

THE IMPACT OF OVEREDUCATION ON THE LIKELIHOOD OF CANADIAN
GRADUATES TAKING CONTINUING EDUCATION
FOR JOB OR CAREER PURPOSES

by

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DEDICATION PAGE

This is for you, my grandpa. I learnt the importance of education from your extraordinary life-time contribution in your education career. My interest in education led to this thesis. Your endless inspiration and support will always be remembered deep in my heart.

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ABSTRACT

The main purpose of this paper is to explore how the probability of taking continuing education programs towards no degree for job or career purposes after graduation will be affected by overeducation, which can be defined as having actual education levels that exceed requirements for the job. Using the data from the National Graduates Survey – Class of 2005-Public User Microdata File (PUMF) (Statistics Canada 2007), a probit model was estimated to test the hypothesis that graduates who are already overeducated would take fewer continuing education programs for job or career purposes. Possible reasons for the negative relationship between overeducation and the likelihood of taking continuing education programs after graduation were examined based on human capital theory.

Keywords: continuing education, overeducation, human capital theory, life-cycle study.

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CHAPTER 1 INTRODUCTION

To be able to meet the more changeable and specialized requirements of skills as technology advances, employees have to acquire higher levels of skills, upgrade their existing skills or receive skills in a new field. Education is considered to be the most important investment in human capital theory for its crucial effect on acquiring skills (Becker 1993). Education also identifies the level of preexisting skills based on the screening theory: higher levels of preexisting skills are expected from higher levels of education (Taubman and Wales 1974). Employees will expect to develop their skills by receiving further education, which can compensate for deficiencies in their initial education and bridge differences between their skills and the skills that are required, specifically by their job. There is substantial demand by graduates to take more education or training programs for job or career purposes after they graduate from some levels of schooling. The most frequent reasons for taking continuing education for job or career purposes would be to satisfy the application requirements for the job, to get promotion or to change fields. In the 2002 Follow-Up National Graduates Survey by Statistics Canada, the data show that the main reasons for graduates to take continuing education after post-secondary graduation are job-related. About 46% of participants claimed that they continued their education because they wanted to get a job or to find a better job. Another 14% declared that they continued their education after graduation to keep their current job, to perform better on their current job or to get a raise in pay (Adamuti-Trache and Hawkey 2009). As a result, continuing education for job or career purposes is gradually becoming the normal state of affairs.

A number of factors affect the probability that graduates will receive continuing education for job or career purposes after graduation. These include their job satisfaction, their intention to quit, and whether their job matches their level of education or qualification. Though all of these contribute to the probability of taking continuing education, this paper will focus on the impact of overeducation on the probability of taking further education.

There is abundant literature on overeducation, mainly concentrated on the study of the incidence of overeducation and its earnings consequences. These studies include Duncan and Hoffman (1981), Rumburger (1987), Hartog (2000), Vahey (2000) (the first study that examines the relationship between overeducation and wage effect in Canada), Sloane, Battu and Seaman (1996) (the first study of overeducation in UK), etc. In addition, some studies explore the impact of overeducation on job satisfaction and job mobility (Sicherman (1991)), on overeducation in immigrants' communities (Galarneau and Morissette(2009) and Wald and Fang (2008)), and examined how overeducation affects the probability of taking on-the-job trainings (van Smoorenburg and van der Velden (2000)).

Duncan and Hoffman (1981) were first to define overeducation and undereducation by distinguishing between workers' actual levels of education and the level of education required for their job. Using the definition of overeducation from Duncan and Hoffman (1981), Sicherman (1991) then suggested that overeducation can be explained by the trade-off between schooling and other forms of human capital so that workers might qualify for similar jobs by having different levels of schooling but similar levels of total human capital. In his paper, on-the-job training was treated as one component of human

capital which can be a substitute for the initial education of workers. Using British data, Sloane, Battu and Seaman (1996) find a very similar result suggesting that having working experience, tenure and training can compensate low level of formal education. As on-the job training is one main part of continuing education, it is reasonable to hypothesize that overeducation can be explained as the trade-off between continuing education and initial education, which shows the close relationship between overeducation and continuing education. Therefore overeducation is highly likely to influence the probability of taking continuing education.

Although there are no published studies that have directly considered the impact of overeducation on the likelihood of taking continuing education, there is one paper by van Smoorenburg and van der Velden (2000) which discussed the impact of overeducation on the probability of training. They suggest that overeducated workers will take less additional training if initial education and training are substitutes by studying the STOA (Schoolverlaters tussen onderwijs en arbeidsmarkt-School Leavers' Employment) survey in 1996. The participants of this survey are the graduates from various types of secondary and vocational education in Dutch. They confirmed their hypothesis that overeducation would result in a significantly lower probability of training by using a logistic regression. They explore two possible reasons why the overeducated graduates have a lower likelihood of taking an additional training. One reason is related to the overeducated workers' intention to quit and the other is to their existing "learning ability". The authors believed that overeducated workers had stronger intentions to quit their job as they were less interested in investing in firm training. In addition, the authors also believed that

overeducated workers who had to leave their job had lower learning ability. As a result, overeducated workers have higher costs to take additional training. The authors tested both explanations in their model but, unfortunately, they found overeducated graduates do not have a lower likelihood of taking training because of higher intention to quit. There is no evidence to confirm the existence of “learning ability”.

This paper aim to provide better insights into the relations between initial education and continuing education by exploring two questions: whether the probability of taking continuing education towards no degree is associated with overeducation and why does this relationship exist? The rest of the paper is organized as follows: Chapter 2 describes the important definitions and measurements; Chapter 3 reviews existing studies of continuing education and overeducation; Chapter 4 summarizes the incidence of continuing education and overeducation and key variables; Chapter 5 tests the hypothesis, which is that overeducated graduates would take less continuing education programs towards no degree for job or career purposes after graduation; Chapter 6 summarizes the results.

CHAPTER 2 IMPORTANT DEFINITIONS AND MEASUREMENTS

2.1 DEFINING CONTINUING EDUCATION FOR JOB OR CAREER PURPOSES

Continuing education can be referred to as either further education or adult education in North America. The definition of further education in Adamuti-Trache and Hawkey (2009) refers to “two different types of education and training in which individuals who already completed a post-secondary program in 2000 engaged in further education between 2000 and 2005. One is participation in formal education programs lasting three months or longer offered by post-secondary institutions.” “The second is enrolment in career-related training courses requiring at least twenty hours of participation.”(P13). Adamuti-Trache and Hawkey (2009) specified that “further education [is] amongst post-secondary graduates from colleges and institutes, university colleges, and universities across Canada. Further education consists of formal (structured) education at the post-secondary level (e.g., degree and non-degree programs that lead to some formal recognition) and non-formal education and training offered by various providers (e.g., career-related training courses)” (P3).

Following the definition and specification of continuing education in Adamuti-Trache and Hawkey (2009), continuing education towards no diploma, certificate or degree for job or career purpose in this thesis is defined as any education or training program towards no diploma, certificate or degree taken for job or career-related reasons after graduation. In this study, participants who fall into this category are expected to have worked towards a non-credit bearing programs or events taken for job or career reasons, such as courses, workshops, seminars and tutorial, etc.

2.2 DEFINING OVEREDUCATION AND MEASUREMENT

In previous literature, there are three main methods of measurements of overeducation. The first measurement comes from job analysis (JA), the second measurement comes from workers' self-assessment (WA), and the third measurement comes from realized matches (RM) (Hartog 2000). The first two measurements JA and WA are more often applied in the study of overeducation.

Specifically, JA is a systematic evaluation of completed level of education requirements by jobs compared with employees' actual highest level of education. Li, Gervais and Duval (2006) studied the panel data from the Survey of Labor and Income Dynamics (SLID), between 1993 and 2001. They utilized a definition of the overqualified worker as someone who held a university degree and had worked for at least one month during the period of the research in an occupation that required at most a high school education. This definition comes from Galarneau and Morissette (2009). Li, Gervais and Duval (2006) determined the occupational classification and skill levels by using the Essential Skills Research Project (ESRP) as their JA. The ESRP connected the education levels required by the job to criteria including experience, specific training, etc.

In the second method of measurement WA, workers evaluate the level of education required for the job. Wald and Fang (2008) used the data from the 1999 Workplace and Employee Survey (WES) to study the earnings consequences of overeducation for immigrants in Canada. In the WES, there is a question: "What is the minimum level of education required for this job?" Based on the approach from Wald and Fang (2008) to measure overeducation from WA in 2005, the authors used the comparison of a worker's actual educational attainment with the education level that the worker believes to be

necessary for either job entry or performance. Employees are considered as overeducated if their highest level of education is beyond the minimum level of education they think is required for their job. Employees are considered as matched if their highest level of education is the same as the minimum level of education they think is required for their job. Employees are considered as undereducated if their highest levels of education are less than the minimum level of education they think is required for their job. Wald and Fang (2008) derived a set of three dichotomous variables characterizing the fit as overeducated, matched, or undereducated. The authors utilized WA in the waves of the Panel Study of Income Dynamics (PSID) between 1976 and 1978: “How much formal education is required to get a job like yours”. The answers were bracketed into 7 classes: 0-5, 6-8, 9-11, 12, 13-15, 16, and 17. In another paper that used the PSID, Sicherman (1991) assigned the answer as: 13-15 corresponding to “college, no degree necessary”; 16 meaning “college degree, B.A. or B.S.” and 17 indicating “college advanced or professional degree”. The author defined the “overeducation” as that the education level of respondents exceed education level believed to be required to get a job like theirs (Sicherman 1991).

The second method of measurement, WA, was applied in this study. Based on the comparison between the respondents’ highest level of education and the lowest level of education required by their jobs, which was derived from the question “When you were selected for this job, what level of education was needed to get the job?” in the survey, overeducation was defined as having actual education level that exceeds requirements for the job. Matching level was defined as having actual education level which is the same as

the level required for the job, while undereducation was defined as having actual education level which is less than requirement for the job.

CHAPTER 3 LITERATURE REVIEW

Few studies have addressed continuing education in Canada. Of those that have, many concentrate solely on the return to education and training programs among adult learners in Canada. However, using the Labor Force Survey (LFS), a monthly household survey conducted by Statistics Canada, Haggar-Guénette (1991) examined the workforce aged 30 to 64 who were taking credit courses in each October between 1980 and 1990.

Haggar-Guénette (1991) found that continuing education was more prevalent among women, younger adults, and adults with higher educations. Using the same database from 1992 to 1996, Gower (1997) confirmed that continuing education is motivated by a desire to improve job prospects. He also explored the relationship between taking continuing education and unemployment, the relationship between taking continuing education and diminishing economic inequality. Myers and Myles (2005) suggested that less-educated respondents are more likely than others to have access to training through their occupations and that they are more likely to be able to afford paying for their own training. Blundell & Dearden (1999) studied the determinants and effects of training, “generally defined in terms of courses designed to help individuals develop skills that might be of use in their job” (P6-P7). They suggested that gender; presence of children; type of job; union membership and ethnic minority status can determine the probability of taking training. Adamuti-Trache and Hawkey (2009) examined patterns of post-secondary graduates from colleges and institutes, university colleges, and universities in further education for Canadian-born Aboriginals, Canadian-born non-Aboriginals, and immigrants across Canada in 2000.

There is abundant literature studying overeducation, which mainly concentrates on the study of the earnings consequences. Table 1 below summarizes the main studies on which this paper is based:

Table 1: Main Studies of Overeducation

Duncan and Hoffman (1981)	Defined overeducation and undereducation by distinguishing between workers' actual levels of education and the level of education required for their job
Sicherman (1991)	Explained overeducation as the trade-off between schooling and other forms of human capital
Sloane, Battu and Seaman (1996)	Formal education can be compensated with training
Hartog (2000)	Summarized three main methods of measurements of overeducation: JA, WA, RM
Li, Gervais and Duval (2006)	Job analysis (JA)
Wald and Fang (2008)	Worker self-assessment (WA)
Van Smoorenburg and Van der Velden (2000)	Overeducated workers will take less additional training if initial education and training are substitutes

CHAPTER 4 DATA DESCRIPTION

The data used for this thesis was taken from the National Graduates Survey – Class of 2005-Public User Microdata File (PUMF) (Statistics Canada 2007).

The National Graduates Survey contains information on graduates' education and labor market outcomes in Canada. Specifically, with regards to education, the survey records graduates' primary and secondary education, continuing education after graduation, and financial information for education program. With regards to employment, it records graduates' first job; the job they held in the last week prior to the interview and other jobs (Statistics Canada 2007). The National Graduates Survey had been conducted every four years between 1978 and 1990. From 1990, Statistics Canada changed the survey frequency to once every five years. Respondents to this survey are the graduates who graduated two years before the survey year from universities and community colleges across Canada.

Statistics Canada conducted the class of 2005 survey from May to September 2007 and recorded the data for the 2005 graduates' cohort. The PUMF contains a reduced list of variables compared to the master file. Graduates from trade/vocational programs, graduates from programs taken outside of Canada, and graduates who lived in the United States are excluded, leaving 16,081 records in the PUMF, which is roughly half the number in the master file. The PUMF contains data for the present study: demographic information of graduates, detailed information on continuing education and training experience after graduation, graduates' work experience, and evaluations of their jobs.

4.1 THE INCIDENCE OF TAKING CONTINUING EDUCATION TOWARDS NO DEGREE FOR JOB OR CAREER PURPOSES AND OVEREDUCATION

In Tables 2-6, the incidence of continuing education for job or career purposes and overeducation was examined.

Table 2 indicates the basic information in the National Graduates Survey – Class of 2005- Public User Microdata File (PUMF) (Statistics Canada 2007). In general, the proportion of males is 41.43% which is less than the proportion of females (58.57%). More than half of respondents are under 25 years old. In different age domains: less than 25, from 25 to 29, from 30 to 39 and 40 or more, more women (41.31%) were married or in a common-law relationship than men (36.76%). More women have dependent children (22.99%) than men (18.65%).

At the time of graduation, more than 90% of respondents could speak English or English and French well enough to conduct a conversation with no large difference between males and females while more females (8.38%) could only speak French after graduation than males (4.83%).

The education levels by 2007 can be broadly categorized in to three levels: College or CEGEP diploma or certificate (the first level of degree), bachelor's degree or first professional degree, university diploma or certificate below bachelor level (the second level of degree), and Master's degree, doctorate and university certificate, diploma or degree above bachelor level (the third level of degree). About 50% of respondents graduated within the second level. Furthermore, more than 50% of female (50.70%) held the second level of degree but less than 50% of male (45.61%) held the second level of degree. Males and females shared similar percentages in the other two categories.

Based on the North American Industry Classification System (NAICS) 2002, the survey classified jobs into 7 industry groups: (1) Goods-producing industry; (2) Trade, transportation and warehousing; (3) Finance, insurance, real estate and public administration; (4) Professional, scientific and technical services; (5) Educational services; (6) Health care and social assistance, and (7) Other services.

More than 15% of graduates held a job in Educational services or Health care and social assistance in the last week prior to the interview, while less than 10% of graduates held a job in Goods-producing industry and trade, transportation and warehousing in the last week prior to the interview. Substantial gender differences were shown in the fields of jobs. About four times more women (22.78%) worked in health care and social assistance than men (5.58%). Approximately three times more men (16.17%) worked in goods-producing industry than women (5.50%) and around twice as many men (16.20%) worked in professional, scientific and technical services than women (8.83%).

More than 60% of graduates held a permanent job, while less than 40% of graduates held a temporary job (e.g. seasonal, temporary, term, casual, etc.) or had no job in the week prior to the interview or had not stated their job information.

To study graduates' gross annual earnings, the survey classified gross annual earnings into 18 groups (Canadian dollars): less than 5000, 5,000 to 9,999, 10,000 to 14,999, 15,000 to 19,999, 20,000 to 24,999, 25,000 to 29,999, 30,000 to 34,999, 35,000 to 39,999, 40,000 to 44,999, 45,000 to 49,999, 50,000 to 54,999, 55,000 to 59,999, 60,000 to 64,999, 65,000 to 69,999, 70,000 to 74,999, 75,000 to 79,999, 80,000 to 84,999 and 85,000 or more.

About one third of graduates earn less than \$25,000 per year, one third of graduates earn between \$25,000 and \$49,999, and one third graduates earn more than 49,999. Graduates' gross annual income can be divided into three levels: low income (less than \$25,000), middle income (\$25,000 to \$49,999) and high income (more than \$49,999). Of the 18 categories, the largest amount of graduates (~ 10%) earn middle income - \$30,000 to \$34,999 (10.11%), \$35,000 to \$39,999 (9.48), or \$40,000 to\$ 44,999 (9.8%) per year, while less than 8.5% of graduates' annual earnings are more than \$75,000. Substantial gender differences were shown in different income levels: percentages of women are higher in the low income level; percentages of men and women are similar in the middle income level, and percentages of men are higher in the high income level. There are many studies that examine different reasons for the income inequality between genders, like Gunderson, M. (2006).

Table 3 shows the incidence of overeducation. More than 50% of respondents who held a job last week claimed that they were overeducated for their job; however; only less than 3% of respondents reported that they were undereducated for their job. Overeducated workers, workers whose education level matched with their job and undereducated workers do not appear to differ in a substantial manner between genders. About 5% more men are overeducated than women, while about 5% more women's education level matched with the education level required by the job than men.

Table 4 and Table 5 present a breakdown of demographical information for overeducation and graduates taking continuing education towards no degree for job or career purposes. Among the graduates who claimed that they are overeducated for their job, around half of those graduates are under 25 years old. About 40% of graduates are

married but only 23% of graduates have dependent children. More than 60% of graduates could speak English well enough to conduct a conversation, and around 31% of graduates could speak English and French, with no large difference seen between males and females, while twice as many females could only speak French after graduation than males. There are no significant differences between proportions for those figures summarized above and proportions for those figures which are shown among the graduates who declared that they have taken continuing education towards no degrees for job or career purposes.

However, the information showing as follows was quite different for the graduates who are overeducated for their job and the graduates who have taken continuing education towards no degree for job or career purposes since graduation. 39.86% of respondents who are overeducated graduated with a bachelor's degree or first professional degree, university diploma or certificate below bachelor level, while more than half of respondents who have taken continuing education towards no degree for job or career purposes held the same level of education degree. 24.92% and 24.33% were respectively presented for the college or CEGEP degree and master's degree, doctorate, university diploma or certificate above bachelor degree.

In different job fields, proportions for males and females are quite different for the graduates who are overeducated for their job and the graduates who have taken continuing education towards no degrees for job or career purposes since graduation. In goods-producing industries, the percentage of female graduates who are overeducated is three times higher than the percentage of male graduates. In health care and social assistance, the percentage of male graduates who are overeducated is around four times

higher than the percentage of female graduates. The significant differences of proportion for males and females can also be seen among graduates who have taken continuing education towards no degree for job or career purposes.

Approximately 75% of graduates who are overeducated held a permanent job, while about 70% of graduates who have taken continuing education toward no degree for job or career purposes held a permanent job.

Gross annual earnings were shown to be different for the graduates who are overeducated for their job and the graduates who have taken continuing education towards no degree for job or career purposes since graduation. Specifically, from Figure 1 and Figure 2, overeducated males share the same trend with overeducated females in the middle income level (\$25,000 to \$49,999) and high income level (more than \$49,999).

Furthermore, the biggest difference is shown in the top income level (\$80,000 to \$84,999 and \$85,000 or more). More females are overeducated in the low income level (less than \$25,000). Similar trends are presented among the graduates who declared that they have taken continuing education towards no degree for job or career purposes. Figure 3 and Figure 4 show that there are more males and females who are overeducated than males and females who have taken continuing education towards no degree for job or career purposes in the low income level, while there are fewer men and women who are overeducated than men and women who have taken continuing education towards no degree for job or career purposes in the middle and high income level.

Table 6 summarizes the demographical information for overeducation and participation of continuing education towards no degree for job or career purposes. For the respondents

who have taken continuing education towards no degree for job or career purposes: 45.07% of respondents who held a job last week declared that they were overeducated for their job; 52.66% of respondents reported that their initial education level matched with their job requirements; however, only 2.27% of respondents claimed that they are undereducated. For the respondents who have not taken any continuing education towards no degree for job or career purposes: 56.99% of respondents declared that they were overeducated; 40.58% of respondents reported that their initial education level matched with their job requirements; however, only 2.43% of respondents believed that they are undereducated. There are fewer graduates who are overeducated for their jobs who have taken continuing education for job or career purposes than graduates who are overeducated and have not taken continuing education towards no degree for job or career purposes. There are differences between genders for the respondents who have taken continuing education for job or career purposes: specifically, about 8% of more men are overeducated than women, while about 8% more women's highest education level matched with the lowest education level required by the job. The percentage of male respondents who are undereducated is only 64% of the female respondents.

4.2 KEY VARIABLES

The participation in continuing education towards no degree for job or career purposes comes from the following question in the National Survey-Class of 2005 "Since your graduation, was any of this education or training taken for job or career-related reasons?".

A binary dependent variable, continuing education, is derived based on this question.

When continuing education is equal to zero, this represents that graduates haven't taken any continuing education program towards no degree for job reasons since their graduation. When continuing education is equal to one, it shows that graduates have taken some continuing education program after graduation.

The key independent variables are binary variables: Overeducation, Matching Level and Undereducation, which are derived from the comparison between the completed level of education required to get the last week's job, which was taken from the question: "When you were selected for this job, what level of education was needed to get the job?", and the highest level of education of the graduate by 2007. When overeducation is equal to one, it is defined as employees whose actual education level exceeds requirements for the job or there are no education requirement specified by their job. When Matching Level is equal to one, it is defined as employees whose actual education level is the same as the one required by the job. When Undereducation is equal to one, it is defined as employees whose actual education level is less than the job requirements; and zero otherwise.

The following variables have been chosen as control variables for the probability of taking continuing education or training programs for job or career purposes: job satisfaction, quit intention, job matching, gross annual earnings, gender, age, marital status, dependent children, language, permanent job, classification of industry group for

Job held last week, and respondents' actual education level. More detailed descriptions for those control variables are in the Appendix B.

CHAPTER 5 METHODOLOGY AND RESULTS

5.1 THE IMPACT OF OVEREDUCATION ON THE PROBABILITY OF TAKING CONTINUING EDUCATION TOWARDS NO DEGREE FOR JOB OR CAREER PURPOSES

To analyze the impact of overeducation on the probability of taking continuing education towards no degree for job or career purposes, both females and males are included in the hypothesis that the graduate who is already overeducated would take fewer continuing education programs for job or career purposes. The probit model for the test is:

$$\text{Eq(1)} \quad \Pr(Y = 1|X) = \Phi(X'\beta)$$

where Y is a dummy variable indicating whether participants took continuing education towards no degree for job or career purposes and X is a set of characteristics likely to affect the probability of taking continuing education towards no degree for job or career purposes in equation 1. The first two columns in Table 6 show the basic probit model for males and females with X: Overeducation, Undereducation, Age, Marital status, Dependent children, Permanent job, Language, Job industry, Education Level. One control variable was successively added each time to the other four models to make the model more accurate and more realistic: Job satisfaction, Quit intention, Job matching and Gross annual earnings¹. Φ is a cumulative distribution function of the standard normal distribution and the parameters β are the coefficients to estimate for X.

The coefficient of overeducation for females in model 5 shown in Table 7 is -0.166, which is significant at the 1% significance level, while for men the coefficient is -0.0338,

¹ Gross annual earnings correspond to the respondent's latest job and may be already the result of having taken continuing education. Using Gross annual earnings as determinants of continuing education may cause misspecification.

which is not significant. The results confirm the hypothesis that the graduate who is already overeducated would take fewer continuing education programs towards no degree for job or career purposes for females at 10% significance level, while for males, the impact of overeducation is not significant. Comparing model 1 with model 2, job satisfaction has a significant effect on men (the coefficient of job satisfaction for men is 0.255 at 1% significance level) rather than women (0.0129, not significant). By controlling “job satisfaction”, the coefficient of overeducation for men increases to -0.184 at 10% significance level while the coefficient for women increases to -0.314 at 10% significance level. The comparison between model 1 and model 2 shows: men who are satisfied with their job will have a higher likelihood of taking continuing education for job or career purposes, while women’s satisfaction for their job is not a significant determinant for their likelihood to take continuing education. Furthermore, men’s job satisfaction reduces the negative impacts of overeducation on their likelihood of taking continuing education towards no degree for job or career purposes. Comparing model 2 with model 3, the effect of a new control variable, quit intention, is not significant for either males or females, which is consistent with the result from van Smoorenburg and van der Velden (2000) that overeducated graduates do not have a lower likelihood of taking training because they have high intention to quit. When comparing model 3 with model 4, the effect of “job matching” is significant at 1% significance level for both males and females. The coefficients of overeducation for males and females rise up noticeably by the controlling of “job match”.

The high level of significance of controlling “job matching” and its effect on the coefficient of overeducation can be partly explained by its derivation. “Job matching” is

derived from the question: “How closely is the (main) job you held last week related to your certificate, diploma or degree?” Many respondents consider that this question is about how their job field matched with their study field. Nevertheless, some respondents may hold a different point of view that this question is about how their level of education matched with their job requirements. For the second group of respondents, there would be an overlap between the “job matching” variable and the “overeducation” variable, which can partly explain the results in model 3 and model 4.

Comparing model 4 with model 5, the effects of the control variable, gross annual earnings are different in different income categories. Specifically, negative wage effects on the probabilities of taking continuing education towards no degree for job or career purposes are shown in the low income level (less than \$25,000), while positive wage effects are shown in the middle income level (\$25,000 to \$49,999) and high income level (more than \$49,999), except for the income levels (\$25,000 to \$29,999 and \$35,000 to \$39,999). The results indicate that respondents with low income jobs have lower likelihood of taking continuing education towards no degree for job or career purposes as their income increases, while respondents with middle or high income jobs have higher likelihood of taking continuing education towards no degree for job or career purposes as their income increases².

Possible explanation for the results is shown as follows: the marginal propensity to consume for low income workers is relatively high. As their income increases, the low income workers will consume more rather than invest in their career. In addition, employers raise wages to coincide with workers’ excess skills, which results in the

² The reported coefficients may be biased due to potential endogeneity of the earnings variable.

decrease of probability of on-the-job-training sponsored by employers. This is especially evident among very low income workers. As a result, low income workers have negative wage effects on the probability of taking continuing education towards no degree for job or career purposes.

Middle income or high income workers have less pressure of daily expenses, so they are more likely to pursue a job promotion or change to another job field for self-development as their income increases. In order to do so, they will take more continuing education. Therefore, middle income or high income workers have positive wage effects on the probability of taking continuing education towards no degree for job or career purposes.

By controlling gross annual earnings in model 5, the coefficients of overeducation for males turns out to be not significant, while the results for females stays at the 1% significance level, which shows that overeducation effects on the likelihood of taking continuing education towards no degree for job or career purposes for males are not significant under controlling income, while controlling income has no effect on the result for females.

In model 5, the coefficients of overeducation, job matching, graduates' age (40 or more), marital status, language (French and French and English), job field (goods-producing and industry, finance, insurance, real estate and public administration), levels of education (Master's degree, doctorate, university diploma or certificate above bachelor level) and levels of wages (\$25,000 to \$29,999, \$45,000 to \$49,999, \$50,000 to \$54,999, \$55,000 to \$59,999, \$60,000 to \$64,999, \$75,000 to \$79,999, \$80,000 to \$84,999, \$85,000 to more) for males and females are at obviously different significance levels.

Table 11 and Table 12 report marginal effects of all the independent variables in Models 1 - 5. The effects are calculated for the following set of default characteristics: “gross annual income from \$30,000 to \$34,999; age less than 25; English only; professional, scientific and technical services; bachelor’s degree or first professional degree, university diploma or certificate below bachelor level”.

5.2 THE GENDER STUDY OF THE IMPACT OF OVEREDUCATION ON THE PROBABILITY OF TAKING CONTINUING EDUCATION TOWARDS NO DEGREE FOR JOB OR CAREER PURPOSES

To analyze the differences between genders on the probability of taking continuing education towards no degree for job or career purposes, a similar probit model was tested with all the variables in model 5 and new variables (all the variables in model 5 multiplied by a dummy variable: female (female=1, otherwise=0) and dummy variable: female). The results of the gender study were presented in Table 8.

Table 8 shows that for men and women, the likelihood of taking continuing education towards no degree for job or career purposes is affected to varying degrees by graduates’ level of education, job fields and levels of income and job satisfaction. Specifically, the coefficient of Overeducation*female shown in Table 8 is -0.132, which is significant at 10% significance level, suggesting that for males and females, the impact of overeducation on the probability of taking continuing education towards no degree for job or career purposes is different. 10%, 5% or 1% significance levels can be seen in the estimated coefficients of graduates’ level of education*female (Master’s degree, doctorate, university diploma or certificate above bachelor level*female), different job fields (goods- producing industry*female and finance, insurance, real estate and public*female) and different levels of gross annual income (45,000 to 49,999*female and

60,000 to 64,999*female). In addition, the coefficient of job satisfaction*female is -0.217 at 10% significance level, indicating that for females, the impact of graduates' satisfaction with their jobs on the probability of taking continuing education towards no degree for job or career purposes are stronger. The results in Table 8 suggest that there is no obvious gender effect on the impacts of other variables as expected.

5.3 THE VALIDITY OF THE SURPLUS OF SKILLS

There are two possibilities which can cause the mismatch between workers' initial education and job requirements. One possibility is that the workers' education field does not match with the job field. This possibility was diminished by controlling the variable "job matching" (Table 7). The other possibility is that the workers' education level does not match with the job requirements. Workers are believed to be overeducated if their actual education level exceeds requirements for the job. Overeducated graduates are expected to have higher levels of preexisting skills than the job required, which is a surplus of skill. Due to the surplus of skill, overeducated workers don't have to take more continuing education for job or career purposes to satisfy the requirements of their job and respondents will meet with less competition in the Canadian labor market by being overeducated. To test the validity of the surplus of skills, suppose that there is an unobservable variable: surplus of skills, which both influences the probability of taking continuing education towards no degree for job or career purposes and the probability of being overeducated. A bivariate probit model was estimated by gender:

$$\text{Eq(2)} \quad \Pr(Y_1 = 1|X_1) = X_1'\beta_1 + \varepsilon_1$$

$$\text{Eq(3)} \quad \Pr(Y_2 = 1|X_2) = X_2'\beta_2 + \varepsilon_2$$

$$\text{Eq(4)} \quad \text{corr}(\varepsilon_1, \varepsilon_2) = \rho$$

where Y_1 is a dummy variable indicating whether participants took continuing education towards no degree for job or career purposes (continuing education=1, graduates have taken some continuing education program after graduation); X_1 is a set of characteristics likely to affect the probability of taking continuing education: Job satisfaction, Quit intention, Job matching, Age, Marital status, Dependent children, Permanent job, Job industry, Education Level, Language and Gross annual earnings. β_1 are the coefficients to estimate the probabilities of taking continuing education towards no degree for job or career purposes. Y_2 is a dummy variable indicating whether the participants are overeducated (Overeducation=1, graduates were overeducated); X_2 is a set of characteristics likely to affect the probability of being overeducated: Job satisfaction, Quit intention, Job matching, Age, Marital status, Dependent children, Permanent job, Job industry, Education Level, Language and Gross annual earnings. X_1 and X_2 contain the same set of variables. β_2 are the coefficients to estimate the probabilities of being overeducated.

ε_1 is the residual which will influence the likelihood of taking continuing education towards no degree for job or career purposes and ε_2 is the residual which will influence the likelihood of being overeducated. $\text{corr}(\varepsilon_1, \varepsilon_2)$ is the correlation between ε_1 and ε_2 . In Table 9 males' $\text{corr}(\varepsilon_1, \varepsilon_2)$ is -0.0153, which is not significant at 10% significance level. While the correlations between ε_1 and ε_2 for females showed in Table 10 is -0.0919 and is significant at the 1% significance level. The result for female showing in Table 10 is consistent with the hypothesis that surplus of skills can determine both the probability of taking continuing education towards no degree for job or career purposes and the

probability of being overeducated for females, while for males in Table 9, the result is not significant. A possible explanation for this difference between genders is that to males workers, being overeducated don't contribute to the surplus of skill need for their job. Furthermore, the negative correlation between two error terms in Table 9 and Table 10 suggests that surplus of skills have the opposite effect on the probability of taking continuing education towards no degree for job or career purposes and the probability of being overeducated for both males and females, which can explain the lower probability of taking continuing education associated with overeducation. For females, the result is more significant than males.

A similar model was used by Van Smoorenburg and van der Velden (2000). The authors assumed that the unobservable variable which both influences the probability of taking continuing education for job or career purposes and the probability of being overeducated is workers' learning ability rather than surplus of skills, and they found there is no evidence to support their hypothesis of the existence of "learning abilities". However, their precondition of the assumption "learning ability", that overeducated workers who have to leave their job might have less learning abilities, may not be valid. There are a lot of possibilities that can explain why those overeducated workers have to leave their job, like a lack of work experience, etc. Besides, it's more acceptable that overeducated workers have higher learning abilities. Otherwise, their initial education level would not be higher than other workers. So it's more reasonable to explain the unobservable variable which both influences the probability of taking continuing education towards no degree for job or career purposes and the probability of being overeducated as surplus of skills based on human capital theory.

CHAPTER 6 CONCLUSION

In this paper, I have used the National Graduates Survey – Class of 2005-Public User Microdata File (PUMF) (Statistics Canada 2007) to estimate the impact of overeducation on the likelihood of taking continuing education towards no degree for job or career purposes, both for females and males. The Canadian evidence confirms the hypothesis that the female graduate who is already overeducated would take fewer continuing education programs towards no degree for job or career purposes; however, the result for male is not significant. There are gender differences in several variables, notably in the overeducation variable. The validity of one explanation for the negative impacts by genders, surplus of skills, has also been tested and the result suggested that the surplus of skills can influence in opposite ways the probability of taking continuing education towards no degree for job or career purposes and the probability of being overeducated for females, while the result is not significant for males. As a result, the lower probability of taking continuing education associated with overeducation is explained for female, while partly explained for males.

TABLE

Table 2: General Information

	Men	Women	Total
		Number	
Total	6662	%	9419
	41.43		100
Age			
Less than 25	52.15	53.67	53.04
25 to 29	23.00	20.06	21.27
30 to 39	16.24	14.03	14.94
40 or more	8.61	12.24	10.74
Marital Status			
Married	36.76	41.31	39.43
Single	63.24	58.69	60.57
Dependent children	18.65	22.99	21.19
Language			
English	62.34	59.03	60.40
French	4.83	8.38	6.91
English & French	32.83	32.59	32.69
Education			
College or CEGEP diploma or certificate	31.68	29.02	30.12
Bachelor's degree or first professional degree, university diploma or certificate below bachelor level	45.61	50.70	48.59
Master's degree, doctorate, university diploma or certificate above bachelor level	22.71	20.28	21.29
Field of job			
Goods-producing industries	16.17	5.50	9.93
Trade, transportation and warehousing	8.83	7.31	7.94
Finance, insurance, real estate, public administration	13.79	10.41	11.81
Professional, scientific and technical services	16.20	8.83	11.89
Educational services	11.42	18.71	15.69
Health care and social assistance	5.58	22.78	15.65
Other services	12.07	11.41	11.68
Type of contract			
Permanent job	63.04	60.65	61.64

Not permanent	36.96	39.35	38.36
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**Gross annual earnings
in Canadian dollar (\$)**

Less than 5000	1.97	2.84	2.48
5,000 to 9,999	3.86	5.56	4.86
10,000 to 14,999	4.20	5.87	5.18
15,000 to 19,999	4.27	6.09	5.34
20,000 to 24,999	5.43	8.68	7.34
25,000 to 29,999	6.79	9.41	8.33
30,000 to 34,999	9.26	10.70	10.11
35,000 to 39,999	9.49	9.47	9.48
40,000 to 44,999	10.00	9.66	9.80
45,000 to 49,999	7.54	7.29	7.39
50,000 to 54,999	7.81	6.43	7.00
55,000 to 59,999	5.10	3.96	4.43
60,000 to 64,999	5.35	3.85	4.47
65,000 to 69,999	3.53	2.24	2.77
70,000 to 74,999	3.46	2.09	2.65
75,000 to 79,999	2.19	1.47	1.77
80,000 to 84,999	2.08	1.36	1.66
85,000 or more	7.67	3.03	4.94

Table 3: General information on Overeducation

	Men	Women	Total
		%	
Overeducation	54.84	49.63	51.76
Matching Level	43.16	47.76	45.89
Undereducation	2.00	2.60	2.35

Note: Based on the comparison between graduates' highest level of education and the lowest level of education required by their jobs, which was derived from the question: "When you were selected for this job, what level of education was needed to get the job?" in the survey, Overeducation is defined as employees' actual education level exceeds requirements for the job or there is no education requirement specified by their job, Matching Level is defined as employees' actual education level is the same as the education level required by the job and Undereducation is defined as employees' actual education level is less than the job requirements.

Table 4: Detailed Information of Overeducation

	Overeducation=0			Overeducation=1			Ratio (Overeducation=1/Overeducation=0)			
		Men	Women	Total	Men	Women	Total	Men	Women	Total
	Number	2331	3774	6105	2831	3719	6550	121.45	98.54	107.29
	%	38.18	61.82	100.00	43.22	56.78	100.00	113.20	91.85	100.00
Age										
Less than 25		53.87	55.19	54.69	49.54	52.60	51.28	91.95	95.30	93.77
25 to 29		25.32	20.97	22.63	21.19	19.02	19.96	83.70	90.69	88.18
30 to 39		15.71	13.18	14.15	17.88	15.16	16.33	113.76	115.03	115.44
40 or more		5.09	10.66	8.53	11.39	13.23	12.43	223.73	124.06	145.69
Marital Status										
Married		39.51	42.98	41.66	38.14	40.46	39.46	96.53	94.14	94.72
Single		60.49	57.02	58.34	61.86	59.54	60.54	102.26	104.42	103.77
Dependent children		17.56	20.92	19.63	21.43	23.58	22.65	122.06	112.72	115.37
Language										
English		60.60	58.69	59.42	64.58	60.04	62.00	106.56	102.30	104.34
French		4.91	8.93	7.40	4.69	8.25	6.71	95.53	92.34	90.74
English & French		34.49	32.38	33.18	30.73	31.71	31.29	89.11	97.94	94.30
Education										
College or CEGEP diploma or certificate		26.98	28.74	28.07	37.71	31.86	34.39	139.74	110.86	122.49
Bachelor's degree or first professional degree, university diploma or certificate below bachelor level		56.49	56.12	56.26	35.15	43.44	39.86	62.22	77.41	70.85
Master's degree, doctorate, university diploma or certificate above bachelor level		16.53	15.13	15.67	27.14	24.69	25.75	164.22	163.16	164.38
Field of job										
Goods-producing industries		17.16	5.52	9.94	21.37	7.11	13.26	124.50	128.73	133.41
Trade, transportation and warehousing		5.22	3.87	4.38	15.16	13.72	14.34	290.51	354.32	327.18
Finance, insurance, real estate, public administration		16.59	10.48	12.80	16.67	14.14	15.23	100.49	134.92	119.00
Professional, scientific and technical services		25.56	10.29	16.09	12.74	9.09	10.67	49.83	88.35	66.29
Educational services		20.65	31.36	27.29	9.32	14.22	12.11	45.15	45.36	44.36
Health care and social assistance		6.94	31.03	21.88	6.02	23.09	15.72	86.70	74.41	71.84
Other services		7.87	7.45	7.61	18.72	18.63	18.67	237.82	250.16	245.37
Type of contract										
Permanent job		79.57	71.85	74.80	78.10	75.59	76.67	98.15	105.21	102.51
Not permanent		20.43	28.15	25.20	21.90	24.41	23.33	107.20	86.72	92.55

Gross annual earnings

Less than 5000	0.77	1.12	0.99	2.83	4.33	3.69	366.54	386.28	373.02
5,000 to 9,999	1.68	2.83	2.39	5.59	8.01	6.97	332.33	282.82	291.18
10,000 to 14,999	1.64	3.17	2.58	5.85	8.24	7.21	357.71	259.98	279.11
15,000 to 19,999	2.32	4.32	3.55	5.66	7.78	6.87	244.36	180.20	193.27
20,000 to 24,999	3.32	6.53	5.31	6.68	10.77	9.01	201.44	164.91	169.88
25,000 to 29,999	5.45	9.59	8.01	8.12	9.55	8.93	148.85	99.57	111.51
30,000 to 34,999	8.64	11.02	10.11	10.20	10.72	10.49	118.06	97.26	103.79
35,000 to 39,999	10.77	10.79	10.79	8.91	8.49	8.67	82.73	78.68	80.41
40,000 to 44,999	13.09	12.76	12.88	7.74	6.90	7.26	59.14	54.07	56.35
45,000 to 49,999	10.18	9.67	9.87	5.74	5.16	5.41	56.38	53.33	54.82
50,000 to 54,999	10.36	8.07	8.95	6.00	5.04	5.46	57.94	62.47	60.99
55,000 to 59,999	6.77	4.85	5.58	4.23	3.16	3.62	62.45	65.22	64.87
60,000 to 64,999	5.77	4.54	5.01	5.06	3.16	3.98	87.66	69.65	79.41
65,000 to 69,999	3.86	2.66	3.12	3.36	1.99	2.58	86.99	74.90	82.74
70,000 to 74,999	4.14	2.21	2.95	3.17	1.85	2.42	76.69	83.64	82.10
75,000 to 79,999	2.09	1.82	1.92	2.15	1.23	1.62	102.95	67.25	84.38
80,000 to 84,999	1.91	1.40	1.60	1.96	1.20	1.53	102.86	85.39	95.70
85,000 or more	7.23	0.03	4.39	6.72	2.42	4.27	93.01	9192.02	97.37

Note: overeducation is derived from the comparison between the lowest level of education required to get the last week's job, which was taken from the question: "When you were selected for this job, what level of education was needed to get the job?" in the survey, and the highest level of education of the graduate by 2007. Overeducation =0, if employees' actual education level does not exceed requirements for the job.

Overeducation =1, if employees' actual education level exceeds requirements for the job or there is no education requirement specified by their job

Table 5: Detailed Information of Taking Continuing Education towards no degree for Job or Career purpose

	Number	Continuing Education=0			Continuing Education=1			Ratio (Continuing Education=1/ Continuing Education=0)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
	%	4094.00	5371.00	9465.00	2558.00	4025.00	6583.00	62.48	74.94	69.55
		43.25	56.75	100.00	38.86	61.14	100.00	89.85	107.74	100.00
Age										
Less than 25		56.20	59.39	58.01	45.76	45.89	45.84	81.43	77.27	79.02
25 to 29		22.22	19.30	20.56	24.22	21.09	22.31	109.00	109.29	108.49
30 to 39		14.07	12.04	12.92	19.68	16.75	17.89	139.79	139.18	138.48
40 or more		7.51	9.27	8.51	10.34	16.26	13.97	137.78	175.38	164.11
Marital Status										
Married		32.10	36.94	34.84	44.21	47.14	46.00	137.74	127.62	132.03
Single		67.90	63.06	65.16	55.79	52.86	54.00	82.16	83.82	82.87
Dependent children										
		16.40	20.77	18.88	22.26	25.94	24.52	135.74	124.94	129.88
Language										
English		60.44	56.94	58.45	65.36	61.82	63.19	108.13	108.57	108.12
French		5.64	10.01	8.13	3.52	6.20	5.16	62.44	61.95	63.50
English & French		33.91	33.05	33.42	31.12	31.98	31.64	91.76	96.76	94.68
Education										
College or CEGEP diploma or certificate		35.02	32.83	33.78	26.40	23.98	24.92	75.37	73.03	73.76
Bachelor's degree or first professional degree, university diploma or certificate below bachelor level		43.60	49.64	47.03	48.71	52.05	50.75	111.73	104.85	107.92
Master's degree, doctorate, university diploma or certificate above bachelor level		21.38	17.53	19.19	24.89	23.98	24.33	116.44	136.76	126.76
Field of job										
Goods-producing industries		14.86	5.91	9.78	18.97	5.09	10.44	127.62	86.16	106.72
Trade, transportation and warehousing		10.07	9.77	9.90	7.23	4.12	5.32	71.81	42.20	53.74
Finance, insurance, real estate, public administration		11.80	9.64	10.57	17.51	11.53	13.83	148.35	119.65	130.84
Professional, scientific and technical services		16.17	9.62	12.45	16.94	7.99	11.44	104.75	83.10	91.88
Educational services		10.02	14.82	12.74	14.18	24.29	20.39	141.51	163.87	160.00
Health care and social assistance		4.02	17.50	11.67	8.33	30.27	21.82	207.28	172.98	186.94
Other services		14.06	13.64	13.82	9.34	8.58	8.87	66.44	62.92	64.21
Type of contract										
Permanent job		56.95	55.30	56.01	72.74	67.81	69.73	127.72	122.63	124.49
Not permanent		43.05	44.70	43.99	27.26	32.19	30.27	63.33	72.01	68.82

Gross annual earnings

Less than 5000	2.77	3.88	3.40	0.86	1.64	1.34	31.00	42.23	39.24
5,000 to 9,999	5.31	7.94	6.81	1.85	2.79	2.43	34.88	35.15	35.63
10,000 to 14,999	5.70	8.04	7.03	2.12	3.34	2.86	37.24	41.53	40.74
15,000 to 19,999	5.54	7.27	6.53	2.53	4.60	3.80	45.68	63.28	58.16
20,000 to 24,999	6.84	10.91	9.16	3.48	6.07	5.06	50.84	55.63	55.25
25,000 to 29,999	8.14	10.96	9.75	4.92	7.62	6.57	60.46	69.55	67.42
30,000 to 34,999	10.23	11.58	11.00	7.90	9.70	9.00	77.28	83.76	81.83
35,000 to 39,999	9.84	9.36	9.57	8.99	9.58	9.35	91.37	102.31	97.73
40,000 to 44,999	9.25	8.55	8.85	11.07	10.96	11.00	119.62	128.16	124.27
45,000 to 49,999	7.49	5.63	6.43	7.59	9.21	8.58	101.28	163.58	133.39
50,000 to 54,999	7.17	4.74	5.79	8.67	8.40	8.51	121.02	177.11	147.03
55,000 to 59,999	3.94	2.51	3.12	6.73	5.67	6.08	170.75	226.09	194.67
60,000 to 64,999	4.30	2.21	3.11	6.82	5.78	6.19	158.62	261.43	198.94
65,000 to 69,999	2.44	1.52	1.92	5.06	3.08	3.85	207.07	202.02	200.56
70,000 to 74,999	2.12	1.20	1.60	5.33	3.14	3.99	251.73	260.40	249.83
75,000 to 79,999	1.60	0.88	1.19	3.03	2.16	2.50	189.60	243.87	209.60
80,000 to 84,999	1.40	0.81	1.06	2.98	2.01	2.39	212.83	248.31	224.52
85,000 or more	5.93	1.99	3.68	10.07	4.26	6.52	169.90	213.89	176.99

Notes: Participation in continuing education towards no degree for job or career purposes was taken from question in the National Survey-Class of 2005 "Since your graduation, was any of this education or training taken for job or career-related reasons?" Continuing education=0, if graduates haven't taken any continuing education programs towards no degree for job or career purposes since their graduation. Continuing education =1, if graduates have taken some continuing education programs towards no degree for job or career purposes after graduation.

Table 6: Detailed Information on Continuing Education for Job or Career Purposes and Overeducation

	Continuing Education=0			Continuing Education=1		
	Men	Women	Total	Men	Women	Total
	%			%		
Overeducation	58.07	56.18	56.99	50.37	41.73	45.07
Matching Level	39.70	41.24	40.58	47.95	55.62	52.66
Undereducation	2.23	2.58	2.43	1.68	2.64	2.27

Note: Participation in continuing education towards no degrees for job or career purposes was taken from question in the National Survey-Class of 2005 "Since your graduation, was any of this education or training taken for job or career-related reasons?" Continuing education=0, if graduates haven't taken any continuing education programs towards no degree for job or career purposes since their graduation. Continuing education =1, if graduates have taken some continuing education programs towards no degree for job or career purposes after graduation.

Based on the comparison between graduates' highest level of education and the lowest level of education required by their jobs, which was derived from the question: "When you were selected for this job, what level of education was needed to get the job?" in the survey, Overeducation is defined as employees' actual education level exceeds requirements for the job or there is no education requirement specified by their job, Matching Level is defined as employees' actual education level is the same as the education level required by the job and Undereducation is defined as employees' actual education level is less than the job requirements.

Table 7: Probit Model of the Probability of Taking Continuing Education

EQUATION	VARIABLES	(1)	(1)	(2)	(2)	(3)	(3)	(4)	(4)	(5)	(5)	
		continuing education	continuing education	continuing education	continuing education	continuing education	continuing education	continuing education	continuing education	continuing education	continuing education	continuing education
		female	male	female	male	female	male	female	male	female	male	
continuing education	overeducation	-0.316*** (0.0445)	-0.207*** (0.0544)	-0.314*** (0.0449)	-0.184*** (0.0544)	-0.315*** (0.0449)	-0.182*** (0.0545)	-0.257*** (0.0467)	-0.102* (0.0567)	-0.166*** (0.0487)	-0.0338 (0.0590)	
	undereducation	-0.116 (0.129)	-0.245 (0.192)	-0.115 (0.129)	-0.248 (0.191)	-0.114 (0.129)	-0.246 (0.191)	-0.0924 (0.128)	-0.236 (0.193)	-0.0636 (0.141)	-0.213 (0.195)	
	job satisfaction			0.0129 (0.0726)	0.255*** (0.0870)	0.0240 (0.0751)	0.233*** (0.0895)	-0.0412 (0.0773)	0.169* (0.0899)	-0.0696 (0.0782)	0.148 (0.0947)	
	quit intention					0.0265 (0.0532)	-0.0507 (0.0618)	0.0322 (0.0533)	-0.0295 (0.0623)	0.0723 (0.0550)	-0.00646 (0.0638)	
	job matching							0.297*** (0.0666)	0.372*** (0.0723)	0.163** (0.0695)	0.274*** (0.0756)	
	age: 25 to 29	0.125** (0.0561)	0.0980 (0.0658)	0.123** (0.0562)	0.0902 (0.0657)	0.125** (0.0562)	0.0901 (0.0657)	0.113** (0.0565)	0.0687 (0.0660)	0.0603 (0.0580)	0.0773 (0.0689)	
	30 to 39	0.309*** (0.0717)	0.199** (0.0858)	0.308*** (0.0717)	0.195** (0.0859)	0.309*** (0.0717)	0.193** (0.0860)	0.295*** (0.0715)	0.172** (0.0859)	0.137* (0.0755)	0.153* (0.0892)	
	40 or more	0.375*** (0.0766)	0.170 (0.111)	0.372*** (0.0767)	0.154 (0.111)	0.373*** (0.0767)	0.152 (0.112)	0.359*** (0.0769)	0.133 (0.114)	0.226*** (0.0815)	0.0569 (0.120)	
	marital status	0.101** (0.0455)	0.199*** (0.0648)	0.102** (0.0455)	0.198*** (0.0646)	0.102** (0.0456)	0.197*** (0.0646)	0.0944** (0.0456)	0.190*** (0.0654)	0.0514 (0.0471)	0.156** (0.0680)	
	dependent children	0.0825 (0.0604)	0.127 (0.0821)	0.0801 (0.0604)	0.124 (0.0820)	0.0800 (0.0604)	0.124 (0.0820)	0.0840 (0.0604)	0.131 (0.0826)	0.0476 (0.0628)	0.114 (0.0863)	
	permanent job	0.279*** (0.0487)	0.335*** (0.0654)	0.279*** (0.0488)	0.330*** (0.0652)	0.281*** (0.0490)	0.326*** (0.0650)	0.261*** (0.0492)	0.293*** (0.0655)	0.0679 (0.0538)	0.111 (0.0723)	
	French	-0.496*** (0.0749)	-0.303** (0.122)	-0.495*** (0.0749)	-0.301** (0.122)	-0.493*** (0.0750)	-0.305** (0.122)	-0.512*** (0.0749)	-0.317** (0.123)	-0.493*** (0.0785)	-0.282** (0.128)	
	English and French	-0.106** (0.0451)	-0.0671 (0.0535)	-0.106** (0.0451)	-0.0668 (0.0534)	-0.105** (0.0452)	-0.0689 (0.0533)	-0.113** (0.0451)	-0.0726 (0.0537)	-0.129*** (0.0462)	-0.0729 (0.0553)	
	goods-producing industry	-0.448*** (0.0945)	-0.125 (0.0887)	-0.446*** (0.0947)	-0.122 (0.0888)	-0.447*** (0.0947)	-0.126 (0.0889)	-0.412*** (0.0946)	-0.0964 (0.0889)	-0.532*** (0.0976)	-0.202** (0.0951)	
	trade, transportation and warehousing	-0.695*** (0.0934)	-0.429*** (0.109)	-0.698*** (0.0936)	-0.405*** (0.110)	-0.700*** (0.0936)	-0.404*** (0.109)	-0.629*** (0.0949)	-0.331*** (0.111)	-0.604*** (0.101)	-0.347*** (0.116)	
	finance, insurance, real estate and public administration	-0.245*** (0.0770)	0.0665 (0.0924)	-0.244*** (0.0771)	0.0706 (0.0923)	-0.245*** (0.0772)	0.0696 (0.0922)	-0.214*** (0.0772)	0.104 (0.0929)	-0.333*** (0.0792)	-0.00690 (0.0970)	
	professional, scientific and technical	-0.507*** (0.0770)	-0.301*** (0.0924)	-0.507*** (0.0771)	-0.302*** (0.0923)	-0.506*** (0.0772)	-0.302*** (0.0922)	-0.500*** (0.0772)	-0.305*** (0.0929)	-0.574*** (0.0792)	-0.406*** (0.0970)	

services										
health care and social assistance	(0.0801) 0.0480	(0.0869) 0.148	(0.0803) 0.0477	(0.0870) 0.147	(0.0803) 0.0473	(0.0870) 0.146	(0.0802) 0.0435	(0.0868) 0.144	(0.0834) -0.00582	(0.0915) 0.120
other industries	(0.0599) -0.534*** (0.0799)	(0.119) -0.418*** (0.103)	(0.0600) -0.532*** (0.0804)	(0.119) -0.399*** (0.103)	(0.0600) -0.534*** (0.0805)	(0.119) -0.395*** (0.103)	(0.0596) -0.476*** (0.0811)	(0.119) -0.355*** (0.103)	(0.0621) -0.473*** (0.0832)	(0.123) -0.314*** (0.107)
college or CEGEP diploma or certificate	-0.214*** (0.0499)	-0.141** (0.0586)	-0.216*** (0.0499)	-0.156*** (0.0590)	-0.215*** (0.0499)	-0.157*** (0.0589)	-0.223*** (0.0500)	-0.171*** (0.0594)	-0.0865 (0.0539)	-0.0856 (0.0634)
Master's degree, doctorate, university diploma or certificate above bachelor level	0.104* (0.0592)	-0.0776 (0.0703)	0.105* (0.0594)	-0.0892 (0.0703)	0.106* (0.0595)	-0.0911 (0.0704)	0.0828 (0.0602)	-0.126* (0.0704)	-0.0334 (0.0662)	-0.203*** (0.0756)
gross annual earnings: less_than_5000									-0.433*** (0.159)	-0.562*** (0.215)
5000 to 9999									-0.411*** (0.124)	-0.481*** (0.163)
10000 to 14999									-0.374*** (0.120)	-0.326** (0.159)
15000 to 19999									-0.127 (0.106)	-0.209 (0.165)
20000 to 24999									-0.265*** (0.0969)	-0.292** (0.139)
25000 to 29999									-0.129 (0.0934)	-0.263** (0.127)
35000 to 39999									0.107 (0.0904)	-0.0297 (0.113)
40000 to 44999									0.109 (0.0899)	0.101 (0.111)
45000 to 49999									0.392*** (0.0980)	0.0811 (0.122)
50000 to 54999									0.276*** (0.104)	0.192 (0.121)
55000 to 59999									0.397*** (0.125)	0.320** (0.134)
60000 to 64999									0.654*** (0.130)	0.312** (0.140)
65000 to 69999									0.298** (0.145)	0.320** (0.155)
70000 to 74999									0.683*** (0.172)	0.564*** (0.157)
75000 to 79999									0.536*** (0.167)	0.378** (0.173)

80000 to 84999									0.482**	0.289
									(0.188)	(0.195)
85000 to more									0.429***	0.198
									(0.166)	(0.138)
Constant	-0.131	-0.495***	-0.139	-0.724***	-0.157	-0.686***	-0.366**	-0.966***	-0.0411	-0.716***
	(0.137)	(0.190)	(0.154)	(0.207)	(0.157)	(0.210)	(0.164)	(0.219)	(0.181)	(0.242)
Observations	6,585	4,447	6,576	4,442	6,575	4,441	6,575	4,441	6,248	4,187

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Participation in continuing education towards no degree for job or career purpose was taken from the question in the National Survey-Class of 2005 "Since your graduation, was any of this education or training taken for job or career-related reasons?" Continuing education=0, if graduates haven't taken any continuing education programs towards no degree for job or career purposes since their graduation. Continuing education =1, if graduates have taken some continuing education programs towards degree for job or career purposes after graduation.

Overeducation and undereducation are derived from the comparison between the lowest level of education required to get the job they held last week, which was taken from the question: "When you were selected for this job, what level of education was needed to get the job?" in the survey, and the highest level of education of the graduate by 2007. Overeducation =0, if employees' actual education level does not exceed requirements for the job. Overeducation =1, if employees' actual education level exceeds requirements for the job or there is no education requirement specified by the job. Undereducation=0, if employees' actual education level is not less than the job requirement. Undereducation=1, if employees' actual education levels is less than the job requirement.

Job Satisfaction is derived based on the question: "Considering all aspects of the (main) job you held last week, how satisfied were you with the job? Would you say you were 01.very satisfied, 02.satisfied, 03.dissatisfied or 04.very dissatisfied?" Job satisfaction=0, if the respondents' answers was 03 or 04, which means respondents are dissatisfied with their job. Job satisfaction=1, if the respondents' answers was 01 or 02, which means respondents are satisfied with their job.

39 Quit intention is derived based on the question: "In the past four weeks, have you looked for another job with a different employer?" Quit Intention=0, if the respondents' answer was "no", which means respondents have low quit intentions. Quit intention=1, if the respondents' answer was "yes", which means respondents have high quit intentions.

Job matching is derived from the question: "How closely is the (main) job you held last week related to your certificate, diploma or degree? Is it 01.closely related 02.somewhat related or 03.not related at all?" Job Matching=0, if the respondents' answer was 03, which means the (main) job the employee held last week was unrelated to his certificate, diploma or degree. Job Matching=1, if the respondents' answer was 01 or 02, which means the (main) job the employee held last week was related to his certificate, diploma or degree.

Gross annual earnings in Canadian dollars for the job are derived based on several questions: "Considering the (main) job you held last week, during how many months in a year would you usually work at this job? Considering the (main) job you held last week, do you usually work every week of the month? How many weeks a month do you usually work at this job? How many (paid) hours a week do you usually work at this job? How many days a week do you usually work at this job? What is the easiest way for you to tell us your wage or salary, including tips and commissions, before taxes and other deduction for this job? Would it be yearly, monthly, weekly, hourly or on some other basis?"

Table 8: Probit Model of the Probability of Taking Continuing Education for Gender Study

EQUATION	VARIABLES	(1) continuing education
continuing education	overeducation	-0.0338 (0.0590)
	undereducation	-0.213 (0.195)
	job satisfaction	0.148 (0.0947)
	quit intention	-0.00646 (0.0638)
	job matching	0.274*** (0.0756)
	age: 25 to 29	0.0773 (0.0689)
	age: 30 to 39	0.153* (0.0892)
	age: 40 or more	0.0569 (0.120)
	marital status	0.156** (0.0680)
	dependent children	0.114 (0.0863)
	permanent job	0.111 (0.0723)
	French	-0.282** (0.128)
	French and English	-0.0729 (0.0553)
	goods-producing industry	-0.202** (0.0951)
	trade, transportation and warehousing	-0.347*** (0.116)
	finance, insurance, real estate and public administration	-0.00690 (0.0969)
	Professional, scientific and technical services	-0.406*** (0.0915)
	health care and social assistance	0.120 (0.123)

other industries	-0.314*** (0.107)
college or CEGEP diploma or certificate	-0.0856 (0.0634)
Master's degree, doctorate, university diploma or certificate above bachelor level	-0.203*** (0.0756)
gross annual earnings: less than 5000	-0.562*** (0.215)
5000 to 9999	-0.481*** (0.163)
10000 to 14999	-0.326** (0.159)
15000 to 19999	-0.209 (0.165)
20000 to 24999	-0.292** (0.139)
30000 to 34999	-0.263** (0.127)
35000 to 39999	-0.0297 (0.113)
40000 to 44999	0.101 (0.111)
45000 to 49999	0.0811 (0.122)
50000 to 54999	0.192 (0.121)
55000 to 59999	0.320** (0.134)
60000 to 64999	0.312** (0.140)
65000 to 69999	0.320** (0.155)
70000 to 74999	0.564*** (0.157)
75000 to 79999	0.378** (0.173)
80000 to 84999	0.289 (0.195)
85000 or more	0.198 (0.138)
overeducation*female	-0.132* (0.0765)
undereducation*female	0.150

	(0.241)
job satisfaction*female	-0.217*
	(0.123)
quit intention*female	0.0788
	(0.0843)
job matching*female	-0.111
	(0.103)
age: 25 to 29*female	-0.0170
	(0.0901)
age: 30 to 39*female	-0.0155
	(0.117)
age: 40 or more*female	0.169
	(0.145)
marital status*female	-0.104
	(0.0827)
dependent children*female	0.0665
	(0.107)
permanent job*female	-0.0430
	(0.0902)
French*female	-0.211
	(0.150)
English and French*female	-0.0562
	(0.0720)
goods-producing industry*female	-0.330**
	(0.136)
trade, transportation and warehousing*female	-0.257*
	(0.153)
finance, insurance, real estate and public*female administration	-0.326***
	(0.125)
educational services*female	-0.169
	(0.124)
health care and social assistance*female	-0.126
	(0.138)
other industries*female	-0.159
	(0.136)
college or CEGEP diploma or certificate*female	-0.000961
	(0.0832)
Master's degree, doctorate, university diploma or certificate above bachelor level*female	0.170*
	(0.100)
gross annual earnings: less than 5000*female	0.129
	(0.268)
5000 to 9999*female	0.0708
	(0.205)

10000 to 14999*female	-0.0481 (0.199)
15000 to 19999*female	0.0818 (0.196)
20000 to 24999*female	0.0269 (0.169)
25000 to 29999*female	0.134 (0.158)
35000 to 39999*female	0.137 (0.144)
40000 to 44999*female	0.00820 (0.143)
45000 to 49999*female	0.311** (0.157)
50000 to 54999*female	0.0847 (0.160)
55000 to 59999*female	0.0769 (0.184)
60000 to 64999*female	0.342* (0.192)
65000 to 69999*female	-0.0213 (0.212)
70000 to 74999*female	0.119 (0.233)
75000 to 79999*female	0.158 (0.241)
80000 to 84999*female	0.192 (0.271)
85000 or more*female	0.230 (0.216)
female	0.541*** (0.206)
Constant	-0.716*** (0.242)
Observations	10,435

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Participation in continuing education towards no degree for job or career purposes was taken from the question in the National Survey-Class of 2005 "Since your graduation, was any of this education or training taken for job or career-related reasons?" Continuing education=0, if graduates haven't taken any continuing education programs towards no degree for job or career purposes since their graduation. Continuing education =1, if graduates have taken some continuing education programs towards no degree for job or career purposes after graduation.

Overeducation and undereducation are derived from the comparison between the lowest level of education required to get the job they held last week, which was taken from the question: "When you were selected for this job, what level of education was needed to get the job?" in the survey, and the highest level of education of the graduate by 2007. Overeducation =0, if

employees' actual education level does not exceed requirements for the job. Overeducation =1, if employees' actual education level exceeds requirements for the job or there is no education requirement specified by the job. Undereducation=0, if employees' actual education level is not less than the job requirement. Undereducation=1, if employees' actual education levels is less than the job requirement.

Job Satisfaction is derived based on the question: "Considering all aspects of the (main) job you held last week, how satisfied were you with the job? Would you say you were 01.very satisfied, 02.satisfied, 03.dissatisfied or 04.very dissatisfied?" Job satisfaction=0, if the respondents' answer was 03 or 04, which means respondents are dissatisfied with their job. Job satisfaction=1, if the respondents' answers was 01 or 02, which means respondents are satisfied with their job.

Quit intention is derived based on the question: "In the past four weeks, have you looked for another job with a different employer?" Quit Intention=0, if the respondents' answer was "no", which means respondents have low quit intention. Quit intention=1, if the respondents' answer was "yes", which means respondents have high quit intention.

Job matching is derived from the question: "How closely is the (main) job you held last week related to your certificate, diploma or degree? Is it 01.closely related 02.somewhat related or 03.not related at all?" Job Matching=0, if the respondents' answer was 03, which means the (main) job the employee held last week was unrelated to his certificate, diploma or degree. Job Matching=1, if the respondents' answer was 01 or 02, which means the (main) job the employee held last week was related to his certificate, diploma or degree.

Gross annual earnings in Canadian dollars for the job are derived based on several questions: "Considering the (main) job you held last week, during how many months in a year would you usually work at this job? Considering the (main) job you held last week, do you usually work every week of the month? How many weeks a month do you usually work at this job? How many (paid) hours a week do you usually work at this job? How many days a week do you usually work at this job? What is the easiest way for you to tell us your wage or salary, including tips and commissions, before taxes and other deduction for this job? Would it be yearly, monthly, weekly, hourly or on some other basis?"

For gender study purpose, all variables are multiplied by female.

Table 9: Biprobit Model of Taking Continuing Education and Overeducation for Males

VARIABLES	(1) continuing education	(2) overeducation	(3) athrho
job satisfaction	0.150 (0.0947)	-0.500*** (0.104)	
quit intention	-0.00791 (0.0638)	0.0552 (0.0693)	
job matching	0.282*** (0.0736)	-1.036*** (0.0899)	
age: 25 to 29	0.0747 (0.0688)	0.167** (0.0755)	
30 to 39	0.148* (0.0890)	0.471*** (0.0974)	
40 or more	0.0431 (0.120)	1.082*** (0.135)	
marital status	0.157** (0.0680)	-0.0632 (0.0735)	
dependent children	0.111 (0.0866)	0.00752 (0.0914)	
permanent job	0.112 (0.0723)	0.125 (0.0761)	
French	-0.281** (0.129)	-0.180 (0.131)	
English and French	-0.0730 (0.0552)	-0.134** (0.0583)	
goods-producing industry	-0.208** (0.0937)	0.948*** (0.0993)	
trade, transportation and warehousing	-0.358*** (0.114)	1.307*** (0.124)	
finance, insurance, real estate and public administration	-0.0147 (0.0961)	0.786*** (0.0995)	

Table 10: Biprobit Model of Taking Continuing Education and Overeducation for Females

VARIABLES	(1) continuing education	(2) overeducation	(3) athrho
job satisfaction	-0.0612 (0.0781)	-0.213** (0.0847)	
quit intention	0.0729 (0.0550)	-0.00360 (0.0590)	
job matching	0.214*** (0.0676)	-1.018*** (0.0732)	
age: 25 to 29	0.0561 (0.0579)	0.0455 (0.0607)	
30 to 39	0.121 (0.0754)	0.283*** (0.0788)	
40 or more	0.196** (0.0817)	0.494*** (0.0859)	
marital status	0.0514 (0.0471)	-0.0217 (0.0503)	
dependent children	0.0554 (0.0630)	-0.154** (0.0661)	
permanent job	0.0544 (0.0534)	0.298*** (0.0585)	
French	-0.493*** (0.0787)	0.0200 (0.0780)	
English and French	-0.129*** (0.0462)	-0.0202 (0.0489)	
goods-producing industry	-0.576*** (0.0967)	0.880*** (0.102)	
trade, transportation and warehousing	-0.664*** (0.0990)	1.264*** (0.103)	
finance, insurance, real estate and public administration	-0.383*** (0.0780)	0.966*** (0.0854)	

professional, scientific and technical services	-0.405*** (0.0914)	0.436*** (0.0949)	professional, scientific and technical services	-0.607*** (0.0829)	0.664*** (0.0872)
health care and social assistance	0.115 (0.123)	0.772*** (0.126)	health care and social assistance	-0.0379 (0.0614)	0.654*** (0.0682)
other industries	-0.320*** (0.105)	1.178*** (0.115)	other industries	-0.525*** (0.0817)	1.020*** (0.0866)
college or CEGEP diploma or certificate	-0.0921 (0.0628)	0.380*** (0.0680)	college or CEGEP diploma or certificate	-0.0763 (0.0538)	-0.176*** (0.0574)
Master's degree, doctorate, university diploma or certificate above bachelor level	-0.208*** (0.0732)	0.948*** (0.0816)	Master's degree, doctorate, university diploma or certificate above bachelor level	-0.0816 (0.0646)	0.977*** (0.0650)
gross annual earnings: less than 5000	-0.571*** (0.216)	0.742*** (0.234)	gross annual earnings: less than 5000	-0.473*** (0.159)	0.796*** (0.179)
5000 to 9999	-0.487*** (0.163)	0.439** (0.185)	5000 to 9999	-0.441*** (0.124)	0.682*** (0.125)
10000 to 14999	-0.332** (0.159)	0.673*** (0.168)	10000 to 14999	-0.398*** (0.119)	0.533*** (0.119)
15000 to 19999	-0.211 (0.165)	0.339* (0.179)	15000 to 19999	-0.146 (0.106)	0.405*** (0.108)
20000 to 24999	-0.288** (0.139)	-0.0820 (0.156)	20000 to 24999	-0.277*** (0.0965)	0.244** (0.0962)
25000 to 29999	-0.262** (0.127)	0.210 (0.139)	25000 to 29999	-0.132 (0.0928)	0.0773 (0.0959)
30000 to 34999	-0.0251 (0.113)	-0.140 (0.122)	30000 to 34999	0.111 (0.0903)	-0.104 (0.101)
35000 to 39999	0.105 (0.110)	-0.438*** (0.122)	35000 to 39999	0.128 (0.0896)	-0.373*** (0.0989)
40000 to 44999	0.0869 (0.122)	-0.387*** (0.134)	40000 to 44999	0.414*** (0.0976)	-0.433*** (0.108)
45000 to 49999	0.194 (0.121)	-0.533*** (0.129)	45000 to 49999	0.297*** (0.104)	-0.402*** (0.109)
50000 to 54999	0.324** (0.134)	-0.338** (0.146)	50000 to 54999	0.429*** (0.124)	-0.631*** (0.121)
60000 to 64999	0.315**	-0.166	60000 to 64999	0.679***	-0.511***

	(0.140)	(0.150)		(0.130)	(0.144)		
65000 to 69999	0.319**	-0.155		65000 to 69999	0.324**	-0.488***	
	(0.155)	(0.168)			(0.145)	(0.157)	
70000 to 74999	0.563***	-0.422**		70000 to 74999	0.708***	-0.592***	
	(0.158)	(0.189)			(0.170)	(0.185)	
75000 to 79999	0.380**	-0.192		75000 to 79999	0.568***	-0.681***	
	(0.173)	(0.179)			(0.166)	(0.179)	
80000 to 84999	0.274	-0.370*		80000 to 84999	0.525***	-0.851***	
	(0.198)	(0.215)			(0.189)	(0.192)	
85000 or more	0.203	-0.642***		85000 or more	0.478***	-0.978***	
	(0.137)	(0.152)			(0.165)	(0.151)	
Constant	-0.734***	0.267	-0.0153	Constant	-0.136	0.283	-0.0919***
	(0.240)	(0.256)	(0.0349)		(0.179)	(0.192)	(0.0290)
Observations	4,187	4,187	4,187	Observations	6,248	6,248	6,248

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Participation in continuing education towards no degree for job or career purposes was taken from the question in the National Survey-Class of 2005 "Since your graduation, was any of this education or training taken for job or career-related reasons?". Continuing education=0, if graduates haven't taken any continuing education programs towards no degree for job or career purposes since their graduation. Continuing education =1, if graduates have taken some continuing education programs towards degree for job or career purposes after graduation.

Overeducation is derived from the comparison between the lowest level of education required to get the job they held last week, which was taken from the question: "When you were selected for this job, what level of education was needed to get the job?" in the survey, and the highest level of education of the graduate by 2007. Overeducation =0, if employees' actual education level does not exceed requirements for the job. Overeducation =1, if employees' actual education level exceeds requirements for the job or there is no education requirement specified by the job.

Job Satisfaction is derived based on the question: "Considering all aspects of the (main) job you held last week, how satisfied were you with the job? Would you say you were 01.very satisfied, 02.satisfied, 03.dissatisfied or 04.very dissatisfied?" Job satisfaction=0, if the respondents' answer was 03 or 04, which means respondents are dissatisfied with their job. Job satisfaction=1, if the respondents' answer was 01 or 02, which means respondents are satisfied with their job.

Quit intention is derived based on the question: "In the past four weeks, have you looked for another job with a different employer?" Quit Intention=0, if the respondents' answer was "no", which means respondents have low quit intention. Quit intention=1, if the respondents' answer was "yes", which means respondents have high quit intention.

Job matching is derived from the question: "How closely is the (main) job you held last week related to your certificate, diploma or degree? Is it 01.closely related 02.somewhat related or 03.not related at all?" Job Matching=0, if the respondents' answer was 03, which means the (main) job the employee held last week was unrelated to his certificate, diploma or degree. Job Matching=1, if the respondents' answer was 01 or 02, which means the (main) job the employee held last week was related to his certificate, diploma or degree.

Gross annual earnings in Canadian dollars for the job are derived based on several questions: "Considering the (main) job you held last week, during how many months in a year would you usually work at this job? Considering the (main) job you held last week, do you usually work every week of the month? How many weeks a month do you usually work at this job? How many (paid) hours a week do you usually work at this job? How many days a week do you usually work at this job? What is the easiest way for you to tell us your wage or salary, including tips and commissions, before taxes and other deduction for this job? Would it be yearly, monthly, weekly, hourly or on some other basis?"

Table 11 Marginal Effects for Male

VARIABLES	(1) continuing education
overeducation	-0.0131 (0.0229)
undereducation	-0.0803 (0.0707)
job satisfaction	0.0563 (0.0354)
quit intention	-0.00250 (0.0247)
job matching	0.104*** (0.0277)
age: 25 to 29	0.0301 (0.0270)
age: 30 to 39	0.0598* (0.0353)
age: 40 or more	0.0222 (0.0469)
marital status	0.0606** (0.0266)
dependent children	0.0443 (0.0335)
permanent job	0.0426 (0.0276)
French	-0.105** (0.0452)
French and English	-0.0282 (0.0213)
goods-producing industry	0.0799**

Table 12 Marginal Effects for Male

VARIABLES	(1) continuing education
overeducation	-0.0656*** (0.0192)
undereducation	-0.0251 (0.0551)
job satisfaction	-0.0276 (0.0311)
quit intention	0.0287 (0.0218)
job matching	0.0640** (0.0269)
age: 25 to 29	0.0239 (0.0230)
age: 30 to 39	0.0545* (0.0301)
age: 40 or more	0.0898*** (0.0324)
marital status	0.0203 (0.0186)
dependent children	0.0188 (0.0248)
permanent job	0.0268 (0.0212)
French	-0.184*** (0.0269)
French and English	-0.0509*** (0.0181)
goods-producing industry	0.0167

	(0.0321)		(0.0426)
trade, transportation and warehousing	0.0228	trade, transportation and warehousing	-0.0117
	(0.0410)		(0.0435)
finance, insurance, real estate and public administration	0.157***	finance, insurance, real estate and public administration	0.0958***
	(0.0342)		(0.0371)
educational services	0.160***	educational services	0.226***
	(0.0361)		(0.0317)
health care and social assistance	0.207***	health care and social assistance	0.224***
	(0.0456)		(0.0308)
other industries	0.0359	other industries	0.0403
	(0.0377)		(0.0379)
college or CEGEP diploma or certificate	-0.0331	college or CEGEP diploma or certificate	-0.0341
	(0.0244)		(0.0212)
Master's degree, doctorate, university diploma or certificate above bachelor level	-0.0772***	Master's degree, doctorate, university diploma or certificate above bachelor level	-0.0132
	(0.0281)		(0.0261)
gross annual earnings: less than 5000	-0.195***	gross annual earnings: less than 5000	-0.162***
	(0.0634)		(0.0546)
5000 to 9999	-0.172***	5000 to 9999	-0.155***
	(0.0515)		(0.0435)
10000 to 14999	-0.120**	10000 to 14999	-0.142***
	(0.0549)		(0.0427)
15000 to 19999	-0.0787	15000 to 19999	-0.0498
	(0.0600)		(0.0411)
20000 to 24999	-0.109**	20000 to 24999	-0.102***
	(0.0488)		(0.0362)
30000 to 34999	-0.0984**	30000 to 34999	-0.0506
	(0.0455)		(0.0362)
35000 to 39999	-0.0115	35000 to 39999	0.0425
	(0.0435)		(0.0360)
40000 to 44999	0.0395	40000 to 44999	0.0434
	(0.0435)		(0.0358)

45000 to 49999	0.0317 (0.0480)	45000 to 49999	0.155*** (0.0381)
50000 to 54999	0.0755 (0.0481)	50000 to 54999	0.110*** (0.0411)
55000 to 59999	0.127** (0.0534)	55000 to 59999	0.157*** (0.0484)
60000 to 64999	0.124** (0.0558)	60000 to 64999	0.253*** (0.0461)
65000 to 69999	0.126** (0.0616)	65000 to 69999	0.119** (0.0569)
70000 to 74999	0.222*** (0.0599)	70000 to 74999	0.262*** (0.0593)
75000 to 79999	0.150** (0.0682)	75000 to 79999	0.209*** (0.0617)
80000 to 84999	0.114 (0.0778)	80000 to 84999	0.189*** (0.0707)
85000 or more	0.0781 (0.0548)	85000 or more	0.169*** (0.0635)
Observations	4,187	Observations	6,248

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Participation in continuing education towards no degree for job or career purpose was taken from the question in the National Survey-Class of 2005 "Since your graduation, was any of this education or training taken for job or career-related reasons?" Continuing education=0, if graduates haven't taken any continuing education programs towards no degree for job or career purposes since their graduation. Continuing education =1, if graduates have taken some continuing education programs towards no degree for job or career purposes after graduation.

Overeducation and undereducation are derived from the comparison between the lowest level of education required to get the job they held last week, which was taken from the question: "When you were selected for this job, what level of education was needed to get the job?" in the survey, and the highest level of education of the graduate by 2007. Overeducation =0, if employees' actual education level does not exceed requirements for the job. Overeducation =1, if employees' actual education level exceeds requirements for the job or there is no education requirement specified by the job. Undereducation=0, if employees' actual education level is not less than the job requirement. Undereducation=1, if employees' actual education levels is less than the job requirement.

Job Satisfaction is derived based on the question: "Considering all aspects of the (main) job you held last week, how satisfied were you with the job? Would you say you were 01.very satisfied, 02.satisfied, 03.dissatisfied or 04.very dissatisfied?" Job satisfaction=0, if the respondents' answers was 03 or 04, which means respondents are dissatisfied with their job. Job satisfaction=1, if the respondents' answers was 01 or 02, which means respondents are satisfied with their job.

Quit intention is derived based on the question: "In the past four weeks, have you looked for another job with a different employer?" Quit Intention=0, if the respondents' answer was "no", which means respondents have low quit intentions. Quit intention=1, if the respondents' answer was "yes", which

means respondents have high quit intentions.

Job matching is derived from the question: "How closely is the (main) job you held last week related to your certificate, diploma or degree? Is it 01.closely related 02.somewhat related or 03.not related at all?" Job Matching=0, if the respondents' answer was 03, which means the (main) job the employee held last week was unrelated to his certificate, diploma or degree. Job Matching=1, if the respondents' answer was 01 or 02, which means the (main) job the employee held last week was related to his certificate, diploma or degree.

Gross annual earnings in Canadian dollars for the job are derived based on several questions: "Considering the (main) job you held last week, during how many months in a year would you usually work at this job? Considering the (main) job you held last week, do you usually work every week of the month? How many weeks a month do you usually work at this job? How many (paid) hours a week do you usually work at this job? How many days a week do you usually work at this job? What is the easiest way for you to tell us your wage or salary, including tips and commissions, before taxes and other deduction for this job? Would it be yearly, monthly, weekly, hourly or on some other basis?"

FIGURES

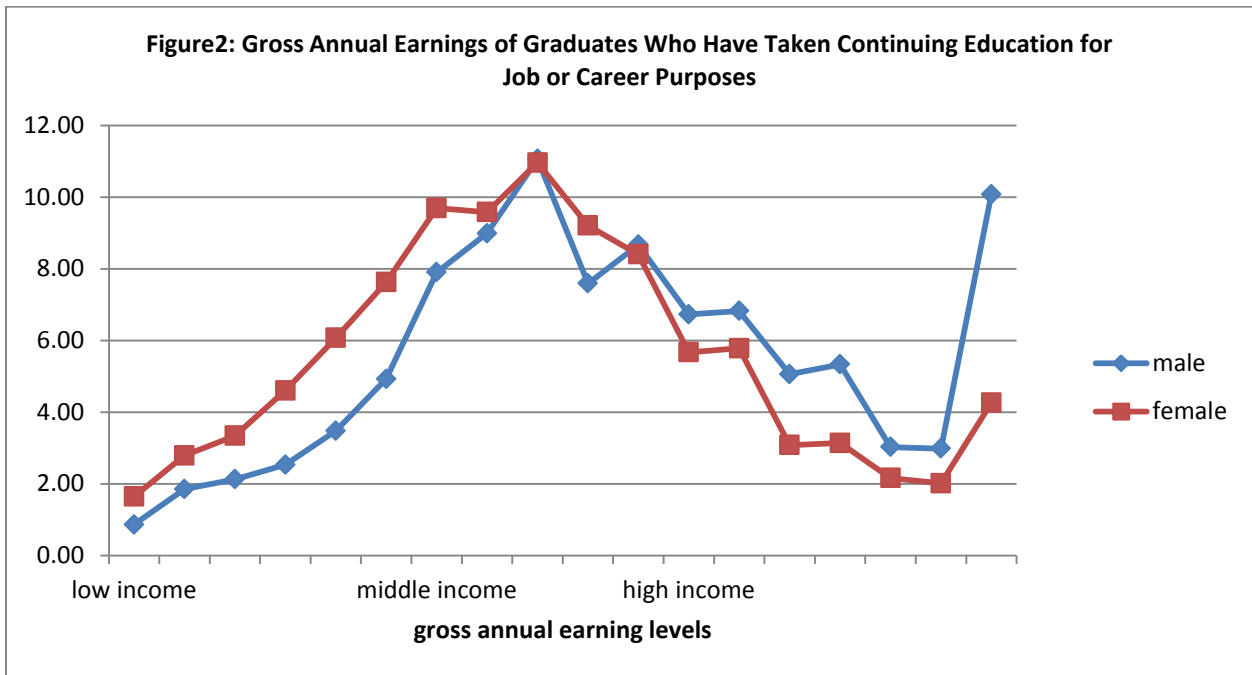
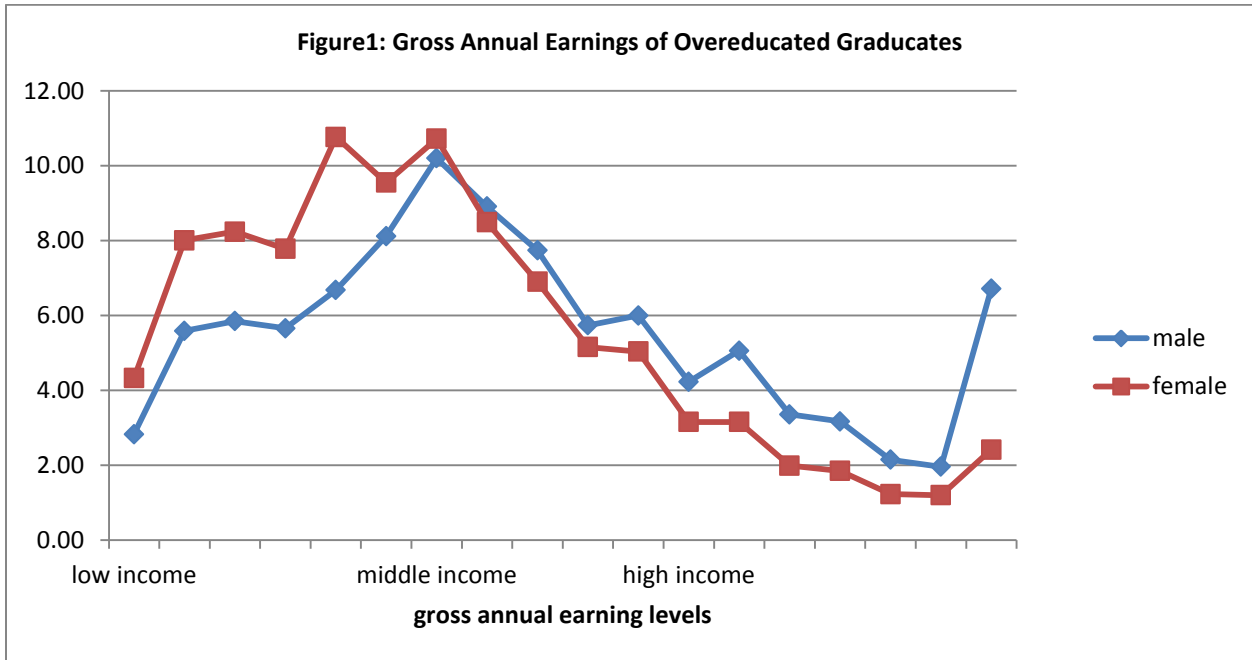


Figure3: Percentage of Males Who are Overeducated and Percentage of Males who Have Taken Continuing Education for Job or Career Purposes

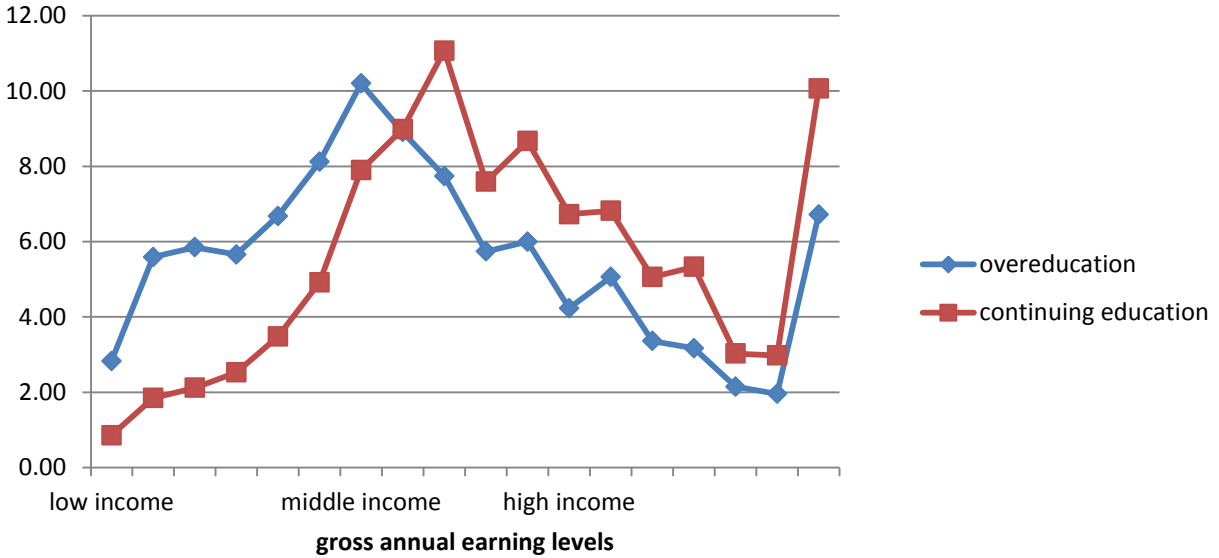
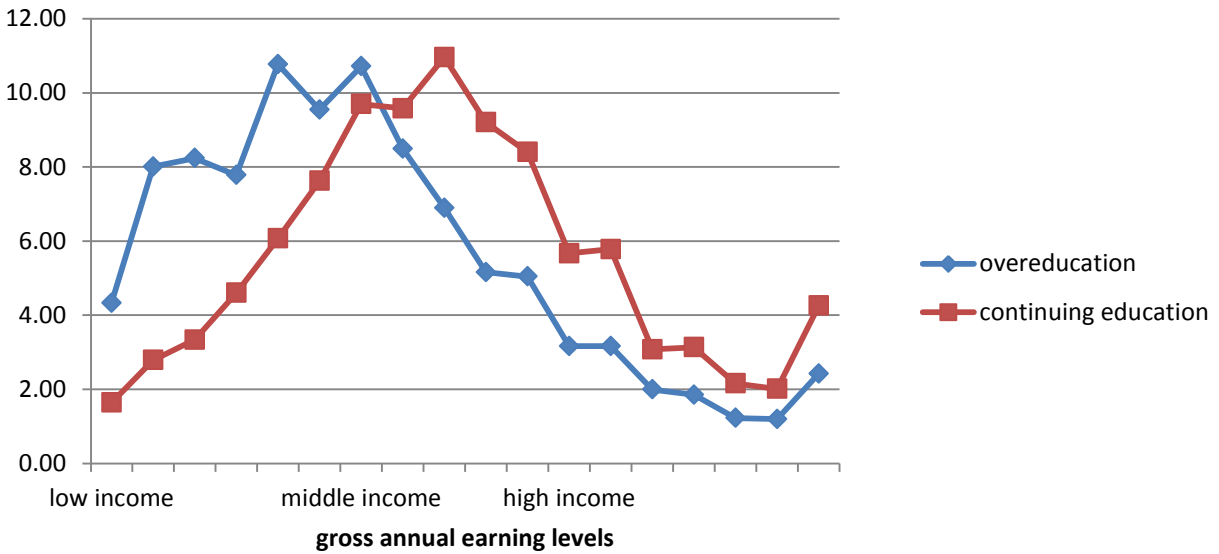


Figure4: Percentage of Females Who are Overeducated and Percentage of Females Who Have Taken Continuing Education for Job or Career Purposes



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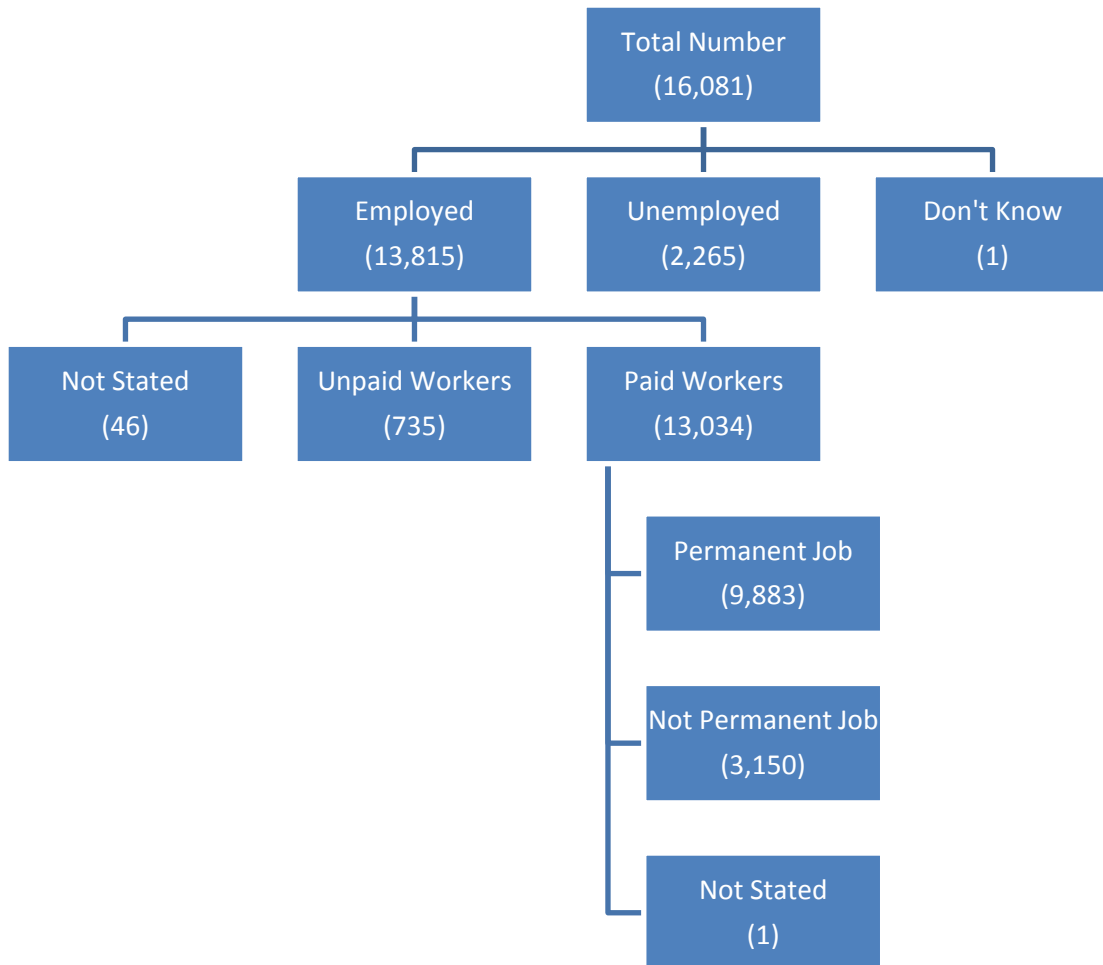
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APPENDIX A Biased Data



In the Survey, there are 47 respondents who did not state whether their job is permanent according to the description of permanent jobs in the codebook. However, 46 respondents did not state whether their job is permanent according to the calculation (structure chart above) based on other related variable descriptions in the codebook. Therefore, one person is missing.

The respondents of gross annual earnings should be the graduates who were employed last week so the valid skip for gross annual earnings should be for 2266 respondents (unemployed workers + don't know). However, the valid skip is reported in 2283 cases according to the description of permanent jobs in the codebook. Therefore, 17 people are missing.

APPENDIX B Control Variables

1. Continuing education (ED_Q07)

Graduates were asked the following question in the survey: "Since your graduation, was any of this education or training taken for job or career-related reasons?"

A dichotomous variable "continuing education" is derived based on this question:

0= graduates have taken some continuing education programs for job or career purposes after graduation.

1= graduates haven't taken any continuing education programs for job or career purposes since their graduation satisfied with their job, if the respondent's answer was 01 or 02

2. Overeducation Undereducation and Matching Level (JOBQL07)

They are derived from the question: "When you were selected for this job, what level of education was needed to get the job?" in the survey, and the highest level of education of the graduate by 2007.

Overeducation: 0=graduate's education level is higher than their job request

1= graduate's education level is not higher than their job request

Undereducation: 0=graduate's education level is lower than their job request

1= graduate's education level is not lower than their job request

Matching level: 0=graduate's education level matches with their job request

(omitted) 1= graduate's education level doesn't match with their job request

3. Job satisfaction (LF_Q56A)

Graduates were asked the following question in the survey: “Considering all aspects of the (main) job you held last week, how satisfied were you with the job? Would you say you were 01.very satisfied, 02.satisfied, 03.dissatisfied or 04.very dissatisfied?”

A dichotomous variable “Job Satisfaction” is derived based on this question:

0=dissatisfied with their job, if the respondent’s answer was 03 or 04

1=satisfied with their job, if the respondent’s answer was 01 or 02

4. Quit intention (LF_Q58)

Graduates were asked the following question in the survey: “In the past four weeks, have you looked for another job with a different employer?”

A dichotomous variable “Quit Intention” is derived based on this question:

0=low quit intention, if the respondent’s answer was “no”

1=high quit intention, if the respondent’s answer was “yes”

5. Job matching (LF_Q55)

Graduates were asked the following question in the survey: “How closely is the (main) job you held last week related to your certificate, diploma or degree? Is it 01.closely related 02.somewhat related or 03.not related at all?”

A dichotomous variable “Job Matching” is derived based on this question:

0=unrelated, if the respondent’s answer was 03

1=related, if the respondent’s answer was 01 or 02

6. Gross annual earnings (JOBIN07P)

Gross annual earnings in Canadian dollars for the job are derived based on several questions: “Considering the (main) job you held last week, during how many months in a year would you usually work at this job? Considering the (main) job you held last week,

do you usually work every week of the month? How many weeks a month do you usually work at this job? How many (paid) hours a week do you usually work at this job? How many days a week do you usually work at this job? What is the easiest way for you to tell us your wage or salary, including tips and commissions, before taxes and other deduction for this job? Would it be yearly, monthly, weekly, hourly or on some other basis?" Gross annual earnings in Canadian dollars for jobs held during the 2007 survey reference week are categorized into eighteen dummy variables:

Less than 5000: 0=graduate's gross annual earnings is not less than \$5000

1= graduate's gross annual earnings is less than \$5000

5,000 to 9,999: 0=graduate's gross annual earnings is not from \$5,000 to \$9,999

1= graduate's gross annual earnings is from \$5,000 to \$9,999

10,000 to 14,999: 0=graduate's gross annual earnings is not from \$10,000 to \$14,999

1= graduate's gross annual earnings is from \$10,000 to \$14,999

15,000 to 19,999: 0=graduate's gross annual earnings is not from \$15,000 to \$19,999

1= graduate's gross annual earnings is from \$15,000 to \$19,999

20,000 to 24,999: 0=graduate's gross annual earnings is not from \$20,000 to \$24,999

1= graduate's gross annual earnings is from \$20,000 to \$24,999

25,000 to 29,999: 0=graduate's gross annual earnings is not from \$25,000 to \$29,999

1= graduate's gross annual earnings is from \$25,000 to \$29,999

30,000 to 34,999: 0=graduate's gross annual earnings is not from \$30,000 to \$34,999

(omitted) 1= graduate's gross annual earnings is from \$30,000 to \$34,999

35,000 to 39,999: 0=graduate's gross annual earnings is not from \$35,000 to \$39,999

1= graduate's gross annual earnings is from \$35,000 to \$39,999

40,000 to 44,999: 0=graduate's gross annual earnings is not from \$40,000 to \$44,999

1= graduate's gross annual earnings is from \$40,000 to \$44,999

45,000 to 49,999: 0=graduate's gross annual earnings is not from \$45,000 to \$49,999

1= graduate's gross annual earnings is from \$45,000 to \$49,999

50,000 to 54,999: 0=graduate's gross annual earnings is not from \$50,000 to \$54,999

1= graduate's gross annual earnings is from \$50,000 to \$54,999

55,000 to 59,999: 0=graduate's gross annual earnings is not from \$55,000 to \$59,999

1= graduate's gross annual earnings is from \$55,000 to \$59,999

60,000 to 64,999: 0=graduate's gross annual earnings is not from \$60,000 to \$64,999

1= graduate's gross annual earnings is from \$60,000 to \$64,999

65,000 to 69,999: 0=graduate's gross annual earnings is not from \$65,000 to \$69,999

1= graduate's gross annual earnings is from \$65,000 to \$69,999

70,000 to 74,999: 0=graduate's gross annual earnings is not from \$70,000 to \$74,999

1= graduate's gross annual earnings is from \$70,000 to \$74,999

75,000 to 79,999: 0=graduate's gross annual earnings is not from \$75,000 to \$79,999

1= graduate's gross annual earnings is from \$75,000 to \$79,999

80,000 to 84,999 : 0=graduate's gross annual earnings is not from \$80,000 to \$84,999

1= graduate's gross annual earnings is from \$80,000 to \$84,999

85,000 or more: 0=graduate's gross annual earnings is not more than \$85,000

1= graduate's gross annual earnings is more than \$85,000

7. Female (GENDER)

Female is a dummy variable: defined as whether respondents is female or not:

0=male

1=female

8. Marital status (DE_Q01)

Marital status is a dummy variable: defined as whether respondents are married or not:

0=single / widowed / separated / divorced

1=married or common-law

9. Dependent children (DE_Q02P)

Dependent children is a dummy variable: defined as whether respondents have dependent children:

0= have no dependent children

1=have dependent children

10. Age (GRADAGEP)

Age is categorized into four dummy variables: defined as age of respondent at the time of graduation:

Less than 25: 0=graduate's age is not less than 25

(omitted) 1= graduate's age is less than 25

From 25 to 29: 0=graduate's age is not from 25 to 29

1= graduate's age is from 25 to 29

From 30 to 39: 0=graduate's age is not from 30 to 39

1= graduate's age is from 30 to 39

40 or more: 0=graduate's age is not 40 or more

1= graduate's age is 40 or more

11. Language (LANGGRP)

Language is categorized into three dummy variables

English (with or without another non-official language) (omitted):

0= at the time of graduation, respondents cannot speak English well enough to conduct a conversation

1= at the time of graduation, respondents can speak English well enough to conduct a conversation)

French (with or without another non-official language):

0= at the time of graduation, respondents cannot speak French well enough to conduct a conversation

1= at the time of graduation, respondents can speak French well enough to conduct a conversation)

English and French (with or without another non-official language)

0= at the time of graduation, respondents cannot speak English and French well enough to conduct a conversation

1= at the time of graduation, respondents can speak English and French well enough to conduct a conversation

12. Permanent job (LF_Q24)

Permanent job is a dummy variable: defined as whether respondents have a permanent job or is there some way that the job was not permanent (e.g. seasonal, temporary, term, casual, etc.):

0=this job is not permanent

1=this job is permanent

13. Job industry (LFCINDP)

The classification of industry group for job is based on the North American Industry Classification System (NAICS) 2002. Job industry is categorized into seven dummy variables:

01. Goods-producing industry

0= respondents' job held in the last week prior to the interview was not in the goods-producing industry

1= respondents' job held in the last week prior to the interview was in the goods-producing industry

02. Trade, transportation and warehousing

0= respondents' job held in the last week prior to the interview was not in the trade, transportation and warehousing industry

1= respondents' job held in the last week prior to the interview was in the trade, transportation and warehousing industry

03. Finance, insurance, real estate and public administration

0= respondents' job held in the last week prior to the interview was not in the finance, insurance, real estate and public administration industry

1= respondents' job held in the last week prior to the interview was in the finance, insurance, real estate and public administration industry

04. Professional, scientific and technical services (omitted)

0= respondents' job held in the last week prior to the interview was not in the professional, scientific and technical services industry

1= respondents' job held in the last week prior to the interview was in the professional, scientific and technical services industry

05. Educational services

0= respondents' job held in the last week prior to the interview was not in the educational services industry

1= respondents' job held in the last week prior to the interview was in the educational services industry

06. Health care and social assistance

0= respondents' job held in the last week prior to the interview was not in the health care and social assistance industry

1= respondents' job held in the last week prior to the interview was in the health care and social assistance industry

07. Other services

0= respondents' job held in the last week prior to the interview was not in other services.

1= respondents' job held in the last week prior to the interview was in other services.

14. Education Level (HLOS07P)

Education level is categorized into three variables, defined as the highest level of studies respondents completed by 2007

01. College or CEGEP diploma or certificate

0= the highest level of studies respondents completed by 2007 is not college or CEGEP diploma or certificate

1= the highest level of studies respondents completed by 2007 is college or CEGEP diploma or certificate

02. Bachelor's degree or first professional degree, university diploma or certificate below bachelor level (omitted)

0= the highest level of studies respondents completed by 2007 is not bachelor's degree or first professional degree, university diploma or certificate below bachelor level

1= the highest level of studies respondents completed by 2007 is bachelor's degree or first professional degree, university diploma or certificate below bachelor level

03. Master's degree, doctorate and university certificate, diploma or degree above bachelor level

0= the highest level of studies respondents completed by 2007 is not master's degree, doctorate and university certificate, diploma or degree above bachelor level

1= the highest level of studies respondents completed by 2007 is master's degree, doctorate and university certificate, diploma or degree above bachelor level

APPENDIX C Distribution of Taking Continuing Education

