Relations industrielles / Industrial Relations

Can older workers be retrained? Canadian evidence from worker-firm linked data

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Volume 76, Number 3, Fall 2021

URI: https://id.erudit.org/iderudit/1083608ar
DOI: https://doi.org/10.7202/1083608ar

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Publisher(s)

Département des relations industrielles de l'Université Laval

ISSN

0034-379X (print)
1703-8138 (digital)

Explore this journal

Cite this article

Fang, T., Gunderson, M. & Lee, B. (2021). Can older workers be retrained? Canadian evidence from worker-firm linked data. *Relations industrielles / Industrial Relations*, *76*(3), 429–453. https://doi.org/10.7202/1083608ar

Article abstract

Our empirical analysis is based on Statistics Canada's worker-firm matched data set, the 2003 Workplace and Employee Survey (WES). The sample size is substantial: about 4,000 workers over the age of 50 and 12,000 between the ages of 25 and 49. Training was a focus of the survey, which offers a wealth of worker-related and firm-related training variables.

We found that the mean probability of receiving training was 9.3 percentage points higher for younger workers than for older ones. Almost half of the gap is explained by older workers having fewer training-associated characteristics (personal, employment, workplace, human resource practices and occupation/industry/region), and slightly more than half by them having a lower propensity to receive training, this being the gap that remained after we controlled for differences in training-associated characteristics. Their lower propensity to receive training likely reflects the higher opportunity cost of lost wages during the time spent in training, possible higher psychological costs and lower expected benefits due to their shorter remaining work-life and lower productivity gains from training, as discussed in the literature.

The lower propensity of older workers to receive training tended to prevail across 54 different training measures, with notable exceptions discussed in detail. We found that older workers can be trained, but their training should be redesigned in several ways: by making instruction slower and self-paced; by assigning hands-on practical exercises; by providing modular training components to be taken in stages; by familiarizing the trainees with new equipment; and by minimizing required reading and amount of material covered. The concept of "one-size-fits- all" does not apply to the design and implementation of training programs for older workers.

Can older workers be retrained? Canadian evidence from worker-firm linked data

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Using Statistics Canada's worker-firm matched Workplace and Employee Survey, which provides the most comprehensive series of firm-related and worker-related training indicators (54), we found that the mean probability of receiving training was 9.3 percentage points higher for younger workers (25-49) than for older ones (50+). Slightly more than half of the gap is explained by older workers having a lower propensity to receive training, this being the gap that remained after we controlled for differences between the two groups in training-associated characteristics. Their lower propensity to receive training tended to prevail across 54 different training measures. We conclude that older workers can be trained, but their training should be redesigned in several ways: by making instruction slower and self-paced; by assigning hands-on practical exercises; by providing modular training components to be taken in stages; by familiarizing the trainees with new equipment; and by minimizing required reading and amount of material covered.

Keywords: training, older workers, worker-firm matched data, Canada

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We gratefully acknowledge the financial support of the CEIBS research fund on "Aged to Perfection: Benefits from An Inactive Population" in honour of Dr. Gerard Van Schaik, Co-Chairman of the CEIBS Board of Directors.

Introduction

The issues of an *older workforce* are gaining importance for policy and practice for a variety of reasons. Because the workforce is aging, living longer and retiring later, work life is being extended with a growing proportion of workers in older age brackets. Older workers are gaining importance not only numerically but also in their potential to mentor and synergize with younger workers.[1] Evidence from personnel economics (Lazear and Freeman 1997), for example, indicates that a mix of young and old workers will most likely produce the most productive work environment.

Older workers may be working longer because the recession and financial crisis of 2007- 2008 dissipated the savings and increased the debt load of workers nearing retirement (Marshall 2011). As well, the longer time spent in acquiring higher education is providing an incentive to work longer to amortize education costs. Older workers will also be working longer because of growing uncertainty about their employer-sponsored pension plans and because incentives for early retirement in defined-benefit pension plans are no longer prominent. Finally, mandatory retirement policies have been largely banned by legislation (Conference Board of Canada, 2005).

In their transition to retirement and increasingly back from retirement, older workers are often leaving their career jobs and engaging in alternative "bridge" jobs, many of which are non-standard (e.g., part-time, limited-term contracts, self-employment, telecommuting) and quite different from their earlier career jobs (Cohen 2008; Monette 1996; OECD 2019a, 2019b). Although our research deals with the training of *all* older workers, including those who have been dismissed or lost their lifelong jobs, their human capital and skills are often industry-specific and tend not to fit the requirements of the new knowledge economy (Neal 1995). For example, many older workers have been displaced through mass layoffs from their earlier career jobs in declining industries like steel, pulp and paper and auto manufacturing, with harmful effects on their life expectancy (Morissette, Zhang and Frenette 2007; Sullivan and von Wachter 2009). Such displaced older workers are often considered in a state of limbo—too old to begin a new career, but too young to retire. Consequently, it will become increasingly important to understand how this aging workforce is utilized, given the growing knowledge economy and the decline in physically arduous blue-collar work (Beach 2008).

The literature on the effects of permanent job loss tends to focus on job loss from plant closings and mass layoffs. More recently, the pandemic has also led to massive job losses. The hope is that much of this is temporary and that individuals will eventually return to their former jobs when the pandemic is

1. The importance of the aging population and its extended work-life is discussed in Carrière and Galarneau (2011), Krekula and Vickerstaff (2017), Milligan and Schirle (2018). Ní Léime *et al.* (2017) and OECD (2006).

over. However, Barrero, Bloom, and Davis (2020) estimate that 42 percent of recent layoffs from COVID-19 in the United States will result in permanent job losses, and that there are only 3 new hires for every 10 layoffs caused by the pandemic. This pandemic-induced restructuring and reallocation of labour clearly will affect older workers, whose health is also more at risk because of the pandemic.

In addition to the issues of an aging workforce and the effects of economic restructuring, *training* issues have attracted more attention in the current economy. Employers are often facing skill shortages due to retiring workers in the large baby-boom cohort (Cohen 2008; Conference Board 2005; OECD 2019a, 2019b). With the decline in lifetime employment provided by the old standard employment contract, individuals can expect to change jobs more often, with obvious implications for training needs. This change has also put a premium on continuous lifelong learning—and relearning—with retraining being an important component of that process (OECD 2019a, 2019b; Steffens 2015). For example, vocational rehabilitation and workplace accommodation requirements often involve training components (Campolieti, Gunderson and Smith 2014). Training is generally regarded as a key component of active labour adjustment programs that help reallocate labour from declining sectors and regions to expanding sectors and regions, with the twin benefits of reducing unemployment in the declining sectors and decreasing skill shortages in the expanding ones (Cohen 2008). Active adjustment programs, like training, are generally preferred to passive income maintenance programs that can support the "stay" option and exacerbate unemployment and labour shortages. With the dramatic increase in higher education, and the realization that such education is no longer a ticket to secure employment, increased attention is being paid to vocational training that can make individuals "job ready."

In addition to equipping workers to adjust to technological change, training can also *foster or induce* endogenous technological change, as has likely occurred with the computer revolution since the mid-1970s (Beaudry and Green 2005). This may be a case of Says Law: a growing supply of skilled labour will drive technological change (Acemoglu 1996, 1998, 2002). Training has also driven the innovation that is regarded as crucial to sustain productivity in a high-wage economy.[2] In the literature on *high-performance work practices* that foster competitiveness, the emphasis is on the importance of "bundling" training with other *complementary* workplace practices, such as

2. The importance of training in fostering innovation has been documented in such studies as Acemoglu (1997), Belzil and Hansen (2006), Boothby *et al.* (2007), Castrillón and Cantorna (2005), Guidetti and Mazzanti (2005) and Xu and Lin (2005, 2011),

employee involvement, job rotation, multi-tasking, broader-based job classifications and performance-based compensation.[3]

Clearly, the issues of an *aging workforce* and *training* are *each* of increasing importance for policy and practice. Their importance is compounded where *both* intersect: the training of older workers. That intersection is the focus of our study.

We will begin by discussing some of the theoretical issues in training of older workers. Particular attention will be placed on how those issues shed light on the training incentives of employers and older workers, on the barriers that older workers face and on what organizations can do to overcome them. We will then discuss the data that we will use, followed by a discussion of the empirical framework and estimation procedures. Next will come the empirical evidence on three relevant dimensions. First, we will *profile* how 54 different training indicators differ between older and younger workers, without controlling for any of the other factors that may influence such indicators. Second, we will provide an *econometric analysis* of the effect of being an older worker, as opposed to being a younger worker, after we have controlled for differences between the two groups in other determinants of training across the 54 training indicators. Finally, we will use a *decomposition analysis* to illustrate the extent to which differences in the mean probability of receiving training between younger and older workers are due to differences in the means of worker *characteristics (explanatory vari*ables*)* that affect training indicators, as opposed to differences between older and younger workers in the *propensity to undertake or receive training (i.e., regression coefficients)*. Our paper will conclude with a summary and policy discussion.

Theoretical issues in the training of older workers

A multidisciplinary perspective is important because training of older workers can be studied within various disciplines and from different perspectives. The different theoretical perspectives and their interrelatedness are discussed below, with an emphasis on the implications for training of older workers.

The basic *human capital framework of economics* suggests two points: older workers are less likely than younger workers to be trained and they receive less training. The benefits are likely to be smaller for them and the costs higher. Specifically, older workers are likely to benefit less because they have a shorter remaining work-life over which to amortize the costs of training (Picot and Wannell, 1987). This is so whether employers or employees bear

3. The literature on the importance of bundling training with complementary high-performance work practices is reviewed in Boothby *et al.* (2007) and Orlando and Johnson (2004).

the costs (Xu and Lin, 2011). As workers grow older, they are more likely to be matched with the requirements of their job and do not go through the frequent job turnover that younger workers go through (and which requires re-orientation or re-training) as they search for a good job match (Park 2012). The accumulated experience of older workers may also act as a substitute for training.

In addition to the reduced benefits of training, older workers may also face higher costs in terms of lost wages, i.e., opportunity costs, during time spent on training. As well, there may be higher psychological and learning costs to the extent that the new training is harder for them to absorb, in part because more time has passed since their earlier period of formal education.

On a related note, the *health and safety literature* documents a strong positive relationship between age and disability (Arin 2015; Cossette and Duclos 2002) and between age and days lost due to injuries (Dillingham 1981), as well as longer absences due to illness and longer recovery times (Rosen and Jerdee 1985, p. 27). These facts show the need for vocational rehabilitation training and workplace accommodations for older workers.

The *discrimination literature* shows that older workers are subject to discrimination and age stereotyping, and there is little reason to believe that such discrimination would not affect training of older workers, as evidenced by the phrase "you cannot teach an old dog new tricks." Such stereotypes have been documented in various reviews of the literature[4] and in résumé studies, which show that older workers receive fewer call-backs compared to equally qualified younger workers (Baert *et al.* 2016; Postuma and Campion 2009; Riach 2015; and Richardson *et al.* (2013). However, Kunze *et al.* (2013) provide evidence that, contrary to stereotypes, older workers are less resistant to change than are younger workers.

According to the literature on how *productivity changes with age*, there is little or no clear relationship between productivity and age.[5] The heterogeneity among individuals of the same age group is greater than the heterogeneity between individuals across age groups. Some skills like strength, dexterity, memory and reaction speed decline with age; however, older workers often compensate through increases in other inputs, such as institutional knowledge, firm-specific human capital, wisdom, diligence and experience as well as the ability to mentor younger workers.

4. Evidence on age stereotyping and discrimination is reviewed in AARP (2000), Bayl-Smith and Griffin (2014), Butler (1980), Chou and Choi (2011), Cully et. al, (2000), Gunderson (2003), Harris et al., (2018), Kite and Wagner (2002), Nelson (2002), Taylor *et al.* (2013) and Wilkinson and Ferraro (2002).

5. Reviews of the relationship between age and productivity include Hellerstein, Neumark and Troske (1999), Jablonski, Kunze and Rosenblum (1990), Kuhn (2005), Posner (1995, pp. 66-98, 156-201), Posthuma and Campion (2009), Richter (1992) and Sterns, Sterns and Hollis (1996).

According to the *organization behaviour/psychology literature*, retirement, and especially involuntary retirement, has negative effects on the cognitive functioning of older workers and their health and well-being (Bonsang et al., 2013; Mazzonana and Peracchi 2012; Rohwedder and Willis 2010). Training may facilitate not only continued employment but also cognitive learning.

Closely related to the organization behaviour literature, the *psychology and training literature* on cognitive and non-cognitive skills does suggest that older workers perceive themselves as having less need for training and having concerns over their ability to absorb and utilize training (Guthrie and Schwoerer 1996 and references cited therein). Importantly, the literature also finds that older workers have more difficulty in absorbing training. They take longer to be trained and may have limited productivity gains from training.[6] This difficulty reflects a variety of factors: declines in cognitive, physical, memory and motor skills; difficulty in keeping up with the pace of instruction; difficulties with conceptual learning as opposed to hands-on learning; lack of foundations in computer skills and IT; lack of familiarity with new equipment and technology; and awkwardness in being retrained with younger workers.

Importantly, these difficulties can be overcome if training is redesigned to meet the needs of older workers in several ways:[7] by making instruction slower and self-paced to allow sufficient time; by assigning hands-on practical exercises; by ensuring that the training is relevant; by building on the trainee's current knowledge base; by using modular training components that can build on previous components to go from the simple to the complex; by providing feedback; by familiarizing the trainee with new equipment; by emphasizing experiential and practical learning, as opposed to conceptual learning; by minimizing required reading and the amount of material to cover; by training in small groups; and by training older workers separately from younger workers.

While these various perspectives can shed light on the issue of older worker training, we find the *human capital perspective* and the *psychology and training literature* to be most useful for interpreting our subsequent empirical results. The human capital perspective shows the incentives for both employers and employees, while the psychology and training literature shows the barriers to older workers and how employers can design training to overcome those barriers.

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6. Reasons for difficulty in training older workers are discussed in Birren and Fisher (1995), Dostie and Léger (2014), Göbel and Zwick (2013), Hayslip and Kennely (1985), Knowles (1990), Kubeck *et al*. (1996) in a review of 32 studies, Park (1994), Spirduso and MacRae (1990) and Sterns (1986).

7. Features of training programs that can meet older workers' needs are outlined in Beier and Ackerman (2005), Belbin and Belbin (1972), Callahan, Kiker and Cross (2003), Dunn (2005), Kruse (2001), Simpson (2005) and Sterns and Doverspike (1987, 1989).

To understand the features of training that may be barriers to the productive training of older workers, we used a worker-firm matched dataset that has 54 training indicators. These indicators may also show ways to accommodate the training needs of older workers.

While our 54 training indicators pointed to the usual suspects (training costs and benefits, barriers to older workers), there were also some surprises. Older workers did not refuse training primarily because of health reasons or a perception of their courses as being too difficult. They refused primarily because they felt the courses were not suitable. The onus is thus on employers and training institutions to design courses that suit the needs and capabilities of older workers.

WES data

Our empirical analysis was based on Statistics Canada's worker-firm matched dataset: the Workplace and Employee Survey (WES). Because the survey has (unfortunately) been discontinued, we used 2003 data. Only odd-year WES data contained information on organizational factors that could affect training decisions.

On the employer side, the target population was defined as all business locations in Canada that had paid employees in March, except for employers in the Yukon, Nunavut and the Northwest Territories and employers in crop or animal production, fishing, hunting and trapping, private households, religious organizations and public administration. On the employee side, the target population was composed entirely of employees working or on paid leave in March in the selected workplaces that received an income tax form. The WES drew its sample from the Business Register (BR), a monthly updated list of all businesses in Canada. To reduce the response burden, this list may combine the information the businesses provide with data from other surveys or administrative sources (Statistics Canada, 2021).

Our analysis is based on the individual WES file. It is restricted to workers age 25 and older and is broken down into older workers age 50 and older (as defined by the OECD 2006) and workers 25-49. It is also restricted to for-profit organizations because they were the only ones that had information on whether there was competition and, if so, whether it was local, regional or global. The WES is an ideal dataset for our analysis because it is a worker-firm matched dataset and hence has information on both workers and firms, with one of its primary focuses being on-the-job training. It has an extensive set of 54 *indicators* about older worker training, including the following: whether the worker *received* training in the past year; *type and duration* of training; *instruction* for on-the-job training; *nature* of the classroom courses;

instruction for classroom training; whether training was offered but *refused*; and *reasons for refusing* training, including being too old or too late in one's career. The sample size is substantial: about 4,000 older workers over the age of 50 and 12,000 between the ages of 25 and 49.

Table 1 presents the means of the 54 training indicators for older workers (50+) and younger workers (25-49). For the various categories, these are the percentages of workers who received that type of training. The differences are raw and unadjusted, being not controlled for factors other than age. They are the dependent variables used in our subsequent regression analyses to control for other factors influencing those outcomes.

TABLE 1

Profile of Training Indicators for Older and Younger Workers, WES 2003 (% responding yes for categorical measures; mean magnitude for continuous measures)

TRAINING INDICATOR	OLDER WORKERS 50+	YOUNGER WORKERS 25-49	DIFFERENCE
	(1)	(2)	(3) = (1) – (2)
PANEL 1			
Prevalence and Duration (7)			
Received either OJT or classroom	0.459	0.552	-0.093
Received on-the-job (OJT) only	0.145	0.173	-0.028
Received classroom only	0.228	0.244	-0.016
Received both OJT and classroom	0.086	0.136	-0.050
Days of any training	2.721	5.105	-2.384
Days of OJT training	1.105	2.894	-1.789
Days of classroom training	1.617	2.211	-0.594
PANEL 2			
Nature of OJT (13)			
Orientation	0.049	0.075	-0.026
Managerial/supervisory	0.037	0.103	-0.066
Professional	0.141	0.197	-0.056
Apprenticeship	0.027	0.021	0.006

TRAINING INDICATOR	OLDER WORKERS 50+	YOUNGER WORKERS 25-49	DIFFERENCE
Sales and marketing	0.077	0.088	-0.011
Computer hardware	0.057	0.061	-0.004
Computer software	0.303	0.264	0.039
Other equipment	0.090	0.071	0.019
Group decisions, problem solving	0.026	0.055	-0.029
Teams, leadership, communicating	0.048	0.071	-0.023
Health, safety, environment	0.139	0.105	0.034
Literacy or numeracy	0.003	0.006	-0.003
Other	0.236	0.250	-0.014
PANEL 3			
Instruction for OJT (7)			
Self-learning	0.139	0.120	0.019
Supervisor	0.317	0.388	-0.071
Fellow worker	0.212	0.299	-0.087
In-house trainer	0.286	0.267	0.019
Outside trainer	0.220	0.175	0.045
Equipment supplier	0.090	0.059	0.031
Other	0.038	0.027	0.011
PANEL 4			
Nature of Classroom Training (13)			
Orientation	0.008	0.009	-0.001
Managerial/supervisory	0.059	0.077	-0.018
Professional	0.207	0.222	-0.015
Apprenticeship	0.020	0.014	0.006
Sales and marketing	0.075	0.063	0.012

TRAINING INDICATOR	OLDER WORKERS 50+	YOUNGER WORKERS 25-49	DIFFERENCE
Computer hardware	0.044	0.029	0.015
Computer software	0.171	0.180	-0.009
Other equipment	0.041	0.027	0.014
Group decisions, problem solving	0.006	0.009	-0.003
Teams, leadership, communicate	0.032	0.038	-0.006
Health, safety, environment	0.186	0.198	-0.012
Literacy or numeracy	0.002	0.005	-0.003
Other	0.329	0.344	-0.015
PANEL 5			
Instruction for Class Training (6)			
Supervisor	0.116	0.113	0.003
Fellow worker	0.101	0.089	0.012
In-house trainer	0.315	0.270	0.045
Outside trainer	0.549	0.612	-0.063
Equipment supplier	0.090	0.083	0.007
Other	0.059	0.055	0.004
PANEL 6			
Refused Training in Past Year (1)	**0.088**	**0.088**	**0**
REASONS FOR REFUSAL (7)			
Busy with job duties	0.401	0.457	-0.056
Courses not suitable	0.299	0.236	0.063
Courses too difficult	0.002	0.002	0
Health reasons	0.012	0.010	0.002
Family responsibilities	0.036	0.057	-0.021
Too old or late in career	0.049	0.004	0.045
Other	0.201	0.234	-0.033

As indicated by the negative differences in column 3 of Panel 1, training was shorter-lasting and less prevalent among older workers than among younger workers for almost all of the dimensions of training. This is a common result found in the literature across different countries.[8]

REGRESSION ANALYSES

The *gross* difference between older and younger workers across a wide range of training indicators may reflect differences in their training-associated *characteristics* and differences in their *propensity* to take different types of training, after controlling for or netting out the other factors that influence the training indicators. The net effect can be considered a pure older worker effect, since it controls for the other determinants of the training indicators. It is estimated here as simply the coefficient on an older versus younger worker dummy variable, which is based on separate regressions for each of the 54 training indicators, after controlling them for a wide array of other variables that can affect those training indicators.[9] As indicated at the bottom of Table 2, the variables include the following: gender; visible minority status; Aboriginal status; immigrant status; marital status; education; presence of dependent children; full-time vs. part-time status; regular permanent vs. non-standard work; presence of a collective agreement; use of a computer at work; use of technology at work; number of employees at the firm;% part-time,% temporary; new goods or processes being introduced at work; whether there was no competition or local, regional or global competition; existence of individual or group incentive plans; whether overtime was worked; whether there was downsizing; occupation; industry and region. These full regressions are estimated separately for each of the 54 different training indicators.

8. The literature from different countries invariably finds that older workers engage in less training than do younger workers (e.g., Cully et. al 2000: Frazis et. al 2000; Greenlaigh and Stewart 1987; Hurst 2008; OECD 2006; and Park 2012). Dostie and Léger (2014), Underhill (2006), Xu and Lin (2011) and Zeytinoglu *et al.* (2007) document similar effects for Canada.

9. The coefficients are from an Ordinary-Least-Squares (OLS) regression and are very close to the marginal effects from a Probit function, available on request. The OLS procedure also facilitates the subsequent decomposition analyses. For categorical dependent variables whose mean is less than 0.20 or greater than 0.80, caution should be used in interpreting the changes in the probabilities based on the OLS linear approximation to reflect the non-linear relationship.

TABLE 2

Effect of Being an Older Worker vs. Being a Younger Worker on Various Training Indicators After Controlling for Other Determinants of Training Indicators (Coefficient from an older worker dummy variable in OLS regression)

TRAINING INDICATOR	MEAN DEPENDENT VARIABLE	OLDER WORKER COEFFICIENT	P-VALUE
PANEL 1			
Prevalence and Duration			
Received either OJT or classroom	0.531	-0.052***	0.008
Received on-the-job (OJT) only	0.166	-0.002	0.915
Received classroom only	0.240	-0.009	0.599
Received both OJT and classroom	0.124	-0.041***	0.001
Days of any training	4.555	-2.276***	0.007
Days of OJT training	2.481	-1.289***	0.002
Days of classroom training	2.074	-0.987	0.145
PANEL 2			
Nature of OJT (13)			
Orientation	0.070	-0.022	0.212
Managerial/supervisory	0.090	-0.037**	0.013
Professional	0.187	-0.075***	0.007
Apprenticeship	0.022	-0.006	0.627
Sales and marketing	0.086	-0.005	0.815
Computer hardware	0.060	0.006	0.732
Computer software	0.271	0.065**	0.040
Other equipment	0.075	0.027	0.249
Group decisions, problem solving	0.050	-0.016	0.257
Teams, leadership, communicating	0.067	-0.008	0.631
Health, safety, environment	0.111	-0.000	0.985
Literacy or numeracy	0.006	-0.006	0.174
Other	0.247	-0.042	0.172

TRAINING INDICATOR	MEAN DEPENDENT VARIABLE	OLDER WORKER COEFFICIENT	P-VALUE
PANEL 3			
Instruction for OJT (7)			
Self-learning	0.124	0.024	0.299
Supervisor	0.375	-0.078**	0.026
Fellow worker	0.283	-0.071**	0.033
In-house trainer	0.270	0.015	0.628
Outside trainer	0.184	0.048	0.113
Equipment supplier	0.065	0.024	0.218
Other	0.029	0.012	0.286
PANEL 4			
Nature of Classroom Training (13)			
Orientation	0.009	0.001	0.919
Managerial/supervisory	0.073	-0.020	0.210
Professional	0.219	-0.023	0.400
Apprenticeship	0.015	-0.001	0.931
Sales and marketing	0.065	0.011	0.511
Computer hardware	0.032	0.012	0.562
Computer software	0.178	0.013	0.572
Other equipment	0.030	0.016	0.201
Group decisions, problem solving	0.008	-0.001	0.794
Teams, leadership, communicating	0.037	0.000	0.968
Health, safety, environment	0.195	-0.012	0.645
Literacy or numeracy	0.004	-0.002	0.322
Other	0.341	-0.029	0.379

TRAINING INDICATOR	MEAN DEPENDENT VARIABLE	OLDER WORKER COEFFICIENT	P-VALUE
PANEL 5			
Instruction for Class Training (6)			
Supervisor	0.114	0.007	0.762
Fellow worker	0.092	0.009	0.633
In-house trainer	0.279	0.011	0.735
Outside trainer	0.600	-0.028	0.417
Equipment supplier	0.084	0.016	0.426
Other	0.056	0.005	0.761
PANEL 6			
Refused Training in Past Year	**0.088**	**0.016**	**0.132**
REASONS FOR REFUSAL (7)			
Busy with job duties	0.444	-0.102*	0.089
Courses not suitable	0.250	0.120**	0.014
Courses too difficult	0.002	-0.004	0.277
Health reasons	0.010	-0.006	0.564
Family responsibilities	0.052	-0.010	0.571
Too old or late in career	0.014	0.039***	0.004
Other	0.226	-0.037	0.432

Significance is denoted by *** at the 0.01 level, ** at the 0.05 level and * at the 0.10 level

Control variables include: gender; visible minority status; Indigenous status; immigrant status; marital status; education; presence of dependent children; full-time vs. part-time status; regular permanent vs. non-standard work; presence of a collective agreement; use of a computer at work; use of technology at work; number of employees at the firm;% part-time,% temporary; new goods or processes being introduced at work; whether there was no competition or local, regional or global competition; existence of individual or group incentive plans; whether overtime was worked; whether there was downsizing; occupation; industry and region.

Table 2 presents the pure or net older worker effect (i.e., the coefficient on the dummy variable coded 1 if the worker was 50 or older and zero if 25-49).[10] A negative older worker coefficient means that older workers were less likely than younger workers to receive that training outcome, to use that type of training or instruction or to refuse training for that reason. A positive coefficient means the opposite. Please note that in the absence of causal estimation procedures the relationships here are associations and not causal.

As indicated in the first row of the top panel of Table 2, after we controlled for other determinants of training, older workers were significantly less likely than younger workers, by 5.2 percentage points, to receive some form of training. This probability was 10% lower than the mean of 53.1%.

The coefficient for the days of training received also indicates that older workers received fewer days of training than did younger workers. Specifically, after we controlled for the other determinants of training, older workers received significantly less training than did younger workers, namely 2.3 fewer days. While the difference seems small, it was half the 4.6 days of training that all workers received on average.

Older workers were thus less likely to be trained and received fewer days of training on average, after we controlled for other factors that affect training. The reason may be the reduced benefit of most types of training for older workers (given their shorter time horizons for amortizing the costs, and the lower productivity gains after training) and the higher costs (given their higher wages and hence higher opportunity cost, as well as possible psychological costs).

Overall, considering the negative effects of *all* of the *prevalence and duration* indicators, we see that older workers generally had a lower probability of being trained and received fewer days of training on average even after we controlled for other factors that influence the prevalence and duration of training. These pure older worker effects are generally substantial in size when compared with the means of column 1. The effects are small and insignificant only for two indicators: having received *only* on-the-job training and having received *only* classroom training.

As seen in Panel 2 of Table 2, the negative effects *of different types of on-the-job training* show that older workers were less likely to be trained across most types of on-the-job training, especially for managerial, supervisory and professional training. In many cases, however, the differences between older and younger workers were small and statistically insignificant. The notable exception is that older workers were much more likely to receive on-the-job training in computer software. This is understandable because they likely did

10. Space constraints prevent us from presenting the full range of results for the other determinants (i.e., 53 different regression results involving two pages for each). The full results are available on request.

not have such training in their earlier education or as part of their lifestyle. Because they more likely received training in computer software, they must have needed it for their work and could absorb it readily enough—otherwise such training would not likely continue.

With respect to instruction for on-the-job training (Panel 3), older workers were much less likely to be taught by a supervisor or a fellow worker. This finding is logical because they likely had fewer supervisors, being older, and likely had younger fellow workers who were reluctant to train older workers. Mentoring and on-the-job training likely went in the other direction, from older workers to younger ones.

With respect to *classroom training* (13 indicators were about its *nature* (Panel 4) and 6 about *instruction* (Panel 5), the differences between older and younger workers were very small and statistically insignificant. The same applied to the probability of having refused training.

With respect to *reasons* for refusing training (Panel 6), older workers were much more likely to say the courses were unsuitable, rather than too difficult, i.e., a barrier. Indeed, course difficulty did not significantly predict refusal of training. This fact is informative because it shows that employers and training institutions should design and implement courses that are suitable to older workers' needs and capabilities, as discussed previously. The concept of "one-size-fits all" obviously does not apply to the design and implementation of training courses for older workers.

Although older workers were obviously more likely to refuse training because they thought they were too old or too late in their career, this reason was of extremely minor importance. Few workers even mentioned it as a reason. Older workers were less likely than younger workers to refuse training because they were busy with job duties, presumably because they had already found a fit with their duties and could handle them. Family responsibilities and health factors were not significant reasons for older workers refusing training, even though health declines with age.

Decomposition analysis

The previous analysis of Table 1 indicates that the unadjusted or raw difference in the mean probability of being trained was 9.3 percentage points, with younger workers having a higher probability (i.e., 55.2% versus 45.9% for older workers). The training gap can be broken down into two components (Oaxaca, 1973). One component can be attributed to differences between older and younger workers in the means of the *characteristics (explanatory vari*ables*)* that affect training indicators. The other component can be attributed to differences between older and younger workers in the *propensity to*

undertake or receive training (i.e., regression coefficients) for a given set of characteristics.

As shown in Table 3, the 9.3 percentage point difference includes 4.1 percentage points or 44% that can be attributed to differences between older and younger workers in the means of the explanatory variables or characteristics (i.e., personal characteristics, employment and workplace characteristics, human resource practices that come under incentive schemes, and occupation/industry/region). In other words, the lower probability of older workers being trained is almost half explained by characteristics that lower this probability for older and younger workers alike.

TABLE 3

Breakdown of 0.093 Training Gap, with Probability of Receiving Training Being Higher for Younger Workers (0.552) than for Older Workers (0.459)

OVERALL YOUNGER – OLDER TRAINING GAP		EXPLAINED, DUE TO DIFFERENCES IN ENDOWMENTS		UNEXPLAINED, DUE TO DIFFERENCE IN RETURNS	
Amount	**%**	**Amount**	**%**	**Amount**	**%**
.093	100%	.041	44%	.052	56%

The remaining 5.2 percentage points or 56% of the training gap can be explained by a lower propensity among older workers to be trained (i.e., differences in the regression coefficients including the constants in each equation). This lower propensity among older workers to be trained reflects the higher likely cost of training older workers (higher opportunity cost of lost wages during the time spent in training and possible psychological costs) and lower expected benefits due to the shortness of their remaining work-life and any lowering of productivity from taking training, as discussed previously.

Summary observations for individuals and employers

The evidence presented here is generally consistent with older workers and their employers making rational decisions on various aspects of training. Older workers had a lower probability of being trained—almost half as much—because they had more of the characteristics (personal, employment, workplace, human resource practices and occupation/industry/region) that lower this probability for both older and younger workers. The remaining half of the training gap can be explained by a lower propensity among older workers to be trained, likely due to higher expected costs and lower expected benefits.

Training of older workers was less prevalent across most types of on-the-job training likely because the benefits were lower for them and the costs higher. As discussed previously, the benefits were lower because older workers had less time remaining in the labour force and because their greater experience could substitute for training. The costs might be higher because older workers earn more money and suffer a higher opportunity cost, as well as a higher psychological cost and greater difficulties in absorbing training. Discrimination might also be a barrier.

On-the-job training was more prevalent among older workers in only two cases. One case was training in computer software. This exception is consistent with older workers not being exposed to computers in their much earlier formal education and not acquiring computer skills through their lifestyle, as is the case with younger workers. Evidently, such training was required in their work, and they were able to absorb it; otherwise, it would likely be uncommon.

The other exception was training for health and safety. This might be a rational employer response to the extent that older workers incur higher costs for lost time due to accidents because they generally earn higher wages and recover over a longer period.

Supervisors and fellow workers were a less common source of on-the-job training for older workers, probably because the latter had fewer supervisors (often being themselves older workers) and because younger workers were less likely to train older workers. In contrast, self-learning was more common for older workers, probably because of the importance they attached to learning at their own pace.

Older and younger workers refused training in identical proportions. Perhaps surprisingly, older workers did not refuse because of expectable barriers like course difficulty, health problems or family responsibilities. The most important reason, and to a greater degree than among younger workers, was that the courses were unsuitable. This finding highlights the importance for employers and training institutions to design and implement training courses with older workers' needs and capabilities in mind.

Can older workers be trained? Yes, they can be. But the training should be redesigned to meet their needs and capabilities in several ways: by making instruction slower and self-paced; by assigning hands-on practical exercises; by providing modular training to be taken in stages; by familiarizing the trainees with new equipment; and by minimizing required reading and amount of material covered. The concept of "one-size-fits- all" does not apply to the design and implementation of training courses for older workers.

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SUMMARY

Our empirical analysis is based on Statistics Canada's worker-firm matched data set, the 2003 Workplace and Employee Survey (WES). The sample size is substantial: about 4,000 workers over the age of 50 and 12,000 between the ages of 25 and 49. Training was a focus of the survey, which offers a wealth of worker-related and firm-related training variables.

We found that the mean probability of receiving training was 9.3 percentage points higher for younger workers than for older ones. Almost half of the gap is explained by older workers having fewer training-associated characteristics (personal, employment, workplace, human resource practices and occupation/industry/region), and slightly more than half by them having a lower propensity to receive training, this being the gap that remained after we controlled for differences in training-associated characteristics. Their lower propensity to receive training likely reflects the higher opportunity cost of lost wages during the time spent in training, possible higher psychological costs and lower expected benefits due to their shorter remaining work-life and lower productivity gains from training, as discussed in the literature.

The lower propensity of older workers to receive training tended to prevail across 54 different training measures, with notable exceptions discussed in detail. We found that older workers can be trained, but their training should be redesigned in several ways: by making instruction slower and self-paced; by assigning hands-on practical exercises; by providing modular training components to be taken in stages; by familiarizing the trainees with new equipment; and by minimizing required reading and amount of material covered. The concept of "one-size-fits- all" does not apply to the design and implementation of training programs for older workers.

RÉSUMÉ

Notre analyse empirique est fondée sur l'ensemble des données appariées entre les travailleurs et les entreprises de Statistique Canada, le *Workplace and Employee Survey (WES)* de 2003. La taille de l'échantillon est importante, environ 4 000 travailleurs de plus de 50 ans et 12 000 qui ont entre 25 et 49 ans. Cette enquête est centrée sur la formation, de sorte qu'elle comporte une multitude de variables sur ce sujet tant pour les travailleurs que pour les entreprises.

Notre analyse économétrique a révélé que la probabilité moyenne de recevoir une formation était de 9,3 points de pourcentage plus élevée chez les jeunes que chez les travailleurs plus âgés. Près de la moitié de cet écart peut être attribué au fait que les travailleurs âgés ont moins de caractéristiques associées à la réception de la formation (c'est-à-dire caractéristiques personnelles, d'emploi, du milieu de travail, des pratiques en matière de ressources humaines et de la profession/industrie/région). D'autre part, un peu plus de la moitié de l'écart est attribué au fait qu'ils ont moins tendance à recevoir des formations après avoir pris en compte leurs caractéristiques. Cela reflète probablement un coût d'opportunité

plus élevé des salaires perdus pendant la formation et des coûts psychiques possiblement plus élevés pour les travailleurs plus âgés. Comme le révèle la littérature, cela reflète aussi le fait qu'il y a moins d'avantages à former les personnes plus âgées en raison de leur horizon de vie professionnelle plus court et des gains de productivité plus faibles associés à la formation.

La faible tendance des travailleurs âgés à recevoir une formation s'exprime dans 54 mesures de la formation, avec quelques exceptions notables. Nous constatons que les travailleurs âgés peuvent être formés, mais cela nécessite une formation conçue pour répondre aux besoins des travailleurs âgés. Ces caractéristiques comprennent une instruction plus lente et auto-rythmée, des exercices pratiques, des composants de formation modulaires qui se construisent par étapes, les familiariser avec de nouveaux équipements et minimiser la lecture requise et la quantité de matériel couvert. Le concept d'uniformité ne s'applique pas à la conception et à la mise en œuvre de formations pour les travailleurs âgés.