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Changes in the occupational profile of young men and women in Canada

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|----------------|--|
| . | not available for any reference period |
| .. | not available for a specific reference period |
| ... | not applicable |
| 0 | true zero or a value rounded to zero |
| 0 ^s | value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded |
| P | preliminary |
| r | revised |
| X | suppressed to meet the confidentiality requirements of the <i>Statistics Act</i> |
| E | use with caution |
| F | too unreliable to be published |
| * | significantly different from reference category ($p < 0.05$) |

Changes in the occupational profile of young men and women in Canada

by Sharanjit Uppal and Sébastien LaRochelle-Côté

Overview of the study

Between 1991 and 2011, the proportion of employed people aged 25 to 34 with a university degree rose from 19% to 40% among women, and from 17% to 27% among men. Given the increase in the proportion of university graduates, did the occupational profile of young workers change over the period? This article examines long-term changes in the occupation profiles of young men and women, for both those who did and did not have a university degree. Changes in the share of women employed in these occupations are also examined.

- In 2011, at least 20% of all employed women aged 25 to 34 with a university degree were in three occupations: registered nurses, elementary school and kindergarten teachers and secondary school teachers. This was also the case in 1991.
- Among university-educated men, the three most common occupations—computer programmers and interactive media developers, financial auditors and accountants, and secondary school teachers—employed 11% of workers aged 25 to 34 in 2011.
- Among young workers who did not have a university degree, retail salespersons and sales clerk employed the most men (3%) and women (4%) in 2011. Other occupations held by men and women in this group were characterized by significant gender differences.
- Between 1991 and 2011, the proportion of female workers rose in nearly all major occupations held by university graduates. The most significant gains were among health policy researchers, consultants and program officers (from 47% to 76%); specialists in human resources (57% to 78%); and general practitioners and family physicians (from 43% to 62%).
- Among non-university graduates aged 25 to 34, the proportion of females rose in some specific occupations, such as police officers (from 13% to 24%), but declined in many others, such as cooks (from 50% to 33%), customer service representatives and financial services workers (from 95% to 79%) and food counter attendants (from 79% to 65%).

Introduction

Recently, issues related to the rising educational attainment of young individuals, especially among women, have generated a lot of interest.¹ Between 1991 and 2011, the proportion of employed people aged 25 to 34 with a university degree rose from 19% to 40% among women, and from 17% to 27% among men. The last few decades have also been characterized by increases in female labour force participation and a reduced gender wage gap.² At the same time, gains were made by young workers in occupations typically requiring a university degree—particularly young women, as they

became more represented in all instructional programs.³ Canada's young workforce is therefore better-educated and better-skilled than two decades ago.

Amid these well-documented facts, recent results from the 2011 National Household Survey (NHS) indicated that retail salesperson was the most common occupation among women and men aged 15 and over, and that retail industries employed the most people in Canada (11.5%).⁴ The NHS also showed that many people were still employed in so-called 'traditional' occupations

(such as nurses and elementary school teachers for females, and truck drivers and carpenters for males), thus leaving the impression that the growing share of young men and women with a university degree had little overall impact on the occupational profile of young men and women.⁵

Global changes in the occupational profile of workers, however, are the result of a number of labour market forces, including the interaction between labour market entrants and leavers, changes in educational attainment and gender differences. Age, gender, and educational attainment are thus important dimensions to consider in the study of occupational profiles over time.

This paper focuses on changes in the occupational profiles of labour market entrants aged 25 to 34. Because they are in the early stages of their life-cycle, and because they will continue to influence the labour market as they age, younger workers are key drivers of change for the labour market. In view of the rising educational attainment of young workers (especially women), what can be said about the occupational profiles of successive cohorts of labour market entrants in Canada? Are they concentrated in the same occupations as two decades ago? And, if so, which ones? This paper addresses these questions and also provides additional information about the gains made by females across occupations, especially in occupations typically held by university-educated workers.⁶

Female university graduates are more concentrated within a few occupations

To examine how workers aged 25 to 34 are distributed across detailed occupations, it is important to focus on a restricted number of occupations.⁷ This is because occupational classification systems typically include many categories (up to 500), with many occupations accounting for a very small proportion of workers. In this paper, only the 25 occupations employing the most people are shown, on the basis of the four-digit National Occupational Classification (NOC). Consistent information can be retrieved on these “top 25” occupations over a period of 20 years from the 2011 National Household Survey (NHS) and the 1991 and 2006 Censuses of Population (see *Data sources, methods and definitions*). To account for gender differences and control for changes in the level of educational attainment, the following sub-populations are examined:

- female university graduates
- male university graduates
- females without a university degree
- males without a university degree.

Female and male university graduates are examined first. In 1991, 2006 and 2011, the three most common occupations among young female graduates were elementary school and kindergarten teachers, registered nurses, and secondary school teachers. In all three years, these three occupations accounted for more than 20% of all employed women with a university degree (Table 1). While the share of elementary school and kindergarten

teachers decreased somewhat from 12% in 1991 to 11% in 2006, and to 10% in 2011, the share of registered nurses increased from 4% in 1991 to 6% in 2011.⁸

In 2011, the top 10 occupations comprised 35% of all university-educated women, and the top 25 comprised 52%. Thus, more than one-half of all university-educated women were in 5% of all occupations included in the NOC classification. Similar levels of concentration were found in the top 3, top 10, and top 25 occupations in both 1991 and 2006.

Changes in the occupational mix of university-educated women occurred over the period. A few of the top 25 occupations on the list in 2011 were not on the list in 1991, such as specialists in human resources; business development officers and marketing researchers; customer service, information and related clerks; and food and beverage servers. Conversely, other occupations that were among the top 25 in 1991 did not appear on the list of the top 25 occupations in 2011, such as, for example, secretaries and financial managers, which employed about 3% of female graduates in 1991.

As expected, most of the 25 occupations employing the most university-educated women typically require a university degree. For example, elementary and secondary school teachers, registered nurses, and financial auditors and accountants all normally require some degree of university education. In 2011, about 56% of young female graduates worked in occupations normally requiring a university degree (about the same as in 1991).

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Not all occupations in the top 25, however, necessarily require a university degree. Some, like general office clerks for instance generally require high school education or less. About 15% of young female graduates were in occupations like these in 2011, a proportion that varied little from 1991.

Other female graduates worked in occupations requiring a college education or apprenticeship training (e.g. administrative officers, and

community and social service workers), or as managers. This was the case for 29% of young female graduates in 2011.

Male university graduates were less likely to be concentrated within a few occupations

In comparison with young female graduates, young male graduates were less likely to be concentrated in a small number of occupations

(Table 2). In 2011, computer programmers and interactive media developers had the most men with a university degree (4%). The next two occupations (financial auditors and accountants, and secondary school teachers) together accounted for 7% of all male graduates. In all, 11% of male graduates were employed in these top 3 occupations (compared with the 21% of female graduates concentrated in three occupations), 26% were employed

Table 1 The 25 occupations employing the most women aged 25 to 34 with a university degree in 1991, 2006 and 2011

	1991	2006	2011
	percentage		
Elementary school and kindergarten teachers	11.8	11.0	9.8
Registered nurses	4.0	4.2	6.1
Secondary school teachers	5.4	5.0	4.8
Financial auditors and accountants	2.8	3.0	3.0
General office clerks	1.0	1.8	2.1
Administrative officers	1.2	1.3	1.9
Community and social service workers	1.5	1.4	1.8
Retail salespersons and sales clerks	1.6	2.0	1.8
Social workers	1.7	1.6	1.7
Postsecondary teaching and research assistants	1.4	2.0	1.7
Lawyers and Quebec notaries	2.2	1.8	1.7
Professional occupations in public relations and communications	0.9	1.1	1.5
Sales, marketing and advertising managers	1.1	1.6	1.4
Specialists in human resources	...	1.2	1.4
Early childhood educators and assistants	1.0	1.1	1.3
Retail trade managers	1.2	1.2	1.2
Business development officers and marketing researchers and consultants	...	1.2	1.2
College and other vocational instructors	1.8	1.2	1.1
Customer service, information and related clerks	...	1.3	1.1
Food and beverage servers	...	0.9	1.0
Pharmacists	1.2	0.9	0.9
General practitioners and family physicians	1.4	...	0.8
Accounting and related clerks	1.9	1.1	0.8
Health policy researchers, consultants and program officers	1.1	...	0.8
Professional occupations in business services to management	...	...	0.8
Computer system analysts	1.6	..	..
Secretaries (except legal and medical)	1.6	...	...
Financial managers	1.2	...	...
Physiotherapists	0.9	...	...
Computer programmers	0.9	..	..
Information systems analysts and consultants	..	1.1	...
Administrative clerks	...	0.9	...
Financial and investment analysts	...	0.9	...
Percentage working in top 3 occupations	21.2	20.2	20.7
Percentage working in top 10 occupations	34.8	34.0	34.7
Percentage working in top 25 occupations	52.4	50.8	51.7

.. not available for a specific reference period

... not applicable (not part of the top 25 occupations in that year)

Sources: Statistics Canada, Census of Population, 1991 and 2006; National Household Survey, 2011.

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in the top 10 (35% among females), and 44% were employed in the top 25 (52% among females). These proportions varied little from 1991.

Comparisons with 1991 are not always possible among men. This is because occupations related to information technology, which employ many male graduates, were scattered across multiple occupations in 2011, while they consisted of just two categories

in 1991 (computer programmers and computer system analysts).⁹ Altogether, the share of occupations related to information technology rose over the period, from 6% to about 9% of all male graduates.

Other occupations employed a significant portion of men in 1991, 2006 and 2011. This was the case for financial auditors and accountants (4% in 2011) and three teaching occupations (secondary

school teachers, elementary school teachers, and postsecondary teachers and research assistants), which comprised 8% to 9% of all male graduates in each year.

However, some occupations disappeared from the list of the top 25 occupations over the period. Examples included general practitioners and family physicians, college instructors, accounting clerks, manufacturing

Table 2 The 25 occupations employing the most men aged 25 to 34 with a university degree in 1991, 2006 and 2011

	1991	2006	2011
		percentage	
Computer programmers and interactive media developers	..	4.2	3.6
Computer programmers	2.4	..	..
Financial auditors and accountants	3.9	2.9	3.5
Secondary school teachers	4.1	3.8	3.4
Information systems analysts and consultants	..	3.6	2.9
Computer system analysts	3.7	..	..
Elementary school and kindergarten teachers	2.3	2.7	2.4
Postsecondary teaching and research assistants	1.6	2.4	2.4
Mechanical engineers	1.6	1.6	2.1
Retail salespersons and sales clerks	1.7	2.2	2.1
Civil engineers	1.9	1.4	1.9
Sales, marketing and advertising managers	2.0	2.1	1.8
Lawyers and Quebec notaries	2.9	1.9	1.7
Retail trade managers	2.2	1.7	1.7
Electrical and electronics engineers	2.2	1.4	1.6
Other financial officers	...	1.2	1.6
Software engineers and designers	..	1.7	1.5
Financial and investment analysts	...	1.4	1.3
Business development officers and marketing researchers and consultants	...	0.9	1.2
Banking, credit and other investment managers	1.0	1.1	1.1
Professional occupations in business services to management	...	1.1	1.1
Sales representatives wholesale trade - Non-technical	1.9	1.3	1.0
Police officers (except commissioned)	0.9	0.9	0.9
Customer service, information and related clerks	...	1.1	0.9
Computer engineers (except software engineers)	1.0	1.1	0.9
Administrative officers	...	...	0.9
Financial managers	2.1	...	0.9
Technical sales specialists, wholesale trade/grain elevator operators	1.8	...	...
General practitioners and family physicians	1.8	...	...
College and other vocational instructors	1.1	0.9	...
Accounting and related clerks	1.1	...	...
Manufacturing managers	0.9	...	...
University professors	0.9	...	...
Commissioned officers, Armed Forces	0.9	...	...
User support technicians	..	1.1	...
Percentage working in top 3 occupations	11.7	11.6	10.5
Percentage working in top 10 occupations	27.8	27.5	26.1
Percentage working in top 25 occupations	47.9	45.7	44.4

.. not available for a specific reference period

... not applicable (not part of the top 25 occupations in that year)

Sources: Statistics Canada, Census of Population, 1991 and 2006; National Household Survey, 2011.

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clerks, university professors, and commissioned officers in the Armed Forces. These occupations were replaced by a number of occupations related to business and financial services (such as other financial officers, financial and investment analysts, and business development officers and marketing researchers and consultants).

As was the case among women, not all occupations in which university-educated men were employed necessarily required a university

degree. In 2011, 51% of men were employed in occupations normally requiring a university degree (compared with 56% among their female counterparts). Conversely, 15% were in occupations usually requiring a secondary school education or less (the same proportion as female graduates). The rest, 34%, were in occupations requiring a college education or in managerial occupations.

More gender differences among those who did not have a university degree

Among young workers aged 25 to 34 with a university degree, as many as 11 occupations were in the top 25 occupations of both men and women in 2011.

In contrast, gender differences were larger among those who did not have a university degree. Of the top 25 occupations held by men and women aged 25 to 34 in 2011,

Table 3 The 25 occupations employing the most women aged 25 to 34 without a university degree in 1991, 2006 and 2011

	1991	2006	2011
		percentage	
Retail salespersons and sales clerks	4.1	4.6	4.4
Early childhood educators and assistants	1.4	4.0	4.3
General office clerks	3.1	3.4	4.2
Cashiers	2.7	2.8	2.7
Retail trade managers	2.2	2.5	2.6
Food and beverage servers	2.8	2.6	2.6
Nurse aides, orderlies and patient service associates	1.6	2.4	2.5
Customer service, information and related clerks	0.9	2.7	2.5
Administrative officers	1.4	1.7	2.4
Receptionists and switchboard operators/Telephone operators	2.2	2.2	2.4
Registered nurses	3.7	2.4	2.3
Food counter attendants, kitchen helpers and related occupations	...	1.9	2.1
Hairstylists and barbers	1.6	1.8	1.9
Secretaries (except legal and medical)	7.9	2.6	1.8
Accounting and related clerks	4.3	2.3	1.7
Community and social service workers	...	1.3	1.6
Light duty cleaners	1.6	1.6	1.6
Other assisting occupations in support of health services	...	1.0	1.4
Customer service representatives - financial services	2.0	1.4	1.3
Licensed practical nurses	1.0	...	1.2
Restaurant and food service managers	...	1.1	1.2
Bookkeepers	1.5	0.9	1.1
Estheticians, electrologists and related occupations	...	...	1.1
Cooks	1.3	1.1	1.0
Visiting homemakers, housekeepers and related occupations	...	1.0	1.0
Administrative clerks	0.9	1.3	...
Elementary and secondary school teacher assistants	...	1.1	...
Data entry clerks	1.6	...	...
Babysitters, nannies and parents' helpers	1.3	...	...
Banking, insurance and other financial clerks	1.2	...	...
Legal secretaries	1.1	...	...
Sewing machine operators	1.0	...	...
Percentage working in top 3 occupations	16.3	12.0	12.9
Percentage working in top 10 occupations	35.0	30.0	30.6
Percentage working in top 25 occupations	54.4	51.7	53.0

... not applicable (not part of the top 25 occupations in that year)

Sources: Statistics Canada, Census of Population, 1991 and 2006; National Household Survey, 2011.

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just five were commonly shared by both. Of these five occupations, one—retail salespersons and sales clerks—employed the most men (3%) and women (4%).

Among women, the next two largest occupations were early childhood educators and general office clerks. Together with retail salespersons, the top 3 occupations employed 13% of all young women who did not have a degree (Table 3). Other significant occupations included

cashiers, retail trade managers, food and beverage servers, nurse aides, and customer service clerks.

Among men, the three largest occupations were retail salespersons, carpenters and truck drivers, which accounted for 9% of male workers without a university degree (Table 4). In this population, other significant occupations included automotive service technicians, retail trade managers, construction trades helpers, material handlers, electricians, cooks, and welders.

Some changes took place in the occupational profile of workers who did not have a university degree between 1991 and 2011, especially among women. In 1991, 12% of women without a university degree were employed as secretaries or accounting and related clerks. In 2011, these two occupations accounted for less than 4% of them.

Among men, things remained relatively more stable. Four of the five occupations that were at the top of the list in 1991 were still

Table 4 The 25 occupations employing the most men aged 25 to 34 without a university degree in 1991, 2006 and 2011

	1991	2006	2011
		percentage	
Retail salespersons and sales clerks	2.7	3.3	3.3
Carpenters	1.9	2.2	2.7
Truck drivers	3.3	3.8	2.7
Automotive service technicians, truck and bus mechanics and mechanical repairers	2.4	2.5	2.4
Retail trade managers	3.2	2.4	2.4
Construction trades helpers and labourers	1.9	2.1	2.3
Material handlers	1.9	2.3	2.2
Electricians (except industrial and power system)	0.9	1.2	1.8
Cooks	1.1	1.3	1.6
Welders and related machine operators	1.3	1.7	1.6
Shippers and receivers	1.4	1.5	1.3
Security guards and related occupations	...	1.0	1.3
Customer service, information and related clerks	...	1.3	1.2
Heavy equipment operators (except crane)	1.0	1.1	1.2
Janitors, caretakers and building superintendents	1.8	1.3	1.2
Delivery and courier service drivers	1.4	1.2	1.1
Police officers (except commissioned)	0.9	0.9	1.1
Grocery clerks and store shelf stockers	...	...	1.0
Plumbers	...	...	1.0
Landscaping and grounds maintenance labourers	...	1.0	1.0
Computer network technicians	..	...	1.0
Other ranks, Armed Forces	1.3	...	1.0
Farmers and farm managers	1.8	1.0	0.9
Construction millwrights and industrial mechanics/Textile machinery mechanics and repairers	1.1	0.9	0.9
Restaurant and food service managers	0.9	0.9	0.9
Sales representatives wholesale trade - Non-technical	1.6	1.1	...
Information systems analysts and consultants	..	1.0	...
User support technicians	..	1.0	...
Computer programmers and interactive media developers	..	1.0	...
Electronic service technicians - household and business equipment	1.2	...	...
General farm workers	1.1	...	...
Machinists, machining and tooling inspectors	0.8	...	...
Heavy-duty equipment mechanics	0.7	...	...
Sales marketing and advertising managers	0.7	...	...
Percentage working in top 3 occupations	9.2	9.6	8.7
Percentage working in top 10 occupations	22.5	23.1	23.0
Percentage working in top 25 occupations	38.3	39.0	39.1

.. not available for a specific reference period

... not applicable (not part of the top 25 occupations in that year)

Sources: Statistics Canada, Census of Population, 1991 and 2006; National Household Survey, 2011.

among the top 5 in 2011. They were retail salespersons and sales clerks; truck drivers; automotive service technicians; truck and bus mechanics and mechanical repairers; and retail trade managers. Almost 11% of the working men were employed in these four occupations in 2011 (compared with 12% in 1991).

Share of female workers rising in occupations held by university graduates

Since the share of female university graduates rose over the period, the proportion of women in occupations held by university graduates naturally rose. Which ones had the largest increases? To study the changes in gender composition, occupations held by young workers aged 25 to 34 were regrouped into three categories:

- 1) those in the top 25 occupations for both men and women
- 2) those in the top 25 occupations for women only
- 3) those in the top 25 occupations for men only.

In general, women made significant gains in occupations held by university graduates (Table 5). Hence, within occupations shared by both male and female graduates (the first category), the proportion of women in sales, marketing and advertising managers rose by 17 percentage points over the period (from 35% to 52%). It also increased significantly among lawyers (16 percentage points); retail trade managers (15 percentage points); financial auditors and accountants (14 percentage points); and secondary school teachers (11 percentage points).

Gains were even larger in the second category of occupations (those appearing only in the top 25 occupations held by female university graduates). For example, the proportion of female workers who were health policy researchers, consultants and program officers rose by nearly 30 percentage points over the period. Women made a gain of 21 percentage points among specialists in human resources. The proportion of women among general practitioners and family physicians also rose over the period, by a margin of 19 percentage points (from 43% to 62%). Occupations that had the fewest changes were those that already had a high portion of females in 1991 (such as registered nurses and early childhood educators).

Gains were also made by females in the third category (those appearing only in the top occupations held by male graduates), albeit by lower margins. Notable gains occurred among civil engineers (15 percentage points) and police officers (14 percentage points). However, gains were more muted in a few occupations that had a lower female representation, especially engineering (electrical engineers, mechanical engineers and computer engineers). Hence, female workers still represented less than 20% of the university-educated workforce in these three occupations in 2011.¹⁰

Among occupations that were held by workers who did not have a university degree, the proportion of women increased in some occupations, but declined in others (Table 6).

Taking the five occupations that were shared by both men and women as an example (first category), the proportion of female workers increased among retail trade managers (9 percentage points) and restaurant and food service managers (7 percentage points), but declined among cooks (-18 percentage points) and customer service clerks (-11 percentage points).

The top female-only occupations (second category) already had a relatively high percentage of female workers in 1991. As a result, rather than gaining women, many occupations lost women over the period. For example, the proportion of women declined by 15% among customer service representatives—financial services (from 95% to 79%), and by 13 percentage points among food counter attendants and kitchen helpers (from 79% to 65%).

The top male-only occupations (the third category) had a small share of women to begin with—less than 25% in nearly all cases. In these occupations, the only noticeable increase over the period occurred among police officers, which increased their share of women by 11 percentage points (from 13% to 24%). Some of these occupations lost ground even further. Examples include grocery clerks (from 38% to 32%) and other rank members in the Armed Forces (from 15% to 12%).¹¹

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Table 5 Share of women, top 25 occupations held by men and women with a university degree, 1991 and 2011

	Rank in 2011		Share of women		Change (1991 to 2011)
	Women	Men	1991	2011	
	out of 25		percentage		percentage point
Top occupations shared by men and women					
Sales, marketing and advertising managers	13	10	34.5	51.7	17.2
Lawyers and Quebec notaries	11	11	42.1	57.6	15.5
Retail trade managers	16	12	34.8	50.1	15.3
Financial auditors and accountants	4	2	40.1	54.1	14.0
Secondary school teachers	3	3	55.6	66.2	10.6
Business development officers and marketing researchers and consultants	17	17	48.5	57.5	9.0
Retail salespersons and sales clerks	8	8	46.4	53.9	7.4
Postsecondary teaching and research assistants	10	6	45.5	50.0	4.5
Elementary school and kindergarten teachers	1	5	82.7	85.1	2.4
Professional occupations in business services to management	25	19	47.5	49.5	2.0
Customer service, information and related clerks	19	22	65.8	62.0	-3.8
Top occupations, women only					
Health policy researchers, consultants and program officers	24	...	47.3	76.0	28.7
Specialists in human resources	14	...	57.3	77.8	20.5
General practitioners and family physicians	22	...	42.9	61.5	18.6
Food and beverage servers	20	...	57.0	74.1	17.1
General office clerks	5	...	69.3	82.9	13.6
Social workers	9	...	78.1	90.2	12.1
Community and social service workers	7	...	69.2	80.9	11.7
Administrative officers	6	...	66.0	74.6	8.6
Accounting and related clerks	23	...	63.1	70.5	7.4
Pharmacists	21	...	65.1	70.3	5.2
Professional occupations in public relations and communications	12	...	69.1	74.1	5.0
College and other vocational instructors	18	...	60.2	65.1	4.9
Early childhood educators and assistants	15	...	96.4	96.3	-0.1
Registered nurses	2	...	95.1	92.4	-2.7
Top occupations, men only					
Civil engineers	...	9	11.0	25.6	14.6
Police officers (except commissioned)	...	21	19.7	34.1	14.4
Financial managers	...	25	34.6	46.2	11.6
Sales representatives wholesale trade - Non-technical	...	20	30.4	40.8	10.4
Electrical and electronics engineers	...	13	8.9	17.2	8.3
Other financial officers	...	14	29.6	37.5	7.9
Mechanical engineers	...	7	5.5	12.3	6.8
Banking, credit and other investment managers	...	18	37.4	42.6	5.2
Computer engineers (except software engineers)	...	23	12.2	17.3	5.1
Financial and investment analysts	...	16	38.4	43.4	5.0
Computer programmers and interactive media developers	...	1	..	14.4	..
Information systems analysts and consultants	...	4	..	26.1	..
Software engineers and designers	...	15	..	15.1	..

.. not available for a specific reference period

... not applicable (not part of the top 25 occupations in that year)

Sources: Statistics Canada, Census of Population, 1991 and 2006; National Household Survey, 2011.

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Table 6 Share of women, top 25 occupations held by men and women without a university degree, 1991 and 2011

	Rank in 2011		Share of women		Change (1991 to 2011)
	Women	Men	1991	2011	
	out of 25		percentage		percentage point
Top occupations shared by men and women					
Retail trade managers	5	5	36.0	45.2	9.2
Restaurant and food service managers	21	25	43.4	50.4	7.0
Retail salespersons and sales clerks	1	1	55.8	50.5	-5.3
Customer service, information and related clerks	8	13	71.9	61.1	-10.8
Cooks	24	9	50.2	32.7	-17.5
Top occupations, women only					
Nurse aides, orderlies and patient service associates	7	...	77.6	85.9	8.3
Other assisting occupations in support of health services	18	...	82.7	90.0	7.3
Community and social service workers	16	...	73.3	76.4	3.1
Hairstylists and barbers	13	...	87.4	90.4	3.0
General office clerks	3	...	84.0	86.7	2.7
Early childhood educators and assistants	2	...	96.5	97.5	1.0
Licensed practical nurses	20	...	92.3	93.0	0.7
Administrative officers	9	...	82.3	82.2	-0.1
Accounting and related clerks	15	...	86.3	86.1	-0.2
Registered nurses	11	...	93.9	92.0	-1.9
Secretaries (except legal and medical)	14	...	99.1	97.1	-2.0
Light duty cleaners	17	...	67.3	64.6	-2.7
Receptionists and switchboard operators/Telephone operators	10	...	95.6	92.6	-3.0
Visiting homemakers, housekeepers and related occupations	25	...	91.7	87.8	-3.9
Estheticians, electrologists and related occupations	23	...	96.5	92.4	-4.1
Bookkeepers	22	...	93.8	88.2	-5.6
Food and beverage servers	6	...	81.9	75.7	-6.2
Cashiers	4	...	92.0	84.3	-7.7
Food counter attendants, kitchen helpers and related occupations	12	...	78.7	65.4	-13.3
Customer service representatives - financial services	19	...	94.6	79.3	-15.3
Top occupations, men only					
Police officers (except commissioned)	...	17	13.0	24.4	11.4
Shippers and receivers	...	11	16.7	19.6	2.9
Heavy equipment operators (except crane)	...	14	1.8	3.9	2.1
Material handlers	...	7	9.1	10.8	1.7
Truck drivers	...	3	2.4	3.6	1.2
Construction millwrights and industrial mechanics/Textile machinery mechanics and repairers	...	24	1.3	2.4	1.1
Plumbers	...	19	0.8	1.9	1.1
Welders and related machine operators	...	10	3.2	4.1	0.9
Automotive service technicians, truck and bus mechanics and mechanical repairers	...	4	0.9	1.6	0.7
Electricians (except industrial and power system)	...	8	1.6	2.2	0.6
Carpenters	...	2	1.6	2.2	0.6
Delivery and courier service drivers	...	16	7.0	7.1	0.1
Construction trades helpers and labourers	...	6	5.3	5.2	-0.1
Janitors, caretakers and building superintendents	...	15	24.8	24.4	-0.4
Landscaping and grounds maintenance labourers	...	20	14.4	13.5	-0.9
Security guards and related occupations	...	12	20.8	19.4	-1.4
Farmers and farm managers	...	23	22.3	19.2	-3.1
Other ranks, Armed Forces	...	22	14.8	11.5	-3.3
Grocery clerks and store shelf stockers	...	18	38.0	31.7	-6.3
Computer network technicians	...	21	..	13.4	..

.. not available for a specific reference period

... not applicable (not part of the top 25 occupations in that year)

Sources: Statistics Canada, Census of Population, 1991 and 2006; National Household Survey, 2011.

Gender segregation higher among those without a university degree

To study gender differences across all occupations, a 'segregation index' can be calculated.¹² The segregation index (see *Data sources, methods and definitions*) can be interpreted as the percentage of women (or men) that would have to switch occupations for the occupational distribution of men and women to be the same (i.e., 50% of men and women in all occupations).

Because gender differences were more significant among non-graduates, the segregation index was higher among those who did not have a university degree (Table 7). In 1991, non-graduate workers had a segregation index of 61.8, meaning that 62% of women (or men) would have had to switch occupations to have a 50/50 share of men and women in every occupation. In 2011, the index fell by nearly 4 percentage points, to 58.2.¹³

Among university graduates, 39% of women (or men) with a university degree would have had to switch occupations to achieve a 50/50 gender balance in all occupations in 2011. This supports the view that men and women with a university degree were more alike in their occupational profile. Similar results were found in 1991 (40%).

Changes in the segregation index can be attributed to two factors. The first is the 'sex composition effect'—the extent to which women (or men) are entering occupations dominated by the opposite sex. The second is the 'occupation mix effect'—the extent to which an occupation expanded (or declined) as a proportion of the total.

Of the 3.6 point decline in the segregation index of non-graduates between 1991 and 2011, 3.0 points were due to changes in the sex composition effect (reflecting the move by men into female-dominated occupations, and by women into

male-dominated occupations). Just 0.6 points were due to the change in the occupation mix.

Among the university-educated, even though the index changed little over the period, the sex composition effect and the occupation mix effect worked in opposite directions. As women made gains in male-dominated occupations over the period, the sex composition effect pushed the segregation index down by 2.4 points. However, changes in the occupation mix pushed the index upward by 1.3 points. This indicates that the occupational profile of male and female graduates became more characterized by occupations that have a relatively strong degree of female or male concentration.

Conclusion

Over the last two decades, the educational attainment of Canadians, and especially Canadian women, rose significantly. These changes, however, did not necessarily lead to systematic changes in the occupational profile of men and women. In 2011, as in 1991 and 2006, at least 20% of all university-educated working women aged 25 to 34 were employed in three occupations: elementary school and kindergarten teachers, registered nurses, and secondary school teachers. In contrast, men were less concentrated, with 11% of male university graduates in the three occupations employing the most men in 2011.

Table 7 Decomposition of overall changes in occupational segregation in 1991 and 2011

	Without a university degree	With a university degree
	index	
Segregation index		
1991	61.8	39.7
2011	58.2	38.6
Change	-3.6	-1.1
	points	
Decomposition		
Sex composition	-3.0	-2.4
Occupation mix	-0.6	1.3

Sources: Statistics Canada, Census of Population, 1991; National Household Survey, 2011.

Changes in the occupational profile of young men and women in Canada

Among those who did not have a university degree, there were significant changes among women, but less so among men. In 1991, secretaries and accounting and related clerks together employed 12% of women without a university degree. By 2011, this proportion fell to less than 4%. With the exception of retail salespersons and sales clerks, the occupational profiles of men and women without a university degree

were largely different, at least when compared with the profiles of men and women with a university degree.

Between 1991 and 2011, many gains were made by female university graduates, as the share of female workers increased in the vast majority of occupations. A different story emerged among those who did not graduate from university: some occupations that already employed a large portion of women

became less female-dominated, and many occupations employing the most men retained a high portion of male workers. However, gender segregation measures remained higher for non-university graduates than for university graduates in 2011.

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Data sources, methods and definitions

Data sources

Data from the 2011 National Household Survey (NHS) and census data from 1991 and 2006 were used in the study. The study covered employed men and women aged 25 to 34. In the NHS, a random sample of 4.5 million dwellings was selected, accounting for almost 30% of all private dwellings in Canada (but it excluded persons living in institutional collective dwellings such as hospitals, nursing homes and penitentiaries; Canadian citizens living in other countries; and full-time members of the Canadian Forces stationed outside Canada). The overall response rate for the NHS, a voluntary survey, was 68.6%. The final responses are weighted so that the data from the sample accurately represent the NHS' target population.

The census is conducted every five years. All households receive the short form, which asks for basic information only. Prior to 2011, a 20% sample of households received the long form which, in addition to the basic information, also asked more detailed questions on matters including labour market activities.

The choice of using the census and NHS data is motivated by the fact that this paper focuses only on men and women aged 25 to 34. Other sources with a smaller sample, such as the Labour Force Survey, would not allow for a detailed analysis of the occupational mix among young graduates and non-graduates.

Methods

Following the method first developed by Duncan and Duncan (1955), the index of segregation can be defined as

$$S_t = (0.5) \sum_i |m_{it} - f_{it}|$$

where m_{it} (f_{it}) is the proportion of all working males (females) who are employed in occupation i at time t . This index is usually expressed as a percentage and indicates the proportion of women (or men) that would have to change occupations to have the occupation distribution of men and women be the same. A value of zero implies complete integration, while a value of 100 means complete segregation.

To study changes in segregation over time, it is helpful to decompose the index into the sex composition effect (change due to changes in sex composition within occupations) and occupation mix effect (change in the relative size of occupations).¹ The segregation index at time t can be expressed as

$$S_t = (0.5) \sum_i |(q_{it} T_{it} / \sum_i q_{it} T_{it}) - (p_{it} T_{it} / \sum_i p_{it} T_{it})|$$

where p_{it} (q_{it}) is the percentage of women (men) in occupation i at time t . T_{it} is the total employment for occupation i at time t . To study the changes in segregation between time periods 1 and 2, the decomposition can be carried out as follows:

$$\text{sex composition effect} = [(0.5) \sum_i |(q_{i2} T_{i1} / \sum_i q_{i2} T_{i1}) - (p_{i2} T_{i1} / \sum_i p_{i2} T_{i1})|] - S_1$$

$$\text{occupation mix effect} = S_2 - [(0.5) \sum_i |(q_{i2} T_{i1} / \sum_i q_{i2} T_{i1}) - (p_{i2} T_{i1} / \sum_i p_{i2} T_{i1})|]$$

To allow for the construction of the index, consistent occupational groups had to be defined for the entire period, meaning some of the four-digit occupations had to be regrouped.²

Data sources, methods and definitions (continued)

Definitions

Employed: A person is considered employed if he or she had a job in the reference week (week preceding the census/survey)—includes persons who were temporarily absent for the entire week because of vacation, illness, a labour dispute at work, maternity/parental leave, bad weather, fire or family responsibilities, or for some other reason.

Occupations: Occupation classifications are based on the four-digit National Occupational Classification (NOC), according to the following:

- 2011 NHS and 2006 Census: Occupations based on NOC 2006 (Human Resources and Skills Development Canada)
- 1991 Census: Occupations based on NOC 1990 (Human Resources and Skills Development Canada).

Some occupations were reclassified over time. For example, among computer and information systems professionals, there were five occupations in 2011: information systems analysts and consultants; database analysts and data administrators; software engineers and designers; computer programmers and interactive media developers; and web designers and developers. In 1991 there were two occupations: computer systems analysts and computer programmers.

Notes

1. This technique was first developed by Fuchs (1975) and subsequently used by many researchers, including Blau and Hendricks (1979) and Blau et al. (2013).
2. In 2011, information systems analysts and consultants; database analysts and data administrators; software engineers and designers; computer programmers and interactive media developers; and web designers and developers were combined to create one group. The corresponding group for 1991 was formed by combining computer systems analysts and computer programmers. Also in 2011, the following occupational groups that were excluded as comparable categories could not be found in 1991: construction estimators; computer network technicians; user support technicians; systems testing technicians; casino occupations; machine operators; and mineral and metal processing. Similarly, the following were excluded from 1991: records and file clerks; computer operators; and elemental medical and hospital assistants. These occupations represented a very small proportion of the overall group of workers in both years.

Notes

1. See Ferguson and Zhao (2013).
2. See Fortin and Huberman (2002).
3. See Uppal and LaRoche-Côté (2014) for an analysis of the proportion of women working as professionals and a study of overqualification among recent university graduates.
4. In 2011, 4.7% of women and 3.3% of men considered themselves retail salespersons. See Statistics Canada (2013).
5. See Scoffield (2013).
6. Boyd (1990) provides a detailed analysis of gender differences in occupational skills using data from the 1961, 1971, 1981 and 1986 Census of Population.
7. Large occupational groupings could be used, but are too heterogenous in certain cases and difficult to interpret.
8. The proportion of nurses correspondingly decreased among those without a university degree, because registered nurses became more likely to hold a university degree over time. See Allen et al. (2007) for details.
9. See *Data sources, methods and definitions*.
10. This is not a surprise, as women remain less likely than men to participate in computer science and engineering programs at university. See Hango (2013).
11. Non-officer members of the Armed Forces.
12. See Blau et al. (2013). The segregation index is discussed in more detail in *Data sources, methods and definitions*.
13. Boyd (1990) found that the index in non-farm occupations among adults declined from 66.5 in 1971 to 57.5 in 1986, meaning that most of the changes in the segregation index took place in the 1970s and 1980s. Because of changes in occupational classification systems, comparisons between 1971 and 2011 are not possible.

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