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## SOCIAL AND ECONOMIC DIMENSIONS OF AN AGING POPULATION

**Older Workers and On-the-Job Training in Canada:  
Evidence from the WES data**

**Isik U. Zeytinoglu  
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**SEDAP Research Paper No. 179**

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Secretary, SEDAP Research Program  
Kenneth Taylor Hall, Room 426  
McMaster University  
Hamilton, Ontario, Canada  
L8S 4M4  
FAX: 905 521 8232  
e-mail: [sedap@mcmaster.ca](mailto:sedap@mcmaster.ca)

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**Older Workers and On-the-Job Training in Canada:  
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I. U. Zeytinoglu, G. B. Cooke and K. Harry  
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Isik U. Zeytinoglu is Professor of Management and Industrial Relations at DeGroote School of Business, McMaster University.

Gordon B. Cooke is Assistant Professor of Industrial Relations at Faculty of Business Administration, Memorial University of Newfoundland and Labrador.

K. Harry is PhD candidate in Human Resources at DeGroote School of Business, McMaster University.

For correspondence contact either [zeytino@mcmaster.ca](mailto:zeytino@mcmaster.ca) or [gcooke@mun.ca](mailto:gcooke@mun.ca)

## **Older Workers and On-the-Job Training in Canada: Evidence from the WES data**

### **Abstract:**

This paper provides evidence of on-the-job training among older workers in Canada. It also examines the effect of age associated with on-the-job training. Statistics Canada's Workplace and Employee Survey (WES) 2001 data, linking employee responses to workplace (i.e. employer) responses are used. Three quarters of workers are categorized as middle aged, with about one in ten being younger and one in five considered to be older. Only 32% of Canadian workers received on-the-job training in the year preceding this survey. When separating workers into the three age categories, 37%, 34%, and 24% of younger, middle-aged, and older workers, respectively, received on-the-job training in that year. Logistic regression analysis results showed that, controlling for workplace, job and individual factors, as compared to middle-aged workers, older workers are significantly less likely to receive on-the-job training. The lack of on-the-job training for older workers should be a concern for policy makers at a time when labour shortages are being predicted. Older workers are healthier than ever and the provision of on-the-job training should be encouraged to retain older workers in the labour market in Canada.

**Keywords:** older workers, on-the-job training, Workplace and Employment Survey

**JEL Classifications:** J14, J18, J24

### **Résumé:**

Cet article documente l'existence de la formation sur le lieu de travail des travailleurs âgés au Canada. Il examine également l'effet de l'âge sur l'incidence de la formation sur le lieu de travail. Cette étude repose sur L'Enquête sur le milieu de travail et les employés de 2001 de Statistique Canada, qui croise les réponses aux questions portant sur le lieu de travail des employés aux réponses données par les employeurs. Les trois quarts des ouvriers tombent dans la catégorie d'âge moyen, environ un travailleur sur dix est considéré comme jeune et un sur cinq âgé. Seulement 32% des travailleurs canadiens ont bénéficié d'une formation en milieu de travail dans l'année antérieure à l'enquête. Après avoir classifié les travailleurs en trois catégories d'âge, on trouve que 37%, 34%, et 24% des travailleurs jeunes, d'âge moyens, et âgés, ont respectivement reçu une formation sur leur lieu de travail. Les résultats des régressions logistiques ont mis en évidence que, contrôlant pour le lieu de travail, l'occupation et les caractéristiques individuelles, comparés aux travailleurs jeunes et d'âge moyens, les ouvriers âgés ont une probabilité sensiblement plus faible de recevoir une formation sur leur lieu de travail. Le manque de formation sur le lieu de travail des travailleurs âgés devrait être une source d'inquiétude pour les décideurs politiques à un moment où l'on prévoit une pénurie croissante de la main-d'oeuvre. Les ouvriers plus âgés n'ont jamais été en meilleure santé et leur permettre de suivre une formation sur leur lieu de travail devrait être encouragé afin de les maintenir sur le marché du travail Canadien.

## **Older Workers and On-the-Job Training in Canada:**

### **Evidence from the WES data**

#### **Introduction**

For all workers learning, particularly job skills training and skills upgrading is an integral part of maintaining their competitive employability profile (OECD 2006a; Statistics Canada, 1997). However, research suggests that employers in Canada are under-investing in training (Goldenberg, 2006). About a third of Canadian workers are trained on-the-job in Canada (Zeytinoglu and Cooke, 2006) but not much is known about the extent of on-the-job training among older workers.

Training as a policy is gaining further importance with the workforce ageing and skill shortages being experienced nationally and at global level in industrialized countries (OECD 2006a) and in certain sectors, such as IT, even in some developing countries (Wooldridge 2006). McMullin and her colleagues (2004) suggest, however, that it is unlikely that labour force ageing will generate widespread skill shortages, but certain occupations, such as nursing and skilled trades will face skill shortages. Removing barriers to training and promoting 'life-long learning and active ageing' are policies suggested in the literature to prevent skill shortages (see, for example, McMullin *et al.*, 2004; OECD, 2001; 2006 a and b).

The purpose of this paper is to provide evidence of on-the-job training for older workers in Canada. The study uses Statistics Canada's Workplace and Employee Survey (WES) 2001 data. The unit of analysis is the individual worker and data linking employee responses to workplace (i.e. employer) responses are used.

Our study is based on the theory of employer-sponsored training of Becker's (1962; 1964). The investment in human capital can occur via formal training in a structured training environment

or can be informal, on-the-job, training. Formal training can take place at educational institutions or by attending classes or training sessions at work. On-the-job training, however, can be informal learned-by-doing or in a location that emulates the work environment. In addition to how training is delivered, i.e. formal versus informal differentiation of training, on-the-job training can also be categorized according to the content as general or company-specific training. As Stevens' (1994) theoretical model of on-the-job training with imperfect competition shows, for some types of on-the-job training that provide transferable skills, both training firms and external firms obtain a positive share of the return on the training investment. And, as Becker discusses, much of on-the-job training is neither completely company specific nor completely general but "the sum of two components". Research shows that less than perfect markets prevail (Ahlstrand *et al.*, 2003), and Becker's theory is more a way of understanding the investment in human capital in its pure form than is a description of what can be observed in practice. Research shows that in investing in their employees' training firms benefit more than workers themselves (Ballot *et al.*, 2006).

Recent studies also suggest that the incidence of training declines with age (OECD, 2006b). Older workers face a number of barriers to training. Employers have negative perceptions about the capabilities of older workers to adapt to technological and organizational change, and workers themselves seem to be reluctant to seek training opportunities and may be underestimating their learning capabilities. Certainly, there can be negative implications for older workers themselves, and society in general, if these workers cannot maintain a valuable set of workplace skills (Ranzijn *et al.*, 2006). Not surprisingly, one effective way to ensure that older workers maintain favourable job prospects is to ensure that they have (re)training opportunities (ibid).

In our study we incorporate the theories and empirical research findings from economics and industrial relations literature to develop the model of older workers' on-the-job training and

other potentially associated factors. As presented below, in Model 1 the focus is on the association between the incidence of on-the-job training in the last 12 months and the worker age. Possible effects of various workplace and individual characteristics are controlled in this model. Based on the theory and existing research, we expect older workers to have less opportunity for on-the-job training as compared to middle-aged and younger workers.

<Insert Model 1 about here>

There are a number of well-known factors that, independently and collectively, influence employers' tendency to provide on-the-job training. The effects of industry (Turcotte and Montmarquette, 2003), human capital characteristics of occupation, education (Lin and Tremblay, 2003) and tenure (Lipsett and Reesor, 1998) and collective agreement coverage (Böheim and Booth, 2004) are well established in the literature.

Effects of other variables such as size and innovation introduced in the workplace, and personal characteristics of gender and immigrant status are emerging in the literature. Though research shows that large workplaces are more likely to provide formal training than smaller workplaces (Chaykowski and Slotsve, 2003), for on-the-job training, research (Zeytinoglu and Cooke, 2006) shows that those employed in small workplaces are more likely to receive on-the-job training relative to the reference large workplaces. Bernier (2005) suggests that, for her sample of small and medium businesses, such decisions do not only depend on the managers themselves but are also influenced or even constrained by the characteristics of their institutional environment. In terms of on-the-job training and innovation introduced in the workplace, studies (Chowhan, 2005; Zeytinoglu and Cooke, 2006) suggest a positive association with innovation and on-the-job training. The incidence of training is lower among low-paid workers (OECD, 2006b) and women receive less training than men (OECD, 2006a; Sussman, 2002). Recent immigrants, who are also predominantly visible minorities, seem to face more labour market difficulties than earlier

immigrants and Canadian-born workers (HRDC 2001) including low training (OECD 2006a).

## Methodology

**Data.** This paper uses Statistics Canada's Workplace and Employee Survey (WES) 2001 employee micro data linked to workplace (i.e. employer) micro data. The advantage of the WES is that it links employer and employee responses. It provides more accurate and unbiased estimates of the effect of particular firm and worker characteristics and gives an indication of how the attributes of the employees and firms' activities jointly affect training decisions (Lin and Tremblay, 2003). WES surveys firms in all industries, with the exception of agriculture, fishing, fur trapping and public administration. WES covers all firms regardless of size. The 2001 WES has data on 20,377 employees from 6,223 workplaces, with a response rate of 88% and 91% respectively. (For more on sampling and sample design, see WES Compendium, 2003).

**Variables.** The **dependent variable** is the incidence of on-the-job training in the last 12 months and the **independent variable** is the age of the worker. Older workers are defined as those over 50 years of age. **Control variables** include workplace characteristics of the size of the workplace and innovation introduced in the workplace; industry characteristic, and job characteristics of low-paid versus higher-paid job and whether the job is covered by a collective agreement or not. Individual characteristics included as control variables are gender immigrant status, education, occupation, full-time work experience, marital status and dependent children. Explanations for this and all of the other variables in this study are shown in Table 1.

< Insert Table 1 here >

**Analysis.** Data analysis consists of descriptive statistics, correlations, and multivariate regression analysis. Next, bivariate correlations are conducted between all variables. In each case, we record the coefficient and significance level of each correlation. Due to space limitations,



however, we are not presenting the correlation table. The correlation matrix is available from the authors upon request. We then proceed to examine in Model 1 the associations between on-the-job training and age characteristic via multivariate logistic regression analysis. In logistic regression, odds ratios provide a meaningful indication of the statistical relationship with the dependent variable. For example, an odds ratio that is closer to zero than to one is a reasonably strong indicator that those exhibiting certain characteristics are relatively unlikely to receive on-the-job training. We present the odds ratios, regression coefficients, and bootstrapped standard errors for each variable, as well as the Wald chi-square as an indicator of model fit.

It is important to note that these are not separate measures of the relationship between the dependent variable and the independent variables (Menard, 2001). They contain the same information. One shows the probabilities and the other presents the direction of association. In our discussions of the effect of the independent variables, we use odds ratios since they are easier to interpret in logistic regression. As Kennedy (2003) discusses, in nonlinear functional forms of analysis such as logit, because of the nonlinearities, the marginal effect of an explanatory variable on the dependent variable creates a dilemma of reporting. There are three measures of reporting marginal effects that are popular in the literature, and all three methods ‘can give misleading estimates of probability changes in contexts in which an explanatory variable is postulated to change by an amount that is not infinitesimal, as is always the case with a dummy variable, for example’ ( Kennedy, 2003: 266). Most of our variables are dummy variables, and thus we suggest that the odds ratios should be used to interpret results.

All of the analyses have been generated using weighted micro data accessed at Statistics Canada McMaster University Research Data Centre (RDC). Statistics Canada strongly recommends the use of bootstrapping in statistical analysis using the WES dataset due to its complex survey design. Bootstrapping involves “resampling” the data with replacement to

generate an empirical estimate of the entire sampling distribution of a statistic (Mooney and Duval, 1993). Any data that involves complex sampling methodology requires special analytic consideration of bootstrapping (Mooney and Duval, 1993). Bootstrapping refers to a process of repeatedly drawing random samples, with replacement, from the data at hand (Hamilton, 2003). In all regression results presented here, we use Statistics Canada's mean bootstrap weights using the revised Stata "bswreg" ado file by Chowhan and Buckley (2005). This is the revised file of the bootstrapped employee weights of the Stata ado file developed by Pierard *et al.* (2004). This program calculates variance estimates using bootstrap weights. This is an easy to use and flexible tool within Stata, which can be employed with the bootstrap weights that are made available with most of Statistic Canada's micro-data sets. The use of bootstrap weights allows researchers to make use of complex survey design information and calculate reliable variance estimates. All presented descriptive statistics are also weighted as recommended by Statistics Canada (see, WES Compendium, 2003).

**Limitations of the Study.** Although this study clarifies the relationship between older worker characteristic and incidence of on-the-job training, a couple potential limitations are worth noting. While the incidence of (i.e. having received) on-the-job training is important, ideally this would be supplemented by other measures, such as training quality or intensity. There is also the possibility that a small number of workers were offered, but declined, training. These issues are not included in the study.

One of the themes that emerge from the reviewed literature is that in today's labour market, employers determine who does or does not receive training. This implies that employers' strategies potentially impact training access. Thus, an additional potential limitation of our study is that the data does not allow us to control for firms' strategy/policy effects regarding the allocation of on-the-job training.

Lastly, in a cross-sectional study such as this, we are unable to determine causation even when strong statistical relationships between variables are detected. Notwithstanding these limitations, the results provide evidence for policy-makers.

**Sample Characteristics.** Descriptive statistics for all variables are presented in Table 2. The weighted WES dataset represents the population of regular full-time workers in the Canadian labour market. Statistics based on the control variables are described in this section. Proportions pertaining to the dependent and independent variables are discussed in the results section.

About two-fifths of regular full-time workers in Canada are employed in very small workplaces. The remainder are fairly evenly split between small, medium, and large workplaces, albeit with slightly fewer in the latter. Similarly, about two-fifths of Canadian workers are employed in non-innovating workplaces. At the other extreme, almost one quarter is employed by a very high innovator. The remaining third of workers are found within low, middle, or high level innovators. In terms of industry, about two-fifths work in the manufacturing or related sector,

three-fifths work in the service sector, and only a very few are employed within the primary sector. The proportion of low-paid regular full-time workers in Canada is 14%. Finally, slightly more than one quarter of regular full-time workers in Canada are covered by a collective agreement.

Turning to individual characteristics, slightly fewer than half are female. Meanwhile, more than one in five of regular full-time workers were not born in Canada, although very few in our data immigrated after 1994. Less than one third of workers are considered to have lower education, with the remainder having attained a higher level. About half of workers are in a blue collar occupation, one in five are in a lower white collar job, with the remainder holding a managerial/professional job. The average full-time work experience exceeds 17 years. Finally, more than two thirds are either married or in a common-law relationship, and fewer than half have dependent children.

## Results

**Percentage of older workers and on-the-job training.** As shown in Table 2, three quarters of workers are categorized as middle aged, with about one in ten being younger and one in five considered to be older. Only 32% of Canadian workers received on-the-job training in the year preceding this survey. When separating workers into the three age categories, 37%, 34%, and 24% of younger, middle-aged, and older workers, respectively, received on-the-job training in that year. The bivariate correlations between on-the-job training and age is .03, .05, and -.08 for young, middle, and older workers, respectively. These are significant at the .01 level. Not surprisingly, the correlations indicate that older workers are less likely to receive on-the-job training relative to their younger counterparts. In the following section, we examine whether these findings remain when controlling for other factors.

< Insert Table 2 about here >

### **Regression results of the association between age of the worker and on-the-job training.**

Results of the logistic regression analysis show that, older workers are also significantly (and by almost 40%) less likely than their middle aged counterparts to receive on-the-job training.

Younger workers also appear to receive even more training than middle aged workers, although not significantly so (see Table 3).

<Insert Table 3 about here>

In terms of control variables, a handful is significantly associated with on-the-job training. Those employed in innovative workplaces are more likely to receive on-the-job training, although the effect of size is small. Those covered by a collective agreement, lesser educated workers, or those with dependent children are all significantly less likely to receive on-the-job training. On the other hand, managers/professionals are significantly more likely to receive on-the-job training relative to the blue collar reference group. Low-paid workers are significantly (by about 30%) less likely than higher-paid workers to receive on-the-job training, though the significance level is at  $p < .10$ . It is important to note that for a large data set such as ours this is a low level of significance.

### **Conclusions**

The results showed that in 2001, the year our study covered, 34% of middle-aged and 37% of younger workers received on-the-job training. On the other hand, only 24% of older workers received on-the-job training in that year. This low level of on-the-job training provided to all workers, particularly to older workers, is disappointing given well-documented benefits that accrue from training (OECD 2006a, Statistics Canada 1997). Further analysis showed that, controlling for many workplace, job and individual factors, older workers are significantly less likely to receive on-the-job training. These are precisely the group of workers considered as

disadvantaged and in need of public policy support (OECD, 2006 a and b). Employers are under-investing in these workers, contributing to the disparity among Canadian workers. Moreover this is happening at a time when the labour force is aging and government sources are predicting labour shortages in Canada (*Achieving Excellence*, 2002; *Knowledge Matters*, 2002) and other industrialized countries (Wooldridge, 2006).

Ongoing skills development is needed to enable workers to earn a decent living, fulfill their work-related goals, and contribute to the current and future productivity of the Canadian economy (OECD, 2006a and b; Statistics Canada, 1997). Yet, our results show that for older workers workplace skills development assistance is partially blocked. Present day older workers are healthier than ever and will live longer. They should be given opportunity to improve their skills to continue contributing to the society.

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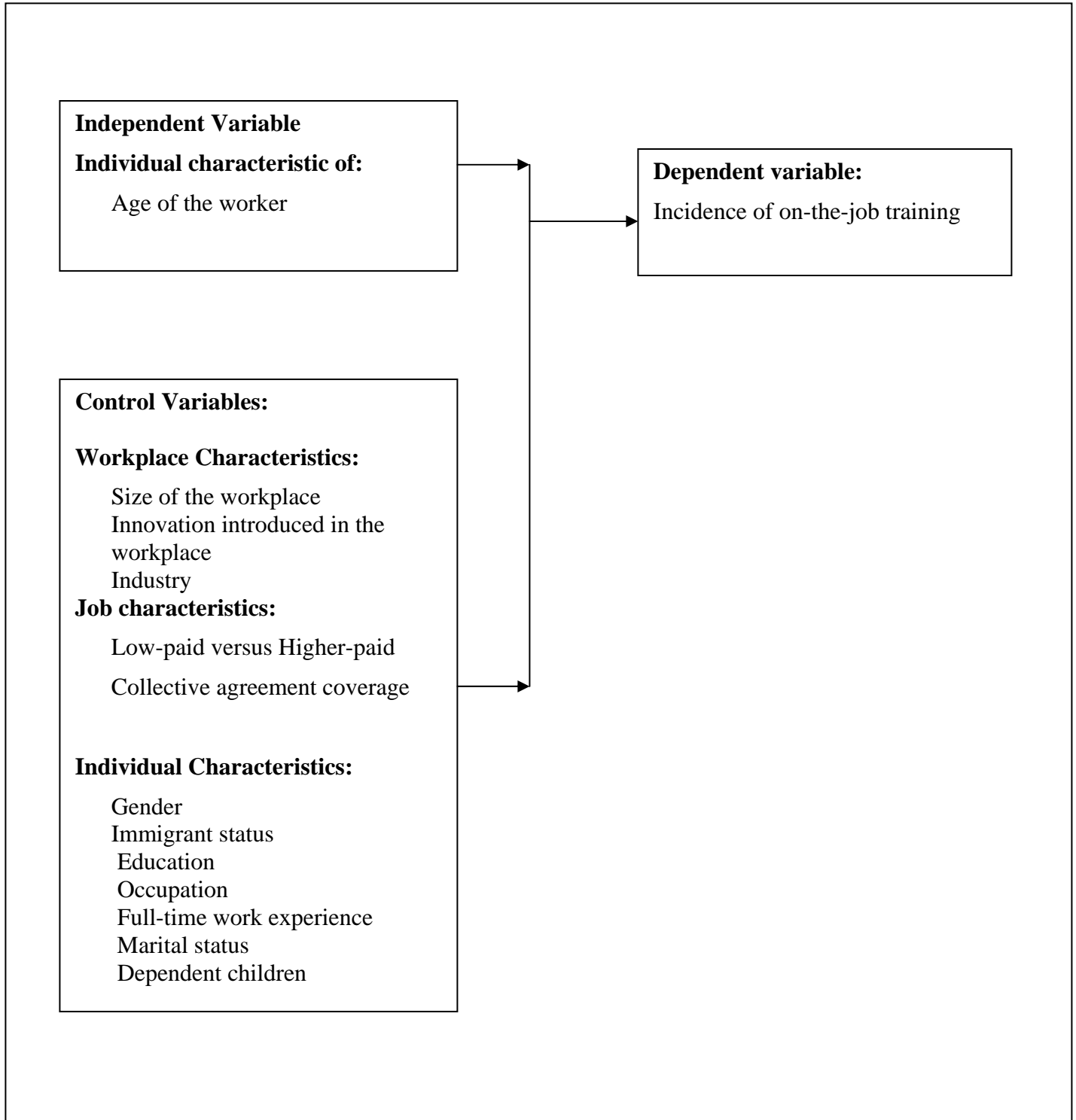
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**Model 1: The Association between the Incidence of On-the-Job Training and Age**



**TABLE 1 – Variable Definitions and Explanations**

<b><u>Variable</u></b>	<b><u>Coding</u></b>	<b><u>Explanation / Question</u></b>
<b>Dependent variable</b>		
Incidence of on-the-job training	1= Yes, 0=No	In the last 12 months, have you received any informal training related to your job (that is on-the-job training)?
<b>Independent variable</b>		
Age		
Younger worker (under 25 yrs)	1= Yes, if under 25 years, 0=Otherwise	Derived by categorizing date of birth into the age ranges identified, in years.
Middle aged worker (25 to under 50)	1= Yes, if between 25 and 50 years, 0=Otherwise (Reference group)	
Older worker (over 50)	1= Yes, if over 50 years, 0=Otherwise	
<b>Control variables</b>		
<b>Workplace Characteristics</b>		
Size of Workplace		
Very small (<29)	1= Yes if in a workplace with less than 30 workers, 0= Otherwise	Categorized by the number of workers on the company payroll in the last pay period of March 2001.
Small (30-99)	1= Yes if in a workplace with 30 or more workers but less than 100, 0= Otherwise	
Medium (100 – 499)	1= Yes if in a workplace with 100 or more workers but less than 500, 0= Otherwise	
Large (>500)	1= Yes if in a workplace with more than 500 workers, 0= Otherwise (Reference group)	
Innovation introduced in the workplace	Added variable values to create an ‘innovation introduced’ variable (4= very high level innovators (said yes to all), 3= high level innovators (said yes to three), 2= middle level innovators (yes to two), 1= low level innovators (yes to one), 0= non-innovators (said no to all).	Between April 1st last year and March 31st this year, has this workplace introduced: <ul style="list-style-type: none"> <li>- new goods and services?</li> <li>- improved goods and services?</li> <li>- new processes?</li> <li>- improved processes?</li> </ul>

**Table 1 continues...**

<b>Industry</b>		
Primary sector	1=Yes, 0=Otherwise	Workplace is in forestry or mining.
Manufacturing & related sector	1=Yes, 0=Otherwise (Reference group)	Workplace is in construction, transportation, warehousing, wholesale, communication or other utilities.
Service sector	1=Yes, 0=Otherwise	Workplace is in retail trade and consumer services, finance and insurance, real estate, rental and leasing, business services, education and health services, or information and cultural industries.
<b>Job Characteristic</b>		
Low-paid	1= If regular full-time worker's wage is less than \$10/hour; 0= if regular full-time worker's wage is \$10.00/hr or more (i.e. higher-paid worker)	First, regular full-time workers are selected. Then, wage is used to code low-paid versus higher-paid workers. In your current job, what is your usual wage or salary before taxes and other deductions?
Collective Agreement Coverage	1= Yes, 0=No	In current job, are you a member of a union or covered by a collective bargaining agreement?
<b>Individual Characteristics</b>		
Gender	1= Female, 0 = Male	
Immigrant Status		
Immigrant	1= Yes, 0=No	Whether the worker immigrated to Canada (versus born in Canada).
New Immigrant	1= Yes, 0=No	Whether the worker immigrated to Canada after 1994.
Highest education attained:		
Lower education	1= Less than high school or completed high school, 0= Some post-secondary (including degree/ certificate/diploma) or university degree or higher	What is your highest level of education?
Occupation:		
Manager or Professional	1=Yes, 0= Otherwise	Manager or Professional
Lower white collar	1=Yes, 0= Otherwise	Marketing/Sales or Clerical/ Administrative
Blue collar	1=Yes, 0= Otherwise (Reference group)	Technical/trades or Production Worker with No Trade/ Certification

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**Table 1 continues...**Full-time work experience  
Full-time work experience  
SquaredNumber of years  
Number of years squared

Marital status

1= single, separated, divorced,  
or widowed and not in a  
common-law relationship; 0=  
Married/ common law

What is your marital status?

Dependent children

1= Yes, has dependent children,  
0= No

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**TABLE 2: Descriptive Statistics of All Variables**

	<u>Mean</u>	<u>Std. Dev.</u>	<u>Proportion</u>
Incidence of on-the-job training			32.1
Independent variable:			
Age:			
Younger worker			8.2
Middle aged worker			73.1
Older worker			18.7
Control variables:			
Size of the workplace:			
Very small workplace			42.8
Small workplace			22.3
Medium workplace			19.9
Large workplace			14.9
Innovation introduced in the workplace:			
Non-innovator			40.9
Low level innovator			8.9
Middle level innovator			16.7
High level innovator			10.6
Very high level innovator			22.9
Industry:			
Primary sector			1.8
Manufacturing & related sector			38.7
Service sector			59.5
Collective agreement coverage			26.6
Individual characteristics:			
Low-paid			13.7
Higher-paid			86.3
Gender (i.e. female)			46.9
Immigrant Status:			
Immigrant			21.4
New Immigrant			2.6
Education:			
Lower education			29.8
Higher education			70.2
Occupation:			
Manager/Professional			29.8
Lower white collar			18.9
Blue collar			51.3
Full-time work experience	17.5	10.5	
Full-time work experience squared	417.40	426.97	
Marital Status:			
Married/Common-law			70.1
Single/separated/divorced/widowed			29.9
Dependent children			47.6
Weighted sample size:			8,471,760

Sample: All regular full-time workers.

**TABLE 3: Associations between Age and On-the-Job Training (Logistic regression)**

<u>Independent Variable</u>	<u>Odds Ratio</u>	<u>Reg. Coeff.</u>	<u>BS Std. Error</u>	<u>Sig.</u>
Younger worker	1.361	0.308	0.168	
Middle aged worker (ref.)				
Older worker	0.615	-0.486	0.123	**
<u>Control Variables</u>				
Very small workplace	0.796	-0.228	0.153	
Small workplace	0.889	-0.118	0.141	
Medium workplace	0.790	-0.236	0.134	
Large workplace (ref.)				
Innovation introduced in the workplace	1.086	0.083	0.026	**
Primary sector	1.157	0.146	0.152	
Manufacturing & related (ref.)				
Service sector	1.089	0.086	0.101	
Low-paid	0.710	-0.343	0.145	*
Collective agreement coverage	0.831	-0.185	0.071	**
Gender (1= female)	1.010	0.010	0.081	
Immigrant	1.072	0.070	0.106	
New Immigrant	1.395	0.333	0.290	
Education (1=Lower education, 0=higher education)	0.608	-0.498	0.090	**
Manager/Professional	1.357	0.305	0.094	**
Lower white collar	1.153	0.143	0.110	
Blue collar (ref.)				
Full-time work experience	1.011	0.011	0.012	
Full-time work experience squared	1.000	0.000	0.000	
Marital status (1=single category)	1.072	0.069	0.097	
(Has) Dependent children	0.780	-0.248	0.088	**
Constant		-0.654	0.212	**
Number of Observations	15,501			
Wald Chi-Square	150.190			
Prob>Wald	0.000			

Significance levels: \*p<.10, \*\* p<.05, \*\*\* p<.01

Sample: All regular full-time workers.

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