

89N0006

c.2

Employment Equity Data Program

Programme statistique sur l'équité en matière d'emploi

C.2

LABOUR FORCE ENTRANTS AND OCCUPATIONS (1.17)

STATISTICS STATISTIQUE
CANADA CANADA

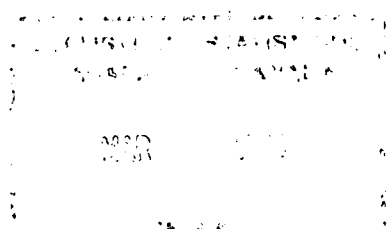


Statistics
Canada

Statistique
Canada

Canada

LABOUR FORCE ENTRANTS AND OCCUPATIONS
(1.17)



A report prepared for the
Interdepartmental Working Group on Employment Equity Data

by

Daniel Boothby
4582, rue Jeanne-Mance
Montreal (Quebec)
H2V 4J7
(514) 843-5295

December 1993



ACKNOWLEDGEMENTS

It would not have been possible to carry out this study without the enthusiastic cooperation I received from the individuals involved in building, updating and maintaining the COPS model. In particular, I would like to thank Luc Séguin, George Jaremek and Wayne Roth of LMOSA, SPP, Human Resources Development Canada and Janet Smith of Ivation Datasystems. Any errors of fact or interpretation which remain despite their guidance are, of course, the sole responsibility of the author.



TABLE OF CONTENTS

Executive Summary	1
Introduction	3
Projections	7
A) Scenarios used	7
B) Projections: Scenarios I, IA and IB	9
C) Entrants by Employment Equity Occupational Category	10
D) Detailed Occupational Distributions	13
E) Summary for Scenarios I, IA and IB	15
F) Scenario II	16
G) Fields of Study: Scenarios I and II	19
Summary of Findings	25
Implications of Employment Equity Policy	27
Appendix A	29
Figure 1. Simplified schematic of the COPS student flow model for a level of schooling	4
Table 1. Historic and projected rates by sex by level of postsecondary education	8
Table 2. Distribution by Employment Equity occupational category of postsecondary graduates entering the labour force in 2001, by sex	11
Table 3. Occupational distribution of community college and undergraduate entrants in the professional and technical categories	14
Table 4. Distribution by Employment Equity occupational categories of labour force entrants from community college and undergraduate programs, by sex	17
Table 5. Detailed occupational distribution for labour force entrants by sex	18
Table 6. Distribution by field of study of labour force entrants by sex	21
Table A1. Percentage distribution of female and male full-year full-time workers in in 1985 by occupational category in 1986	30

EXECUTIVE SUMMARY

This study reports projections for the year 2001 of the flows into occupations of women and men who will have completed a postsecondary degree or certificate in 2001. These projections were prepared using a modified version of the Canadian Occupational Projections System (COPS) Student Flow model, in which the student-age population, enrolment rates at various levels of postsecondary education, fields of study at various levels of postsecondary education, and the structure of flows from fields of study to occupations had different values for women and men.

The principal findings of this study can be summarized as follows. At the university level, the immense majority of graduates, male and female, will find jobs in occupations in the Employment Equity managerial, professional and technical categories in 2001, as they did in 1989. The percentages of female and male university graduates entering these occupational categories are quite similar. There is no significant change by giving women men's structure of fields of study or men's structure of flows into occupations from fields of study, or by projecting women's and men's structures of fields of studies forward to 2001, based on past trends.

Breaking the Employment Equity professional occupational category down into more detailed occupations shows significant differences in the occupational distributions of women and men graduating from undergraduate courses of study and entering professional occupations. Giving undergraduate women male undergraduates' field of study structure eliminates these differences. Neither giving undergraduate women men's structure of flows from fields of study to occupations, nor projecting trends in women's and men's field of study structures forward to 2001, affects the differences between the detailed occupational structures of female and male undergraduates entering professional occupations.

At the community college level, 40% of women labour force entrants enter professional occupations, compared to 20% of men. This disproportion is essentially due to a large number of graduates with nursing diplomas, almost all of whom are women. About a quarter of all female community college graduates who enter the labour force go into clerical occupations; about a quarter of all male community college graduates who enter the labour force go into skilled, semi-skilled and other manual occupations.

A detailed examination of the occupational distributions of female and male community college graduates who enter professional and technical occupations again shows a considerable degree of gender segregation. As is the case for undergraduates, giving female community college graduates men's field of study structure eliminates the difference between the detailed occupational distributions of female and male community college graduates.

The choice of field of study is thus the key variable in explaining differences in the detailed occupational distributions of female and male labour force entrants from postsecondary education. A much larger percentage of men than women study in community college and undergraduate programs in architecture and engineering, mathematics and related fields (such

as computer science) and in physical sciences. Men are far more likely than women to enter professional and technical occupations in these fields. A far greater percentage of women than men study nursing and teaching, and a greater proportion of women enter professional and technical occupations in these fields.

How one views these findings depends on one's view of the aim of Employment Equity policy. If this policy aims at equality between women and men in the percentage of labour force entrants going into managerial, professional and technical occupations, this equality is already attained. If the goal is equality for detailed occupations, not only does considerable gender segregation exist for professional and technical occupations, but this segregation shows no sign of decreasing significantly.

The reason for the persistence of sex segregation among entrants in professional and technical occupations lies in women's and men's choices of fields of study. One would like to know a good deal more about why women enrol in the fields of study they choose. Is it because they foresee restraints on their labour market activity due to family responsibilities? Or because they anticipate discrimination on the basis of sex in certain occupations? Or both? Or other reasons?

This study has considered only the occupations entered by female and male graduates from postsecondary schooling. Other Employment Equity designated groups are not considered, because the necessary data is not available. Other levels of schooling are not examined, because the COPS model does not predict for these levels. In Appendix A, however, 1986 Census data is used to provide rough estimates of the occupational distributions of female and male labour force entrants from all levels of schooling.

The key to extending the COPS model to the other designated groups is collecting Community College Student Information System (CCSIS) and University Student Information System (USIS) data on the basis of the employment equity designated groups. The reason for this is twofold: first, this data serves directly as an input into the COPS model. Second, the data collected by CCSIS and USIS serves to construct the sample for the National Graduates Survey, which is used to derive the structure of flows from fields of postsecondary study into occupations. If CCSIS and USIS data were collected on the basis of designated groups, the National Graduates Survey could sample enough graduates from designated groups to arrive at estimates useable in the COPS model.

INTRODUCTION

This study reports projections for the year 2001 of the flows into occupations of women and men who will have completed a postsecondary degree or certificate in 2001. These projections were prepared using a modified version of the Canadian Occupational Projections System (COPS) Student Flow Model; consequently, the first section of this report discusses the structure of the model and its data sources. The second section presents the projections; the third and final section considers their implications for employment equity policy, and discusses the data requirements for preparing similar projections for other employment equity designated groups.

Figure 1 presents a highly simplified schematic diagram of the structure of the COPS Student Flow Model. As shown, enrolments at a given level of postsecondary education are projected by applying an enrolment rate to the projected population in the relevant age group. A graduation rate for the given level of study is then applied to the enrolment levels (suitably lagged) to produce the number of graduates from the level of study in a particular year.

In the next step, these graduates are assigned to a field of study using different field of study shares for each level of postsecondary education. The resulting projections of graduates by field of study are then adjusted to allow for graduates who continue their education and for those who do not continue their education but do not enter the labour force; the outcome of these adjustments is the number of graduates entering the labour force by level of postsecondary education by field of study.

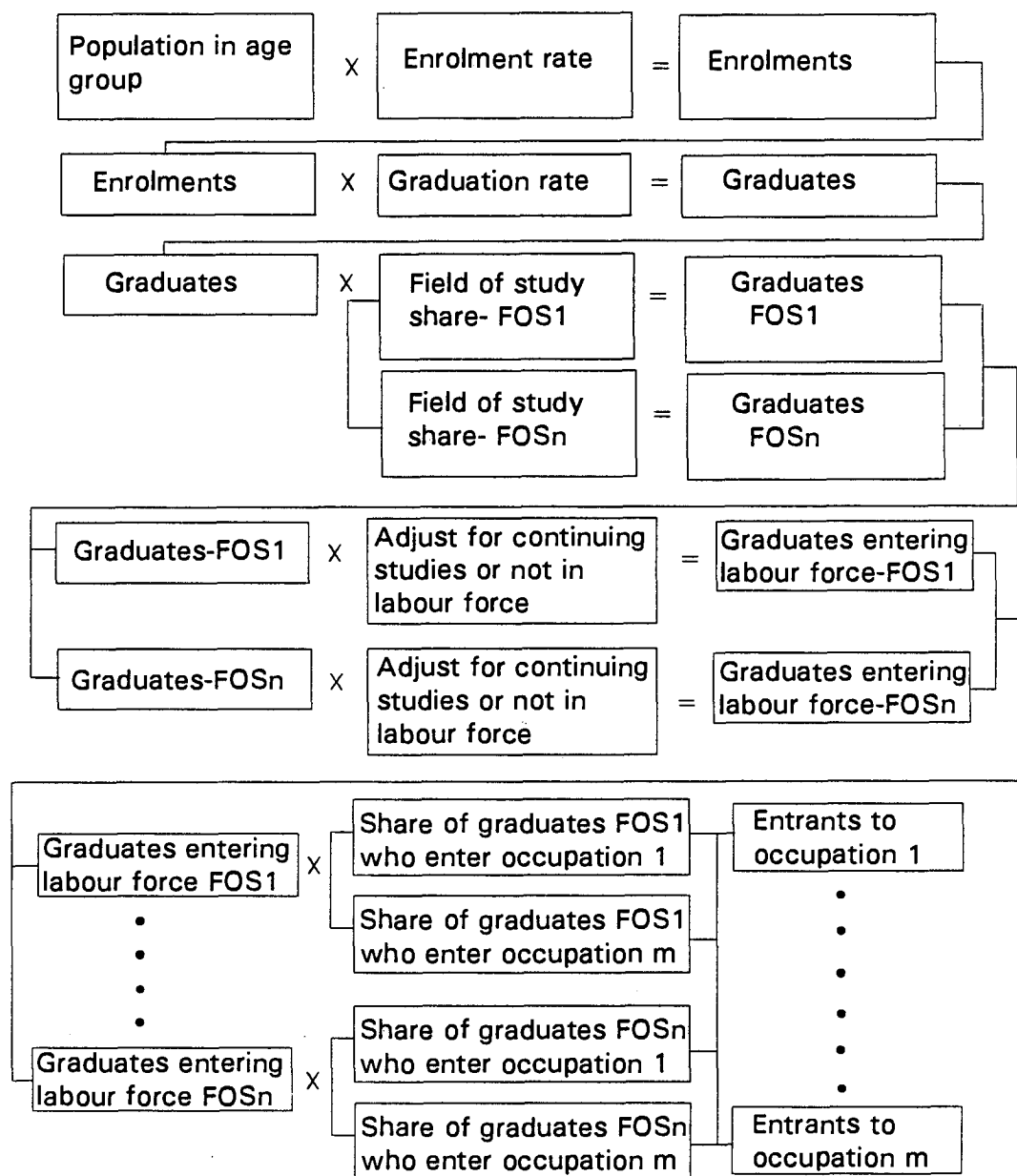
Finally, each group of graduates entering the labour force is allocated to detailed occupations using different occupational shares for each level of education and field of study. Within each level of education, the resulting numbers of entrants into an occupation are summed across fields of study to produce projections of flows into occupations by sex for each level.

There are three levels of postsecondary education used here: community college career programs, undergraduate diploma and certificate programs and undergraduate degree programs. These levels produce the majority of postsecondary graduates entering the labour force. There are fifty-five fields of study in the COPS Student Flow Model at the community college level, and fifty-eight fields of study at the university level. These fields of study are aggregations of the Community College Students Information System (CCSIS) and University Students Information System (USIS) classification structures.¹

¹ The details of this aggregation are given in Employment and Immigration Canada, The COPS Student Flow Model, Hull (Quebec), Strategic Policy and Planning, Employment and Immigration Canada, 1987.

Figure I

Simplified schematic of the COPS student flow model for a level of schooling



As stated above, this brief description of the COPS model greatly simplifies its actual structure. For instance, in the COPS model, university enrolments are predicted by sex, but the two sexes are combined in calculating the flows from fields of study to occupations. The projections by sex reported below were produced by entering separate values for women and men for population levels, enrolment rates, field of study shares, and occupational shares by field of study for each level of postsecondary education. The model was then used to predict for one sex at a time. The many other variables used in the model remained unchanged.

The population data used in the Student Flow Model is prepared by the Statistics Canada Demography Division for COPS. Information on enrolment rates, graduation rates and field of study shares comes from Statistics Canada CCSIS and USIS data. The field of study to occupation shares are computed using National Graduates Survey (NGS) data. The same data sources and methods of data treatment were used in computing these variables for women and men for this study as are used in producing the Student Flow Model.



PROJECTIONS

a) Scenarios used

Two types of values for variables were used in preparing the different sets of projections reported below: historic values and predicted future values. Historic values are the values of the variables for a given group in a given year; predicted values are values predicted for future years on the basis of an analysis of past values.

The four sets of variables whose values in the COPS model are modified to produce our projections by sex are: population levels, enrolment rates, field of study shares, and occupational shares for fields of study. The population levels used for the projections are predicted values of the size of the Canadian population in the relevant age-sex groups in the years 1997 to 2000. These population projections were prepared for COPS by the Demography Division, Statistics Canada.

Both historic and predicted values of enrolment rates are used, depending on the projection scenario. The historic values of enrolment rates for women and men for the various levels of postsecondary education are the values for 1989, calculated using Statistics Canada population information and CCSIS and USIS enrolment data.

The predicted values of enrolment rates are the result of extrapolating the average compounded annual growth rates of women's and men's enrolment rates from 1981 to 1989 to future years. These predicted values were prepared for undergraduate university level enrolment rates only, as there is not a long enough series of overall enrolment rates for community colleges to permit analysis of trends.

Table 1 shows historic enrolment rates for 1981 and 1989 and predicted enrolment rates for the period 1997-2000. The period 1997-2000 is shown because it is enrolments in these years which produce graduates in 2001 in the COPS model.²

² The Student Flow Model divides undergraduate university enrolments between degree programs and diploma and certificate programs on the basis of fixed shares; graduate university enrolments are allocated among graduate diploma and certificate programs, master's degree programs, and doctoral programs by the same method. The university enrolment rate data cover the period 1981-1989; overall community college enrolment rate data were available only for 1987-1989.

Table 1. Historic and projected enrolment rates by sex by level of postsecondary education

Postsecondary level	Year					
	1981	1989	1997 ⁴	1998 ⁴	1999 ⁴	2000 ⁴
Non-university¹						
Female	na	.011	na	na	na	na
Male	na	.088	na	na	na	na
University-Undergraduate²						
Female	.118	.202	.344	.368	.393	.400
Male	.133	.180	.223	.229	.235	.242
University-Graduate³						
Female	.019	.028	.046	.049	.053	.056
Male	.033	.040	.055	.058	.060	.063

¹ Postsecondary non-university enrolments of women or men divided by the population of women or men 17-24 years old.

² Undergraduate enrolments of women or men divided by the population of women or men 18-23 years old.

³ Graduate enrolments of women or men divided by the population of women or men 23-26 years old.

⁴ Projected values.

Historic and predicted values of field of study shares are also used. The historic field of study shares are those of female and male graduates in 1989, calculated using CCSIS and USIS data. The predicted values of field of study shares are produced from a trend regression for each share, adjusted to force the sum of shares for each sex-level of study group to 1. (The adjustment was always very small.) The data used for these regressions are CCSIS and USIS data for the period 1977-1989.

Historic values are used throughout for the proportions of female and male labour force entrants from each field of study, level of study and sex entering the various occupations. These values are calculated from data in the 1988 NGS, which surveyed 1986 postsecondary graduates two years after their graduation.

The projection scenarios used are as follows:

- I. Prepared for women and men at the community college and undergraduate level.

Enrolment rates for women and men for each level of study are at their 1989 levels.

Field of study shares are at their 1989 levels for women and men at each level of study.

Occupational shares for female and male labour force entrants from each field of study at each level of study are at their 1988 levels.

- Ia. Prepared for women at the community college and undergraduate levels only. As in I, except that the field of study shares assigned to women are those for men in 1989, not those of women.
- Ib. Prepared for women at the community college and undergraduate levels only. As in I, except that the occupational shares for fields of study assigned to women are those for men in 1988, not those of women.
- II. Prepared for women and men at the community college and undergraduate levels only.

Community college enrolment rates are the 1989 rates for women and men. Undergraduate enrolment rates are the predicted rates for women and men for 1997 to 2000.

Field of study shares for women and men are those predicted using trend regressions.

Occupational shares for fields of study are those observed in the 1988 NGS.

In the tables reporting the projections, the scenario used for each column of data is given by the Roman numeral at the head of the column, and brief descriptions of the scenarios appear following the table.

b) Projections: Scenarios I, Ia, Ib

Scenario I is a baseline set of projections for graduates entering the labour force in 2001. In this scenario, women's and men's enrolment rates, field of study shares, and occupational shares by field of study are set to historic values. In other words, this scenario shows what the flows of women and men in occupations will be in 2001 if their enrolment rates, choices of field of study, and flows from field of study to occupations continue as they were in the late 1980s.

The projections on the basis of Scenario I show significant differences in the distribution of women and men entering the labour force by Employment Equity occupational categories, and show striking differences in the occupational distributions of female and male entrants within the Employment Equity professional and technical occupational categories. Scenarios Ia and Ib explore the sources of these differences.

In Scenario Ia, women have the same enrolment rates as in Scenario I, and their flows from fields of study to occupational categories are as in Scenario I. The distribution of women

graduates by field of study in 2001 is assumed to be the same as men's distribution in 1989, however. Thus, Scenario Ia examines the flow of women graduates into occupations in 2001 under the assumption that all remains as in 1989 for women, except that changes in women's choice of field of study have made their distribution by field of study identical to that of men.

Scenario Ib assumes that all is the same for women as in 1989, except that women's flows from fields of study to occupations are those of men in 1989. Scenarios Ia and Ib thus explore the relative contribution of two factors to overall differences between women and men in flows into occupations. These factors are: differences between women and men in choice of field of study, and differences between women and men in flows from fields of study to occupations.

c) Entrants by Employment Equity Occupational Category

Table 2 shows the occupational distribution by Employment Equity occupational category of female and male postsecondary graduates entering the labour force in 2001 and the proportion of women among total entrants in each category by level of study. Table 2 also shows the occupational distribution of women graduates from the community college and undergraduate levels for Scenarios Ia and Ib.

There are large differences in the occupational distribution of female and male community college graduates in Scenario I. Female community college graduates are far more likely to enter professional or clerical occupations than men. Male community college graduates are far more likely than women to enter blue collar occupations (crafts, semi-skilled and other manual). As the detailed examination of flows into professional occupations in Table 3 will show, the predominance of women in the flow into professional employment (71% of all community college graduates entering professional employment) is due to the very large number of graduates of nursing diploma programs, almost all of whom are women.

Table 2. Distribution by Employment Equity occupational category of postsecondary graduates entering the labour force in 2001, by sex

	SCENARIO				
	I	I	I	Ia	Ib
Employment Equity Occupational category	% of women	% of men	women as % of total	% of women	% of women
Community College (diploma or certificate)					
Managers (1,2)*	8	10	49	12	12
Professionals (3)	40	20	71	22	39
Technicians (4)	15	19	49	22	14
Supervisors and forewomen/men (5,6)	1	3	35	2	2
Clerical (7)	24	7	81	19	11
Sales (8)	3	7	39	6	5
Service (9)	6	7	49	6	8
Skilled crafts (10)	< 1	14	5	5	3
Semi-skilled (11)	< 1	5	12	2	2
Other manual (12)	2	8	20	5	5
Total	100	100	55	100	100
Undergraduate (degree, diploma or certificate)					
Managers (1,2)	14	15	48	16	15
Professionals (3)	60	53	54	57	55
Technicians (4)	7	7	50	8	7
Supervisors and forewomen/men (5,6)	1	2	38	2	2
Clerical (7)	12	6	69	12	5
Sales (8)	3	7	30	3	6
Service (9)	2	3	42	2	4
Blue collar (10,11,12)	1	6	17	2	6
Total	100	100	51	100	100

* The numbers in parentheses are the Employment Equity occupational categories included under the headings.

Scenario I . Historic levels of all variables for each sex.

Scenario Ia. Scenario Ia. As in I, but women have men's 1989 field of study shares.

Scenario Ib. Scenario Ib. As in I, but women have men's 1989 occupational shares for each field of study.

The differences between the occupational distributions of female and male labour force entrants at the undergraduate level in Scenario I are less significant than the differences at the community college level. Women finishing undergraduate programs are more likely than men to enter professional and clerical occupations; male graduates are more likely to enter sales occupations and blue collar occupations than women.³ About 80% of female undergraduates and 75% of male undergraduates enter managerial, professional or technical occupations; over half of all male and female undergraduates enter professional occupations.

It seems worth noting that almost all female and male graduates at the master's and doctoral levels enter managerial, professional or technical occupations. Over 80% of female and male graduates with doctorates, and around 60% of female and male graduates with master's degrees (or post-graduate certificates) enter professional occupations.

Turning to Scenarios Ia and Ib, we note that at the community college level, giving women men's 1989 field of study distribution (Ia) halves the proportion of women graduates who enter professional occupations, thus reducing this proportion to a level similar to that of male graduates. Giving women the male structure of flows from fields of study to occupations (Ib) leaves the proportion of women graduates who enter professional occupations essentially unchanged.

Overall, the occupational distribution of female community college graduates in Scenario Ia is similar to the occupational distribution of male community college graduates in Scenario I, except that a much higher proportion of women than men enter clerical occupations, and a much lower proportion enter skilled blue collar occupations. In Scenario Ib, the very large difference between the proportions of women and men entering professional occupations found in Scenario I persists, but the difference in the proportions of women and men entering clerical occupations is reduced. In Scenario Ib, women continue to be much less likely than men to enter skilled blue collar occupations.

As noted, the occupational distributions of female and male entrants by Employment Equity occupational category are much more alike at the undergraduate than at the community college level. The distribution of women undergraduate entrants changes more in Ib than in Ia from Scenario I.

Essentially what occurs in Scenario Ib relative to Scenario I is a redistribution of female undergraduate entrants at the lower end of the occupational scale only. The proportion of women entering clerical occupations falls relative to Scenario I; the proportion entering sales, service and blue collar occupations rises. The resulting distribution of female undergraduate entrants by Employment Equity occupational categories is very similar to the distribution of male undergraduate entrants in Scenario I.

³ This should read "graduates entering the labour force", rather than "graduates". The shorter term is used here and below for the sake of concision.

d) Detailed Occupational Distributions

Professional and technical occupations absorb over half of all female community college graduates and around two-fifths of all male community college graduates. Over half of both women and men entering the labour force after undergraduate studies enter professional occupations. Table 3 accordingly presents detailed occupational information for community college entrants in the professional and technical categories, and for undergraduate entrants in the professional category, for Scenarios I, Ia and Ib.

Table 3 shows striking differences between the occupations of female and male community college graduates who enter professional occupations. The most obvious is in the percentage of each group entering occupations in medicine and health: 63% for women, and 24% for men. Almost half of all female community college graduates who enter professional occupations become registered nurses; almost no male community college graduates do so.

Table 3. Occupational distribution of community college and undergraduate entrants in the professional and technical categories.

	SCENARIO				
	I	I	I	Ia	Ib
	% of women	% of men	women as % of total	% of women	% of women
Community College (diploma or certificate)					
Professionals					
Accounting, etc. (1171)*	9	21	50	20	9
Architecture and engineering (214/215)	<1	11	9	10	1
Mathematics, etc. (218)	5	32	29	29	6
Social sciences and related (23)	9	5	82	8	10
Teaching and related (27)	12	4	87	6	7
Medicine and health (31)	63	24	87	22	66
All other professionals	1	3	52	5	1
Total professionals	100	100	71	100	100
Technicians					
Physical and life sciences (211, 213)	6	12	31	11	8
Architecture and engineering (216)	7	36	16	42	7
Social sciences (23)	8	2	81	3	3
Health (31)	52	18	73	20	47
Art; and artists and writers (33)	26	25	50	21	29
All other technicians	2	7	18	3	7
Total technicians	100	100	49	100	100
Undergraduate (degree, diploma or certificate)					
Professionals					
Accounting, etc. (1171)*	10	18	40	16	12
Architecture and engineering (214/215)	2	17	13	15	4
Mathematics, etc. (218)	4	13	28	10	5
Social work (233)	5	3	70	3	6
Law and jurisprudence (234)	4	6	46	6	6
Teaching and related (27)	49	28	67	33	47
Health diagnostic and treating (311)	3	5	39	4	3
Nursing and other health (313,315/316)	16	3	87	6	11
All other professionals	6	8	47	7	8
Total Professionals	100	100	54	100	100

* Numbers in parentheses are standard occupational codes. Note that broad groups, e.g. Health and Medicine, 31 may contain four digit occupations which are professional, technical, or neither. Only professional occupations in health (2 digit SOC = 31, (EEOC=3) are included as health professionals, and so on.

Scenario I. Historic levels of all variables for each sex.

Scenario Ia. As in I, but women have men's 1989 field of study shares.

Scenario Ib. As in I, but women have men's 1989 occupational shares for each field of study.

There are additional differences in the occupations women and men enter after graduating at the community college level. Almost no women graduates enter professional occupations in architecture and engineering, but 11% of male graduates who enter professional occupations enter occupations in this category. Only 5% of women graduates entering professional occupations go into occupations in mathematics and related fields (including programming and systems analysis), compared to 32% of men entering professional occupations.

The occupational distributions of female and male community college graduates who enter technical occupations also differ significantly. Almost half of the men entering technical occupations enter technical occupations in physical and life sciences or architecture and engineering, compared to 13% of women. More than half of all female community college graduates entering technical occupations go into technical occupations in health, compared to less than a fifth of all male community college graduates entering technical occupations.

Women and men entering professional occupations from undergraduate programs have very different detailed occupational distributions. Almost half of the women enter teaching and related occupations, compared to slightly more than a quarter of the men. Sixteen percent of all female undergraduates entering professions go into nursing occupations and "other occupations in health". (This category excludes nursing and diagnosing and treating occupations.) The comparable figure for men is 5%. Thirty percent of men entering professional occupations from undergraduate programs go into occupations in architecture and engineering or in mathematics and related fields; 6% of women undergraduates entering professional occupations enter these occupations.

Comparing Scenarios I and Ia in Table 3 shows clearly that if women are given men's field of study shares (Ia), the occupational distributions of women entering professional and technical occupations from community colleges, and those of women entering professional occupations from undergraduate programs, are quite similar to those of men in Scenario I. If women keep their own field of study shares, but are assigned men's occupational shares for fields of study (Ib), then their occupational distributions in Table 3 are very close to women's occupational distributions in Scenario I.

e) Summary for Scenarios I, Ia and Ib

Overall, the following conclusions can be drawn from Tables 2 and 3 (and hence from Scenarios I, Ia and Ib). The distributions by Employment Equity occupational categories of women and men entering the labour force from community college programs differ greatly. A far larger proportion of women go into professional occupations (in particular, as registered nurses) and into clerical occupations, while men are far more likely to go into blue collar occupations.

If women community college graduates are given the male field of study structure, their

greater tendency to go into professional occupations disappears, essentially because enrolments in nursing diploma programs disappear. In this scenario (Ia), women become somewhat more likely to go into blue collar occupations, but remain far more likely than men to go into clerical occupations. If women graduating from community colleges are given the male occupational structure for each field of study, their tendency to go into clerical occupations is greatly decreased, but the proportion entering professional occupations remains as in Scenario I.

The distributions by Employment Equity occupational category of women and men entering the labour force from undergraduate programs are quite similar for the managerial, professional and technical categories. Most undergraduate entrants go into occupations in these categories. At the "lower end" of the occupational distribution, women undergraduates are more likely to enter clerical occupations, and men are more likely to enter sales, service and blue collar occupations. Giving female undergraduates the field of study structure of male undergraduates has little effect on these differences; giving women men's occupational structure for each field of study virtually eliminates these differences.

Women and men entering the labour force after graduate studies have very similar occupational distributions by Employment Equity occupational category. Management, professional and technical occupations account for virtually all entrants from graduate studies.

A more detailed examination of the professional and technical occupations entered by community college graduates and of the professional occupations entered by graduates from undergraduate university programs shows striking differences in the distributions of female and male graduates by occupations. Men tend to enter engineering, mathematics and science-related occupations; women tend to enter occupations in teaching and health.

At this detailed level, giving women men's field of study shares makes their distribution among professional occupations virtually identical to that of men at both the community college and undergraduate levels (and similarly for technical occupations for community college graduates). Leaving women with their own field of study structure, while giving them men's structure of flows from fields of study to occupations leaves virtually unchanged women graduates' distribution among the detailed occupations considered.

f) Scenario II

Scenario II uses projected enrolment rates for women and men for undergraduate programs and uses projected field of study shares for women and men for community college and undergraduate programs. Women's and men's enrolment rates in 1989 are used for community colleges, because there is not a long enough time series of overall community college enrolments by sex to serve as a basis for projecting enrolment rates at this level.

Table 1 shows that from 1981 to 1989 women's enrolment rates rose relative to men's at all university levels of study. By 1989, the undergraduate enrolment rate for women was higher than the rate for men. The predicted trend in undergraduate enrolments will lead to an undergraduate enrolment rate of 40% of women 18-23 years old in 2000, compared to a 28% undergraduate enrolment rate for men in this age group. Since the proportion of women and men in this age group remains roughly the same over time, the predicted enrolment trends lead to a drastic increase in the proportion of women graduates among total graduates from undergraduate programs.

Table 4 shows the distribution by Employment Equity occupational categories of female and male labour force entrants from community college and undergraduate programs. Table 5 shows more detailed occupational distributions within the professional and technical Employment Equity occupational categories for labour force entrants from community colleges and within the professional category for entrants from undergraduate programs.

Table 4. Distribution by Employment Equity occupational categories of labour force entrants from community college and undergraduate programs, by sex

Employment Equity Occupational category	SCENARIO		
	II	II	II
	% of women	% of men	women as % of total
Community College (diploma or certificate)			
Managers (1,2)	8	10	51
Professionals (3)	39	20	70
Technicians (4)	14	19	49
Supervisors and forewomen/men (5,6)	2	3	37
Clerical (7)	26	7	82
Sales (8)	3	7	39
Service (9)	6	7	50
Skilled crafts (10)	< 1	15	5
Semi-skilled (11)	< 1	5	13
Other manual (12)	2	8	28
Total	100	100	55
Undergraduate (degree, diploma or certificate)			
Managers (1,2)	13	16	53
Professionals (3)	61	54	60
Technicians (4)	7	7	57
Supervisors and forewomen/men (5,6)	1	2	44
Clerical (7)	12	5	75
Sales (8)	3	7	36
Service (9)	2	3	50
Blue collar (10,11,12)	1	7	21
Total	100	100	57

Scenario II. Projected field of study shares for each sex. Field of study to occupation shares for each sex at 1988 levels. Community college enrolment rates for each sex at 1989 levels; undergraduate enrolment rates for each sex at projected levels.

Table 5. Detailed occupational distributions for labour force entrants by sex

	SCENARIO		
	II	II	II
	% of women	% of men	women as % of total
Community College (diploma or certificate)			
Professionals in:			
Accounting, etc. (1171)	10	20	53
Architecture and engineering (214/215)	1	12	10
Mathematics, etc. (218)	8	36	35
Social sciences and related (23)	9	4	82
Teaching and related (27)	12	5	87
Medicine and health (31)	60	20	88
All other professionals	1	3	51
Total professionals	100	100	70
Technicians in:			
Physical and life sciences (211,213)	6	13	32
Architecture and engineering (216)	9	39	18
Social sciences (23)	8	2	82
Health (31)	50	16	74
Art; and artists and writers (33)	27	24	52
All other technicians	2	7	19
Total technicians	100	100	49
Undergraduate (degree, diploma or certificate)			
Professionals in:			
Accounting, etc. (1171)	10	18	47
Architecture and engineering (214/215)	3	19	17
Mathematics, etc. (218)	5	14	34
Social work (233)	5	3	76
Law and jurisprudence (234)	5	6	54
Teaching and related (27)	49	26	74
Health diagnostic and treating (311)	3	5	45
Nursing and other health (313,315/316)	16	3	90
All other professionals	6	8	53
Total Professionals	100	100	60

Scenario II. Projected field of study shares for each sex. Field of study to occupation shares for each sex at 1988 levels. Community college enrolment rates for each sex at 1989 levels; undergraduate enrolment rates for each sex at projected levels.

Comparison of Table 4 with Table 2 shows that the projected changes in the field of study distributions change the distributions of female and male labour force entrants by Employment Equity occupational categories very little. For entrants from undergraduate programs, the projected rise in women's enrolment rate relative to men's results in women making up 57% of entrants in this category, as compared to 51% in Scenario I. Accordingly, the proportion of women among labour force entrants in each occupational category rises for undergraduate entrants.

Comparison of Tables 3 and 5 leads to much the same conclusion as regards the occupational distributions of female and male entrants as does comparison of Tables 2 and 4. Among entrants into professions from community colleges, the mathematics occupational group (largely computer programming) gains about five percentage points of share at the expense of health occupations for both women and men. For entrants into technical occupations from community colleges, and for entrants into professional occupations from undergraduate programs, the occupational distributions from Scenarios I and II, given in Tables 3 and 5, are essentially identical. Thus the changes in field of study distributions for women and men, predicted on the basis of trends between 1977 and 1989, do little to make female and male entrants occupational distributions more similar.

In Table 5 (as in Table 3), the rise in women's undergraduate enrolment rates relative to men's leads to a rise in women as a proportion of labour force entrants from undergraduate studies in each occupational group. Despite this increase, two occupational groups have largely male flows of entrants: architecture and engineering occupations, and occupations in mathematics and related occupations (including computer programming and systems analysis).

In all other professional occupational categories in Table 5, women account for at least 45% of undergraduate labour force entrants. The rise in the proportion of women entrants in these categories results entirely from the assumed increase to 60% in the representation of women among all entrants from undergraduate programs, since the distribution of female and male undergraduate entrants to professions by occupational categories does not change significantly from Scenario I to Scenario II.

In conclusion, the assumed trends in field of study structure in Scenario II do little to change the occupational distributions of female and male entrants between Scenarios I and II. The assumed rise in women's undergraduate enrolment rates relative to men's gives women a larger share of labour force entrants from undergraduate programs in each occupational category considered.

g) Fields of Study: Scenarios I and II

Comparison of Scenarios I and Ia shows that if women's choices of field of study were identical to men's, the occupational distribution of women entering professional occupations

would be very similar to that of men entering professional occupations. Scenario II projects forward to 2001 recent trends in women's and men's choices of field of study, while Scenario I leaves the field of study structure for women and men as it was in 1989. Comparison of these two scenarios shows very little difference between them in the occupational distribution of women and men entering the labour force in 2001 from postsecondary education. It seems worthwhile to examine the field of study structure of these two scenarios in some detail, so as to understand the reasons for these results.

Table 6 gives the distribution by field of study of female and male labour force entrants from community college and undergraduate programs for Scenarios I and II. The field of study categories in Table 6 are aggregations of the COPS field of study categories; the COPS fields of study included under each heading are given in parentheses following the heading.

Table 6. Distribution by field of study of labour force entrants by sex

Field of study*	SCENARIO					
	I	I	I	II	II	II
	% of female graduates	% of male graduates	women as % of graduates	% of female graduates	% of male graduates	women as % of graduates
Community college						
Arts and communications (1-6)	9	9	54	9	9	56
Protectional and correctional services (8)	2	5	36	3	5	38
Social services (9)	6	1	86	5	1	86
Educational and counselling (11)	6	1	92	6	1	91
Management and marketing (13-20)	18	19	53	18	18	56
Secretarial (21-24)	12	<1	99	12	<1	99
Computer science (26)	3	10	29	5	11	37
Nursing diploma (27)	23	3	89	21	3	91
Other nursing, health technician (28-32)	9	4	72	8	4	73
Architecture and engineering tech. (35-48)	3	34	9	3	37	9
Agricultural, forest, and other primary tech. (49-51)	2	5	35	3	6	34
All other fields (7,10,12,25,33,34,52-54)	8	7	39	8	7	59
Total	100	100	55	100	100	55
Undergraduate						
Education (2-5)	23	12	66	22	10	74
Arts (6-8)	4	2	63	4	2	68
Humanities (9-18)	12	8	59	11	8	66
Commerce and administration (20-21)	16	23	43	16	23	48
Economics (22)	2	4	39	2	4	37
Law (24)	3	4	45	3	3	52
Psychology (27)	7	3	73	7	2	79
Sociology (28)	4	2	67	4	2	73
Social work (29)	3	1	72	3	1	79
Biological sciences (31-36)	5	4	53	4	4	60
Architecture and engineering (37-42)	2	15	11	2	16	13
Dentistry and medicine (45-48)	1	4	28	1	3	41
Nursing (49)	5	<1	95	6	<1	96
Other health (50-52)	4	2	72	4	2	76
Computer science (53)	1	5	20	2	5	29
Mathematics and physical sciences (54-58)	2	5	30	2	5	35
All other fields of study (1,19,23,25, 26,30,43,44)	8	7	54	9	5	71
Total	100	100	51	100	100	57

* The numbers in parentheses give the COPS fields of study included in the headings, Community College field of study 55 (unknown) was excluded.

Scenario I. 1989 field of study shares.

Scenario II. Projected field of study shares.

Examination of the field of study distributions for Scenario I (based on the 1989 field of study and enrolment structure) shows vast differences between these distributions for women and men. While 55% of community college graduates are women in Scenario I, only two community college fields of study (management and administration and arts and communication) come within ten percentage points of having 55% women among their students.

Nursing diploma programs account for 23% of women community college graduates; 89% of graduates in this field of study are women. Other nursing and health technician programs account for an additional 9% of women graduates; 72% of graduates from these programs are women. Secretarial courses account for 12% of female graduates, 92% of whom are women. At the other extreme, architecture and engineering technical programs provide 34% of male graduates; only 9% of the graduates from these programs are women.

A similar if less extreme situation prevails for undergraduate fields of study in Scenario I. Fields of study in education account for 23% of women graduates from undergraduate programs; 66% of graduates in education are women. Graduates in architecture and engineering account for 15% of male graduates from undergraduate programs, only 11% of whom are women.

On the other hand, commerce and administration furnishes 16% of female graduates and 23% of male graduates. The proportion of women among commerce and administration graduates--43%--is reasonably close to the 51% of total graduates from undergraduate programs who are women. Women are also represented in a proportion reasonably near their proportion of total graduates in biological sciences and in law.

Projecting past trends in field of study shares forward to 2001 (Scenario II) has some effect on the female and male field of study structure, but this effect is small. The largest changes in field of study shares for women at the community college level in Scenario II relative to Scenario I are that computer science graduates rise from 3% to 5% of female graduates, while nursing graduates fall from 23% to 21% of female graduates. For men, the largest change is that architecture and engineering technicians rise from 34% to 37% of graduates. In general however, most field of study shares change by one percentage point or not at all.

At the undergraduate level, the only change in a field of study share of more than one percentage point from Scenario I to Scenario II is the decline from 12% to 10% of male graduates in education programs. Thus if past trends continue into the future, there will be changes in the field of study shares among female and male postsecondary graduates, but these changes will be slow.

For undergraduates, Scenario II assumes a large rise in women's enrolment rates relative to men's, resulting in a corresponding rise in women's share of graduates from undergraduate programs. Under these assumptions, women will be 57% of all graduates from undergraduate programs in 2001, compared to 51% in Scenario I.

Consequently, women's share of graduates in all undergraduate fields of study is higher in Scenario II than in Scenario I. Nevertheless, women are still a relatively small percentage of all graduates in several undergraduate fields of study. For example, under Scenario II, women are only 13% of graduates from undergraduate programs in architecture and engineering in 2001. Male graduates from architecture and engineering programs account for 16% of all male graduates from undergraduate programs, while female graduates from these programs make up only 2% of all female graduates.

At the other extreme, graduates from undergraduate nursing programs are 6% of female graduates from undergraduate programs in 2001 under Scenario II, while 96% of graduates from undergraduate nursing programs are women. Thus the rise in women's enrolments relative to men's assumed in Scenario II increases the proportion of women among graduates from undergraduate programs in all fields of study, but leaves many fields of study disproportionately male or disproportionately female.



SUMMARY OF FINDINGS

The principal findings of this study can be summarized as follows. At the university level, the immense majority of graduates, female and male, will find jobs in occupations in the Employment Equity managerial, professional and technical categories in 2001, as they did in 1989. Women graduating from university programs are somewhat more likely than men to work in professional occupations; about the same proportion of female and male university graduates enter managerial occupations.

At the undergraduate level, giving women men's structure of fields of study or men's structure of flows from fields of study to occupations makes little difference in the proportion of female graduates entering managerial, professional and technical occupations. Projecting trends in field of study shares for female and male graduates from 1977 to 1989 forward to 2001 also has little effect on the proportions of women and men entering these occupational categories, since the projected changes in field of study shares are small. Giving women men's structure of flows from field of study to occupation does reduce the proportion of female graduates entering clerical occupations while increasing the proportion entering sales, service and blue collar occupations.

At the community college level, about 60% of female graduates and about 50% of male graduates enter managerial, professional or technical occupations. A far greater proportion of female (40%) than of male graduates (20%) enter professional occupations, due to the very large number of women community college graduates from nursing diploma programs. Clerical occupations absorb about a quarter of female community college graduates; blue collar occupations absorb about a quarter of male community college graduates.

Giving women men's field of study structure eliminates the gap between the proportions of male and female community college graduates entering professional occupations, largely because the share of nursing diploma graduates among male graduates is close to zero. Giving women men's structure of flows from fields of study to occupations makes the distribution of female community college graduates among clerical, sales, service and blue collar occupations much more like that of men, but does little to alter the proportions of women entering managerial, professional and technical occupations. Projecting trends in field of study shares forward to 2001 does little to change the occupational distributions of female and male entrants from community college programs, essentially because the projected changes are small.

Examination of the detailed occupational distribution of women and men entering professional occupations from community college and undergraduate programs and of those entering technical occupations from community college programs reveals significant differences between women's and men's distributions. Projecting trends in field of study shares alters women's and men's detailed occupational distributions very little; giving women men's structure of flows from fields of study to occupations also has very little effect.

If women are given men's field of study structure, however, then female and male graduates

from community college and undergraduate programs are very similarly distributed among detailed occupations within the professional category. The same holds for the detailed occupational distribution of male and female community college graduates entering technical occupations.

Finally, if female and male university undergraduate enrolment rates are projected forward on the basis of past growth, there are far more women than men predicted to finish undergraduate programs in 2001. By sheer weight of numbers, the proportion of women rises in every occupational category of labour force entrants from undergraduate programs. Nevertheless, many occupations continue to have predominantly male or predominantly female entrants.

IMPLICATIONS FOR EMPLOYMENT EQUITY POLICY

The implications one draws from these findings for Employment Equity policy depends on one's view of the appropriate aims for Employment Equity policy. If the policy goal is to have women (and other designated groups) represented in every occupation in their exact proportion in the labour force, then the findings of this study are disturbing.

Most women and men entering the labour force after completing a postsecondary course of study enter occupations in the Employment Equity managerial, professional and technical categories. At a detailed occupational level, the flows of women and men into professional and technical occupations from postsecondary education will be distributed among occupations in 2001 much as they were in 1989, that is, many occupations will have predominantly female or predominantly male entrants.

The reason for the differences between male and female postsecondary graduates in their detailed occupational distributions is differences in women's and men's choices of fields of study. Differences in the structure of flows from fields of study to occupations have little effect on the percentages of female and male postsecondary graduates entering the managerial, professional and technical occupational categories and have little effect on the distributions of female and male entrants among occupations in the professional and technical categories. (Sex differences in flows from fields of study to occupations do affect distributions of women and men among the Employment Equity clerical, sales, service and blue collar categories.)

To simplify somewhat, women are under-represented in professional and technical occupations in architecture and engineering, mathematics (including computer programming), and physical science, largely because they are under-represented in courses of study in these fields. Women are over-represented in nursing and teaching, and over-represented in the related courses of study.

Making the detailed occupational distribution of women entering the labour force from postsecondary education identical to that of men thus would require radical changes in women's and men's choices of courses of study. While there was some change over the period 1977-1989 in these choices, projecting 1977-1988 trends forward to 2001 leaves women's and men's field of study structure very little changed, and consequently has very little impact on the detailed occupations they enter.

Deciding what policy measures could effect radical changes in field of study choices requires an understanding of why women and men choose the fields of study they choose. Nothing in the present study bears directly on this issue.

Another view one might take of Employment Equity policy is that it should seek to make flows into broad occupational categories approximately representative of flows into the labour force, rather than seeking representativity at the level of detailed occupations. From this point of view,

the situation as regards flows into the labour force from postsecondary programs is reasonably satisfactory. About the same proportion of female and male postsecondary graduates become managers, and women are more likely than men to enter professional occupations. It then remains only to determine whether the fact that women are more likely to enter clerical occupations than men, and less likely to enter sales, service and blue collar occupations, represents a disadvantage for women.

The choice between these two points of view on the appropriate goals of Employment Equity policy requires some empirical input. One needs to know whether typically female professional occupations have lower pay than typically male professional occupations. If so, do women's field of study and occupational choices result from constraints on their time related to family responsibilities or from perceived or actual discrimination against them in certain occupations or from a combination of reasons?

This study has been exclusively concerned with the sources of difference in the occupations entered by female and male graduates from postsecondary education. The reasons for this are easily stated: the necessary data is not available for other Employment Equity designated groups, and the COPS model does not predict for other levels of schooling. The concluding paragraphs of this section discuss what data would have to be collected in order to allow the same type of analysis to be carried out for other designated groups, while Appendix A uses 1986 Census data to arrive at rough estimates of the occupational distributions of female and male labour force entrants at all levels of schooling.

The key data source for extending the COPS student flow model to other Employment Equity designated groups is the CCSIS and USIS data collected by Statistics Canada from educational institutions. This data serves to construct many of the variables used in the COPS model, including, enrolment rates and the field of study shares for graduates. CCSIS and USIS information collected by educational institutions also serves to construct the sample for the National Graduates Survey.

In order to extend the COPS model to other designated groups, these groups would have to be identified in the collection of CCSIS and USIS data. This data would then serve as a direct input into the COPS model. It could also serve to construct a sample for the National Graduates Survey in which members of designated groups were identified and over-sampled to the extent necessary to allow meaningful analysis.

APPENDIX A

This appendix presents occupational distributions of women and men who are recent labour force entrants by Employment Equity occupational category for a broader range of levels of schooling than those included in the COPS Student Flow Model. The data for Appendix Table A.1, which reports these distributions, come from the 1986 Census 20% sample.

The persons included in the universe of Table A1 are individuals in various age groups who worked full-time full-year in 1985. This restriction is imposed to exclude students who have not yet entered the full-time labour force. For each level of schooling, an age group is chosen which is likely to contain most of the recent labour force entrants from this level of schooling. Thus the age group chosen for a grade 9 education or less is persons 15-19 years old, while the 20-24 years old group is chosen for high school graduates. The occupational category is based on the occupation of the individual's current or most recent job, as of the Census.

There are no surprises in Table A1. The lower the level of schooling, the more women tend to be concentrated in the clerical, sales and service occupational categories and the more men tend to be concentrated in sales, service and the blue collar occupational categories (crafts, semi-skilled and other manual workers).

Clerical occupations are by far the largest occupational category for female recent labour force entrants with no university education; the blue collar occupational categories predominate among men at these levels of schooling. For men in blue collar occupations, the skill level of jobs increases as the level of schooling increases. Among recent labour force entrants with some university education (but no degree), clerical occupations are still the largest occupational category for women, while men are scattered across a broad range of occupational categories.

From the bachelor's degree level up, a dramatic shift in the occupational structure of recent labour force graduates occurs. At each university degree level of schooling, over half of all female and male recent entrants work in professional occupations, as compared to only 10% at lower levels of schooling.

The representation of managers among recent entrants increases steadily as the level of schooling increases, so that managers account for more than 10% of all recent entrants, female and male, at the bachelor's degree and master's degree levels. Conversely, the proportion of blue collar workers among male university graduates falls to less than 5%. Clerical employees are a significant proportion of female recent entrants with a bachelor's degree (14%) but this is far lower than the 45% of female recent entrants with some university education but no degree who are clerical workers.

To summarize, as in the results from the COPS Student Flow Model, more than half of all female and male labour force entrants with a university degree go into professional occupations. Additionally, over 10% of recent entrants, female and male, with a university degree work as managers. At lower levels of schooling, clerical work is the dominant occupational category for women who entered the labour force recently, while various blue collar occupational categories predominate among men.

Table A1. Percentage Distribution of Female and Male full-year full-time workers in 1985 by occupational category in 1986

Selected age groups	Number	EMPLOYMENT EQUITY OCCUPATIONAL GROUPS												
		A	B	C	D	E	F	G	H	I	J	K	L	M
Age: 15-19														
Schooling: Grade 9 or less														
Female	1,040	-	1.4	-	-	1.0	1.0	8.7	5.8	17.8	2.9	11.5	40.4	9.1
Male	2,375	-	-	-	-	.8	.8	2.9	3.8	4.2	3.2	34.1	39.8	9.5
Age: 20-24														
Schooling: High school, no diploma														
Female	53,380	.2	5.0	1.1	2.4	3.1	.6	35.8	8.7	17.6	2.4	3.5	16.2	3.5
Male	94,615	.2	4.0	.4	1.8	2.1	2.6	8.3	7.8	9.7	9.4	19.8	30.0	3.9
High school diploma														
Female	70,885	.3	5.3	1.3	2.5	3.0	.5	54.1	8.9	11.2	1.1	2.0	7.2	2.7
Male	73,785	.3	5.3	.5	2.1	2.9	2.2	11.6	10.2	9.9	9.9	16.8	25.0	3.4
Trades certificate or diploma														
Female	11,660	.2	3.2	2.5	4.0	1.7	.5	43.8	5.8	25.1	2.4	2.2	6.9	1.8
Male	14,515	.2	3.9	.4	2.7	1.2	2.8	5.9	6.6	12.4	17.2	22.4	20.9	3.5
Other non-university														
Female	112,175	.3	5.2	9.5	8.3	2.3	.3	48.1	5.8	12.8	.9	1.2	2.9	2.5
Male	96,130	.4	5.9	2.8	7.5	2.2	2.4	9.6	8.5	9.3	17.4	16.6	13.8	3.7
University, no degree														
Female	26,685	.4	7.3	11.7	7.7	3.6	.4	45.4	6.5	9.8	.6	1.0	2.0	3.7
Male	24,515	1.0	10.0	6.4	7.4	3.6	2.0	15.8	12.1	10.6	7.9	8.5	10.0	4.9
Age: 25-29														
Schooling: Bachelor's degree or graduate certificate														
Female	67,655	1.3	12.3	54.3	6.7	2.3	.3	13.8	3.8	1.6	.3	.7	.6	2.0
Male	81,180	2.4	14.2	52.0	5.0	2.2	1.5	5.1	8.9	2.0	1.5	1.5	1.5	2.2
Master's degree														
Female	5,300	1.6	17.8	57.6	7.2	1.3	.3	5.3	2.5	.8	-	2.5	.7	2.4
Male	8,515	.3	15.7	58.8	5.7	1.1	.7	1.8	4.1	.8	.7	2.9	1.2	3.1
Earned doctorate														
Female	265	-	-	69.8	9.4	-	-	-	-	-	-	7.5	-	7.5
Male	635	-	3.9	74.8	3.9	-	-	-	3.1	-	1.6	7.9	-	1.6

- A Upper level managers
- B Middle and other managers
- C Professional
- D Semi-professional and technical
- E Supervisors
- F Foremen/Forewomen
- G Clerical
- H Sales
- I Service
- J Skilled crafts and trades
- K Semi-skilled manual
- L Other manual
- M Not stated

Source: Special tabulations from the 1986 Census of Canada (20% sample data).

STATISTICS CANADA LIBRARY
BIBLIOTHEQUE STATISTIQUE CANADA



1010160998

[Ca 005

JUN 9 1994

