measuring promotions (got a 1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> promotion).

Because different occupational categories are characterized by different skill sets and job move and promotion rates, separate regressions are run for each of the six occupational categories (Executive, Science and Professional, Administration and Foreign, Technical, Administration Support and Operational) within each of the move/promotion opportunities. Thus, separate regressions are run for each of the 4 job moves by six occupational categories and 3 promotions by 6 occupational categories making a total of 24 regressions for job moves and 18 for promotions. Cox Regression estimates are run for the entire population (less dropped cases) and for the population who entered the public service after 1986.

For each of the regressions, the following covariates are included in the model are:

Equity Group:	Seven group dummy variables are used to identify equity group membership (white female, visible minority female, visible minority male, aboriginal female, aboriginal male, females with a disability and males with a disability <sup>7</sup> ). The quasi comparison group is ‘white males without a disability’.
Work in the NCR:	Because working outside the NCR is generally associated with lower rates of job movement (perhaps because of economies of scale) a dummy variable is used to indicate that the person worked in the National Capital Region.
English as FOL:	A dummy variable indicates whether or not English is the first official language.
Year of Entry:	Year of entry is a continuous variable used to measure the number of years of service.
Year of Birth:	Year of birth is a continuous variable used as a proxy for age. <sup>8</sup>

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<sup>7</sup> The disability flag overrode other equity group flags. Thus, visible minorities or aboriginal peoples with a disability were counted only as persons with a disability.

<sup>8</sup> We also ran models with age squared and experience squared ((1998 - year of entry)<sup>2</sup>). Neither model changed the coefficients or the levels of variance to any great degree. These tables are available upon request.

## Analysis

### Job Moves

Table 3 ( see Appendix 1 ) shows the conditional odds of getting a first, second, third or fourth job move for employees working in one of the six occupational categories conditional on attributes listed above. Figure 3 portrays information for the first column of Table 3. Looking at data for the first job move it appears that within the executive category (block 1 of column 1 in Table 3) the picture is mixed. White females and aboriginal males display higher odds of getting a job move (20% and 10% higher respectively), whereas visible minority males display 25% lower odds. Males with a disability have about the same odds of getting a job move.<sup>9</sup> In the remaining three categories there are less than 30 equity members to count.

In the science and professional category, the picture is quite different. With the exception of women with disabilities, who are 26% less likely to get a first job shift, all other equity group members have the same or better odds of getting a first job shift. Visible minority women, and Aboriginal males for example are about 15% more likely to get a first job shift as compared to white males without a disability. The remaining groups have about the same chance of getting a first job shift, conditional on other variables. Females all have lower odds of getting a first job shift (ranging from 7% to 32% lower), whereas for equity group males the odds are about even as compared to non-equity group members (see figure 3). In the administration and foreign category, the odds of getting a first job move are about even or higher (ranging from 5% lower to 9% higher as compared to white males).

Females working in technical occupations tend to have low odds of a job move (ranging from 5% to 21% less than white males without a disability). However, equity group males have about the same odds (or somewhat better in the case of visible minority males) as white males without a disability.

As has been shown, the administration support category is one characterized by higher rates of mobility. Within the category, white and visible minority women as well as Aboriginal men have about the same odds of experiencing a first job move compared to white men able bodied. Aboriginal females, and women with a disability, however have lower odds (13% and 10% respectively). Visible minority men display higher odds of getting a first job move. Men with a disability display the lowest odds of getting a first job move (22% less).

The operational category is characterized by low rates of job movement, but is the category in which equity groups tend to have the highest odds of getting a first job move as compared to non-equity members in the same category. Save for aboriginal females who have a 10% lower chance of getting a first job move, all the equity groups fare as well as or better than white males without a disability (odds range from 2% less to 30% more).

Generally, the pattern of odds by group seen in the first move are repeated in the second move

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<sup>9</sup> For the purposes of analysis, a difference in odds between equity and non-equity group members of 5% or less (whether it is 5% greater or lower) is considered to be about the same odds.

although the degree of difference is somewhat lower. Visible minorities in particular appear to follow a similar pattern in which the direction and strength of the odds seen for the first job move are repeated for the second job move. However the impact of lower odds in the first move mean that for many groups, the number of people who do go on to get a second or a subsequent move is substantially lower. Thus, it is often difficult to get estimates, particularly for the fourth move.

Overall, the information in Table 3 shows a mixed picture of job mobility. There is some consistency within a group across job moves, but not as much consistency across occupational categories. At this point, it is therefore difficult to point to any substantive trend across occupational sectors or groups.

One problem with the information in Table 3 is that the nature of the dataset means we cannot be certain that the first job move recorded is the first job move experienced. Because the dataset includes information on all public servants who were active between March of 1987 and April of 1998, it is likely that in the majority of cases we are not comparing the propensity to obtain the first career move. For those who entered the civil service in the mid seventies, the first recorded move on the database is probably (and hopefully) not the first move they have experienced. For people who entered the system in the nineties, it is their first move. While years of experience resolves this methodological issue to a degree, choosing a subset of the total population, comprised of people who entered the civil service after 1986 resolves this problem completely (at least for tracking early career progress). Given that the dataset starts tracking career moves in 1987, the first recorded job move for people who entered after 1986 must be the first career move. We can therefore use this population as a means of providing a tighter comparison group for study.

Table 4 (see Appendix 1) provides the same information seen in Table 3, but this time, only for people who entered the public service after 1986. Figure 4 draws information from Table 4 to display the conditional odds of getting a first job move by occupational category and equity group as compared to white males without a disability. The picture is still mixed, but, conditional odds displayed in Figure 4 suggest a greater degree of consistency within an occupational category. In the science and professional, and operational categories, the odds of getting a job move are, with few exceptions, higher for equity group members as compared to white males without a disability, and often substantially higher. In the science and professional category, Aboriginal males, are 40 percent more likely to experience a first job move than white males without a disability. Visible minority women and men with a disability are over 20 percent more likely to get a first job move.

The odds of equity members getting a first job move in the technical and administration support categories, on the other hand, tend to be lower, or about even compared to white males without a disability. Aboriginal males, working in the technical category, for example, are almost 30 percent less likely to experience a first job move. In the administration and foreign category, the odds are higher for visible minorities and even or lower for other equity group members (ranging from 17% higher to 22% lower).

The results discussed so far, are mixed and do not really present a clear picture of the degree to which there may be consistent differences in the rate at which different groups switch positions. Often

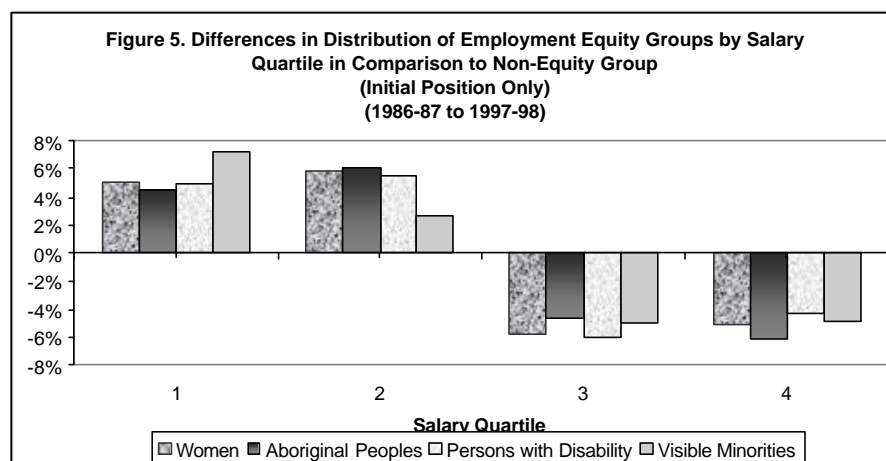
equity group members have higher odds of changing jobs and in some cases they have lower odds of changing jobs.

The picture of career mobility detailed in Tables 3 and 4 is one which could be painted if employment equity programming is working relatively well in some areas, but not in others. However it is also the kind of picture one could envision if equity groups are unevenly distributed across occupational levels. If, for example, are clustered at the top end of a job category where mobility is likely to be minimal and equity group members are more likely to be found at the bottom of the seniority ladder, where job moves are more likely, equity group members will have comparatively more moves than white males without a disability.

### Differential Distribution Across Salary Quartile

One way to explore this issue is to use salary quartiles as a proxy for level. To compute quartiles, the median salary for each occupational group and level was derived from relevant collective bargaining agreements (CBAs) and appended to each job move. In order to insure that salaries are as relevant as possible to the period surveyed (i.e., 1986-87 to 1997-98), the CBAs used are mainly from 1991 as they represent the salaries in effect for the larger part of the period of 1986-87 through 1997-98. All of the 549,202 records were successfully matched with the corresponding salary.

The figure below depicts the differential representation of employment equity groups across salary quartiles.<sup>10</sup> The zero line in the figure represents the percentage of the non-equity group which is found in a given salary quartile. The bars represent the extent to which different employment equity groups are over or under-represented in the salary quartile. As can be seen, there is a clear issue of compression of employment equity groups in the first and second salary quartile. Overall, the representation of employment equity groups tends to be approximately 4 percent above that of the non-equity group for the first and second quartile. Consequently, the opposite is observed in the third and fourth quartile where employment equity groups tend to be under-represented.



<sup>10</sup> Salary quartiles are calculated for each occupational category except the executive category where we do not have accurate salary information. The median salary of each job classification was obtained from agreements and the appropriate salary is applied to each civil servant for each position. The quartiles are calculated using information from the first job on record. The quartile values are maintained through each job move.



In order to control for such differences, we add 3 salary quartile dummy variables to the model which identify people who are in one of four salary categories within a particular occupational categories.<sup>11</sup> Adding this variable set allows us to compare the progress of equity and non-equity members *within* any given salary quartile. In other words, rather than comparing the overall career path of an equity group such as Aboriginal women to white males without a disability, we now compare the career path of Aboriginal women in the lowest salary quartile to white males without a disability who are also within the lowest salary quartile.

Table 5 (see Appendix 1) shows the conditional odds of getting a first, second, third and fourth job move as compared to white males without a disability after controlling for whether a candidate worked in the National Capital Region, year of entry, age at entry, and first official language . It also includes 3 dummies for salary quartiles by occupational category (the comparison group is the highest quartile – the 4<sup>th</sup> quartile). Information for the executive category is not included because we do not have accurate salary for the category.

As compared to Table 3, the differences in conditional odds on the positive side are far less pronounced in Table 5 (see also figure 5) With the exception of the operational category, where the odds move in the same direction and are of about the same magnitude, as were seen in Table 3, the odds of a job move in other categories are more likely to be lower or even. This suggests that adding salary quartiles brings a great deal of explanatory power.<sup>12</sup> It also suggests (as has been detailed above) that equity group members are more likely to be in the lower salary quartiles than white males without a disability, and that equity group members within any given quartile are about as likely or less likely to experience a job move as compared to white males without a disability in the same occupational category quartile.

Looking first at the science and professional category females, have substantially lower odds of getting a first job move than males, regardless of equity groups. Visible minority females for example are 7% less likely to get a first job move as compared to white males without a disability. Aboriginal females and women with a disability are about 30% less likely to get a first job move. White women are 14 percent less likely to experience a job move. The odds of getting a first move for equity group males however, tends to be about the same as is the case for white non-equity group males.

In the administration and foreign category, the odds of getting a first job move are about even in all cases except for that of visible minority males where the odds are 9% higher. In the technical category the odds are lower or even in all cases. As was the case for the science and professional category, women are less likely to get a first job move than is the case for males (the odds range from 4% less for visible minority women to 20% less for aboriginal women).

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<sup>11</sup> We also ran models which treated salary as a continuous variable. The estimates did not change a great deal (tables are available upon request). However, given that the public service is a reasonably rigid internal labour market, and that the salaries are on ladders, we use salary quartiles to mimic the job ladders.

<sup>12</sup> Adding the salary quartile variables also substantially tightened up the variances on the estimates. Tables showing variance figures are available on request.

In the administration support category, the results are similar to those seen in Table 3. Visible minority males display better odds of getting a first job move compared to white males without a disability and all other groups have the same or lower odds of getting a first job move. White females, visible minority females and aboriginal males have about the same odds of getting a first job move and other groups tend to have lower odds (ranging from about 13% less for aboriginal females and women with a disability to 25% less for men with a disability).

With few exceptions, the results showing in Table 5 are repeated in Table 6 which looks only at people who entered the public service after 1986. The major exception is that aboriginal males working in the science and professional category have substantially higher odds of getting a first job move as compared to white males without a disability, whereas in Table 3, the odds are about even. After the first move, however, the odds of aboriginal males getting a first move are negative and substantial.

## Promotions

Thus far, we have looked at job mobility, without taking into consideration the direction of the move. However, only a portion of the moves constitute promotions. The remaining may be loosely defined as lateral moves. Because we do not have a variable that defines a job move as a promotion, we defined promotions to be a move in which there is at least a 4% increase in the median salaries between positions.<sup>13</sup> This operational definition of a promotion was chosen in order to avoid complications resulting from cross occupational group mobility. Although, within an occupational group, promotions are easy to flag (i.e., a change in level), across occupational groups, there is no straightforward manner in which a promotion can be identified unless salary is used as a defining variable (working with a set of over 70 occupational groups and various levels, up to 18 in some occupational groups, defining a promotion as a change in level can be a daunting task).

With the salary variable appended to each transaction in the population database, the salary increase for each job move was calculated by deriving the percentage increase between median salaries for the current and previous positions for each individual in the database (because we are not privy to the echelon held by the employee within a level, the median salary at each level was used as an estimate). Although this potentially inflates the percentage salary increase for each job move, the same transformation is effected on all job moves which allows for comparisons to be made across employment equity groups (i.e., a change in level within an occupational group will generate the same estimated increase regardless of which employment equity group is considered).

Table 7 (see Appendix 1) shows the conditional odds of getting a first, second and third promotion by equity group and occupational category after controlling for whether a candidate worked in the National Capital Region, year of entry, age at entry, and first official language. It also includes 3 dummies for salary quartiles by occupational category (the comparison group is the highest quartile). As compared to previous tables where the event measured the odds of getting a job move, the event

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<sup>13</sup> The salary increase for each job move is calculated by deriving the percentage increase between median salaries for the current and previous positions for each individual in the database (because we are not privy to the echelon held by the employee within a level, the median salary at each level is used as an estimate).

in Table 7 is the odds of getting a promotion.

Results presented in Table 7 suggest that the conditional odds of getting a promotion are very different from those seen in Tables 3 through 6. As compared to white males without a disability the odds of equity members getting a promotion are almost always lower and often substantially lower. With the exception of the operational category (where promotions are few) and visible minorities working in the administration support or the administration and foreign occupational categories, the conditional odds for every other group-category are negative.

In the science and professional category, for example, the odds of getting a first promotion for equity group members other than visible minority or disabled males is at least 20% lower than is the case for white males without a disability. For visible minority and disabled males, the odds are about even (3% less than white males without a disability). In the administration and foreign category, the differences are less pronounced. White females, aboriginal males and visible minorities have about the same odds of getting a promotion (6% less for aboriginal males to 6% higher for visible minority males). However, for the other groups, the odds of getting a first promotion are 7% to 18% lower.

In the technical category, with the exception of visible minority males, who have about the same odds of getting a promotion, all other groups face substantially lower odds of promotion ranging from 14% less for aboriginal males to 24% less for women with a disability. The pattern is similar within the administration support category where visible minority men have high odds of getting a first promotion and the other groups have low odds of getting a promotion as compared to white males without a disability.

In the operational category, the odds of getting a promotion are about the same for equity groups as is the case for non-equity group members. The exceptions to this is visible minority men who show substantially higher odds of getting a promotion as compared to white males without a disability.

Overall, the pattern seen for the first job move is repeated for subsequent moves. By the third move, because of the repeatedly lower conditional odds, the counts of group members are often too low to get an accurate estimate of the odds.

Table 8 (see Appendix 1) shows the same analysis as is presented in Table 7, but this time only for the population who entered the federal public service after 1986. The tighter constraint on entry period means that we can be sure we are talking about the first, second and third promotion in the career rather than the observation period which was the case in Table 7.

The results presented in Table 8 suggest that to a large extent, the picture of differences in promotion rates painted in Table 7 are also accurate for those who entered after 1986. Looking at the first promotion, the operational category continues to display a mixed picture. Women and men with a disability show higher conditional odds of getting a promotion. Visible minority men have about the same odds, and the remaining three groups show substantially lower odds. In the second promotion the odds are all higher, but representation by several groups is so low that an accurate estimate is impossible. By the third promotion no equity group has sufficient counts to estimate the conditional odds.

In the rest of the occupational categories, with six exceptions, the conditional odds of getting a promotion are lower. Within the science and professional category, aboriginal and disabled men show higher odds of getting a first promotion (12% and 15% higher respectively). All other groups display lower odds, ranging from 11% lower for visible minority men to 27% lower for white women. In the administration and foreign category, visible minorities have about the same or better odds of getting a promotion and all other groups have lower odds (ranging from 19% for aboriginal men less to 36% less for disabled women).

In the technical category, all equity group members have lower odds of getting a first promotion as compared to white males without a disability. The difference in odds ranges from 8% less for visible minority males to 43% less for aboriginal males. Finally, in the administration support category, only aboriginal and visible minority males display the same or higher conditional odds of getting a first promotion. All other groups, including white women display substantially lower odds of getting a first promotion (ranging from 12% less for white women to 38% less for men with a disability).

As was the case for the entire population, the odds encountered in the first promotion are often repeated for subsequent promotions. By the third promotion, however, there are so few equity group members in the different occupational categories that an accurate estimate cannot be made.

## CONCLUSIONS

Using administrative data held by the Public Service Commission of Canada covering an eleven-year period, we have looked at the determinants of mobility and the impact of these factors on rates at which different employment equity groups either switch positions or get promoted.

Our analysis showed a substantial degree of segmentation within the public service, both at the level of gender and visible minority status. Women, regardless of group membership are tightly clustered around traditional clerical jobs. Visible minority men are strongly tied to the science and professional category. White men are aligned with executive, operational and technical occupations. Given that different occupational categories are characterized by different rates of job mobility, we believe that these occupational concentrations have masked the differences in career movement rates across groups. For this reason, we examined move rates by occupational category.

Using cox regression analysis we found that the odds of getting a first promotion varied substantially across equity groups, even after controlling for occupational category, years of experience, age, location of the job, level of the job (using salary quartile as a proxy), first official language and months in the position there are often substantial, and negative differences in the rates between equity and non-equity group members. In the science and professional category, for example, women face substantially lower odds of getting a first promotion (ranging from 34% to 53% lower than white males without a disability). Aboriginal males also face lower odds of getting a promotion.

Differences in administration and foreign category are minimal, with most groups facing about the same odds of promotion as compared to white males without a disability. However, equity members

in the technical category face differences of between 12% and 23% lower. The exception to this is visible minority males who have about the same odds of promotion.

In administration support, while visible minority males actually have higher odds of promotion than white males without a disability, and aboriginal males have about the same odds all other groups have lower probabilities of promotion. Finally, in the operational category, the odds of getting a promotion are often higher for equity group members. However, it should be remembered, that this category is characterized by low odds of getting a promotion.

If there is a group that tends to do reasonably well, it is visible minority males, who, perhaps by virtue of the high levels of schooling, often have about the same odds of getting a promotion as their white male able bodied counterparts. The results seen for the entire population are generally repeated for those who entered after 1986 (and for whom we therefore have perfect information).

Generally the direction and magnitude of these differences between equity group members and white males without a disability held over subsequent promotions. This means that there were often too few equity group members to measure the odds of getting a third career move.

The results discussed point to definite, and often pronounced differences in the ability of equity group members to sustain a career in the civil service with an upward mobility path. If this is the case, the federal government may face increased challenges related to both career satisfaction and retention.

## Bibliography

- Multicom (1996) A consultation with visible minority employees at Canadian Heritage. Ottawa: Dept of Canadian Heritage.
- Public Service Commission (1991) A Study on the Retention of Aboriginal Peoples in the Federal Public Service. Public Service Commission in Canada. Ottawa: PSC.
- Public Service Commission of Canada (1996) Annual Report 1995-96, Minister of Public Works and Government Services Canada.
- John Samuel and Associates (1996) Visible minorities and the public service of Canada. Ottawa: a report submitted to the Canadian Human Rights Commission.
- Lee, T. "Statistical Methods for Survival Data Analysis", New York John Wiley 1992
- SPSS. 1999. SPSS Advanced Models 9 Chicago: SPSS.
- Treasury Board Secretariat, Employment Equity Council (Canada) and Visible Minority Consultation Group. Distortions in the mirror (1993): Reflections of visible minorities in the Public Service of Canada. Report of the Visible Minority Consultation Group to the Secretary of the Treasury Board and the Employment Equity Council of Deputy Ministers. Ottawa: Visible Minority Consultation Group.

## **Appendix 1**

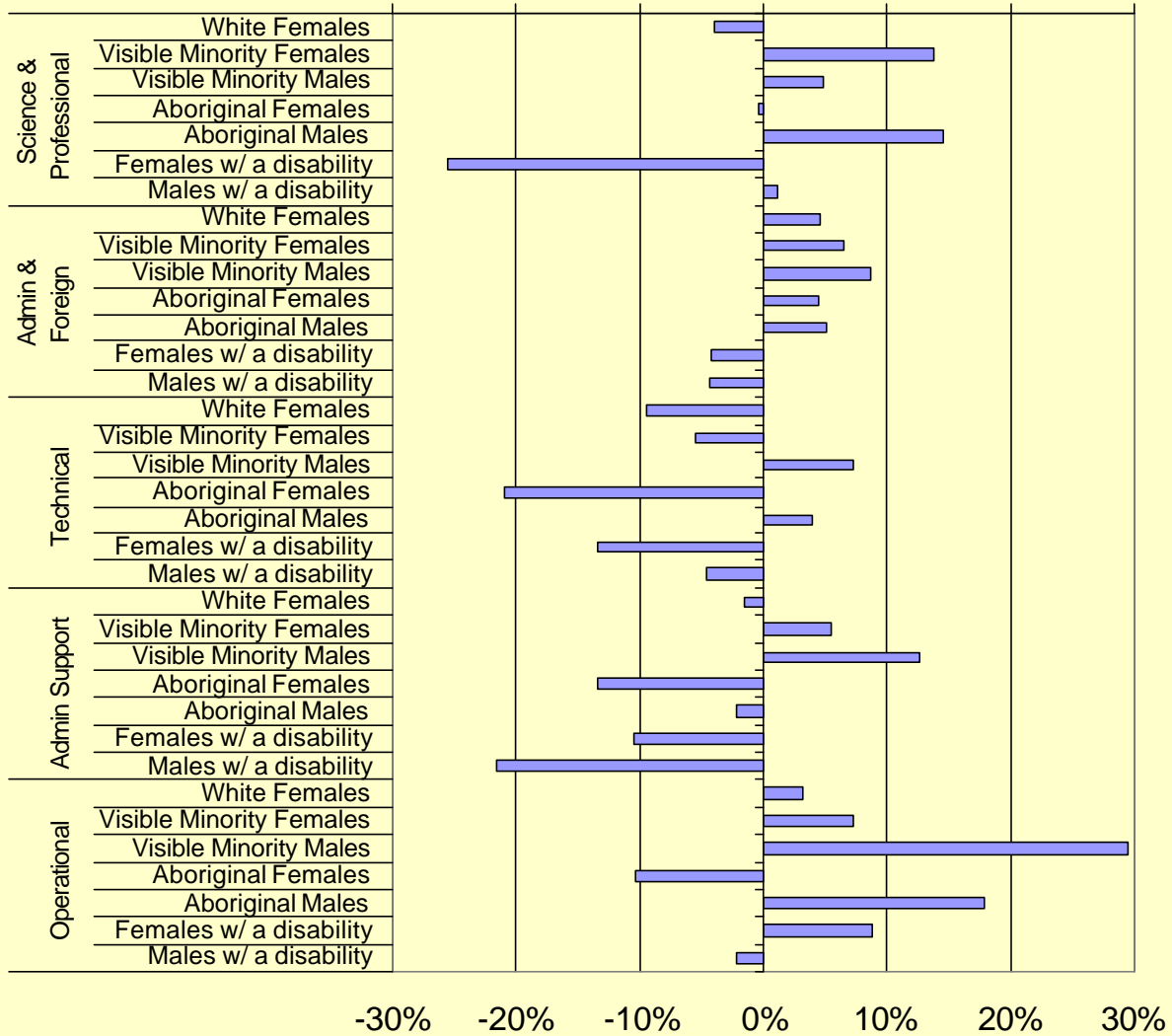
### **Tables 5 to 8 and Figures 5 to 8**

Occupational category	Group	Odds of a Job shift			
		Shift 1	Shift 2	Shift 3	Shift 4
Executive	White Females	1.21	1.16	1.20	1.43
	Visible Minority Females	0.52 *	1.60 *	2.62 *	1.13 *
	Visible Minority Males	0.75	0.79	0.78	1.51 *
	Aboriginal Females	3.55 *	1.46 *	2.07 *	1.05 *
	Aboriginal Males	1.10	1.34	1.12 *	1.06 *
	Females w/ a disability	1.34 *	1.87 *	1.52 *	2.48 *
	Males w/ a disability	0.99	0.97	0.90	1.07
Science & Professional	White Females	0.96	1.02	1.08	1.09
	Visible Minority Females	1.14	1.16	1.09	1.07
	Visible Minority Males	1.05	1.09	1.11	0.96
	Aboriginal Females	1.00	1.16	1.27	1.49
	Aboriginal Males	1.15	0.92	0.76	1.30 *
	Females w/ a disability	0.74	0.83	0.73	1.12 *
	Males w/ a disability	1.01	1.09	1.06	0.88
Admin & Foreign	White Females	1.05	1.04	1.03	1.08
	Visible Minority Females	1.06	1.06	1.03	1.00
	Visible Minority Males	1.09	0.99	1.07	0.86
	Aboriginal Females	1.04	1.08	0.88	0.98
	Aboriginal Males	1.05	1.06	1.16	1.29
	Females w/ a disability	0.96	1.02	0.86	1.08
	Males w/ a disability	0.96	0.95	1.03	0.96
Technical	White Females	0.91	0.96	0.96	1.06
	Visible Minority Females	0.95	0.96	1.05	1.50 *
	Visible Minority Males	1.07	1.06	1.06	0.64
	Aboriginal Females	0.79	0.86	0.70	1.43 *
	Aboriginal Males	1.04	1.03	1.06	1.04
	Females w/ a disability	0.87	0.92	0.99	1.07 *
	Males w/ a disability	0.95	1.03	1.00	0.72
Admin Support	White Females	0.99	1.01	1.09	1.16
	Visible Minority Females	1.05	0.99	1.11	1.23
	Visible Minority Males	1.13	1.07	0.92	1.18
	Aboriginal Females	0.87	0.96	1.08	1.16
	Aboriginal Males	0.98	0.92	1.18	1.15 *
	Females w/ a disability	0.90	0.97	1.00	1.11
	Males w/ a disability	0.78	0.89	0.98	1.11
Operational	White Females	1.03	1.23	1.43	1.29
	Visible Minority Females	1.07	0.80	1.18 *	3.21 *
	Visible Minority Males	1.30	1.29	1.15	1.00
	Aboriginal Females	0.90	1.11	1.43	2.15 *
	Aboriginal Males	1.18	1.11	0.94	0.69
	Females w/ a disability	1.09	1.53	1.27 *	1.69 *
	Males w/ a disability	0.98	1.00	0.96	1.03
Note:	* denotes cells where the size of the group available for analysis is less than 30.				
variables:	dummy for NCR, Year of entry, age at entry, dummy for english as first official language, dummies for the equity groups.				



Figure 3

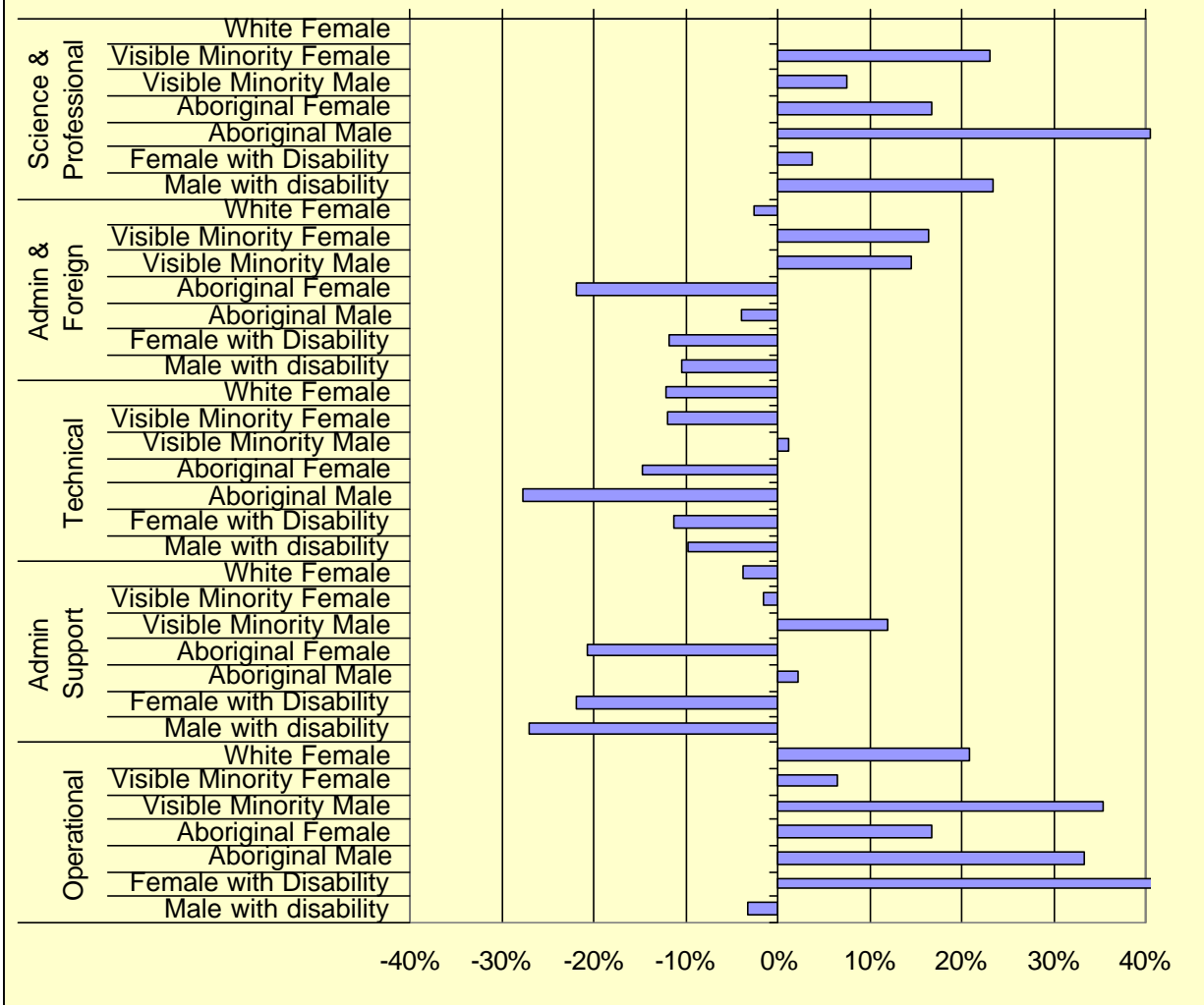
**Conditional Odds of a 1st Job Shift, by Occupational Category, compared to White Males w/out a disability**



Occupational Category	Group	Odds of a job shift			
		Shift 1	Shift 2	Shift 3	Shift 4
Executive	White Female	1.11	1.09	1.22 *	0.96 *
	Visible Minority Female	2.44 *	2.41 *	6.65 *	2.79 *
	Visible Minority Male	0.19 *	0.00 *	0.00 *	*
	Aboriginal Female	0.00 *	*	0.00 *	*
	Aboriginal Male	0.99 *	2.74 *	1.54 *	3.19 *
	Female with Disability	0.32 *	15.96 *	1.39 *	0.00 *
	Male with disability	0.00 *	0.00 *	*	*
Science & Professional	White Female	1.00	1.00	1.05	0.95
	Visible Minority Female	1.23	1.17	1.01	0.86
	Visible Minority Male	1.08	0.96	1.08	0.73
	Aboriginal Female	1.17	1.17	1.67	1.15 *
	Aboriginal Male	1.41	0.89	0.49 *	0.50 *
	Female with Disability	1.04	1.02 *	0.72 *	2.26 *
	Male with disability	1.23	1.25	1.34	0.62 *
Admin & Foreign	White Female	0.97	1.00	1.00	1.01
	Visible Minority Female	1.17	1.03	0.89	1.00
	Visible Minority Male	1.14	1.02	1.17	0.97
	Aboriginal Female	0.78	0.98	0.78	0.99
	Aboriginal Male	0.96	1.02	1.39	0.97
	Female with Disability	0.88	1.06	0.70	0.96
	Male with disability	0.90	0.98	1.06	1.03
Technical	White Female	0.88	0.88	0.92	1.06
	Visible Minority Female	0.88	1.03	0.91 *	2.67 *
	Visible Minority Male	1.01	1.27	0.99	0.56
	Aboriginal Female	0.85	1.03 *	0.46 *	1.06 *
	Aboriginal Male	0.72	0.99	0.98	0.96 *
	Female with Disability	0.89 *	0.57 *	0.92 *	2.31 *
	Male with disability	0.90	1.11	1.01	1.38 *
Admin Support	White Female	0.96	0.98	1.06	1.00
	Visible Minority Female	0.99	0.93	1.17	1.11
	Visible Minority Male	1.12	1.07	0.89	1.36 *
	Aboriginal Female	0.79	0.82	0.97	1.32
	Aboriginal Male	1.02	0.93	1.08 *	0.77 *
	Female with Disability	0.78	0.90	1.03	1.03
	Male with disability	0.73	0.89	1.03	1.06 *
Operational	White Female	1.21	1.28	1.45	1.57
	Visible Minority Female	1.06	0.83 *	1.64 *	0.00 *
	Visible Minority Male	1.35	1.23	1.37	1.89 *
	Aboriginal Female	1.17	1.40	1.79	2.07 *
	Aboriginal Male	1.33	1.03	0.81	0.59 *
	Female with Disability	1.42	1.83 *	1.78 *	2.77 *
	Male with disability	0.97	0.80	0.91 *	2.04 *
Note:	* denotes cells where the size of the group available for analysis is less than 30.				
variables:	dummy for NCR, Year of entry, age at entry, dummy for english as first official language, dummies for the equity groups.				
Selection	Permanent employees who entered the public service after 1986.				

Figure 4

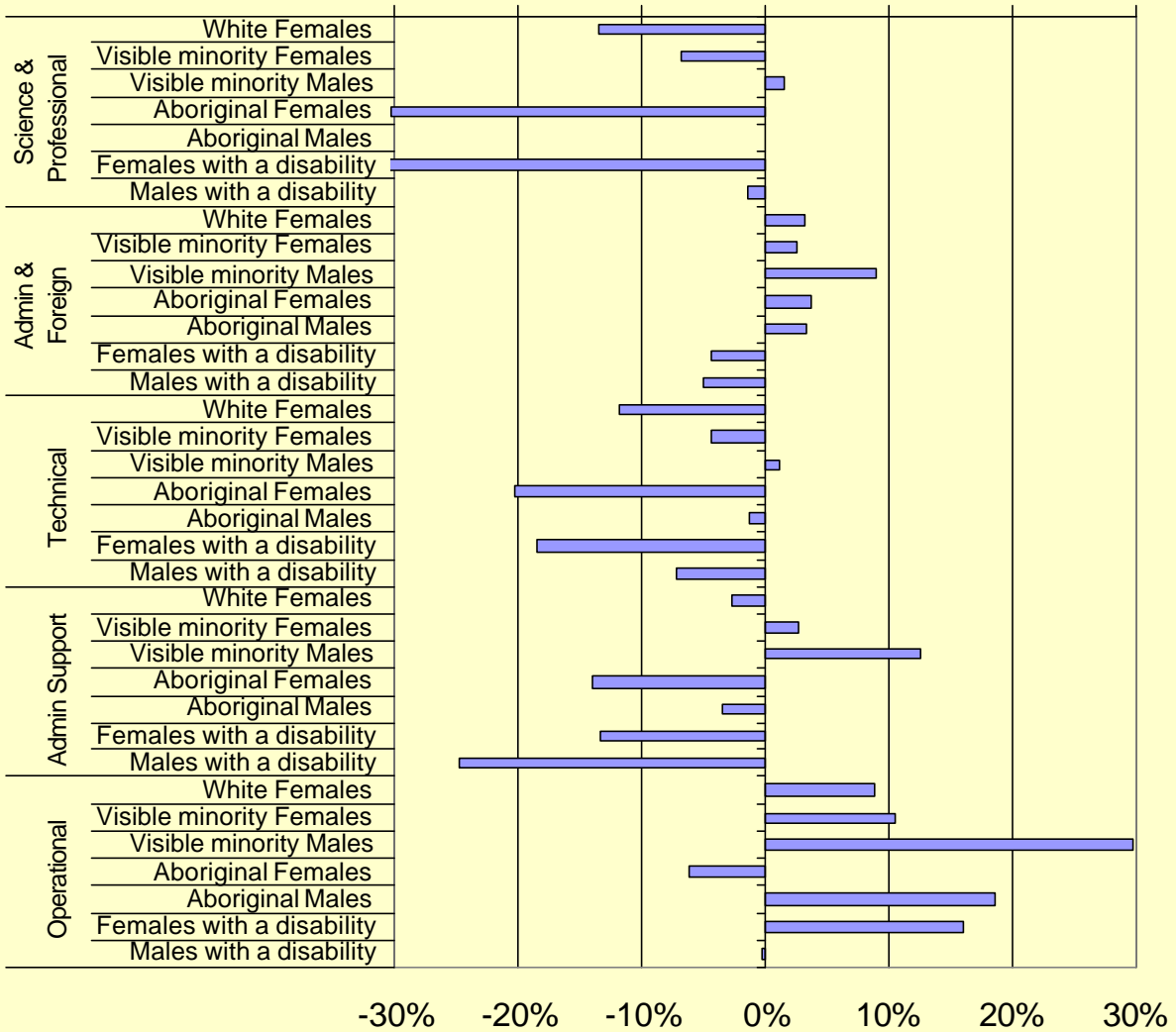
**Conditional Odds of a 1st Job Shift, by Occupational Category, compared to White Males w/out a disability, Permanent employees starting after 1986**



Conditional Odds of a Job Shift, by Occupational Category, compared to White Males without a disability (Salary Quartiles included in model)						
Occupational Category	Group	Odds of a job shift				
		Shift 1	Shift 2	Shift 3	Shift 4	
Science & Professional	White Females	0.86	0.96	1.02	1.04	
	Visible minority Females	0.93	1.05	1.02	0.95	
	Visible minority Males	1.01	1.05	1.05	0.92	
	Aboriginal Females	0.70	1.06	1.17	1.27	
	Aboriginal Males	1.00	0.89	0.77	1.23	*
	Females with a disability	0.68	0.76	0.71	1.26	*
	Males with a disability	0.98	1.05	0.95	0.84	
	Admin & Foreign	White Females	1.03	1.02	1.02	1.06
Visible minority Females		1.02	1.04	1.02	0.99	
Visible minority Males		1.09	0.99	1.08	0.85	
Aboriginal Females		1.04	1.06	0.88	0.95	
Aboriginal Males		1.03	1.05	1.17	1.30	
Females with a disability		0.96	1.00	0.86	1.06	
Males with a disability		0.95	0.94	1.04	0.96	
Technical		White Females	0.88	0.86	0.84	0.95
	Visible minority Females	0.96	0.87	0.95	1.37	*
	Visible minority Males	1.01	1.01	1.01	0.63	
	Aboriginal Females	0.80	0.71	0.54	1.36	*
	Aboriginal Males	0.99	0.95	0.98	1.15	
	Females with a disability	0.82	0.78	0.89	0.78	*
	Males with a disability	0.93	0.99	0.92	0.69	
	Admin Support	White Females	0.97	1.00	1.07	1.13
Visible minority Females		1.03	0.98	1.06	1.15	
Visible minority Males		1.13	1.09	0.97	1.15	
Aboriginal Females		0.86	0.97	1.08	1.13	
Aboriginal Males		0.97	0.91	1.17	1.00	*
Females with a disability		0.87	0.95	0.98	1.06	
Males with a disability		0.75	0.86	0.95	1.07	
Operational		White Females	1.09	1.25	1.39	1.27
	Visible minority Females	1.11	0.80	1.16	3.08	*
	Visible minority Males	1.30	1.28	1.16	1.00	
	Aboriginal Females	0.94	1.11	1.39	2.25	*
	Aboriginal Males	1.19	1.11	0.96	0.69	
	Females with a disability	1.16	1.63	1.28	1.84	*
	Males with a disability	1.00	1.04	0.92	1.01	
	Note:	* denotes cells where the size of the group available for analysis is less than 30.				
variables:	dummy for NRC, Year of entry, age at entry, dummy for english as first official language dummies for the equity groups, dummies for salary quartiles by occupational category.					

Figure 5

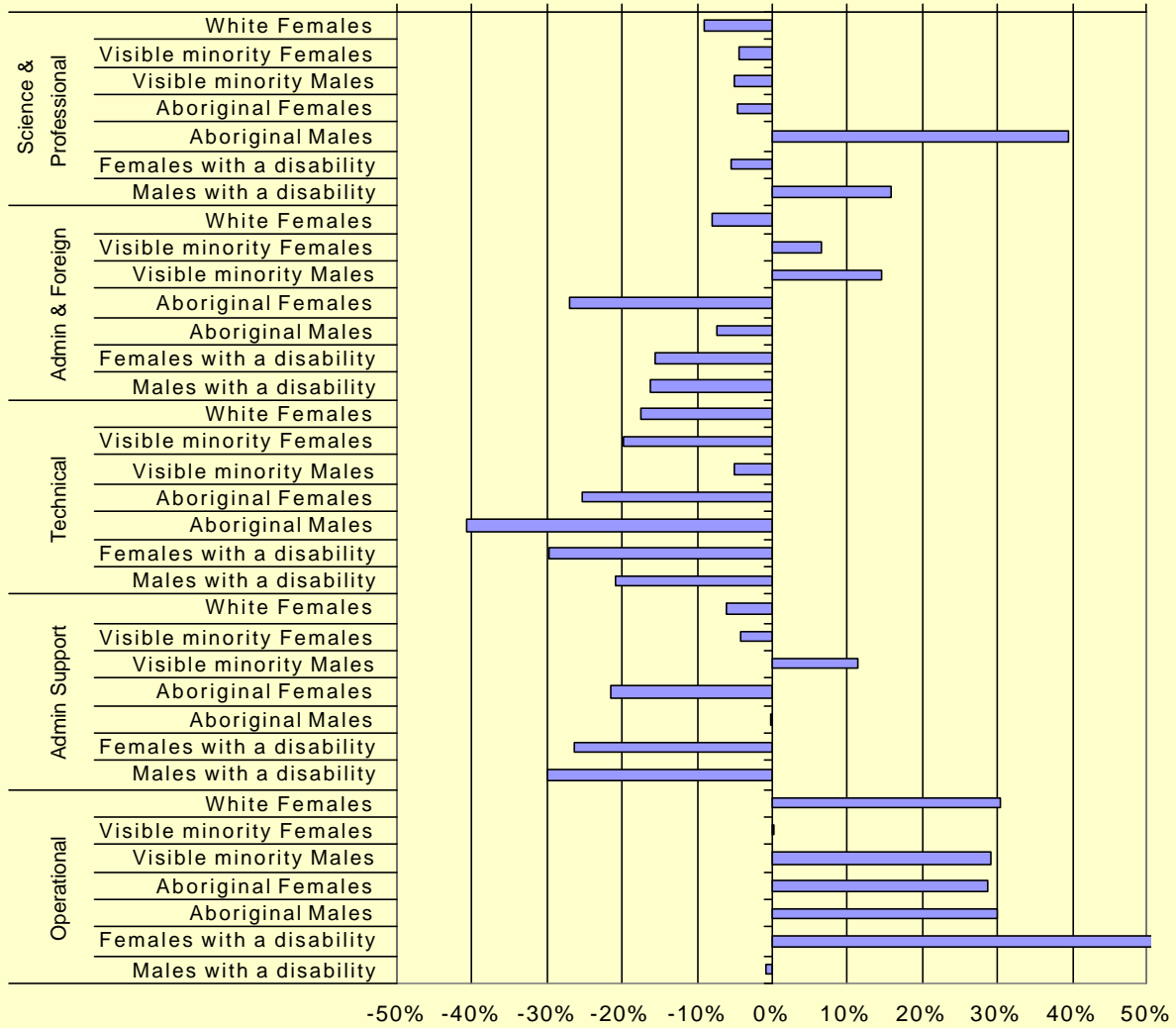
**Conditional Odds of a 1st Job Shift Compared to White Males  
w/out a disability (Salary quartiles included in Model)**



Conditional Odds of a Job Shift, by Occupational Category, compared to White Males w/out a disability (salary Quartiles included in model), Permanent Employees who entered after 1986						
Occupational Category	Group	Odds of a job shift				
		Shift 1	Shift 2	Shift 3	Shift 4	
Science & Professional	White Females	0.91	0.92	1.04	0.88	
	Visible minority Females	0.95	1.08	0.96	0.69	
	Visible minority Males	0.95	0.89	0.98	0.65	
	Aboriginal Females	0.95	1.09	1.64	0.92 *	
	Aboriginal Males	1.39	0.76	0.50 *	0.49 *	
	Females with a disability	0.94	1.02 *	0.70 *	2.42 *	
	Males with a disability	1.16	1.31	1.03	0.58 *	
	Admin & Foreign	White Females	0.92	0.94	0.96	0.98
Visible minority Females		1.06	0.98	0.85	0.99	
Visible minority Males		1.15	1.00	1.18	0.93	
Aboriginal Females		0.73	0.90	0.77	0.95	
Aboriginal Males		0.93	0.96	1.37	0.97	
Females with a disability		0.84	1.01	0.65	0.93	
Males with a disability		0.84	0.96	1.06	1.03	
Technical		White Females	0.83	0.75	0.84	0.94
	Visible minority Females	0.80	0.93	0.90 *	2.75 *	
	Visible minority Males	0.95	1.16	0.97	0.56	
	Aboriginal Females	0.75	0.85 *	0.45 *	1.25 *	
	Aboriginal Males	0.59	0.84	0.95	1.13 *	
	Females with a disability	0.70 *	0.45 *	0.85 *	1.69 *	
	Males with a disability	0.79	1.00	1.04	1.38 *	
	Admin Support	White Females	0.94	0.98	1.05	0.98
Visible minority Females		0.96	0.94	1.11	1.09	
Visible minority Males		1.11	1.10	0.97	1.24 *	
Aboriginal Females		0.78	0.85	0.97	1.29	
Aboriginal Males		1.00	0.90	1.07 *	0.68 *	
Females with a disability		0.74	0.89	1.02	0.98	
Males with a disability		0.70	0.88	1.02	1.04 *	
Operational		White Females	1.30	1.28	1.41	1.48
	Visible minority Females	1.00	0.79 *	1.66 *	0.00 *	
	Visible minority Males	1.29	1.21	1.41	1.96 *	
	Aboriginal Females	1.29	1.38	1.82	2.05 *	
	Aboriginal Males	1.30	1.01	0.82	0.57 *	
	Females with a disability	1.55	1.88 *	1.67 *	2.71 *	
	Males with a disability	0.99	0.85	0.82 *	1.96 *	
	Note:	* denotes cells where the size of the group available for analysis is less than 30.				
variables:	dummy for NCR, Year of entry, age at entry, dummy for english as first official language, dummies for the equity groups, dummies for salary quartiles by occupational category.					
Selection:	All permanent employees who entered the public service after 1986					

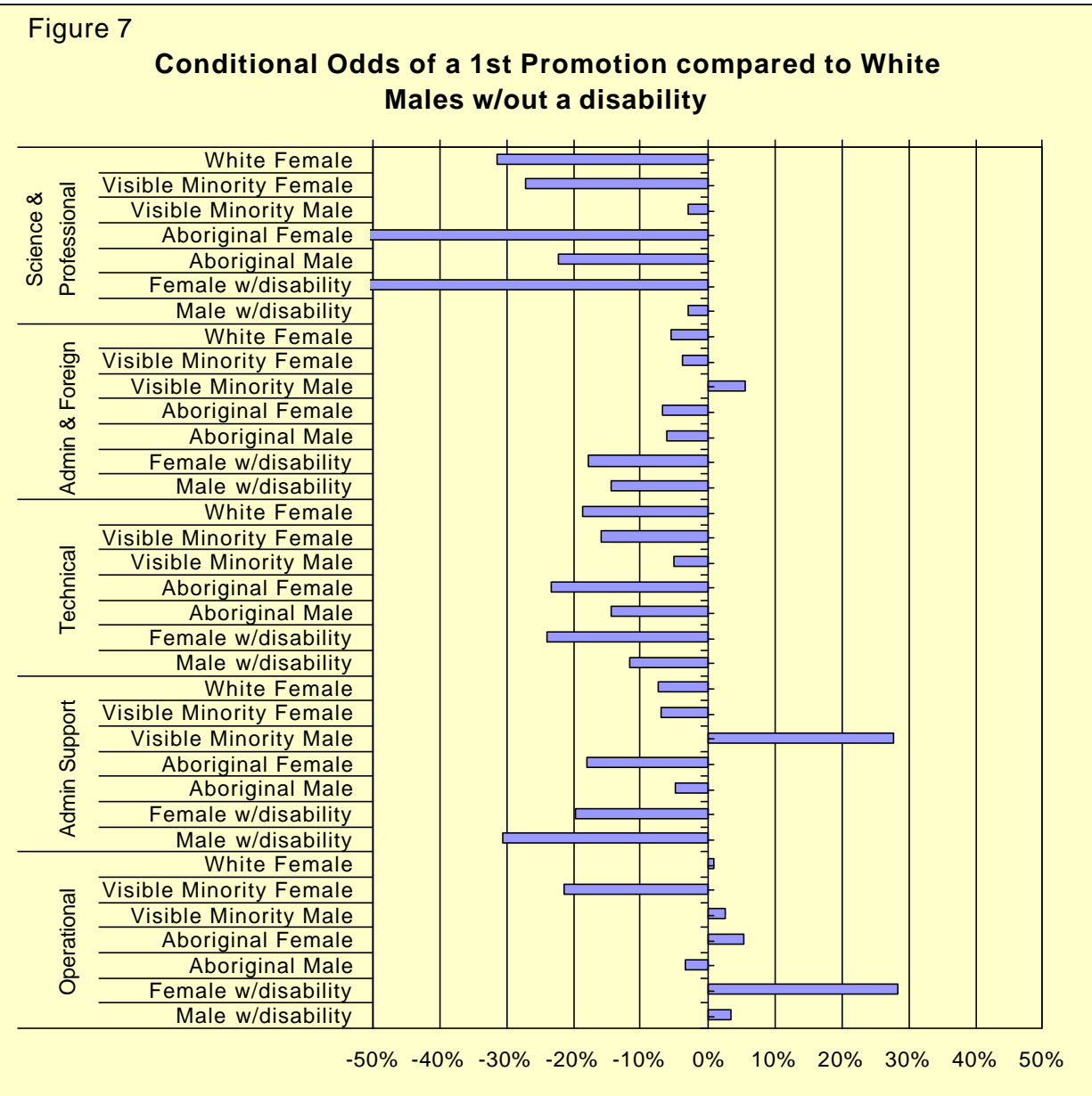
Figure 6

**Conditional Odds of a 1st Job Shift, compared to White Males w/out a disability (Salary quartiles included in model), People who Entered the Public Service after 1986**



<b>Table 7</b>					
<b>Conditional Odds of a Promotion, by Occupational Category, Compared to White Males w/out a Disability</b>					
Occupational Category		Odds of a promotion			
		Promotion 1	Promotion 2	Promotion 3	
Executive	White Female	1.22	1.17	0.91	
	Visible Minority Female	0.66 *	1.46 *	0.00 *	
	Visible Minority Male	0.48	0.65	0.88	*
	Aboriginal Female	1.56 *	14.63 *	3.54 *	
	Aboriginal Male	0.83	0.37 *	1.65 *	
	Female w/disability	1.46 *	0.78 *	2.52 *	
	Male w/disability	0.47	0.70 *	1.01 *	
	Science & Professional	White Female	0.69	0.83	0.95
	Visible Minority Female	0.73	0.88	0.80	
	Visible Minority Male	0.97	1.03	0.81	
	Aboriginal Female	0.48	0.74	1.00 *	
	Aboriginal Male	0.78	0.90	1.04 *	
	Female w/disability	0.43	0.84	0.78 *	
	Male w/disability	0.97	0.90	0.65	
Admin & Foreign	White Female	0.95	1.00	1.10	
	Visible Minority Female	0.96	0.98	1.11	
	Visible Minority Male	1.06	1.19	0.99	
	Aboriginal Female	0.93	1.09	1.17	
	Aboriginal Male	0.94	1.23	0.94	
	Female w/disability	0.82	0.92	0.87	
	Male w/disability	0.86	1.03	0.86	
	Technical	White Female	0.81	0.79	0.78
Visible Minority Female		0.84	0.94	0.58 *	
Visible Minority Male		0.95	1.06	1.44	
Aboriginal Female		0.77	0.50	0.00 *	
Aboriginal Male		0.86	0.90	1.79	
Female w/disability		0.76	0.63	0.55 *	
Male w/disability		0.88	0.99	1.03	
Admin Support		White Female	0.93	0.82	0.91
	Visible Minority Female	0.93	0.80	1.03	
	Visible Minority Male	1.28	0.81	0.82 *	
	Aboriginal Female	0.82	0.71	0.41	
	Aboriginal Male	0.95	0.96	0.69 *	
	Female w/disability	0.80	0.71	0.74	
	Male w/disability	0.69	0.62	0.93	
	Operational	White Female	1.01	1.35	2.07
Visible Minority Female		0.78	2.05 *	0.00 *	
Visible Minority Male		1.03	0.85	0.00 *	
Aboriginal Female		1.05	1.53	4.55 *	
Aboriginal Male		0.96	0.97	0.82 *	
Female w/disability		1.28	1.79 *	0.00 *	
Male w/disability		1.04	1.05	0.51 *	
Note:		* denotes cells where the size of the group available for analysis is less than 30.			
variables:	dummy for NRC, Year of entry, age at entry, dummy for english as first official language, dummies for the equity groups, dummies for salary quartiles by occupational category				

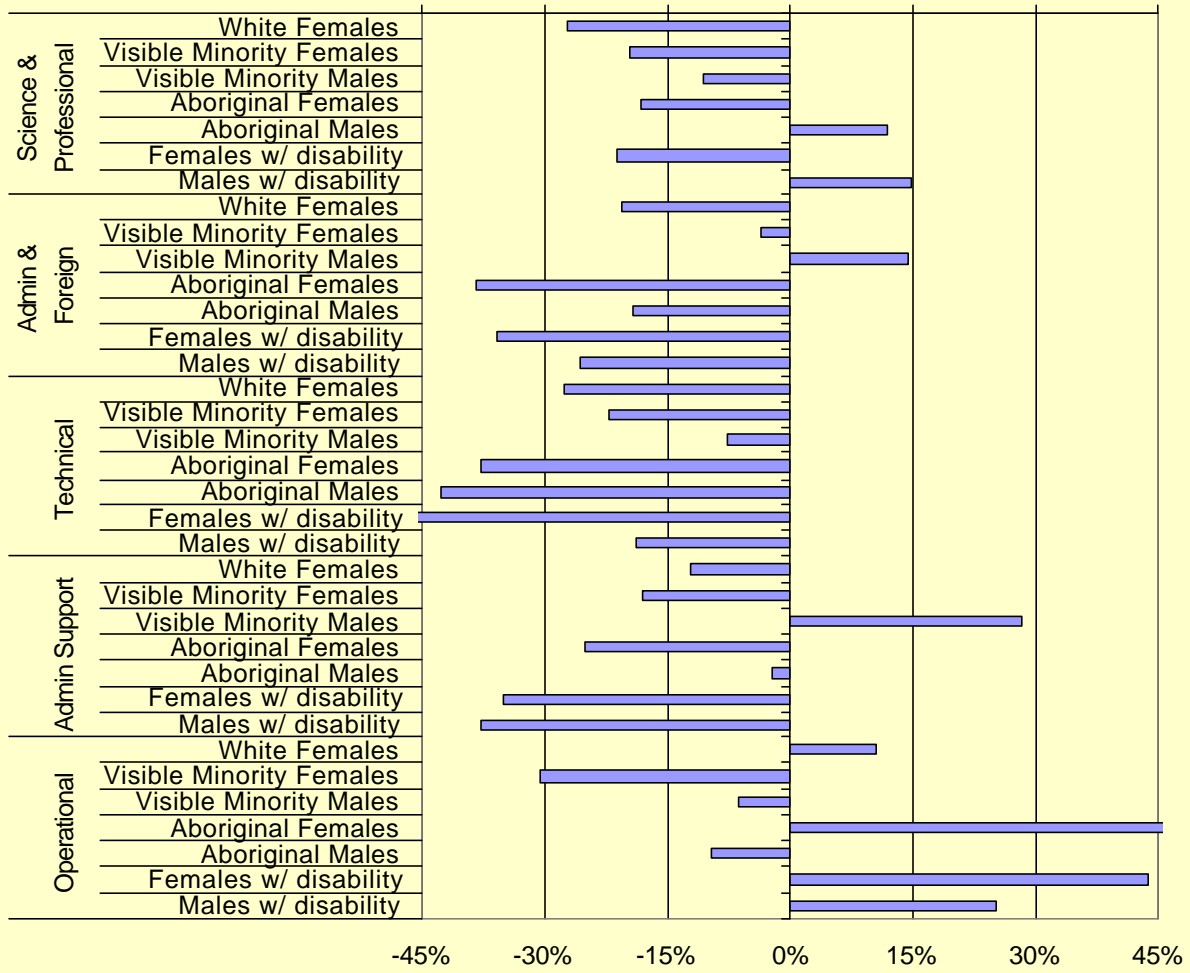




Occupational Category		Odds of a Promotion		
		Promotion 1	Promotion 2	Promotion 3
Executive	White Females	1.24	0.67 *	†
	Visible Minority Females	4.31 *	0.00 *	†
	Visible Minority Males	1.13 *	0.00 *	†
	Aboriginal Females	0.00 *	*	†
	Aboriginal Males	2.13 *	0.00 *	†
	Females w/ disability	1.37 *	0.00 *	†
	Males w/ disability	0.00 *	0.00 *	†
	Science & Professional	White Females	0.73	0.73
Visible Minority Females		0.80	0.85	0.69
Visible Minority Males		0.89	0.87	0.63
Aboriginal Females		0.82	0.65	1.20 *
Aboriginal Males		1.12	0.47 *	1.06 *
Females w/ disability		0.79	1.58 *	0.46 *
Males w/ disability		1.15	0.92	0.70 *
Admin & Foreign		White Females	0.79	0.89
	Visible Minority Females	0.97	0.94	1.23
	Visible Minority Males	1.15	1.26	0.70
	Aboriginal Females	0.62	0.84	0.62
	Aboriginal Males	0.81	1.42	1.11
	Females w/ disability	0.64	0.77	0.37
	Males w/ disability	0.74	0.86	0.39 *
	Technical	White Females	0.72	0.77
Visible Minority Females		0.78	1.16	0.42 *
Visible Minority Males		0.92	1.19	1.49
Aboriginal Females		0.62	0.38 *	0.00 *
Aboriginal Males		0.57	0.86	1.33 *
Females w/ disability		0.54 *	0.51 *	0.00 *
Males w/ disability		0.81	1.13	0.95 *
Admin Support		White Females	0.88	0.73
	Visible Minority Females	0.82	0.76	1.32
	Visible Minority Males	1.28	0.67	0.00 *
	Aboriginal Females	0.75	0.77	0.36
	Aboriginal Males	0.98	1.08	1.23 *
	Females w/ disability	0.65	0.51	1.13 *
	Males w/ disability	0.62	0.51	1.23 *
	Operational	White Females	1.10	1.70
Visible Minority Females		0.70	2.97 *	*
Visible Minority Males		0.94	1.24	0.00 *
Aboriginal Females		1.49	2.21	7.29 *
Aboriginal Males		0.90	1.02	3.14 *
Females w/ disability		1.44	2.28 *	0.00 *
Males w/ disability		1.25	0.53	10.86 *
Note:		* denotes cells where the size of the group available for analysis is less than 30.		
	† denotes regression estimates that could not be calculated because of low counts.			
variables:	dummy for NRC, Year of entry, age at entry, dummy for english as first official language, dummies for the equity groups, dummies for salary quartiles by occupational category.			

Figure 8

**Conditional Odds of a 1st Promotion by Occupational Category  
Compared to White Males w/out a disability, Permanent Employees  
Entering after 1986**



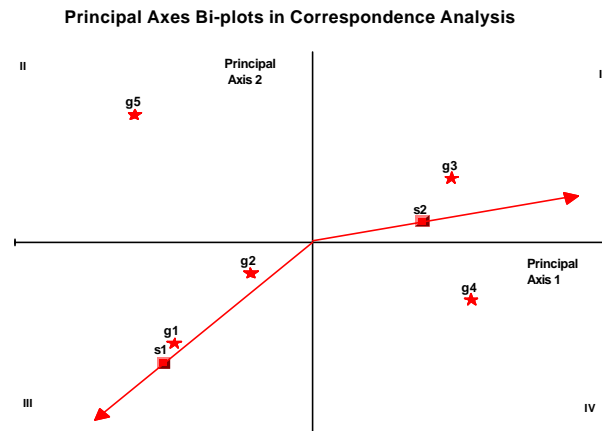
## Appendix 2

### Correspondence Analysis in Cross-Tabular Analysis

Correspondence analysis allows to examine the relationships between two nominal variables in a multidimensional space. A major advantage that correspondence analysis has over other cross-tabular analytical techniques is that it describes these associations in a graphical fashion in accordance with a measure of statistical independence such as the  $P^2$  statistic. In doing so it illustrates the underlying relationships between variable categories. The Euclidean distances in the bi-plots of correspondence analysis approximate the  $P^2$  distances present in the data table. Points that are together in the plot are more alike than those that are far apart.

The example below illustrates the relationship between a variable expressing group membership of individuals in categories g1, g2, g3, g4 and g5 (rows) and in sectors s1 and s2 (columns). These categories are represented by stars and squares in the bi-plot. By calculating row and column profiles and breaking down the  $P^2$  statistic, points corresponding to groups and sectors may be plotted in a plane spanned by two major principal components. Rays (vectors) could be drawn from the origin to each column point (sectors).

The orthogonal projection (perpendicular line) from the row points (groups) to the rays provides an indication of how categories of these two variables are related to each other. In this case, points g1 and g2 are close to each other and located close to the s1 ray while g3 and g4 are closest to the s2 ray despite being located at different sides of it. In other words, individuals belonging to categories g1 and g2 will tend to be over-represented in sector 1 while those in g3 and g4 in sector 2. The point g5 is far away from the rays and equidistant suggesting there is no apparent association of this row category to the any column category.



### Appendix 3

#### Evidence from the 1996 Census:

The 1996 Census suggests that there are some substantial differences in the schooling profiles between the visible minority and other population. Visible Minority men and women are more likely to have at least some university schooling than is the case for men and women who are not visible minorities. Thirty-six percent of visible minority women and 45 percent of visible minority men had at least some university, as compared to 28 percent of women who were not visible minorities and 29% of men who were not visible minorities (see table A2.1).

		Total		Federal Government (SIC 81-82)	
		Not VM	VM Total	Not VM	VM Total
Females	Total	5,709,700	640,045	142,525	8,540
	No HS grad or additional training	21%	22%	9%	5%
	Gr < 5	1%	3%	0%	0%
	Grades 5-8	4%	5%	1%	1%
	Gr 9-13	16%	13%	9%	4%
	Secondary school graduation certificate	18%	14%	19%	8%
	Trades certificate or diploma	3%	2%	3%	2%
	Some non-univ post sec	31%	26%	32%	28%
	Some Univ no deg	11%	13%	14%	15%
	Univ Degree	17%	23%	23%	43%
	University with bachelor or first professional degree	12%	18%	16%	30%
	Univ deg or cert above BA	5%	5%	6%	13%
Males	Total	6,732,090	728,125	197,645	10,305
	No HS grad or additional training	31%	25%	16%	6%
	Gr < 5	1%	3%	0%	0%
	Grades 5-8	7%	5%	2%	0%
	Gr 9-13	23%	17%	14%	5%
	Secondary school graduation certificate	17%	14%	21%	6%
	Trades certificate or diploma	7%	3%	7%	3%
	Some non-univ post sec	33%	26%	38%	20%
	Some Univ no deg	10%	15%	18%	17%
	Univ Degree	19%	30%	38%	68%
	University with bachelor or first professional degree	13%	20%	25%	37%
	Univ deg or cert above BA	6%	10%	14%	32%

Amongst the population working in the federal public service (including agencies), the levels of schooling are higher across all groups, but the levels of schooling for visible minorities remain higher regardless of gender. Eighty-five percent of visible minority men working in the federal public service have at least some university schooling, and 68 percent have a degree (as compared to 56 percent and 38 percent respectively for men who are not visible minorities). Amongst women, 58 percent of visible minorities have at least some university and 43% have a degree (as compared to 37 percent and 23 percent respectively for men who are not visible minorities).