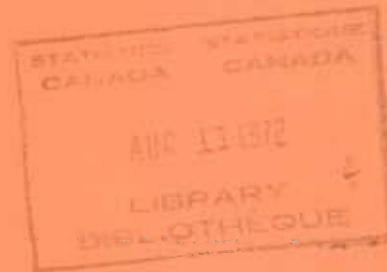


C.B.

# Notes on labour statistics

1971



## TABLE OF CONTENTS

	Page	
	7	Recent developments in labour statistics
Nicole Gendreau	9	Youth participation in the labour force: 1953-70
David Gower	22	The job vacancy survey and labour market analysis
Peter Hicks	25	New data on the student labour force in the summer
Ian Macredie	27	The educational attainment of the Canadian labour force: 1960-70
May Nickson	38	Developing statistics on industrial injuries
Neil MacLeod	41	Female earnings in manufacturing: a comparison with male earnings
Peter Hicks	49	Persons at work less than a full week: seasonal patterns
Ian Macredie	55	Job search patterns





STATISTICS CANADA  
Labour Division  
Manpower Research and Development Section

## NOTES ON LABOUR STATISTICS

1971

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## PREFACE

This issue of Notes on Labour Statistics is the first in an annual series. It is designed to meet a need for a periodical to keep users up to date regarding analytical studies and development projects in Statistics Canada, Labour Division. These include data series on the labour force, employment and unemployment, earnings, hours of work, labour income, labour costs (fringe benefits), unemployment insurance, industrial accidents, job vacancies and pensions.

The main work of the Division is represented in its statistical publications, all well known to users in the labour field. Perhaps not generally recognized is that modern data production involves a substantial research activity — as adaptations are made to changing circumstances, as new technology is brought into play, and as new techniques of analysis give rise to demands for new data series. In our view, some of the research and development work would be of interest to a wider audience and it is the purpose of this publication to make it available.

The publication is the responsibility of the Labour Division. Mrs. I.E. Johnson, formerly Chief of the Analysis and Development Section, was the prime organizer and served as Editor-in-Chief until leaving Statistics Canada. The final stages of this initial publication have been supervised by an editorial panel consisting of Helen Buckley, Co-ordinator, Research and Development (Chairman); D.J. Bailey, Director, Labour Division; and P. Hicks, Assistant Director.

WALTER E. DUFFETT,  
*Chief Statistician of Canada.*



## TABLE OF CONTENTS

	7	Recent Developments in Labour Statistics
Nicole Gendreau	9	Youth Participation in the Labour Force: 1953 - 70
David Gower	22	The Job Vacancy Survey and Labour Market Analysis
Peter Hicks	25	New Data on the Student Labour Force in the Summer
Ian Macredie	27	The Educational Attainment of the Canadian Labour Force: 1960 - 70
May Nickson	38	Developing Statistics on Industrial Injuries
Neil MacLeod	41	Female Earnings in Manufacturing: A Comparison With Male Earnings
Peter Hicks	49	Persons at Work Less Than a Full Week: Seasonal Patterns
Ian Macredie	55	Job Search Patterns





## RECENT DEVELOPMENTS IN LABOUR STATISTICS

The Labour Division of Statistics Canada carries out a far-ranging survey program in the labour area. Possibly the best known of these programs is the monthly Labour Force Survey of 30,000 households which produces the familiar estimates of employment and unemployment as well as a wealth of related data. The division conducts monthly and annual surveys of establishments to produce widely-used data on industrial employment, hours, pay and other labour costs. A large-scale survey of employer job vacancies has recently been undertaken to provide long-needed information on the demand for labour. The Job Vacancy Survey is described in a separate article in this review. In addition to these main surveys, the division compiles statistics from the administrative records of the Unemployment Insurance Commission, produces information on pension plans, and undertakes a program of analysis and of development of new labour data, such as the statistics on industrial accidents described later.

### New Release Practice for Labour Force Data

In the past year, the publication and release practices used in the Labour Force Survey were reviewed and a number of changes introduced. The new format of the monthly press release, which dates from August 1970, encouraged the media to use seasonally-adjusted data and to use an age breakdown (14-24 years and 25 years and over) for all main unemployment and employment series. The annual *Seasonally-Adjusted Labour Force Statistics*, which gives historic series of raw and seasonally-adjusted data, has been greatly expanded and an expansion of the main monthly publication is planned for 1971.

A special feature of the 1971 program will be a "fact book" on unemployment, to contain charts and tables describing characteristics of the unemployed. Planned for 1972 are a new quarterly publication and a very considerable increase in the amount of labour force data which will be released to analytic users by means of CANSIM, the Statistics Canada data bank.

### Automation of Establishment Surveys

Work in automating the main monthly and annual establishment surveys has been proceeding for several years and will be mainly completed in 1971. The monthly surveys in question are the survey of employment, payrolls and hours in larger commercial establishments and the surveys of employment in other establishments. The annual surveys are the survey of employer labour costs and the detailed annual survey of hours and earnings in various industries. This automation lays the framework for future improvements in the quantity and quality of payroll-based statistics. In the short-run, automation has made it possible to produce a compre-

hensive monthly publication covering employment, average earnings, and average hours to replace the former separate publications for wage-earners and for all employees (Catalogue 72-002 and 72-003).

### Payroll Data for the Education Industry

Data on numbers of employees in non-commercial industries have been collected for several years and attention is now being directed towards integrating these industries into the major survey operations, that is, collecting payroll data for their larger establishments. A start has been made among educational institutions and specific reporting problems are now being cleared up.

### Labour Costs in Transportation, Finance and Related Industries

The division conducts an annual survey of main employer labour costs such as straight-time pay, overtime and other premium pay, payments for holidays, sickness, pension plans, unemployment insurance, and a series of other supplementary labour costs. In 1967 and 1968 the survey covered manufacturing industries. The 1969 survey was in mining. The 1970 survey relates to establishments in finance, insurance and real estate and in transportation, communication and other utilities.

### Detailed Study of Earnings in Retail Trade

At the time of release of this review, results should be available from a detailed study of earnings in retail trade which was conducted in September, 1970. The study will include earnings comparisons for large and small firms and for male and female employees, and will quantify the impact of part-time employment on average weekly earnings in total and in specific urban areas.

### Co-operative Arrangements for Pension Statistics

During last year negotiations were completed with the federal Department of Insurance and the pension commissions of the provinces of Quebec, Ontario, Saskatchewan and Alberta for a co-operative statistical program for private pension plans. These agencies supplied data from their administrative records for use in producing statistics regarding the coverage and characteristics of pension plans. This co-operative arrangement will provide a data bank of current, constantly updated pension statistics for an expanded publication program and through a quick retrieval facility will meet the varied needs of research users.

To provide national statistics, these data were supplemented by a survey in those provinces which do not exercise legislative control over private pension plans and thus do not have administrative records.

### **Special Labour Force Surveys**

A full program of supplementary surveys, carried out in conjunction with the monthly Labour Force Survey, is undertaken by the division. In 1971 these surveys explored such areas as absence from work, work experience of students in the summer, characteristics of the unemployed, multiple jobholding, and ways of searching for jobs. The results of these surveys are released from time-to-time as special reports or as articles such as the one on educational attainment in this review. A regular means of release of these data will

be the quarterly labour force publication planned to start in 1972.

### **Pilot Study on Occupation Statistics**

Over the past year the division has been exploring ways and means to produce estimates of the occupational distribution of the labour force on a current basis. Currently under investigation is the feasibility of using the Job Vacancy Survey capability for the collection of occupation data and the production of estimates. A pilot study was conducted in June and July of 1971.

## YOUTH PARTICIPATION IN THE LABOUR FORCE: 1953 - 70

Nicole Gendreau\*

In times of high unemployment, young persons have experienced much higher rates of unemployment than has the labour force as a whole.<sup>1</sup> It may be also that the youth sector has suffered from an even higher unemployment rate on account of the "discouraged worker" effect - that is, a tendency to leave the labour force when demand was falling<sup>2</sup> - and a main objective of this paper is to explore this possibility.

As background, we shall deal briefly with our data sources (Section I) and trace a general picture of the behaviour of youth's participation rates in the period under study (Section II). Finally, in Section III, we seek to establish what, if any, relationship exists between the participation rates of youth and the state of the economy as represented by unemployment rates.

### I. Some Data Problems

Participation rates for all major age and sex groups are provided by the Labour Force Survey.<sup>3</sup> For the age group 14-24 years, however, the analysis of participation rates is complicated by the fact that a large segment in this group is attending school. The proportion attending school varies through the year according to institutional customs; it also changes through time and decreases with each single year of age when moving up through the age group. The problem arises in that the enrolled and the out-of-school populations may be expected to have very different patterns of behaviour in the labour market. The first group is only marginally attached to the labour force (through after-school jobs and summer employment), whereas the second group is mainly integrated. Unfortunately, existing data do not permit us to separate the participation rates.

In planning this study, it was hoped that "activity status" information taken from the Labour Force Survey

could be used as proxies for the enrolled and out-of-school population. Questions on "activity status" are used to classify the population into certain broad categories, chief of which are "worked", "looked for work", "had a job but not at work", "kept house", "went to school" and "retired".<sup>4</sup> Respondents may check two categories: one as the major activity of the week and the other as secondary. The category "going to school", therefore, would not itself supply a clear count of persons attending regular day-time school; it includes those taking night courses, single courses and even non-formal studies such as hobbies or self-improvement. To represent the enrolled population in the labour force, the most hopeful approach seemed to be to take those reporting "going to school" as their major activity and "employed" or "looking for work" as their secondary activity. (They have been classified to the labour force on the basis of the secondary activity.) A test was run using data for March 1970. This showed that 93% of those reporting "going to school" as major activity had worked less than 25 hours and only 2% had worked 35 hours or more, which gave strong support to the hypothesis. However, in the opposite case of persons reporting "worked" as major activity and "going to school" as secondary, a surprising 33% reported working less than 35 hours. In other words, a strong dichotomy was found in only one of the two cases.

Failing to find adequate proxies, we were forced to use the overall participation rates covering all persons in the age group. It should be borne in mind that these rates are in fact an amalgamation of the participation rates of two very different subgroups, namely the enrolled and the out-of-school populations.<sup>5</sup>

\* *Manpower Research and Development Section, Labour Division.*

<sup>1</sup> The unemployment rates of persons 14-19 years of age were 16.4% in 1961 and 15% in 1970, and those 20-24 years of age were 11.8% and 10.5%, while the overall unemployment rates in these same two years were respectively 7.1% and 5.9%.

<sup>2</sup> The discouraged worker hypothesis was first described by Paul H. Douglas in *Real Wages in the U.S., 1890-1926* (Cambridge, Massachusetts: Kelley Publishing Co., 1930), pp. 439-41. The conflicting additional worker hypothesis was first described by W.S. Woytinsky in *Additional Workers and the Volume of Unemployment in the Depression*, Committee of Social Security, Social Science Research Council (Washington: 1940). More recent analyses of these two hypotheses come from: C.D. Long, *The Labour Force under Changing Income and Employment* (Princeton: Princeton University Press, 1958); Robert A. Gordon and Margaret S. Gordon (eds.), *Prosperity and Unemployment* (New York: Wiley and Sons Co., Ltd., 1966); Alfred Tella, "The Relation of Labour Force to Employment", *Industrial and Labor Relations Review*, XVII, No. 3 (April 1964); William G. Bowen and T. Aldrich Finigan, *The Economics of Labor Force Participation* (Princeton: Princeton University Press, 1969).

<sup>3</sup> *The Labour Force*, Statistics Canada (Catalogue 71-001, Monthly) (Ottawa: Information Canada), Table 11.

<sup>4</sup> The questions elicit: What was this person's major activity in the reference week? Secondary activity?

<sup>5</sup> In April 1971, a special survey was carried out to gather more information on this aspect.

## II. Youth Participation Rates, 1953 - 70

As may be seen in Chart 1, the participation rates of the 14-24 age group have shown a very strong annual pattern, characterized by three phases, which repeated itself year after year. This pattern is mainly institutional, though also reflecting other seasonal factors. The peak occurs in May, June, July or August, when a large part of the enrolled population is out of school and either working or looking for work. Perhaps also in these summer months high participation is reinforced by re-entry from the out-of-school population that had withdrawn from the labour force with winter unemployment. This hypothesis of withdrawal is supported by the fact that youth participation rates in the January to April period are consistently lower than in September to December of the preceding year. From an institutional point of view we would expect the opposite, since some part of the September enrolment would normally drop out of school as the months pass, which would cause the youth participation rate to rise (the out-of-school population is known to have a higher participation rate than the enrolled population). Thus, the lower participation rates observed in the period January to April may be taken as a first indication that youth participation rates did respond to labour market conditions.

### The Long-term Trend

As shown in Chart 1, the participation rates of the age group as a whole have been remarkably stable through time; the troughs and peaks varied within 8 and 5 percentage points respectively. However, this stability through time is the result of a compensating effect between the downward trend in male participation rates and a rising trend for females. This may be seen in Chart 2, which also reveals differences in the pattern and levels of participation between the younger portion of the age group 14-19 years and the older portion 20-24 years.

To facilitate the reading of movements over so long a period, we constructed indices of four-month averages with 1953 as a base.<sup>6</sup> Since these averages represent the three annual phases, we are now able to summarize the movements over the 17-year period with only three observations per year. Chart 3 presents the indices for the age group 20-24 years, subdivided to show males, females, and both sexes together. Chart 4 covers the age group 14-19 years of age.

### Males 20 - 24 Years

The index depicted in Chart 3a is characterized by a "constant" and slightly downward trend in the peaks, and by a more pronounced downward trend in the

<sup>6</sup> The calendar year has been divided into three phases of 4 months duration. That is, the first phase runs from January to April, the second phase from May to August, and the third from September to December. Normally the year is divided into quarters for statistical manipulation, but, to represent the two terms of the school year, four-month averages seemed more representative.

troughs. The result is that the gap between the troughs and peaks has been widening through the period.

These three features can all be explained in terms of the rise in enrolment rates over the period under review.<sup>7</sup> Higher enrolment would obviously lower the level of participation in the winter months - although not by the same amount as enrolment increased, since many students would hold part-time jobs or look for work. Higher enrolment should have had relatively little effect on summer participation except to the extent that schools used the trimester system and that students regarded the summer months as an institutional holiday.

One can only speculate whether the downward movement in summer participation, which seems more marked in recent years, could be attributed to economic conditions. It is evident that absence of employment opportunities could keep students out of the labour force in the summer months, although one would also expect that this age group would be less affected than younger males who tend to be less acceptable to employers. The more plausible explanation for declining summer participation in the 20-24 age group is the very large increase in post-secondary enrolment in recent years.<sup>8</sup>

Apart from the trends described, the index for this particular group exhibits great stability over the 17-year period. Indeed, with so little divergence one might suppose that economic conditions did not vary between 1953 and 1970. But the group is not, after all, predominantly made up of secondary workers. The large majority of males 20-24 years have permanently left school and their attachment to the labour force is therefore similar to that of males 25-44 years, even if the attachment to a particular job is lower.

### Females 20 - 24 Years

Chart 3b bears little resemblance to the one just examined for males in the same age group. Through most of the period, peaks and troughs had no regularity and with the enormous upsurge in female participation in the mid-sixties they were lost altogether. However, from 1966 a pattern approaching that of males began to emerge and the correspondence has increased since. In 1970 we can observe for the first time a peak which was lower than that of the preceding year, very much as in Chart 3a.

The general outline of the index is that of two plateaus joined by a steep step. While the latter will be viewed as part of the general movement of women into

<sup>7</sup> Census statistics show that the proportion of 20-24 year-old males with some regular daytime attendance at formal school or university rose from 6.4% in 1951 to 11.3% in 1961. A Labour Force Survey estimate showed 22.9% of the same age group as full-time students in March 1970.

<sup>8</sup> Between 1951 and 1961, the average annual increase in enrolment rates for males in this age group was 1.445; the corresponding figure for the years 1961 to 1970 was 1.16.

CHART-1

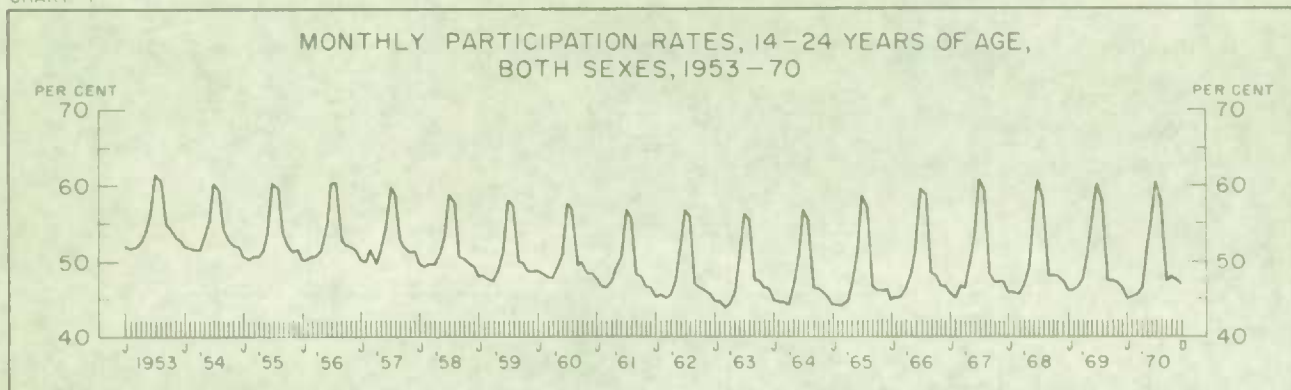


CHART-2

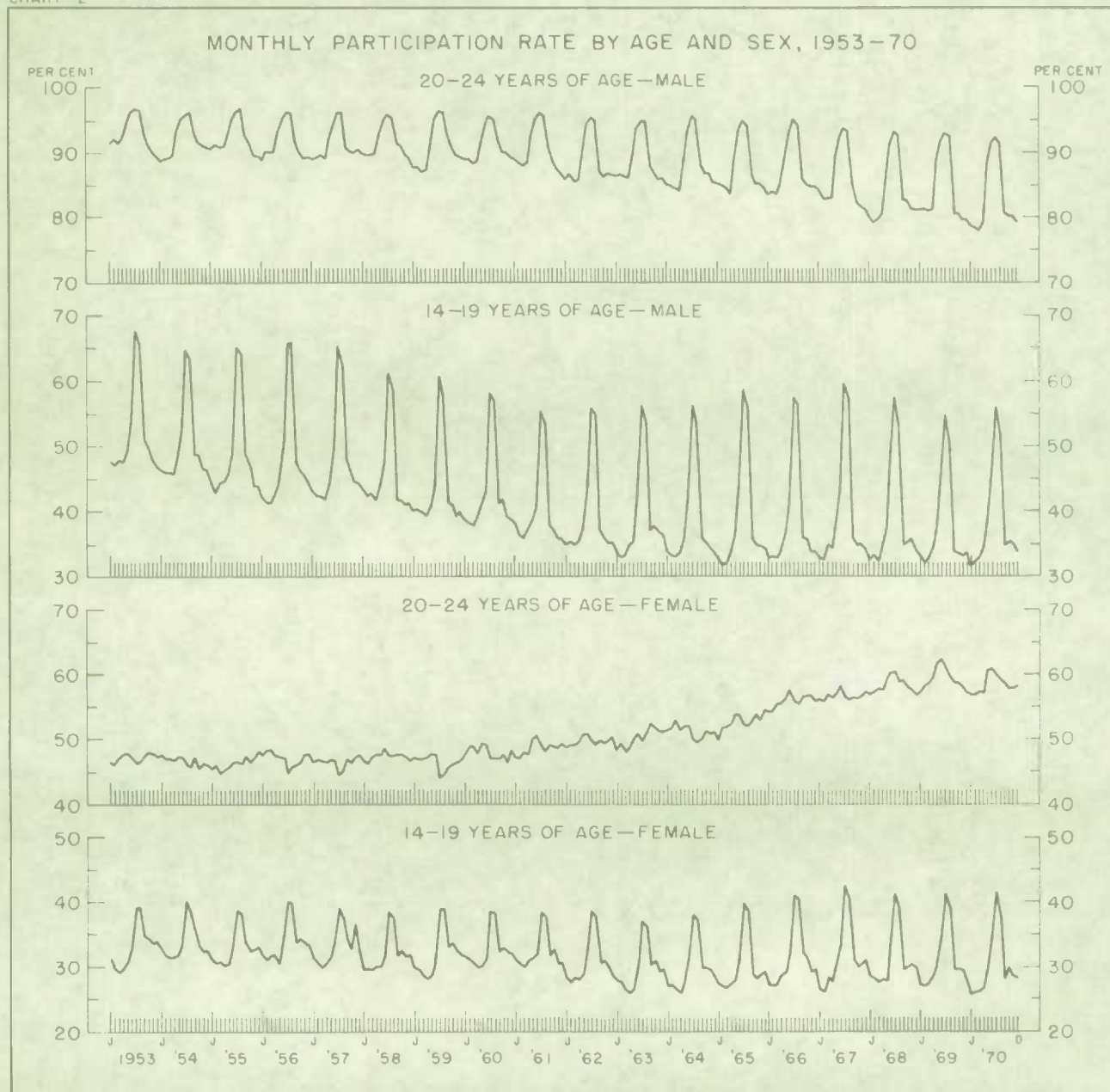
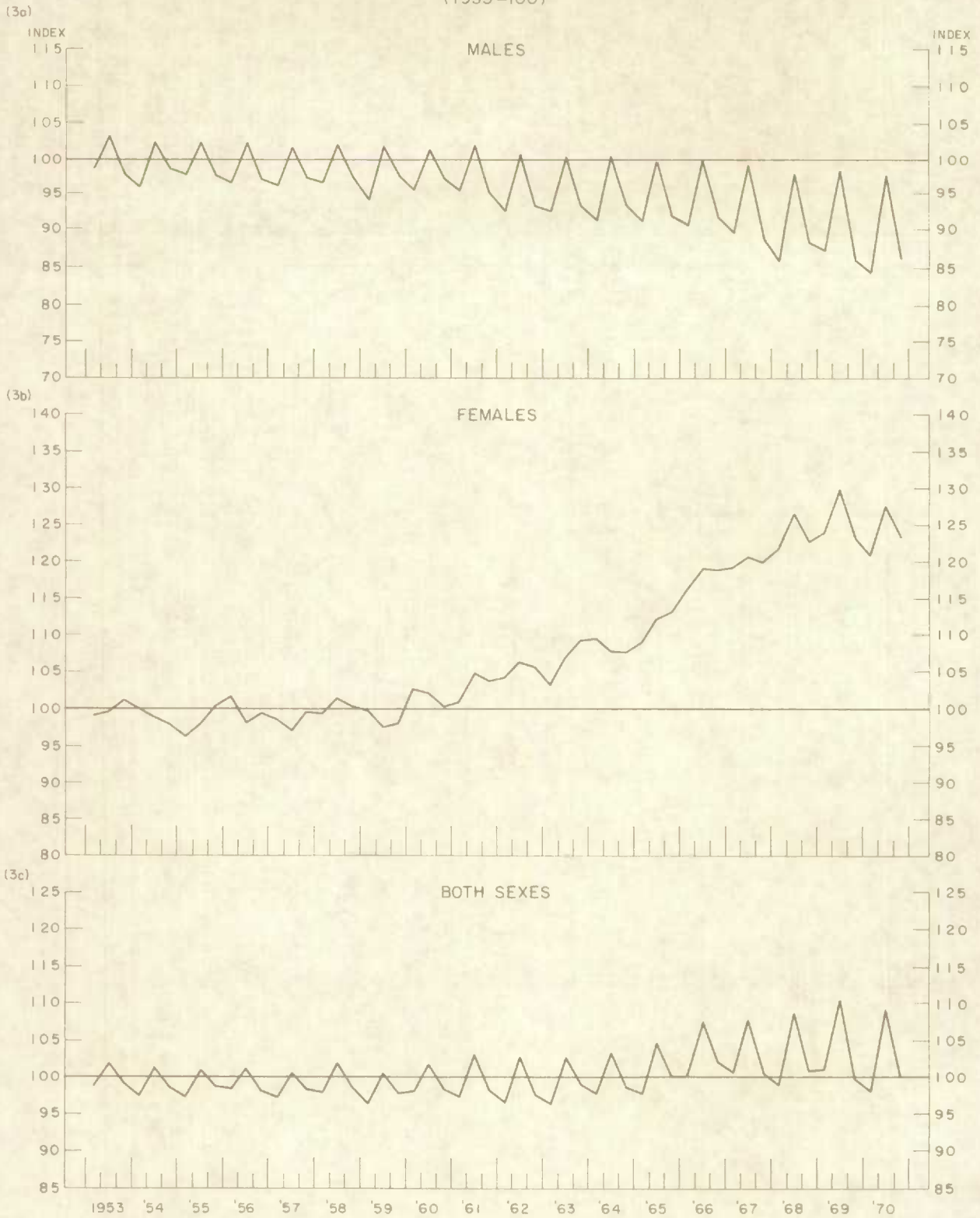


CHART - 3

FOUR-MONTH-AVERAGE INDICES OF PARTICIPATION RATES, 20-24 YEARS OF AGE, 1953-70  
(1953=100)



the labour force, whatever the reasons, it is worth observing that the rise through the early sixties coincided with improving economic conditions, and the acceleration in the mid-sixties with very low levels of unemployment. This suggests that, in addition to changing attitudes of women towards work and of society towards female employment, the market itself may have exerted a pulling influence. Also, from the fact that the higher level of participation has been maintained, one might argue that once in the labour force a taste or attachment was acquired so that a tendency to remain in the labour force persisted even when the job opportunities that had the pulling effect became less plentiful.

Another point worth mentioning is the fact that not until 1970 did the enrolment rate of females in the 20 - 24 years group reach the level attained by their male counterpart ten years earlier.<sup>9</sup> This was also the year, previously noted, when the pattern in participation rates became similar to the males'.

Even with similar enrolment ratios, the oscillations in the female participation index are not as sharply accentuated as in the male index, probably because the male and female patterns in this age group are influenced by differences in the behaviour of the out-of-school population. It is noteworthy that whereas only 30% of the males in the age group were classified as married in the 1961 Census, the corresponding percentage for females was 59.5. The labour force behaviour of young married women is heavily influenced by the presence of pre-school children, so that entries or withdrawals through the year depend less on the seasonal factors affecting male participants, and more on such factors as changes in child-care status, ability to make child-care arrangements and the like.<sup>10</sup> Still other differences would flow from the differences in occupational distribution. Compared to men in the same age group, the women are more concentrated in office and service industries and would be somewhat less prone to seasonal changes in employment.

#### Males 14 - 19 Years

The monthly pattern is given in Chart 2, showing sharp (and regular) peaks in a single month, July, and lowest points occurring in January, February or March. Turning to Chart 4a, which gives the indices of participation rates, we see a pattern not unlike that of the older males examined above. Again the trend to lower partici-

<sup>9</sup> The proportion of females in this age group with some regular daytime attendance at formal schools or universities increased from 3.3% in 1951 to 4.6% in 1961. The estimate for full-time students in March 1970 was 10.3%.

<sup>10</sup> See: B.G. Spencer and D.C. Featherstone, "Married Female Labour Force Participation: A Micro Study", *Special Labour Force Studies*, Series B, No. 4, Statistics Canada (Catalogue 71-516 Occasional) (Ottawa: Information Canada, 1971); J.D. Allingham, "Women Who Work: Part 1", *Special Labour Force Studies*, No. 5, Statistics Canada (Catalogue 71-509 Occasional) (Ottawa: Information Canada, 1967); J.D. Allingham and B.G. Spencer, "Women Who Work: Part 2", *Special Labour Force Studies*, Series B, No. 2, Statistics Canada (Catalogue 71-514 Occasional) (Ottawa: Information Canada, 1968); Sylvia Ostry, "The Female Worker in Canada", *1961 Census Monograph Programme*, Statistics Canada (Ottawa: Information Canada, 1968).

pation is noticeable, as is the widening gap between the peaks and the troughs. Both features can be explained in terms of enrolment rates.<sup>11</sup>

The more interesting features of this index include the variations about the trend of the summer months (peaks). These variations do not exist for older males and seem to reflect a movement similar to that of a business cycle, suggesting that the participation rates of teenage males in the summer months have been influenced by economic conditions. This possibility will be examined in Section III.

Participation rates in the winter months also reveal some variation but the pattern has been more stable than the summer one. Indeed, the upsurge in participation rates of the summer months since 1964 has been nearly non-existent in the winter months.

#### Females 14 - 19 Years

Although similar to males of the same age in the regular peak which occurs in July (Chart 2), the younger females have had a different pattern over time - in particular, the absence of a downward trend in the participation rate in the peak phase (Chart 4b). Even without a downward trend, participation rates of females remain at a much lower level (Chart 2). Some downward movement has occurred in the trough phase but not to the same extent as in the case of teenage males.

Another point of interest in Chart 4b is that the level of participation in the period January to April represents a fairly sharp decline from the preceding four-month average (September to December). While the participation rates of both male groups also declined as the winter advanced, the amount of the decline for teenage females has been much more pronounced. It will also be noted that the swing of the index has become more regular since the middle sixties.

The index of the females 14 - 19 years is the most difficult to interpret. There is a regular annual pattern to it, which doubtless reflects the fact that the enrolled population accounted for a high percentage of the age group.<sup>12</sup> But why should the participation rates of teenage females have been so much lower than those for teenage males, especially in the summer months? The enrolment ratios were similar, and although more of the females were married the latter were a mere 8% of the age group. Were teenage females less interested in summer employment? Was it harder for them to find a job, or were they required to stay at home and help? Such questions cannot be answered from the data available at this time but the heavy withdrawal from the labour force in the months January to April might indicate that this group was the first affected by an increase in unemployment.

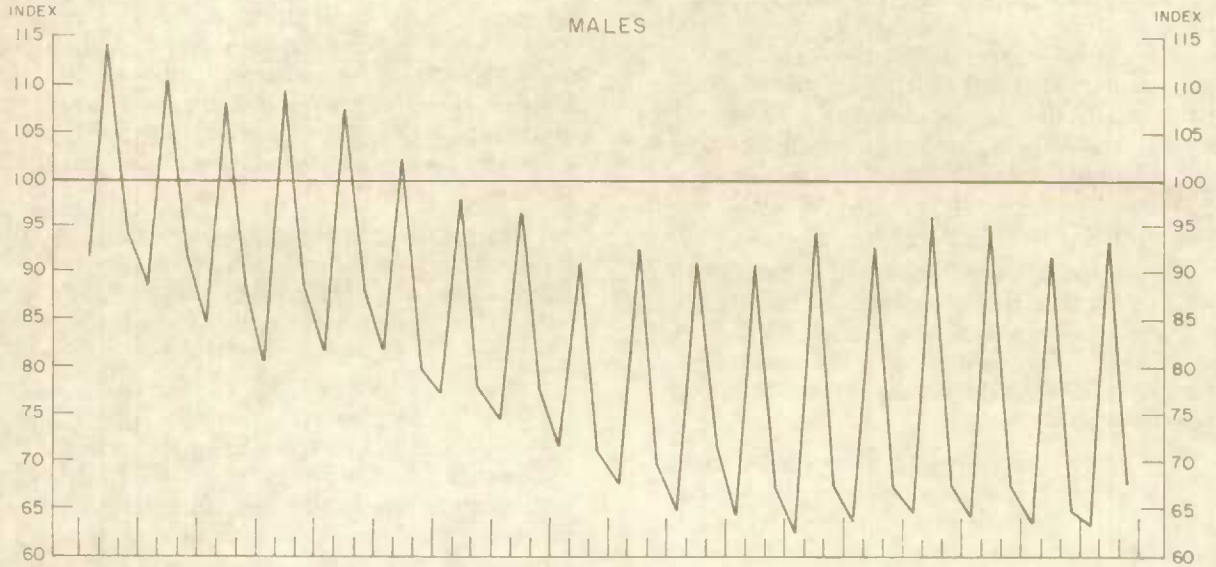
<sup>11</sup> Percentages of age group with some regular daytime attendance at formal schools or university: 1951 - 49.7; 1961 - 68.1; Percentage of full-time students in March 1970: 83.0.

<sup>12</sup> Enrolment ratios of females 14 - 19 years did not differ greatly from those of males in the same age group: 1951 - 48.9%; 1961 - 63.6%; 1970 - 79.3%.

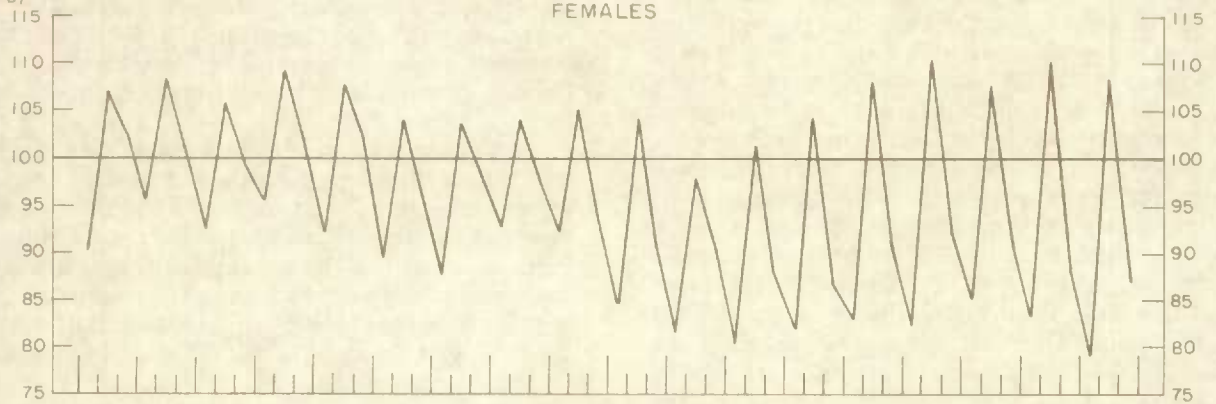
CHART - 4

FOUR-MONTH-AVERAGE INDICES OF PARTICIPATION RATES, 14-19 YEARS OF AGE, 1953-70  
(1953=100)

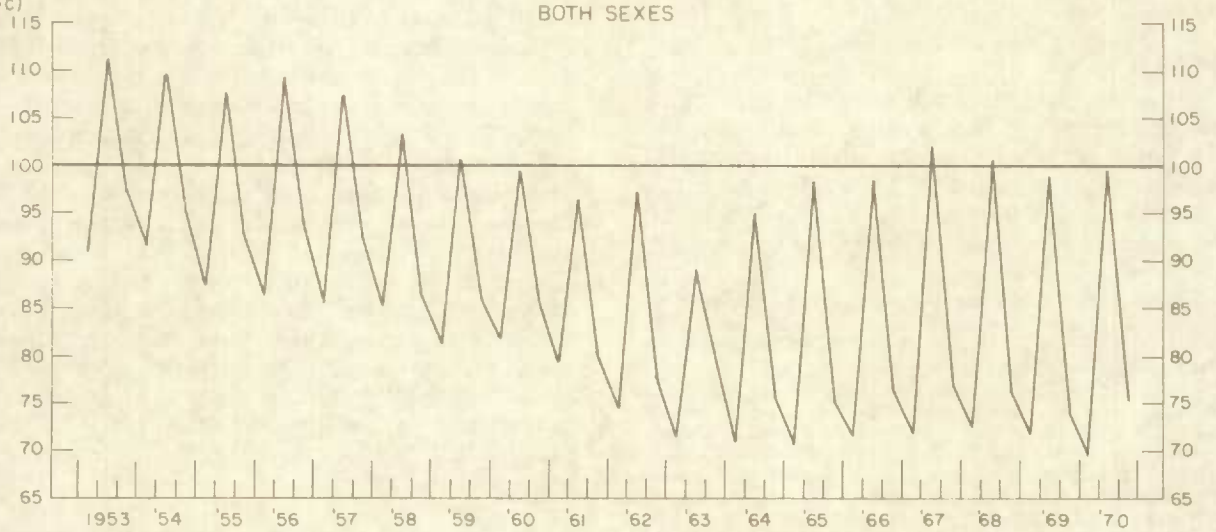
(4a)



(4b)



(4c)





### III. Relationship Between the Demand for Labour and the Participation of Youth in the Labour Force

The analysis to follow is based on the assumption that a relationship exists between the behaviour of the labour force and changes in the demand for labour. Thus, when unemployment increases, a secondary worker will enter the labour force in order to supplement the family income (the additional worker effect), or, alternatively, he (she) will withdraw from (fail to enter) the labour force (the discouraged worker effect). In reality, different persons will react differently to the same situation; but one of the two hypotheses will predominate at the aggregate level or, if the two have similar impact, they will nullify each other. The purpose of this section is to measure the impact of a change in the unemployment rate on the participation of young persons.

#### Specification of the Model

The basic model<sup>13</sup> can be written as:

$$PR = a + bT.D_1 + cT.D_2 + dT.D_3 + eU_0 + fU_{-1} + gU_{-2} + hU_{-3}$$

<sup>13</sup> I would like to acknowledge the considerable assistance of Mr. John Lewis (Special Advisor, Regional and Manpower Research Staff, Statistics Canada) who not only formulated this model but also set up and ran the regressions. Responsibility for any errors in the interpretation of the results remains with the author.

where:

PR = the four-month average participation rate for the population sub-group under study;

T = time in years (1959 = -1, 1960 = 0, 1961 = +1, etc.);

a = the constant term;

$D_i = 1$  in the  $i$ th phase,<sup>14</sup>  
= 0 otherwise;

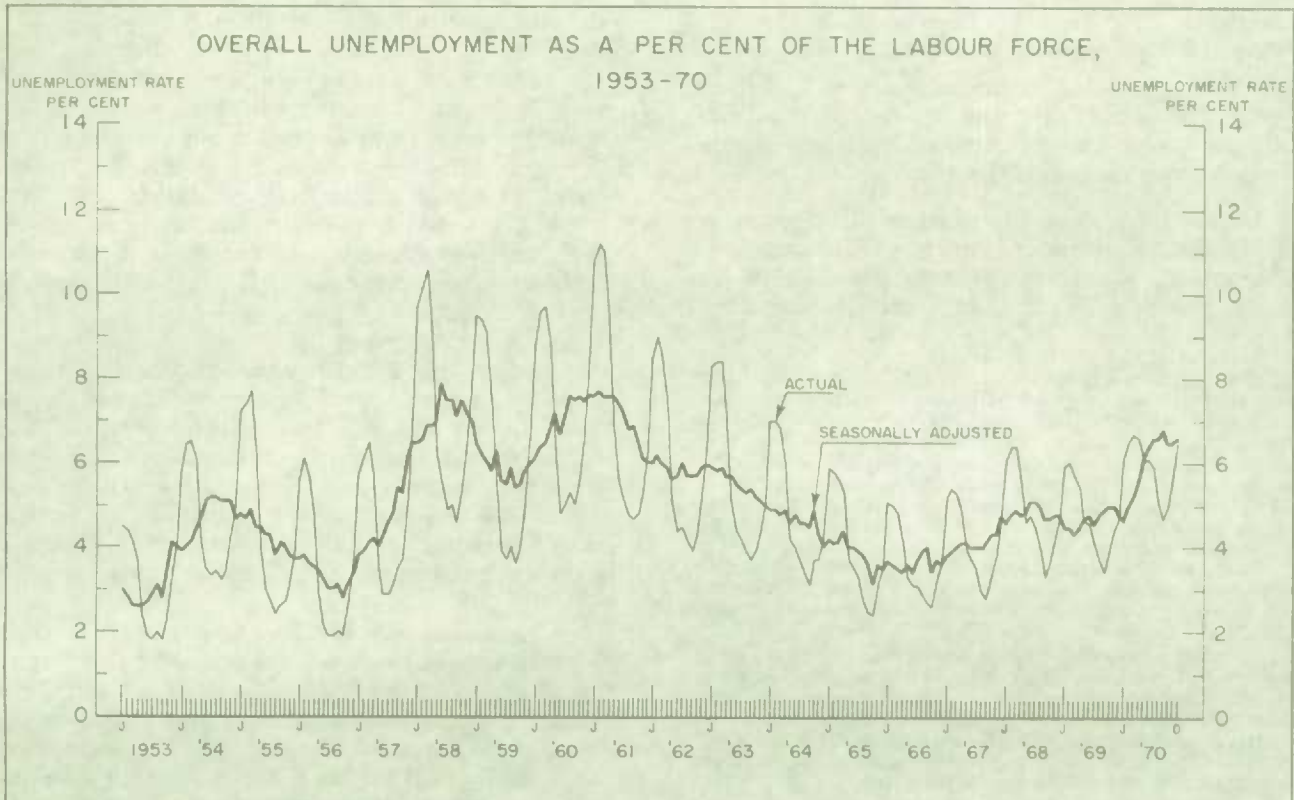
$U_0$  = the present phase average unemployment rate of primary workers (males age 25 - 44);

$U_{-1}$ ,  $U_{-2}$ ,  $U_{-3}$  = the four-month average unemployment rate of primary workers lagged 1, 2, and 3 phases respectively, e.g.,  $U_{-3}$  was the four-month average unemployment rate one year earlier.

The coefficients of the above model were estimated using an ordinary least-squares stepwise multiple regression program.

<sup>14</sup> See footnote 15 page 16.

CHART - 5



### Definition of the Variables

The participation rates were calculated as four-month averages. As previously noted, the annual pattern imposed by schooling closely matches the three four-month periods of the calendar year. Therefore, instead of one overall measure of the time trend,<sup>15</sup> we have three, each one corresponding to one phase of the annual pattern (January to April, the second term of the school year; May to August, the summer months; and September to December, the first term of the school year).

As a proxy for the demand for labour, the model uses the unemployment rate of males 25 - 44 years. This is regarded as a better proxy than the overall unemployment rate because of the highly stable attachment of this group to the labour force. In addition, by using the unemployment rate of an age group which is not under study itself, we avoided the possibility of spurious correlation between the unemployment and participation rates of the same group.<sup>16</sup>

The period selected for examination, 1953 - 70, exhibits a wide variety of economic conditions. It spans the latter portion of one economic cycle, the complete cycle between 1956 and 1966 and with the rising unemployment of recent years the start of a third. Unfortunately, although the unemployment rate has moved extensively over time, it has not returned to the very low levels of the early post-war years; this makes it impossible to test the behaviour of participation rates over a full spectrum.

### Analysis of the Regression Results

The regression results are presented in Table 1 below. The participation rates (the dependent variable) and the unemployment rates (independent variable) were all entered as percentages.

To illustrate the interpretation of the regression results, the case of males 14 - 19 years will be considered. This group's average participation rate in 1960 was 47.6%. Over the 17-year period, the rate declined an

estimated 0.98% per year in the first phase (January to April), while during the summer months the estimated rate of decline was only 0.4%. The symmetry of the impact of school enrolment over the year is evident in the fact that the decline in participation in the third or autumn phase was an estimated 0.97% per year.

Looking for the effect of economic conditions, we found that the unemployment rate in the same period of the preceding year had the strongest influence on participation, and it was negative. More precisely, an increase of 1% in the unemployment rate in the corresponding phase a year earlier brought about an estimated 1% decline in the participation rate. The current rate of unemployment was not significant. But the unemployment rate of the preceding four months had a discernible effect - in this case, a 1% increase in unemployment being associated with an increase in the participation rate of 0.5%. When the unemployment rate was lagged two phases, however, we found instead a small decrease in participation. Interpretation of these findings will be discussed later in the subsection on unemployment variables.

**Constant term** - The constant term, which could be thought of as an approximation of the 1960 annual average participation rate for each group, was as expected: highest for males 20 - 24 years and lowest for females 14 - 19 years. The constant for females 20 - 24 years was slightly higher than that for males 14 - 19 years. This was a change from their relative ranking at the beginning of the period when the younger male group had a higher annual participation rate than did the older group of females (see Chart 2).

**Time-trend variables** - In Section II, it was hypothesized that a given increase in the enrolment rate would not cause an equal decrease in participation rates during the school months, and that the participation rates in the summer months would be even less affected. It would be of interest, therefore, to compare the time-trend coefficients from Table 1 with the increases in enrolment rates. This has been done in Table 2 below.

Except for the older females, who had a substantially different pattern, the expectations were largely borne out by the data. For males 14 - 19 years, the annual average increase in enrolment was 1.67% while the average annual rate of decline in the two "school" phases was .983% and .973%, respectively. The decline carried over into the summer months (Phase 2) but it was a much smaller change (-.354% per year).

In the case of males 20 - 24 years, the .83 average annual change in enrolment was associated with average annual changes in participation rates of .76 and .73 in school months. The closer association between the increase in the enrolment rate and the decrease in participation rates of males 20 - 24 years could be due

<sup>15</sup> This is a departure from the standard method of time series analysis. The institutional factor of school enrolment is responsible to a very large extent for both the trend and the annual pattern of participation rates. Increases in school enrolment affect different parts of the year differently (see Chart 6 in the Appendix). In order to study this seasonal phenomenon, three time-trends representing the three different school phases of the year were calculated. It should be mentioned that the four-months averaging has the disadvantage of hiding some of the minor seasonal variations. However, in the present context, this is not considered a serious drawback since our main interest lies in the relationship between participation rates and unemployment in the three phases.

<sup>16</sup> The unemployment rate is defined as the ratio of the unemployed over the sum of the employed plus the unemployed. The participation rate is the proportion of a given population which is in the labour force (i.e., the sum of the employed and unemployed). If, for instance, only the unemployed leave the labour force, then both the participation and unemployment rates will decline tautologically.

**TABLE 1. Analysis of Participation Rates, 1953-70**

Note: All coefficient values appearing below are significant at the .05 level except those marked \* which are significant at the .1 level.<sup>1</sup>

Variables	Sub-group			
	14-19 years of age		20-24 years of age	
	Male	Female	Male	Female
Constant, $T_0 = 1960$ , (a) .....	47.624	32.426	89.155	52.261
Time-trend variables:				
Jan. to Apr. (T.D <sub>1</sub> ) .....	-.983	-.403	-.764	.857
May to Aug., (T.D <sub>2</sub> ) .....	-.354	...	-.181	.923
Sept. to Dec., (T.D <sub>3</sub> ) .....	-.973	-.294	-.733	.779
Unemployment variables:				
Current rate, (U <sub>0</sub> ) .....	...	...	...	...
Rate lagged 1 period, (U <sub>-1</sub> ) .....	.487	...	...	-.401
Rate lagged 2 periods, (U <sub>-2</sub> ) .....	-.299*	...	.248	...
Rate lagged 3 periods, (U <sub>-3</sub> ) .....	-.953	-.276	...	-.332
Multiple R <sup>2</sup> .....	.955	.909	.959	.925
Regression F .....	155.39	156.83	272.02	110.26

<sup>1</sup> These regressions were run using a stepwise method which entered into the equation only those variables possessing a "t" value of 3.0 or greater, i.e., significant at the .1 level. Therefore, when the symbol "..." appears, the variable was not significant at the .1 level.

**TABLE 2. Comparison of Changes in Participation and School Enrolment Rates**

Age and sex	Average annual change in enrolment rates <sup>1</sup> 1951-70 <sup>2</sup>	Average annual change in participation rates, <sup>3</sup> 1953-70		
		Phase 1 <sup>4</sup>	Phase 2 <sup>4</sup>	Phase 3 <sup>4</sup>
14-19 years:				
Male .....	+ 1.67	-.983	-.354	-.973
Female .....	+ 1.52	-.403	...	-.294
20-24 years:				
Male .....	+ .83	-.764	-.181	-.733
Female .....	+ .35	+.857	+.923	+.779

<sup>1</sup> Calculated by linear interpolation from observations in 1951 and 1970. Source: 1951 Census and Monthly Labour Force Survey, July 1970.

<sup>2</sup> It might be of interest to the reader to know that the annual increase in enrolment rate for males 20-24 years was not only 50% of that for males 14-19 years for the period as a whole, but the timing of increase was not the same within the period. The average annual changes were:

for males, 14-19 years, 1.67 between 1951 and 1961, and 1.49 between 1961 and 1970;

for males, 20-24 years, .45 between 1951 and 1961, and 1.16 between 1961 and 1970.

Moreover there is still room for further increment for older males but the annual increase for younger males will necessarily diminish (in 1970, the enrolment rate of the latter was 83% while that of males, 20-24 years, was 22.9%).

The rates for females 14-19 years were, except for a small time lag, very similar to those of males in the same age group. Females 20-24 years still had in 1970 only half the enrolment rate of males in the same age group (10.3% compared with 22.9%) but they are slowly catching up. Their annual increase was 25% of that of males between 1951 and 1961 but half of it between 1961 and 1971. Whether they will eventually reach parity is hard to say.

<sup>3</sup> Estimated average annual change: from regression coefficients Table 1.

<sup>4</sup> Phase 1 covers months January to April; Phase 2, May to August and Phase 3, September to December.

in part to a declining participation rate in the out-of-school population. Also, the propensity of older students to seek work in the school months may be lower than that of high school students due to such factors as the more demanding study program of older students and the unavailability of jobs considered suitable. Perhaps, too, the higher cost of post-secondary education has tended to eliminate young people from lower income strata.

In the summer months (Phase 2) participation rates of males 20 - 24 years declined at a very slow pace (-.18). The larger out-of-school population had the best chance at that time of the year to secure a job and most students in this age group, enrolled in costly post-secondary institutions, sought summer employment or worked. As noted earlier, students in this age group are least affected by poor economic conditions.

Unlike the other three groups studied, females 20 - 24 years exhibited a strong positive time trend in participation in all three phases of the year. While this was matched by the lowest average annual increase in enrolment, one would have expected the enrolment effect to have resulted in a slight decline in the participation rates; evidently this effect was lost under the push for higher participation. The three annual phases had similar coefficients and the summer months' rate was the strongest.<sup>17</sup> This might be due to a carry-over of the effect of enrolment into the summer months (it was less strongly negative) or might indicate that married females preferred to work -- or that it was more convenient for them to work -- in the summer months.

The unusual secular behaviour of the index of participation of females 14 - 19 (see Chart 4b) was noted in Section II. The participation rate was generally much lower in Phase 1, which corresponds to the second term of schooling, than in Phase 3, which is associated with the first term, and the falling off was much more marked than in the corresponding male group. According to the regression coefficients, the rate of decline in the second term of school (Phase 1) was greater than the rate of decline in the first term (Phase 3) i.e., -.403 and -.294 respectively. Therefore, combining the observations on the relative magnitudes and rates of decline in Phase 1 and Phase 3 participation rates, the disparity between these rates has been increasing during the period under study.

<sup>17</sup> In spite of the statistical significance of these trend coefficients some caution in interpreting their values is in order. As we have seen in Section II (particularly Chart 2) a regular pattern in the females 20 - 24 years participation rate has been apparent only since 1966. Accordingly, the statistical significance of the positive coefficients on time variables may be due more to a consistent upward trend over the years rather than to an actual pattern of the three phases within each year. The symmetry over the year may have arisen from the influence of the past 1966 period, and not due to patterns throughout the 1953 - 70 period.

It should be kept in mind that the time trends represented the whole period and it is worth noting that the gap between participation rates of Phases 1 and 3 for females 14 - 19 years was much wider than that of males in the same age group in both 1957 and 1958 -- years of high unemployment. This difference narrowed in 1965 and 1966 when unemployment was low but the female gap widened again with high unemployment in 1970. This would seem to indicate that participation rates of younger females have been more affected by the heavy seasonal unemployment in the months January to April than those of their male counterparts.

By reference to Table 2, it can be seen that the average annual increases in the enrolment of males and females 14 - 19 years were very similar. However, in the months January to April the average annual rate of decline in participation rates has been twice as fast for males as for females (-.983 and -.403 respectively), and in the months September to December it has been more than three times as fast (-.973 and -.294). Therefore, although the absolute value of the male participation rate has been higher than the female rate over the entire 1953 - 70 period, the differential in the rates of decline suggests that the two groups will eventually have similar participation in the labour force.

In Phase 2 (May to August), the time-trend coefficient was insignificant for females 14 - 19 years. This was the only instance where the time-trend variable was not significant. A non-linear time-trend would probably have led to a better fit to the Phase 2 observations and this may well be the reason for the insignificance of the coefficient. Looking at Chart 2, it appears that the summer months' participation rates of this group were sensitive to both higher enrolment and economic conditions. Specifically, the Phase 2 rates were generally declining between 1953 and 1963 (due to increasing enrolment rates and generally deteriorating economic conditions) down to a low in 1963. Thereafter, a push for higher participation similar to that of the older females coincided with the better economic conditions of 1965 and 1966.

**Unemployment variables** -- The unemployment variables were entered into the equations as discrete variables with respect to time. However, conceptually we could hypothesize a continuous response function relating the degree of response of current participation to any given unemployment rate lagged over time. According to the regression results presented in Table 1, such a function would take a different form for each of the four groups examined. However, one common characteristic is apparent and that is the absence of influence of the current unemployment rate.<sup>18</sup> Various explanations are possible: the discouraged worker effect was of the same magnitude as the additional worker

<sup>18</sup> In all four cases the coefficient of the current unemployment variable was found to be insignificant at the .1 level.

effect; more time was required before reacting to a change in employment conditions. The averaging of four-month rates could also be partly responsible.

Beyond this, the four groups must be examined individually and so, beginning with males 14 - 19, we note that unemployment lagged one phase caused current participation to move in the same direction, while lags of two or three phases (i.e., approximately 8 months to 1 year) corresponded to an inverse movement in current participation. Without a great deal more information we cannot actually define a causal link but it would seem plausible that the inverse relationship between participation and unemployment lagged two or three phases is dependent on the unemployment rate prevailing at the time at which the decision to enroll (and therefore, to some extent, not to participate) was made.

In general, the decision of younger males whether or not to join the labour force appears to be based primarily on their knowledge of economic conditions in similar months a year earlier. It may also be said that a worsening of unemployment has the effect of encouraging some of them to join the labour force in order to supplement the family income.

The behaviour of males 20 - 24 years is substantially different. According to the final results of the regression, the only significant effect was that a rise in unemployment lagged two periods would incline them to join the labour force. The statistical non-significance of the other coefficients prevented us from either drawing inferences about this particular group or making comparisons with other groups.

However, more interesting indications can be gathered at various stages of the regression operations. When only the time-trends were taken into consideration,<sup>19</sup> all unemployment variables' partial correlation coefficients associated with the unexplained error left in the regression had a positive sign. This would suggest that the reaction of males 20 - 24 years is always in the nature of an additional worker effect, regardless of time lag considered. Moreover, since the unemployment lagged one period and two periods had the largest and similar strength in their relationship with the errors left to be explained, while the strength of the other unemployment variables was much weaker, this group's reaction is probably at its highest point six months after the change in the unemployment rate has occurred.

In the case of females 20 - 24 years, although higher unemployment may not have resulted in an actual

decrease in participation rates, the rising trend of participation in the labour force has at times been flattened. This was indicated in the regression by the two significant coefficients being negative. It is worth noting that, unlike the other groups, the coefficient was greatest with unemployment lagged one period. Combining this with the previous discussion regarding the strong positive time-trend in participation, we see that during periods of sharply increasing unemployment the positive trend may have been overwhelmed at short notice by depressed economic conditions.

Unemployment lagged one year (three phases) was the only significant coefficient for females 14 - 19 years and the relationship between unemployment and participation was negative. Moreover, all the unemployment variables reflected a discouraged worker effect when, at an earlier stage of the regression, only time-trend variables were taken into consideration.<sup>20</sup> The behaviour of females in this age group seemed to be partly analogous to the males of that age group and partly to the females 20 - 24 years. However, it is far from being a clear-cut case; cross-classification analysis is needed to ascertain how this group behaved.

### Conclusion

This paper began with the observation that unemployment rates in 1970 were approximately 5 percentage points above the overall rate for the 20 - 24 age group, and almost 10 percentage points higher for the 14 - 19 age group. Because so many in these age groups are secondary workers, the possibility arises that the amount of unemployment experienced by young persons is still further augmented during economic recession by hidden unemployment - persons who would look for work if labour market conditions were more favourable but excluded from measured unemployment because they were not actively seeking employment. While the results of this investigation are not conclusive, there are certain indications that this is so.

The chief reservation to be borne in mind is that the analysis was based on the overall participation rates for four age-sex groups, with no separation between the enrolled and out-of-school populations. Had such a breakdown been possible, the picture which emerged might have been quite different.

The picture we do have may be roughly summarized, beginning with the marked decline in the participation rate of both male groups since the early fifties. This is obviously related to a trend to more and longer schooling but, at least for the younger group, the higher

<sup>19</sup> The equation at that stage of the regression was:  $PR = 90.34 - .800 T.D_1 - .211 T.D_2 - .708 T.D_3$ ; and partial correlation coefficients of the unemployment variables were:  $U_0 = .096$ ;  $U_{-1} = .362$ ;  $U_{-2} = .413$ ;  $U_{-3} = .190$ ; with partial F values of .43, 6.93, 9.48 and 1.73 respectively.

<sup>20</sup> The equation was:  $PR = 32.21 - .412 T.D_1 + 0.070 T.D_2 - 0.241 T.D_3$ ; and the partial correlation coefficients of the unemployment variables were:  $U_0 = -.226$ ;  $U_{-1} = -.210$ ;  $U_{-2} = -.070$ ;  $U_{-3} = -.422$ .

enrolment does not entirely explain the behaviour of the participation rate. The regression results clearly indicate that an increase in the unemployment rate has an overall discouraged worker effect for males under 20 years.

The older males (20 - 24) have a pattern similar to that of primary workers which, of course, many of them are. The only measurable impact of an increase in the unemployment rate is positive.

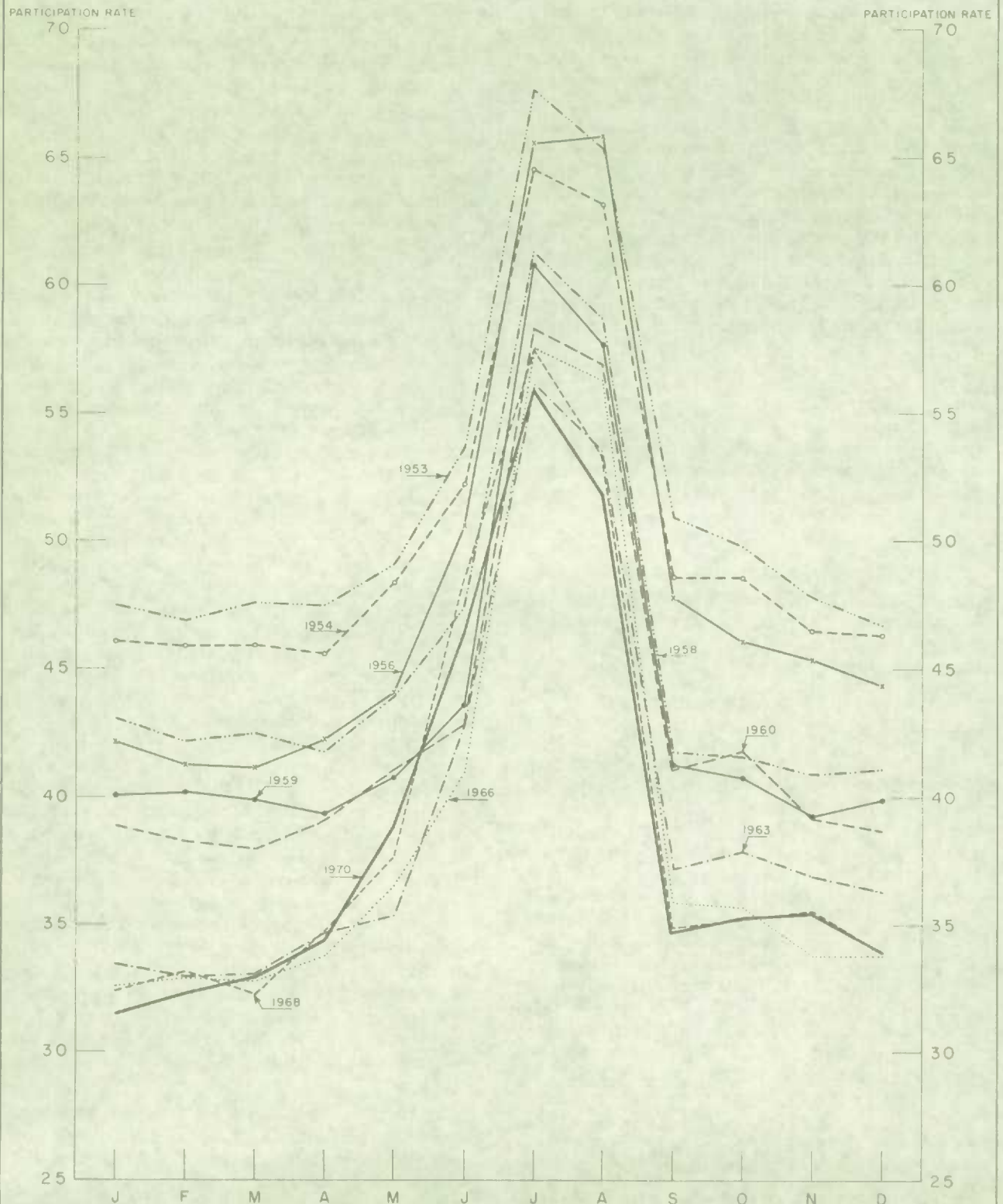
The labour force participation of females 20 - 24 years moved upward at a very rapid rate through the sixties. According to the regression results, this upward movement has been dampened when economic conditions deteriorated, but what is still more interesting is the emergence of a "male" pattern in the few last years for which observations are available. Tentatively, it would appear that this "male" pattern is due to the behaviour of the enrolled females who are moving in and out of the labour force through the year in much the same way as their male counterparts. The larger, out-of-school female group appears to differ basically in behaviour from the out-of-school males, having, to a large extent, adopted the role of secondary workers - their

labour force behaviour heavily influenced by their child-care status. Therefore, even if females in their early twenties should eventually enroll in the same proportion as their male counterparts, their overall labour force behaviour would remain different from that of males until it becomes possible for more females no longer attending school to have a more permanent attachment to the labour force.

Unlike the pattern for young males 14 - 19 years whose enrolment ratios were similar, female participation declined in the school months only, and the trend was not as marked. Towards the end of the period, the participation rates of females 14 - 19 years displayed a strong tendency to become similar to participation rates of males in the same age group, but remained at a much lower level, particularly in the summer months. Young females seem to be the group most affected by high and growing levels of unemployment, apparently least able to compete in the job market and the first influenced by poor economic conditions. This could be due in part to the narrow range of jobs open to them and the strong competition school-girls receive from older females re-entering the labour market.

CHART - A 1

### PARTICIPATION RATES, MALES 14-19, FOR SELECTED YEARS



## THE JOB VACANCY SURVEY AND LABOUR MARKET ANALYSIS

Dave Gower\*

The Job Vacancy Survey (JVS) was originally conceived and designed primarily to provide information necessary to the formulation of policy and the guidance of programs in the Department of Manpower and Immigration. The planning of manpower training programs, for example, required up-to-date and occupation-specific information on employers' demand for labour; placement and counselling services in the local offices could be expected to function more effectively given the same background information. In addition, of course, it was recognized that the vacancy data would be welcomed by other labour market analysts. The absence of such data has long been regarded as a basic gap in Canadian labour market statistics, previous development being heavily concentrated on the supply side.

The object of this article is to inform labour market analysts about job vacancy data, publication of which is expected to begin in 1971. To this end the definitions used to collect the data are explained, and some of the conceptual and quality limitations which analysts may encounter are pointed out.

An explanation of the structure of the survey will be given first. There follows a description of the vacancy measure with the framework of the comparison of labour supply and demand and, to conclude, a comment on some of its potential analytical uses.

### The Survey

The survey is conducted twice a month, the periodicity chosen for operational reasons. The shortest period for which data release is contemplated, however, will be the month, calculated by averaging two survey occasions. The survey has two phases of enumeration. First, there is a mail-out of approximately 35,000 questionnaires. Every sector of the economy is included except domestic service and agriculture. The sampling rates vary widely between different industrial and employment size groups. The mail-out is followed by an interview of about 10% of the reporting units on the mailing list for each occasion.<sup>1</sup> This interview has two main purposes: first, it checks, on a sample basis, the reporting of those who replied by mail and second, it gathers data from those who failed to reply.

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<sup>1</sup> Readers who wish a more detailed description of the way estimates are derived from the two phases of enumeration are referred to S. Ostry and A. Sunter, "Definitional and Design Aspects of the Canadian Job Vacancy Survey", *The Journal of the American Statistical Association*, LXV, No. 331 (September 1970), pp. 1059 - 70.

### The Data

The measure of demand as produced by the Job Vacancy Survey is first and foremost a stock measure. This statistic is obviously distinct from a flow measure such as monthly hirings formerly produced by the Hirings and Separations Survey conducted by the Unemployment Insurance Commission.<sup>2</sup> This difference in the reference period and other restrictions used in defining a job vacancy (as explained below) mean that only a fraction of hirings - evidently a small one - appear in the Job Vacancy Survey data.

As a stock measure, the vacancy data are conceptually comparable to the measure of unemployment. A hope of labour market analysts has been that vacancies and unemployment could be combined to produce a measure of excess demand (or supply) for labour - a measure which plays a vital role in theories of labour market behaviour. There are many pitfalls, however, on the road between the theoretical need and the actual measurement.

The measure of total labour supply is usually considered to be the number of employed plus the number of unemployed, where the unemployed include both those looking for work and the "discouraged workers", that is, those who would have looked for work if they thought it was available. (From the point of view of the actual dynamics of supply and demand in the labour market, it is sometimes valid to remove the employed and consider only the unemployed, depending on the sort of study being performed.)

What, however, is the equivalent statistical meaning of demand for labour? The definition adopted in planning the Canadian Job Vacancy Survey is that demand for labour is measured by employment plus the number of positions which, on a given reference day, are reported by employers as being vacant and for which recruiting activities have been undertaken. In practical terms that are meaningful to an employer answering the question, what symbolizes a job vacancy? An empty desk? Yes, in some cases. An idle machine? Yes, again in some cases. However, in many cases a job vacancy is ephemeral - a feeling by the employer that he could use another employee if he could find one at the right wage and with the right qualifications.

Here we come across the first, and most fundamental, impediment to a conceptual link between supply and demand for labour. A person is a real, identifiable unit (although his status as unemployed or not in the

<sup>2</sup> This survey was discontinued shortly after its transfer to the Department of Manpower and Immigration in 1966.



labour force may sometimes be difficult to measure). A general concept of a vacancy, however, may be a hypothetical thing: a statement of intent by an employer which may or may not have any concrete reality.

One of the ways to overcome the difficulty is to measure only those vacancies reported to a central manpower agency. The act of reporting serves as a test of reality of the vacancy. (It does not, of course, by itself test whether or not a vacancy is based on reasonable expectations vis-à-vis wage and qualifications.) In Canada, however, such administrative data are not considered adequate to provide a comprehensive measure, due to partial coverage of employers and a number of counting problems connected with the fact that the data are a by-product of an administrative operation not specifically designed to produce statistics.<sup>3</sup>

In turning to a survey to measure vacancies, it was necessary to devise means to "harden" the reporting by testing the employer's specific knowledge of his vacancies, and by ascertaining what specific recruiting activity, if any, had been undertaken. For a vacancy to be acceptable, therefore, the employer must be able to give a precise (i.e., codeable) description of the type of work to be done,<sup>4</sup> the exact number of employees required, the minimum starting rate of pay and the starting date. To eliminate vague and speculative vacancies, the employer is asked to report only those vacancies for which he actively recruited in the four weeks prior to the reference date. Also, to ensure that only vacancies of some real impact in the labour market are reported, the employer is asked to report only vacancies that are available to persons outside his firm.

To tighten the definition still further, it was decided to exclude vacancies which had been vacant for less than one day. Since a person is considered unemployed only if he has been without work for an entire reference week (and seeking work at some time during the week), this difference in reference periods detracts further from the comparison of supply and demand. Indications are, however, that the discrepancy is probably not too significant in percentage terms.

It is interesting that the U.S. vacancy survey has not insisted that a job be vacant for an entire reference day, although most of the remaining requirements are

<sup>3</sup> Other countries, such as France and Japan, maintain administrative series on vacancies which find wide internal use. There appears, however, to be more extensive employer use of the central manpower service within these countries. For a more complete description of foreign data series, see *The Measurement and Interpretation of Job Vacancies*, a Conference Report of the National Bureau of Economic Research (New York: Columbia University Press, 1966). This book can be considered as a basic reader in the area of measuring demand for labour.

<sup>4</sup> At date of writing the survey is being coded to both the *Dictionary of Occupational Titles* and the new *Canadian Classification and Dictionary of Occupations*. Later, when the Department of Manpower and Immigration has switched its internal data series to the CCDO, it is expected that double coding will no longer be necessary.

similar to Canada's. Omission of the so-called "instant-fills" would be expected to lower the Canadian vacancy levels relative to the American but there are some operational factors - e.g. no interview collection in the U.S., and "end-of-month" reporting - which probably have the opposite effect. The small amount of comparative data presently available indicates a rather close correspondence in the results of the Canadian and American surveys.

It was decided to make no attempt to remove vacancies which were not reasonable with regard to pay and desired qualifications, although starting wage data are gathered and some analysis of these data should be possible. This decision was based on the fact that no such edit is applied to the definition of unemployment. Of course, any such edits would be extremely difficult to apply in practice.

The analyst must judge to what degree the process of "hardening" has succeeded in making the Job Vacancy Survey data a useful measurement of the unsatisfied demand for labour. There seems little doubt that over time they will produce a useful index of demand, as well as a measure of the geographical, occupational and industrial nature of this demand. But the use of JVS vacancy data as a cardinal measure, in conjunction with unemployment, to calculate excess demand is a much more complex conceptual problem, being to some extent an "apples and oranges" situation because of the differences in definitions.

Because of the variety of hiring patterns found in different sectors of the economy, the Job Vacancy Survey is producing data for vacancies in which successful candidates for employment can start immediately ("current vacancies") and also those where candidates are to start at some specified future date ("future starting date (FSD) vacancies"). Obviously, current vacancies are a less ambiguous indication of "hard" demand. The FSD vacancies undoubtedly represent an influence on the labour market, but it is not certain whether a change in their levels would represent a change in demand or, alternatively, a change in the recruiting time horizon of employers. Whether an analyst would use current vacancies only, or a sum of current and FSD vacancies to represent labour demand, he should remember that without FSD vacancies certain components, such as the demand for teachers, would be omitted.<sup>5</sup>

In order to add an additional qualitative aspect to the data, the Job Vacancy Survey divides current vacancies into those for full-time and those for part-time jobs - vacancies which have different types and degrees of impact in the labour market. In addition, current vacancies are further divided to distinguish those which

<sup>5</sup> For a number of reasons, FSD data tend to have higher variance than current data at similar cell sizes, and consequently their interpretation and use will have to be restricted accordingly.

have been vacant for one month or more before the reference date. There is a temptation to describe the one-month vacancies as "shortage" vacancies, that is, those not caused by friction in the labour market but representing longer-term shortages of particular types of workers. This is a possibility which analysts will wish to investigate, although there is certainly nothing magic about one month.

#### Uses

Once the user community acquires sufficient familiarity with the JVS data, it is anticipated that many analytic uses will be found. Of course, uses will be limited until such time as a good time-series, covering several cycles, becomes available and allows an increase in knowledge of the quality and meaning of the data. When the first tabulations arrived, concern was expressed over the unexpectedly low levels of job vacancies. However, with the accumulation of experience in observing the data, it has been realized that they correspond fairly closely with the American levels. In the opinion of the author, the current levels are reasonable in the light of the existing economic conditions.

One important potential use that should be investigated closely is the use of a vacancy series as a cyclical variable. There is strong evidence that vacancy rates have large fluctuations during a cycle: the American vacancy rates dropped 50% from summer 1969 to summer 1970, while unemployment rose by a somewhat smaller relative magnitude. There is also a reasonable suspicion that vacancies may be a leading cyclical indicator.<sup>6</sup> And

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<sup>6</sup> Theoretically, this would follow if one hypothesizes that the rate of change of unemployment with respect to time has a lagged inverse relationship to the level of vacancies. In addition, there is evidence that the U.S. help-wanted index, which is loosely analogous to a job vacancy series, is a leading indicator (see P. Bloch, "The Help-Wanted Index Points Downward", *The Conference Board Record*, NICB, (Spring, 1970), pp. 46 - 8.

vacancy data should certainly aid in separating out the "structural" and "demand" components of cycles.

In more specific terms, the introduction of a measurement of the demand for labour should be of considerable use in the Philips - Lipsey analysis of wage changes, especially in such lines as are being developed by Kaliski and Hansen,<sup>7</sup> both of whom refer in their publications to the need for demand data. This addition would entail the substitution of data on excess demand for the currently used proxy which is measured unemployment.

Another area of potential use is in the analysis of wage changes and relative incomes. Until now, the construction of models of bargaining behaviour has been severely retarded by the lack of a measure of difficulty which employers experience in finding the desired complement of labour input. A measure of the number of vacancies which are open for immediate start is precisely what is needed, and the proportion of these positions which have existed one month or more adds a qualitative dimension.

Other analytical uses which spring to mind include the analysis of migration patterns. It is also probable that, like most new tools of economic analysis, unforeseen uses will arise. There is every possibility that as experience is gained in using vacancy data for public policy they will come to have a national importance not far from that of the unemployment figures.

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<sup>7</sup> References in this area are numerous. One of the best descriptions of the job vacancy approach to the topic, as well as an extensive list of references, can be found in B. Hansen, "Excess Demand, Unemployment, Vacancies and Wages", *The Quarterly Journal of Economics*, LXXXIV, No. 1 (February 1970), pp. 1 - 23.

## NEW DATA ON THE STUDENT LABOUR FORCE IN THE SUMMER

Peter Hicks\*

During the summer months employment and unemployment data are greatly influenced by the temporary influx of students to the labour force. In July 1970, the monthly Labour Force Survey added questions to measure the characteristics of this student work force. The questions, which were repeated in August, asked persons aged 14-24 years whether they were full-time students in March and, if so, whether they planned to return to school in the autumn. The basic questions were asked again in the summer of 1971, although comparability is slightly affected by the addition in 1971 of a "not sure" category concerning the autumn plans of students.

The table on the next page summarizes the main findings with regard to labour force status up to July 1971, the most recent data available when the note was written. A more detailed analysis of the characteristics of students in July 1970 has already been published.<sup>1</sup>

The table shows that at the peak of the summer, some 40% of returning students enter the labour force, with a much higher proportion of labour force participation among older students. The data suggest a "seasonal" pattern in student labour force participation, rising to a peak in July and falling off in August. The August drop would be due to vacation-taking, early termination of summer jobs, or possibly discouragement after unsuccessful searches for summer work. Similarly, unemployment rates of returning students drop over the course of the summer as students find jobs or drop out of the labour force.

In this context, the "summer" starts in May for students aged 20-24 years and in June for teenage

students who are mainly at school in May. Thus, taking the 1971 data, rates for teenagers are lower than those for older returning students in May and higher in June and July when the former are fully in the labour market. The 1970 data showed a somewhat different pattern in the July to August change, the decline for teenagers being greater than for older students, which left the August unemployment rate for teenagers somewhat below that for those 20-24 years of age. This August switch might be due to a greater need for income among the older group and/or to the longer period available for work after the mid-August survey week (that is, older post-secondary students usually return to school later than those attending secondary schools).

Unemployment rates are much lower for summer students than for young persons leaving school. There are a number of factors which could account for this. Participation rates are much lower for summer students (especially in the under 20 age group) and perhaps only the best qualified enter the labour force. School-leavers are perhaps more selective than summer students in their choice of a suitable job. Or there may simply be more job openings for temporary summer work than for full-time work. Certainly the great discrepancy in unemployment rates between school-leavers and those who were not attending school in the spring suggests an initial period of difficulty in finding work after leaving school. The discrepancy is particularly marked for the older age group. In the case of teenagers it is evident that the period of difficulty in finding work may last a considerable time.

The data available at this time allow a year-to-year comparison for the month of July. Participation rates for summer students in July 1971 were about the same as in 1970, although unemployment was lower. On the other hand, unemployment rates and participation rates were higher in 1971 for school-leavers. Unemployment rates had also risen for young persons not attending school in March.

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<sup>1</sup> A.E. Kyffin, "Student Employment and Unemployment, Summer 1970", *Canada Manpower Review*, III, No. 4, Department of Manpower and Immigration (Ottawa: Information Canada, 1970), pp. 17-29.

**Unemployment Rates and Participation Rates, by Age and Student Status,  
Selected Months, 1970 and 1971**

	July 1970	Aug. 1970	May 1971	June 1971	July 1971
	Unemployment rates				
Persons 14-24:					
Full-time students in March .....	13.8	8.4	13.4	18.6	12.4
Planning to return to school <sup>1</sup> .....	12.3	5.3	11.0	16.4	9.8
Not planning to return to school <sup>1</sup> .....	21.1	20.9	24.3	24.8	23.2
Not full-time students in March .....	8.8	8.8	11.5	9.6	9.6
<b>Totals</b> .....	<b>10.9</b>	<b>8.7</b>	<b>12.0</b>	<b>12.7</b>	<b>10.8</b>
Persons 14-19:					
Full-time students in March .....	14.6	7.8	10.8	20.4	13.6
Planning to return to school <sup>1</sup> .....	12.8	5.0	8.5	18.4	11.0
Not planning to return to school <sup>1</sup> .....	24.2	22.0	23.5	30.5	27.9
Not full-time students in March .....	15.7	14.6	20.3	17.5	17.3
<b>Totals</b> .....	<b>14.9</b>	<b>10.0</b>	<b>15.4</b>	<b>19.3</b>	<b>14.6</b>
Persons 20-24:					
Full-time students in March .....	11.6	10.6	19.4	13.3	8.5
Planning to return to school <sup>1</sup> .....	9.6	6.4	17.5	10.4	4.6
Not planning to return to school <sup>1</sup> .....	15.7	19.0	25.0	16.9	16.5
Not full-time students in March .....	6.5	7.0	8.5	7.0	7.2
<b>Totals</b> .....	<b>7.4</b>	<b>7.6</b>	<b>10.0</b>	<b>8.1</b>	<b>7.5</b>
	Participation rates				
Persons 14-24:					
Full-time students in March .....	46.0	42.4	26.7	36.4	47.4
Planning to return to school <sup>1</sup> .....	42.3	37.7	24.2	32.9	42.8
Not planning to return to school <sup>1</sup> .....	78.2	80.5	46.8	59.7	80.2
Not full-time students in March .....	77.5	76.7	78.7	78.1	77.5
<b>Totals</b> .....	<b>60.5</b>	<b>57.8</b>	<b>50.7</b>	<b>55.5</b>	<b>61.0</b>
Persons 14-19:					
Full-time students in March .....	41.7	37.8	21.5	30.8	42.5
Planning to return to school <sup>1</sup> .....	38.7	34.0	19.9	28.1	38.9
Not planning to return to school <sup>1</sup> .....	78.9	81.5	38.9	55.4	79.3
Not full-time students in March .....	80.1	78.3	79.4	78.4	78.9
<b>Totals</b> .....	<b>49.0</b>	<b>45.0</b>	<b>33.2</b>	<b>40.1</b>	<b>49.3</b>
Persons 20-24:					
Full-time students in March .....	74.5	71.5	56.8	69.2	76.5
Planning to return to school <sup>1</sup> .....	73.9	67.5	57.3	70.0	74.4
Not planning to return to school <sup>1</sup> .....	76.9	79.8	57.8	67.0	80.6
Not full-time students in March .....	76.7	76.3	78.5	78.0	77.0
<b>Totals</b> .....	<b>76.3</b>	<b>75.4</b>	<b>74.4</b>	<b>76.5</b>	<b>76.9</b>

<sup>1</sup> In the 1971 surveys, components of "full-time students in March" do not add because of the existence of a "not sure" category which is not shown in this table.

## THE EDUCATIONAL ATTAINMENT OF THE CANADIAN LABOUR FORCE: 1960 - 70

Ian Macredie\*

The average level of education in the Canadian labour force has increased markedly over the past ten years. In 1970, for example, approximately 70% of the labour force had at least some secondary schooling and almost 40% had completed secondary schooling or

better. In 1960, the same groups accounted for 55% and 25% respectively. This study will examine the factors which have raised the level of education as well as the changes which have occurred in the relationship between education and other labour market variables.<sup>1</sup>

### I. The Shifts in the Education Profile

Changes in the educational attainment of the labour force must come about through either or both of two mechanisms. These are (1) changes in the educational attainment of the population from which the labour force is drawn, and (2) unequal changes in the participation rates<sup>2</sup> of population sub-groups which differ in their individual educational attainment.

#### Population

Chart 1 presents an "education profile" of the labour force (1a) and of the total population 14 years and over (1b) for each of the three years under study. An education profile is simply a method of graphing the percentage share of each level of attainment in a given year. The changing shape of the curves or profiles in the three years shows how the percentage shares have been changing over time.

Notice that the levels of attainment have been plotted with the lowest levels on the left. Therefore, when the left-hand side falls over time (which means that the right-hand side must rise, since the points must add to 100%) we say that the profile has shifted to the right, indicating an increase in the average level of education.

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<sup>1</sup> The data available are somewhat restricted in coverage. Specifically, they understate the true level of educational attainment since they fail to measure formal training obtained in post-secondary institutions other than universities and training taken on-the-job such as apprenticeships. The data were obtained from a question added to the Labour Force Survey in February 1960, 1965, and 1970: "How far did this person go in school?" The responses were coded into (one of) the following categories:

- (1) Some elementary education or less (included those with no schooling)
- (2) Elementary education complete
- (3) Some secondary education
- (4) Secondary education complete
- (5) Some university
- (6) University degree

The 1960 and 1965 data have previously been published in Frank J. Whittingham's study, "Educational Attainment of the Canadian Population and Labour Force: 1960-1965", *Special Labour Force Studies*, No. 1, Statistics Canada (Catalogue 71-505 Occasional) (Ottawa: Information Canada, 1966). The 1970 data are from original tabulations prepared for this paper. See Appendix.

<sup>2</sup> A participation rate is defined as the percentage of a given population which is in the labour force.

The close resemblance between Graphs a and b in Chart 1 indicates that changes in the population profile are at least in part responsible for the corresponding shifts in the profile of the labour force. Accordingly, the causal factors underlying the shifts in the population education profile are also of interest.

To begin with, it can be seen from Table 1 that the older the age cohort, the less educated it tends to be. Therefore, as the ranks are thinned in the older age groups, the passage of time alone will cause an upward shift in the overall median level of schooling.<sup>3</sup> This tendency is reinforced by the fact that younger persons have been increasing as a percentage of the total population.

Secondly, the age group which is entering the labour market (20-24 years) has shown the largest increases in the level of educational attainment. The overall labour force profile would have shifted to the right in the absence of any change in the attainment of this group, simply because it was already the most highly-educated in 1960. But the educational attainment of the age group 20-24 years has improved markedly over the decade and this has accelerated the shift.

#### Participation

If, in the population, each group with the same age, sex, and level of education had the same participation rate (regardless of the level), then the labour force education profile would be identical to the corresponding population profile. This, however, is not the case, as Chart 1 will show.

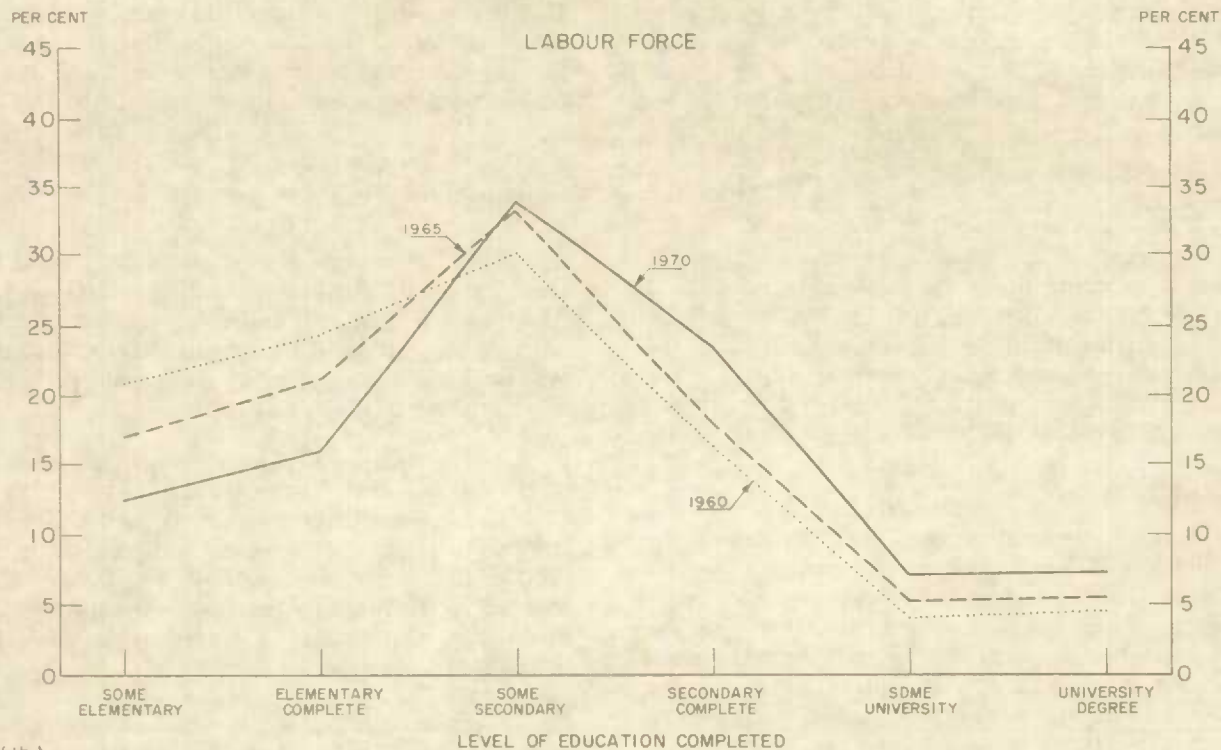
In general, it is the distribution of participation rates that defines how the education profile of the population is transformed into the corresponding profile of the labour force. Changes in particular participation rates, then, will alter this transformation and it is these changes which are of interest here. It is evident that an increase in the participation rate of a highly-educated subgroup of the population will tend to shift the labour

<sup>3</sup> Due to the variety of years of schooling which constitute given levels of education in the various provinces the actual medians have not been calculated.

CHART-1

(1a)

### EDUCATION PROFILES OF THE CANADIAN LABOUR FORCE AND POPULATION: 14 YEARS OF AGE AND OVER: 1960, 1965, 1970



(1b)

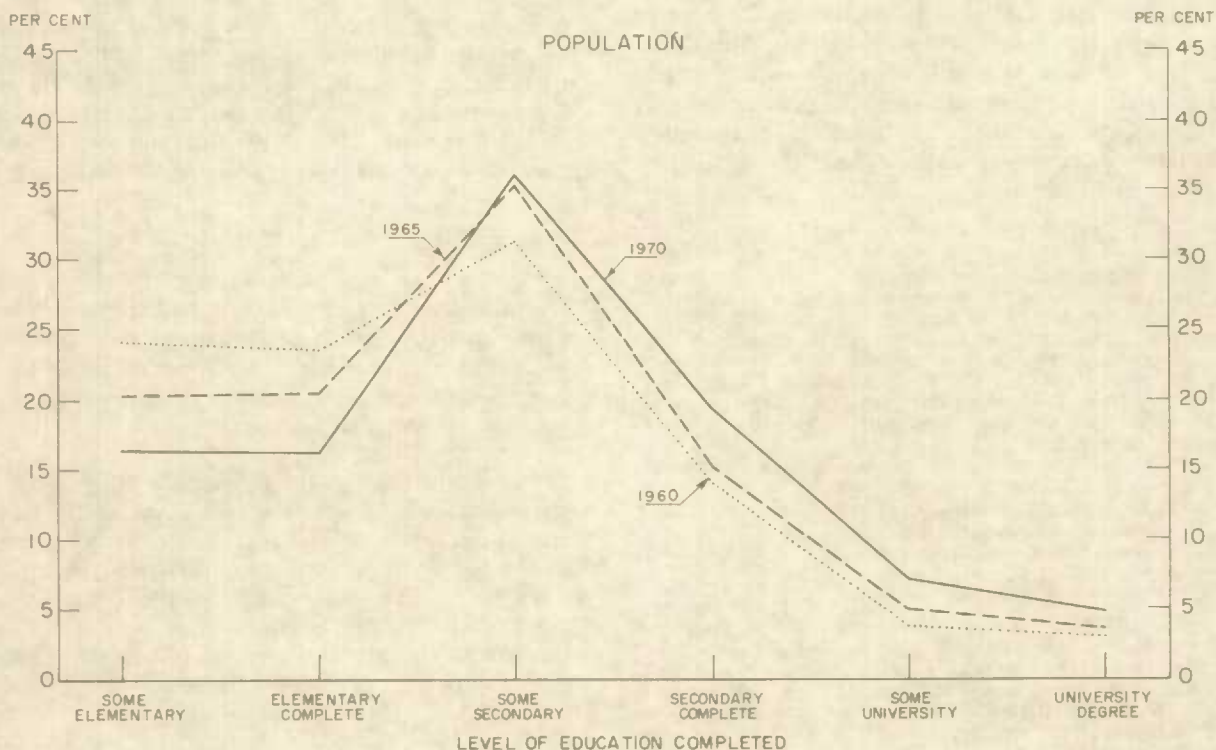


TABLE 1. Population, by Age<sup>1</sup> and Level of Education: Canada 1960, 1965 and 1970

Level of education	1960		1965		1970	
	20-24	65+	20-24	65+	20-24	65+
	per cent <sup>2</sup>					
Some elementary education or less .....	15.7	40.8	9.6	39.5	6.0	39.2
Completed elementary education .....	18.5	31.2	13.9	30.2	8.0	27.9
Some secondary education .....	35.8	14.0	37.4	15.2	32.5	16.2
Secondary education complete .....	20.3	9.6	24.2	10.2	30.3	11.3
Some university .....	7.5	2.1	11.7	2.7	18.3	2.6
University degree .....	2.2	2.4	3.2	2.2	5.0	3.0
Percentage age group in the total population .....	9.9	10.8	10.4	10.6	12.0	10.5

<sup>1</sup> The age group 20-24 years has been used instead of the available category 14-19 years on the grounds that, except for university students, the former age group will consist almost entirely of those who have terminated their formal education.

<sup>2</sup> Columns may not add to 100 per cent due to rounding.

force profile to the right, as will a decrease in the participation rate of a poorly-educated group. The participation rates for a number of age and sex categories for 1960, 1965 and 1970 may be seen in Table 2,

together with a rough summary measure of the education level in the corresponding population subgroup. This rough measure is the percentage which has completed secondary school or more.

TABLE 2. Participation Rates and Percentages of Population Completing at least a Secondary Education

Age group and sex	1960		1965		1970	
	Participation rate	Secondary complete	Participation rate	Secondary complete	Participation rate	Secondary complete
	per cent					
14-19 years:						
Male .....	38.5	8.0	31.6	9.2	32.3	14.3
Female .....	31.0	12.4	27.0	12.7	26.1	19.4
<b>Totals</b> .....	<b>34.7</b>	<b>10.2</b>	<b>29.4</b>	<b>11.0</b>	<b>29.2</b>	<b>16.8</b>
20-24 years:						
Male .....	89.0	27.7	85.1	37.0	78.5	52.4
Female .....	49.0	32.2	51.7	40.8	56.9	54.8
<b>Totals</b> .....	<b>68.4</b>	<b>30.0</b>	<b>68.1</b>	<b>39.1</b>	<b>67.8</b>	<b>53.6</b>
25-44 years:						
Male .....	97.2	23.8	96.9	27.4	96.2	37.3
Female .....	27.2	26.4	31.3	30.0	38.6	43.6
<b>Totals</b> .....	<b>61.8</b>	<b>25.2</b>	<b>63.7</b>	<b>28.7</b>	<b>67.3</b>	<b>40.4</b>
45-64 years:						
Male .....	91.5	18.6	90.8	21.1	89.8	27.1
Female .....	25.6	21.0	31.9	23.0	35.6	28.3
<b>Totals</b> .....	<b>59.1</b>	<b>19.8</b>	<b>61.4</b>	<b>22.0</b>	<b>62.3</b>	<b>27.7</b>
65+ years:						
Male .....	29.3	13.5	25.6	13.5	21.1	14.8
Female .....	5.3	13.2	6.1	16.6	5.1	18.5
<b>Totals</b> .....	<b>17.0</b>	<b>14.0</b>	<b>15.3</b>	<b>15.0</b>	<b>12.5</b>	<b>16.6</b>

Comparing the trends in participation with the trends in the educational attainment of individual age-sex groups, it will be observed that some are complementary while others are divergent. For instance, the numerically important group of males 20-24 years is highly educated and increasingly so; yet their participation rate has declined steadily over the decade.<sup>4</sup> These opposing trends in participation and educational attainment are offsetting so that it is their net effect which contributes to shifts in the education profile of the labour force. On the other hand, females of the same age group, who are even better-educated than the males,

have increased both their participation rates and their educational attainment since 1960. In this case, the trends are complementary in moving the education profile to the right. Finally, the oldest workers (65 years and over) who are the least educated, have increased their educational attainment only slightly, and they have the lowest (and a declining) participation rate.

In order to assess the net impact of these shifting participation rates – or, more specifically, in order to determine to what extent shifting participation rates are responsible for the movement in the labour force education profile since 1960 – a simulated 1970 labour force education profile has been calculated on the basis of 1960 participation rates by age, sex, and level of education. The results of this simulation are given in Table 3.

**TABLE 3. Observed Education Profile of the Labour Force Age 20 or Greater compared to the Same Profile based on the 1960 Participation Rates**

Level of education	Observed males	Simulated males	Observed females	Simulated females	Observed total	Simulated total
	per cent <sup>1</sup>					
Some elementary .....	15.0	15.6	8.4	7.0	12.9	13.3
Elementary complete .....	18.2	18.3	13.2	12.1	16.7	16.7
Some secondary .....	31.8	31.6	30.3	29.8	31.3	31.1
Secondary complete .....	19.9	19.6	32.2	33.5	23.7	23.2
Some university or university degree .....	15.1	14.9	15.9	17.7	15.3	15.6

<sup>1</sup> Columns may not add to 100 per cent due to rounding.

The picture which emerges for 1970 is basically an unaltered education profile. Although there is some slight suggestion that the profile has moved to the right as a result of shifting participation rates, it is difficult to determine whether or not this is within the range of sampling variability. It must be concluded that the substantial changes in the education profile in Chart 1a are not to any significant extent due to shifting participation rates but are primarily the result of increasing numbers of well-educated young people in the population (and therefore, in the labour force) and of diminishing numbers of older, poorly-educated workers.

In addition to the effect of participation rates on the education profile, there are some interesting aspects of the distribution of participation rates themselves. Charts 2 and 3 present a summary description of the participation rates associated with the various education categories.

For males 14 years and over (Chart 2a) there does not seem to be a systematic relationship between partici-

pation and education in any given year. Reading across the graph we see that each successively higher level of education is sometimes associated with a higher participation rate and sometimes with a lower rate. However, the erratic quality of this relationship is largely due to the age group 14-24 years since for those 25 years and over a clearer pattern emerges. Chart 2b shows a consistent relationship – higher levels of education being associated with higher participation rates at least up to the “some secondary” level. Above that level, approximately constant participation rates obtain.

Examining the changes over time, we see that for the total 14 years and over there has been a decline in participation rates in all education categories, but for males 25 years and over the same secular decline is confined to those with less than a complete secondary education.

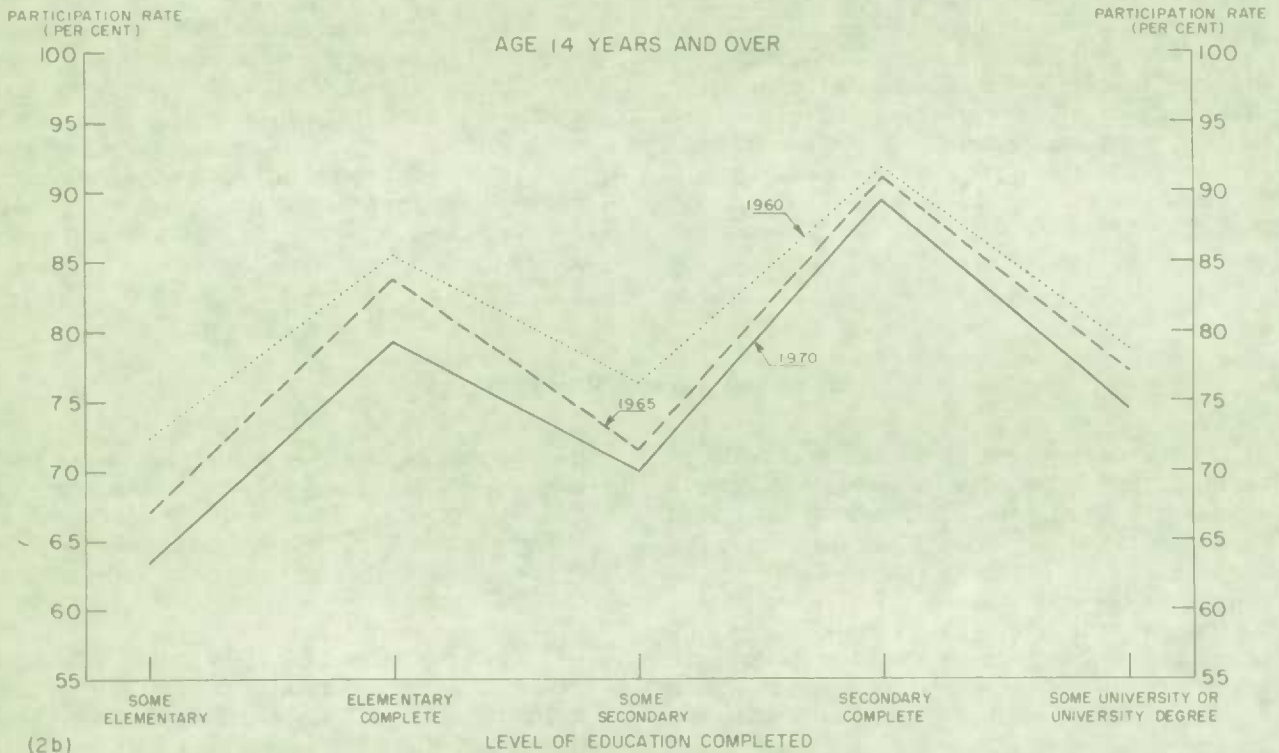
The decline in the overall male participation rate through the sixties is well known and it is evident that the decline is at least in part due to increasing average



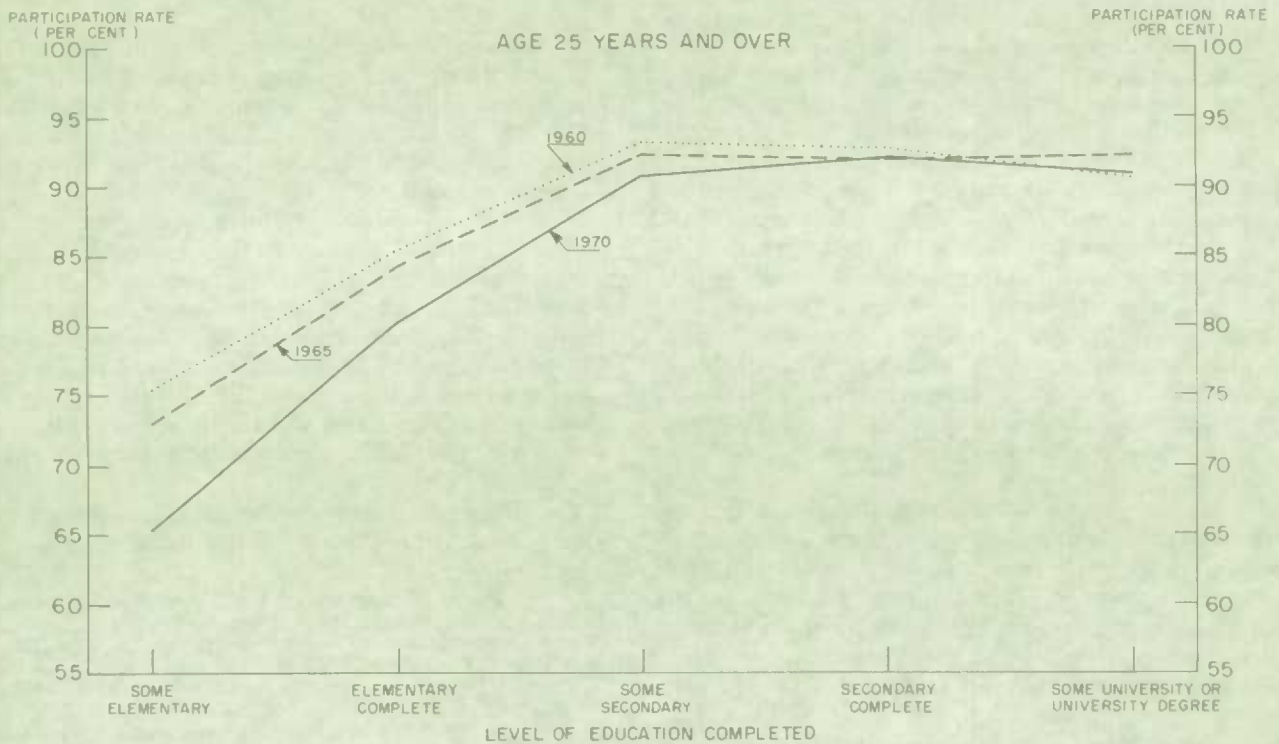
CHART-2

(2a)

PARTICIPATION PROFILE BY LEVEL OF EDUCATION  
FOR MALES<sup>(1)</sup>: 1960, 1965, 1970



(2b)



(1) SOME OF THE DECLINE IN THE MALE PARTICIPATION RATES IN 1970 MAY BE DUE TO THE RETRAINING PROGRAMME OF THE DEPARTMENT OF MANPOWER AND IMMIGRATION, SINCE MOST OF THOSE ENROLLED IN SUCH PROGRAMMES WOULD BE CLASSIFIED AS "GOING TO SCHOOL" AND WOULD THEREFORE NOT BE INCLUDED IN THE LABOUR FORCE. HOWEVER, AN EXACT COUNT OF THE ENROLMENT AS OF FEBRUARY 1970 WAS NOT AVAILABLE SO THAT THIS FACTOR COULD NOT BE QUANTITATIVELY TAKEN INTO ACCOUNT.

years of schooling and to earlier retirement. What this analysis adds is the evidence that the decline in participation (for men 25 years and over) is confined to those with less than a secondary education. Although school enrolment can be ruled out as a contributing factor in this age group, the decline may simply reflect the disproportionate number of older males in the lower education categories which makes their participation rates more subject to the effects of earlier retirement. However, in the two highest education categories, which are not without representation from the older age groups, the participation rates in 1970 were still at their 1960 levels. It is reasonable to suppose that the economy's receding demand for the poorly-educated has affected,

in some degree, both the age of retirement of this segment of the working population and its tendency to withdraw from the labour force.

The female population exhibits a very strong positive relationship between participation and education. Without exception, successively higher levels of education are associated with successively higher participation rates. In addition, the participation profile of those 14 years and over (Chart 3a) is very similar to the profile of the 25 years and over age group. Through time, an increase in participation is found at all education levels, which is in obvious contrast with the males.

## II. Education Profile, Males and Females

Attention now turns to the education profile of the labour force *per se*, giving particular attention to the differences between males and females.<sup>5</sup> For ease of comparison, the differences in the male-female education profiles have been plotted in Chart 4. In reading the chart, a positive value indicates that the percentage of the male labour force with a given level of education is greater than the corresponding percentage in the female labour force; that is, the relative percentage of males is larger. Conversely, a negative value indicates a relatively larger percentage of females.

Perhaps the main observation is that the negative values are largely confined to the higher education levels, starting with "some secondary". In other words, female workers continue to be, on average, better educated than the male, although the differential has not remained static over the decade.<sup>6</sup> Between 1960 and 1965 there was a substantial increase in the relative percentages of males with only "some elementary" or "elementary complete" but the percentages of males with some secondary did move closer to equality with the percentage of females in that category. During the same five-year period, the relative proportion of females with "secondary complete" increased by 5 percentage points. In the university category, the percentage of males exceeded the percentage of females in 1960 but five years later their positions had reversed.

During the 1965-70 period, there was a slowing down in the rate of these changes. The relative percentages of males with "some elementary" and "elementary complete" declined (although they remained higher than the female percentages) and by 1970 the percentage of males with some secondary education exceeded the corresponding percentage for females. In this period,

there appears to have been virtually no change in the relative positions of males and females with "secondary complete" or better. These observations from the last half of the decade might suggest that male workers are beginning to catch up in terms of educational attainment.<sup>7</sup>

Chart 4 compared the distribution of educational attainment in the male labour force to the corresponding female distribution. Table 4 and the discussion which follows look at the relative positions of the sexes within the total labour force over the decade.

These figures reveal that a substantial proportion of the best-educated members of the total labour force are women. In 1960, for example, women constituted 25% of the labour force but 40% of the secondary school graduates in the labour force. By 1970, despite a large increase in the numbers in the labour force, women could claim a slightly larger share of the secondary school graduates. They have also had an impressive share of the university-educated - 25% in 1960<sup>8</sup> and almost 33% in 1970. The latter figures should perhaps be treated with some caution since the group takes in a wide range of educational attainment, all the way from a year general arts to advanced degrees in engineering and the sciences. It seems likely that women are more heavily concentrated at the lower end.

There is another difference as well. If we take the male population 25 years and over with "some university

<sup>7</sup> This is in contrast with the United States experience where the two groups are now approximately equal in educational attainment. See William Deutermann, "Educational Attainment of Workers, March 1969 and 1970", *Monthly Labour Review*, XCIII, No. 10, U.S. Department of Labour (October 1970), pp. 9-10.

<sup>8</sup> The 1961 Census showed women accounting for 24.2% of the labour force with "some university" or a "university degree" (1961 Census of Canada, III, Bulletin 3.1-9, Table 17, Statistics Canada (Catalogue 94-503) (Ottawa: Information Canada).

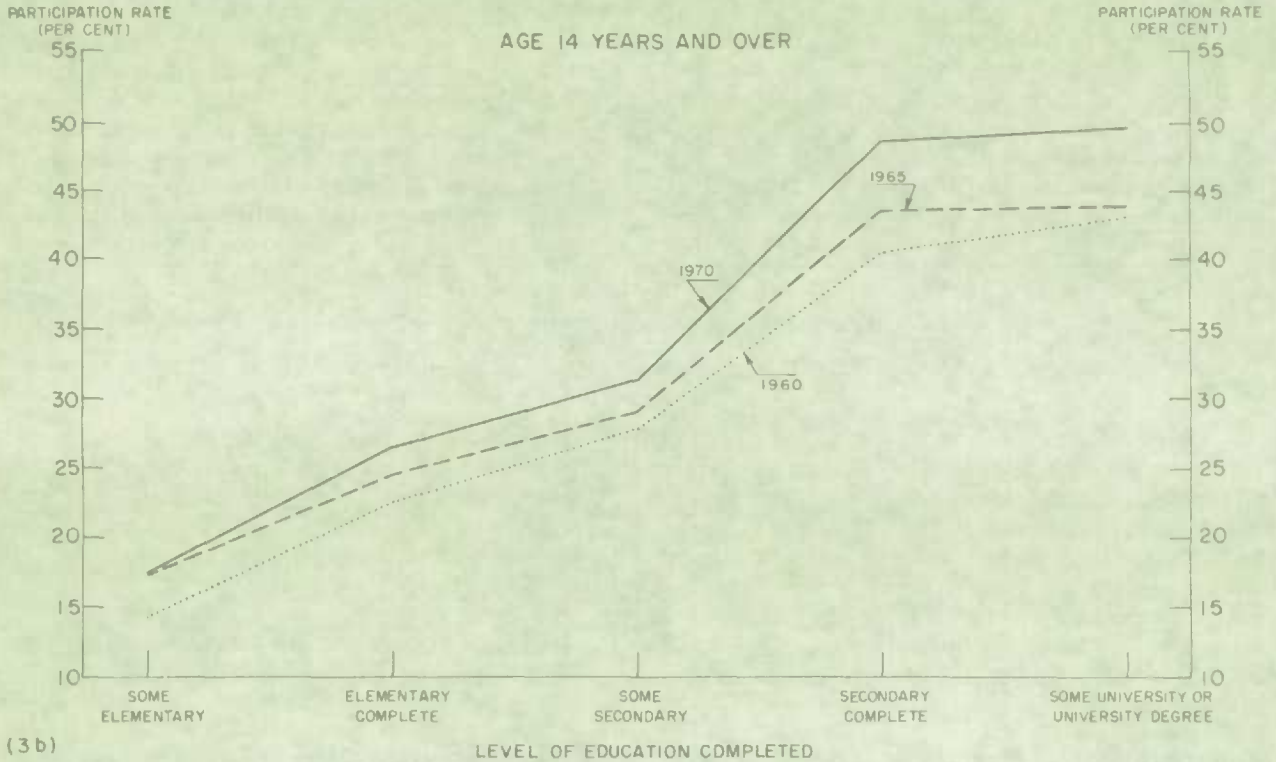
<sup>5</sup> Whittingham, *op. cit.*, has previously commented on these differences in 1960 and 1965.

<sup>6</sup> The higher percentage of females completing a secondary education was also apparent in Table 2.

CHART-3

(3 a)

PARTICIPATION PROFILE BY LEVEL OF EDUCATION  
FOR FEMALES: 1960, 1965, 1970



(3 b)

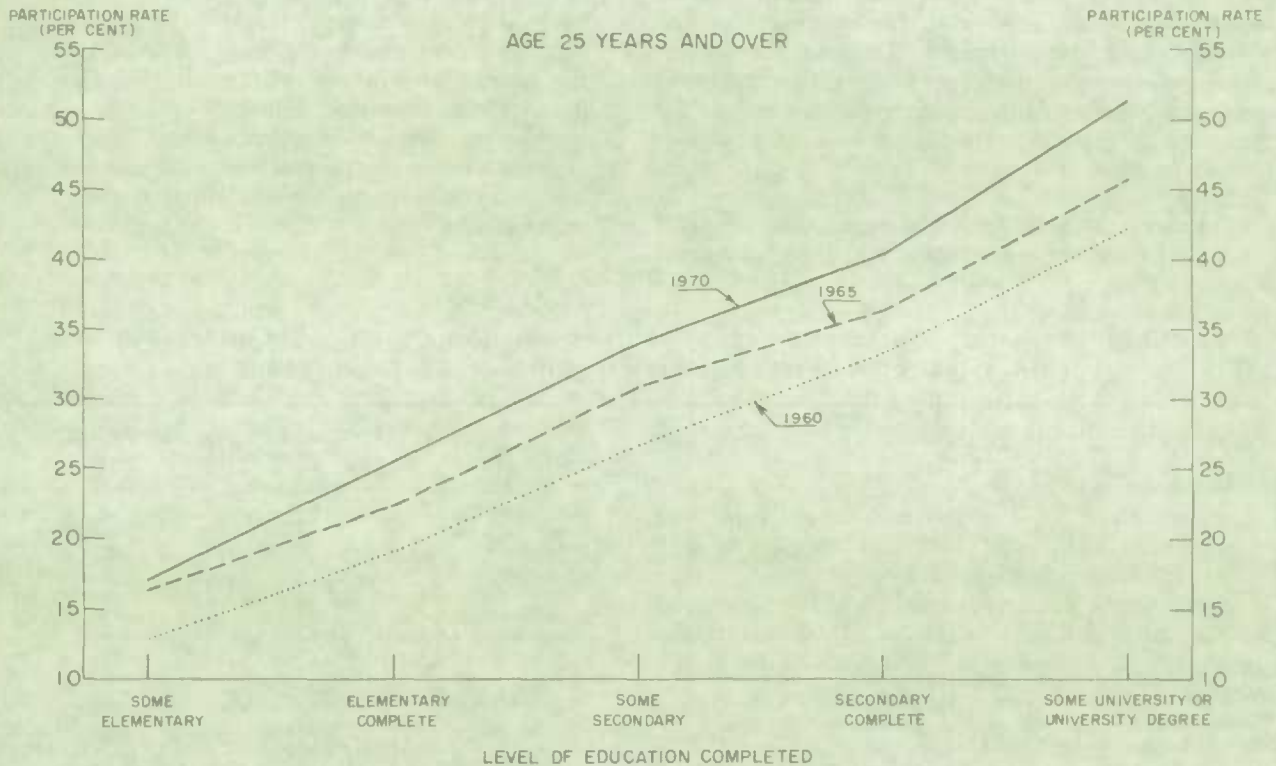
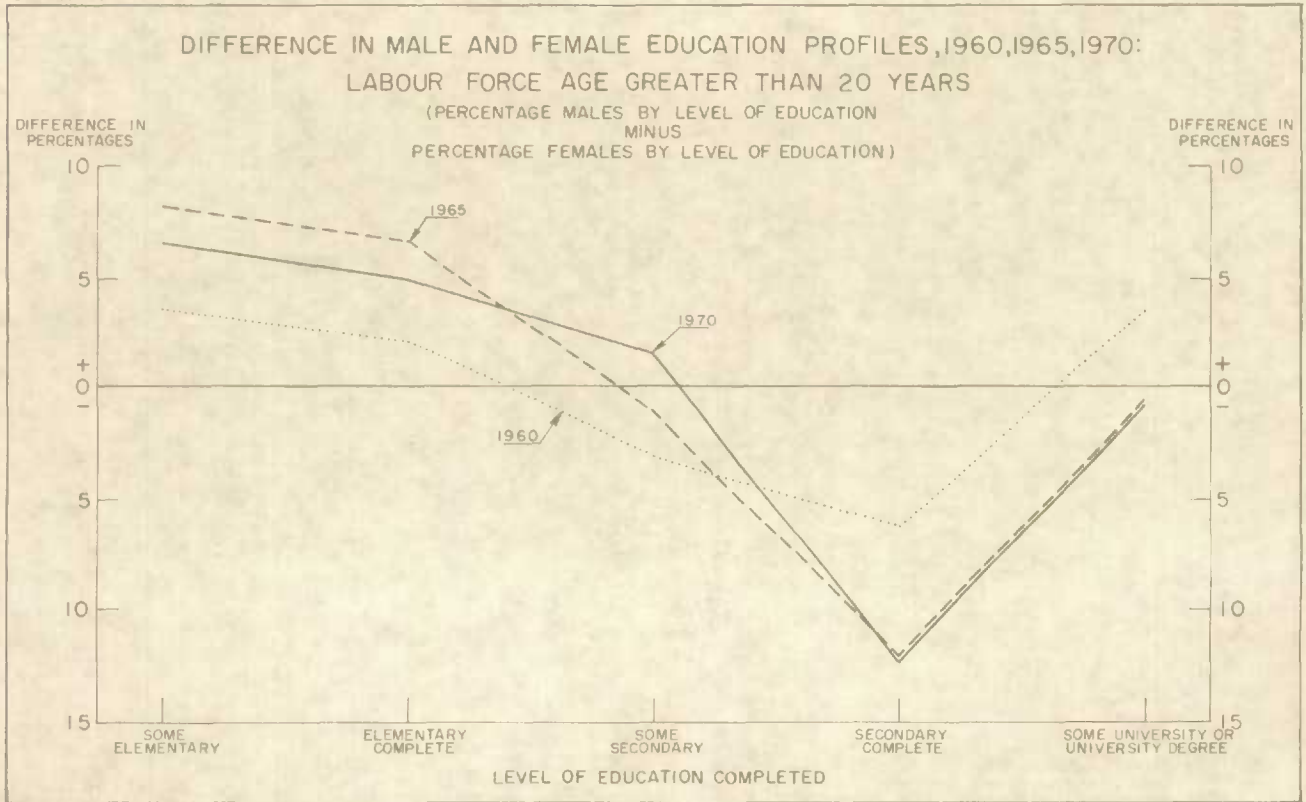


CHART-4



or university degree" (Chart 2b) we find 90.8% were in the labour force in 1970. The participation rate for females in the same education category (Chart 3b) was only 51%. Thus, while women with higher education are as well represented in the labour force as are women as a whole, they are distinctly underrepresented, relative to men, when compared to the total population acquiring higher education.

Turning to the other end of the educational scale, the female share of the labour force with no more than

some elementary education has grown by more than the other education groups (see Table 4). To some extent this increasing percentage would reflect the declining participation of men in the same education group, but the increase is large enough to cover an increase in female representation as well. It is an interesting commentary on the much-publicized increasing participation of women to see that so many of the new opportunities have been suitable for women with less than 7 or 8 grades of school.

TABLE 4. Percentage of Labour Force Accounted for by Females 14 Years of Age and Over, by Selected Levels of Education for 1960, 1965 and 1970

Year	Percentage of entire labour force accounted for by females	Percentage of labour force subgroup accounted for by females		
		Some elementary	Secondary complete	Some university or university degree
1960 .....	25.5	14.2	40.0	25.0
1965 .....	28.6	22.0	41.9	27.3
1970 .....	31.9	24.9	43.5	32.7

### III. Education and Unemployment

In each of the three years examined in this study, there is a strong inverse relationship between the level of education of a labour force subgroup and its unemployment rate (see Table 5). This is hardly new information, but again there would be an interest in seeing how the relationship may have changed over the decade.

In order to make comparisons of unemployment rates by sex and level of education over time, it is necessary to adjust the rates of each subgroup according to the overall unemployment rates prevailing in each of the three years. To do this, the individual unemployment rates (e.g., the rate for males with some secondary education) have been divided by the overall rate by sex to yield an unemployment index. The validity of this procedure rests on the assumption that the relationship between the individual rates and the total was constant over time. This is an arbitrary assumption but, given the limited data, it must suffice. Tables 5 and 6 give the raw unemployment rates and the unemployment indices respectively.

On *a priori* grounds we would expect that, over the decade, those with only "elementary or less" would show the greatest increase in unemployment relative to the overall unemployment rate. However, according to Table 6, this was not consistently the case. While males in this category had the greatest increase in the unemployment index in the five years ending 1965, the same group registered a slight decline in the five years ending 1970. The second five-year period shows no change for males with "elementary complete" and an actual increase in the unemployment index of males with "some secondary" or better.

A similarly mixed distribution of changes is evident in the indices for females, and here there are some observations which are strongly contrary to our expectations. Specifically, the greatest changes occur in the least-educated group and these were declines in the unemployment indices in both periods.

There are several possible reasons why the data did not substantiate our expectations. For example, job

**TABLE 5. Observed Unemployment Rates: Canada, 1960, 1965 and 1970, by Sex and Level of Education (14 Years of Age and Over)**

Level of education	1960			1965			1970		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	per cent								
Some elementary or less .....	20.6	7.9	18.7	14.3	6.1	12.8	15.5	6.4	13.6
Elementary complete .....	10.9	4.3	9.6	7.5	3.4	6.6	8.4	5.0	7.5
Some secondary .....	7.7	4.1	6.7	5.6	4.0	5.1	8.0	5.1	7.2
Secondary complete or more .....	3.4	1.6	2.8	2.3	1.4	1.9	3.4	3.0	3.3
Overall rate by sex .....	10.7	3.7	8.9	6.9	3.1	5.8	7.7	4.2	6.5

Source: The unemployment rates are taken from the monthly publication *The Labour Force*, Statistics Canada (Catalogue 71-001 Monthly) (Ottawa: Information Canada), for February 1960, 1965 and 1970.

**TABLE 6. Unemployment Indices: Canada, 1960, 1965 and 1970, by Sex and Level of Education (14 Years of Age and Over)**

Level of education	1960			1965			1970		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	per cent								
Some elementary or less .....	1.93	2.14	2.10	2.07	1.97	2.21	2.01	1.52	2.11
Elementary complete .....	1.02	1.16	1.08	1.09	1.10	1.14	1.09	1.19	1.15
Some secondary .....	.72	1.11	.75	.81	1.26	.88	1.04	1.21	1.09
Secondary complete or more .....	.32	.43	.32	.33	.45	.33	.44	.71	.51

seniority may be a good substitute for formal education in terms of job security. If so, the risk of unemployment which confronts the older cohorts due to lower levels of education may be mitigated by their high degree of job seniority. As well, the earlier observations on participation may have some relevance here. For males, the decline in participation was found to be concentrated in the lower education categories (some secondary or less) and it may be that these withdrawals from the labour force have come largely from the ranks of the unemployed. This would make the observed behaviour of

the unemployment indices somewhat more reasonable. For females, the increase in the participation rates of those with the least education is consistent with, but does not explain, the above-noted behaviour of the indices. That is, the increases in participation are consistent with relatively improving employment rates among poorly-educated females.

Without considerably more data, we are left to conclude that no strong secular trend exists, or at least is not apparent, in these data.

#### IV. Summary

Young people in the labour force continue to be better educated than their parents or grand-parents and this age-education relationship has become more pronounced over the decade. It is this age-education relationship which has accounted for most of the shift in the education profile of the labour force since 1960.

The female members of the labour force continue to be better educated on average than the male and this disparity has increased somewhat over the decade.

The decline in male participation over the decade was largely confined to men with less than a complete secondary education, while the increase in female participation rates has been spread over the entire range of educational attainment. By combining the observations on participation rates and unemployment rates by level of education, it might be concluded that declining participation among poorly-educated males is in part responsible for the fact that the incidence of unemployment in the group has not increased perceptibly over the decade.

#### APPENDIX

TABLE A 1. Population by Age, Sex and Level of Education: Canada, February, 1970

	Total male	Age							
		14-19	20-24	25-34	35-44	45-54	55-64	65+	
		'000							
Some elementary .....	1, 261	121	58	131	191	217	230	313	
Elementary complete .....	1, 210	69	71	188	247	239	200	195	
Some secondary .....	2, 663	890	300	451	411	314	196	101	
Secondary complete .....	1, 195	101	226	275	225	193	116	59	
Some university .....	573	79	198	117	72	57	33	18	
University degree .....	468	—	46	159	115	76	44	29	
<b>Totals .....</b>	<b>7, 370</b>	<b>1, 261</b>	<b>897</b>	<b>1, 322</b>	<b>1, 261</b>	<b>1, 096</b>	<b>819</b>	<b>714</b>	
	Total female	Age							Total
		14-19	20-24	25-34	35-44	45-54	55-64	65+	
		'000							
Some elementary .....	1, 157	85	49	122	171	209	223	297	2, 418
Elementary complete .....	1, 201	73	72	172	227	223	193	240	2, 411
Some secondary .....	2, 698	813	278	464	431	349	212	152	5, 360
Secondary complete .....	1, 689	146	313	394	315	262	141	117	2, 884
Some university .....	496	87	128	100	65	56	39	22	1, 069
University degree .....	262	--	43	92	50	35	24	17	731
<b>Totals .....</b>	<b>7, 503</b>	<b>1, 205</b>	<b>884</b>	<b>1, 344</b>	<b>1, 260</b>	<b>1, 134</b>	<b>832</b>	<b>844</b>	<b>14, 873</b>

— estimated empty cell.  
 -- estimate less than 10,000.

TABLE A2. Labour Force by Age, Sex and Level of Education: Canada, February, 1970

	Total male	Age						
		14-19	20-24	25-34	35-44	45-54	55-64	65+
		'000						
Some elementary .....	799	42	50	120	175	194	173	46
Elementary complete .....	958	35	65	181	240	226	169	42
Some secondary .....	1,865	257	270	440	401	300	167	29
Secondary complete .....	1,067	60	210	270	222	190	100	17
Some university .....	347	13	73	103	70	56	30	--
University degree .....	428	--	36	152	111	75	40	14
<b>Totals</b> .....	<b>5,466</b>	<b>407</b>	<b>704</b>	<b>1,266</b>	<b>1,219</b>	<b>1,040</b>	<b>679</b>	<b>151</b>

	Total female	Age							Total
		14-19	20-24	25-34	35-44	45-54	55-64	65+	
		'000							
Some elementary .....	202	13	16	26	47	52	41	--	1,001
Elementary .....	318	20	30	53	76	75	52	12	1,277
Some secondary .....	846	163	135	156	173	139	71	--	2,711
Secondary complete .....	823	99	227	172	134	126	54	10	1,890
Some university .....	222	20	62	52	33	34	17	--	569
University degree .....	155	--	34	54	31	23	13	--	584
<b>Totals</b> .....	<b>2,565</b>	<b>314</b>	<b>503</b>	<b>512</b>	<b>494</b>	<b>450</b>	<b>249</b>	<b>43</b>	<b>8,031</b>

-- estimated empty cell.  
 -- estimate less than 10,000.

Note: For definitions of the labour force and the unemployed see *The Labour Force*, Statistics Canada, (Catalogue 71-001 Monthly) (Ottawa: Information Canada).

TABLE A3. Unemployed by Age, Sex and Level of Education: Canada, February, 1970

	Unemployed (age 14 years and over)		
	Male	Female	Total
	'000		
Some elementary .....	124	13	136
Elementary complete .....	80	16	96
Some secondary .....	150	43	194
Secondary complete .....	48	28	77
Some university or university degree .....	15	--	23
<b>Totals</b> .....	<b>418</b>	<b>108</b>	<b>526</b>

-- estimate less than 10,000.

Note: For definitions of the labour force and the unemployed see *The Labour Force*, Statistics Canada, (Catalogue 71-001 Monthly) (Ottawa: Information Canada).

## DEVELOPING STATISTICS ON INDUSTRIAL INJURIES

May Nickson\*

The production of statistics on industrial injuries in Canada falls to ten separate workmen's compensation boards in the ten provinces. No national statistical program exists. And since, for the usual reasons of different concepts, collection procedures, etc. provincial statistics are not easily combined, there are no national statistics on accidents and injuries at work. The general accident situation across Canada in terms of trends in incidence by region, industry, or occupation is largely unknown.

This paper reports on an investigation launched by Statistics Canada at the request of the Industrial Accident and Prevention Branch of the Canada Department of Labour. The latter, which is responsible for the federal government's accident prevention program, requires data to (a) identify the areas most likely to benefit from increased safety activity, (b) evaluate the effectiveness of the various safety regulations and programs now in operation, and (c) facilitate a general assessment of the accident situation to be made by the Canadian Association of Administrators of Labour Legislation (CAALL).

### Purpose of Statistics

The purpose of Statistics Canada's investigation is to determine the benefits, costs and feasibility of developing a program for tabulating national statistics.

An initial study showed that the cost of industrial injuries is surprisingly high. From data on the insured population it was estimated that 16% of all employed workers have an accident each year, and that 7% have an accident resulting in a time-loss from work. Workmen's compensation boards are spending annually nearly \$300 million on compensation and administration to alleviate some of the after-effects of some 760,000 accidents. The total Canadian wage bill is increased 0.8% by payments from employers to workmen's compensation boards, and the increase would be higher if all employers were covered. In addition to this, government agencies and boards across Canada are spending about \$20 million on direct accident prevention measures.

There are a number of agencies, private as well as government, concerned with safety and accident prevention measures, and safety is being promoted in many different ways - for example: regulations of working conditions and methods of operation; inspection of establishments and sites; education and training pro-

grams; promotion and advertising; development of safety devices and clothing. The role of statistics is to assist in evaluating the effectiveness of various programs, to suggest means of distributing available resources (e.g., when to inspect) and to help pin-point areas of risk (who has accidents, the conditions under which they occur) for direction of research on prevention measures.

### Type of Statistics Required

Persons concerned with accident prevention need to know the industries, areas (sometimes even the plants), and occupations in which the highest incidence of accidents or the most serious accidents occur. They also need to know the nature of injuries occurring, the causes, and the main mechanical hazards involved. Comparable statistics should therefore be available by province and by industry, giving the number of accidents, type of accident, and nature of the injury. These data should be related to a specific time period, such as a calendar year, and to information on the average number of persons employed in each province and industry in order to obtain incidence.

Since certain industries operate under the jurisdiction and control of the federal government, a separate tabulation of accidents in these areas would be required by the Department of Labour in conjunction with the national program. In addition, information is needed on which to base estimates of the medical costs of accidents and the economic costs resulting from time lost from work.

### Preliminary Recommendations

In order to fulfill the role indicated above, statistics would be required both on injuries occurring and on exposure risk. One of the reasons why statistics on industrial injuries are still relatively undeveloped in Canada, and elsewhere, appears to be in the difficulties of securing and matching both types of data. Records on injuries are not usually maintained by individual business establishments which can report employment, while the workmen's compensation boards collect injury data but not employment.

The absence of records on injuries would pose serious difficulties if these statistics were to be developed from a survey of establishments. The information would have to be collected immediately following an accident or at the onset of an illness and, with intermittent occurrences, the data collection agency would find it difficult to control coverage. On the other hand, workmen's compensation boards receive reports on almost all injuries where employees are insured and the

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percentage of workers covered is very high (about 85%). For these reasons, and because Statistics Canada is currently attempting to reduce the reporting burden for Canadian businessmen rather than add to it, the initial Statistics Canada report recommended against a direct survey and suggested that an attempt be made to develop statistics from the provincial workmen's compensation boards.

Canada appears to be in a good statistical position in this field, relative to other countries. All workmen's compensation boards are operating efficiently and in a reasonably similar fashion, insuring a high proportion of the work force, and already collecting most of the basic information required for analytic studies. Most boards have been producing annual statistics on injuries for a number of years. However, although there appears to be much similarity in methods of operation, there is little uniformity in the statistics produced. Some boards tabulate claim forms, some tabulate settlements and others something in between. Some tabulate all injuries, some those with time lost from work, some only injuries receiving compensation. Many different codes are used to identify accidents and different methods are employed in combining groups of industries. To produce national statistics, therefore, raises first of all the question of standardizing coding and tabulating procedures.

The preliminary inquiry suggests that, although not all problems have found solution, the chances of success are good. Most boards have adopted mechanical or computerized methods of data processing; many of them are realizing that accidents must be analyzed at more than one period of time and possibly with different reference periods. The old arguments over whether it is better to analyze from claims or settlements seem now to have been resolved quite simply: both are needed. Some boards are already producing both to a limited degree and some are planning to produce more.

The most difficult aspect appears to be the standardization of industrial coding. This is required not merely for the production of national aggregates but also for relating accident statistics to employment and hours of work in the various industries. The latter would provide a measure of exposure against which to assess the incidence and frequency of employment injuries, the lack of which is probably the major data gap in most tabulations of injuries today.

Although the concept of exposure most widely accepted refers to hours spent in the plant, the closest concept which can be measured with reasonable accuracy appears to be the average number of persons employed during the year (man-years). These data are collected by Statistics Canada for larger establishments and sampled for smaller ones but, since they are based on monthly

surveys, it would be difficult for agencies other than Statistics Canada to collect the information.

The initial report recommended that for national statistics exposure be measured in terms of man-years (average employment) and that an attempt be made to match injury data collected by the workmen's compensation boards to employment data tabulated at Statistics Canada.

A further recommendation was made for national tabulations on injury data. The need for such tabulations did not in itself appear to be very significant but there was a definite requirement for comparisons of trends and other analysis between provinces or with other areas, and it appeared that analysis could best be standardized by a central control in conjunction with national tabulations.

### Continuing Investigations

Following presentation of the Statistics Canada report in September 1970, the CAALL Safety Committee agreed to promote a national program of injury statistics covering injuries involving time-loss or permanent disability, using Statistics Canada coding for industry and occupation, and Statistics Canada employed man-years, and basing the classification of injuries and accidents on the American Standard Z-16-2. The Committee also noted that since all operations of workmen's compensation boards, including statistical output, were under direct control of the chairmen and directors, an effort should be made by the Safety Committee and its members to inform the board members of the advantages of nationally standardized statistics and what would be involved if they participated.

To date only the B.C. Workmen's Compensation Board and the Canada Department of Labour have fully entered the program but Nova Scotia and Manitoba have participated in the investigations being carried out. It will be possible for provinces to join the national injury program gradually and intermittently.

It is evident that considerable costs are involved in changing the boards' statistical programs and in matching the differing industrial classifications now used to the Standard Industrial Classification (S.I.C.) in use at Statistics Canada. Statistics Canada has initiated a pilot study to (a) check the extent of coding that can be done from claim forms; (b) discover the problems confronting workmen's compensation boards in using the S.I.C. code; (c) test the possibilities for uniformity in the "time-loss" definition for tabulating accidents; (d) determine which of several possible employment estimates would be most useful; (e) attempt separation of injuries (with equivalent employment) by jurisdictional control (i.e., federal or provincial government departments); and (f) hopefully, to indicate the usefulness of incidence data.

In addition to its commitment to the pilot study, Statistics Canada is prepared to consider giving aid with industrial coding and possibly tabulating further claim reports or consolidating provincial tabulations which are reconcilable.

The Central Classifications Staff of Statistics Canada has agreed to serve as a central agency providing rulings on the classification of work injuries where they are needed. This staff has recently produced a paper on classifications using the Z-16-2 which will be distributed

to provincial workmen's compensation boards. Statistics Canada is also making available lists of establishments with Statistics Canada industry classifications to provincial boards or departments of labour on request. The Labour Division is providing a liaison service for tracing apparent mismatches. The role of co-ordinator may be a new trend for Statistics Canada, particularly if the list matches prove successful. It could allow for a wider use of Statistics Canada data for outside computer analysis and an accompanying reduction in the reporting burden for business.

## FEMALE EARNINGS IN MANUFACTURING: A COMPARISON WITH MALE EARNINGS

Neil MacLeod\*

It is a well-established fact that female workers in Canada generally earn less than male workers. The purpose of this study was to examine the relative earnings of female employees in manufacturing industries as well as to look for possible relationships between pay differentials and (1) the importance of female employment and (2) the level of wages paid. The study does not purport to investigate why differential earnings exist for the very good reason that the necessary data on occupational mix, age, education and experience do not exist. The same data gaps preclude comment on whether equal pay for equal work prevails.

Source data were surveys conducted by the Labour Division for the publication *Earnings and Hours of Work in Manufacturing* (Catalogue 72-204 Annual) (Ottawa: Information Canada). Industrial comparisons were made using 3-digit Standard Industrial Classification (S.I.C.) groups for 1967 and combined groupings for trend analysis for the period 1946-68. A two-group occupational split was used: wage-earners (production and related workers) and salaried employees (office and related workers), with clerical workers selected from the latter for further examination.

For the purpose of this study, the percentage of average female to male earnings is called the female pay ratio. The female employment ratio is similarly defined, i.e., the number of female employees per 100 male employees.

### Wage-earners

In manufacturing, males in the wage-earning category outnumber the females by more than three to one. In 1967, the average hourly earnings were lower in all industrial groups but the amount of the difference varied considerably. Table 1 presents the female pay ratios for 64 industries ranked accordingly. The ratios range from a high of 86% in tobacco products to a low of 57% in commercial printing. The listing did not reveal any visible pattern of groupings, e.g. industries requiring muscle power, technical skills, durable goods industries, etc. Other factors were subject to statistical testing.

\* *Employment Section, Labour Division.* This article was written while Mr. MacLeod was a summer student employee with the Employment Section.

TABLE 1. Manufacturing Industries Ranked by Pay Ratio, Level of Female Earnings and Employment Ratio for Wage-earners: Canada, 1967

S.I.C. class	Industry	Female to male average hourly earnings		Rank by level of female average hourly earnings	Rank by female to male employment ratio
		Pay ratio	Rank		
		I	II	III	IV
		%			
153	Tobacco products .....	86.05	1	1	11
201	Spun yarn and fabrics (synthetic).....	85.87	2	45.5	30
332	Major appliances (including non-electric).....	85.33	3	7	49
161	Rubber footwear .....	83.84	4	38	15
193-7	Woolen yarn and cloth.....	83.60	5	45.5	19
334	Household radios and televisions .....	83.25	6	30	12
261	Household furniture .....	82.99	7	41	42
123-5	Grain mill products .....	82.70	8	15	47
111	Fish products .....	82.24	9	64	24
291	Iron and steel mills .....	79.56	10	2	64
321	Aircraft and parts .....	79.17	11	5	59
163	Tires and tubes.....	78.91	12	3	58
229	Miscellaneous textiles.....	78.34	13	35	6
183	Cotton yarn and cloth.....	78.08	14	33	25
101	Slaughtering and meat processing .....	77.22	15	9	36
239	"Other" knitting mills.....	76.06	16	55.5	4
356	Glass and glass products .....	75.56	17	12.5	32
143	Distilleries .....	75.17	18	6	26
231	Hosiery.....	74.87	19	59	5

TABLE 1. Manufacturing Industries Ranked by Pay Ratio, Level of Female Earnings and Employment Ratio for Wage-earners: Canada, 1967 - Concluded

S.I.C. class	Industry	Female to male average hourly earnings		Rank by level of female average hourly earnings	Rank by female to male employment ratio
		Pay ratio	Rank		
		I	II	III	IV
		%			
338	Electrical wire and cable .....	74.81	20	14	55
339	Miscellaneous electrical products.....	74.68	21	27	16
375	Paints and varnishes .....	74.10	22	18.5	51
336	Electrical industrial equipment .....	73.65	23	12.5	37
266	"Other" furniture .....	73.36	24	48.5	40
318	Office and store machinery .....	73.09	25	8	35
179	Luggage, handbag and small leather goods.....	72.92	26	59	8
323	Assembling (motor vehicles) .....	72.27	27	4	62
252	Veneer and plywood mills .....	72.11	28	22.5	41
174	Shoes, except rubber .....	71.94	29	57	10
251	Saw, shingle, and planing mills .....	71.72	30	28.5	63
2012	Filament yarn and staple fibres.....	71.03	31	25	39
112	Fruit and vegetable canners and preservers .....	70.77	32	61	18
381	Scientific professional equipment .....	70.38	33	21	20
169	"Other" rubber products.....	70.37	34	33	28
254	Sash, door and flooring mills .....	70.35	35	59	54
374	Pharmaceuticals and medicines.....	70.20	36	25	17
131	Confectionery .....	69.77	37	52.5	9
335	Communications equipment .....	69.14	38	18.5	13
385	Plastic fabricators, n.e.s. ....	68.78	39	50	22
294	Iron foundries .....	68.40	40	20	61
128	Biscuits.....	68.24	41	42.5	7
376	Soap and cleaning compounds .....	68.21	42	11	33
141	Soft drinks .....	68.20	43	54	57
105-7	Dairy products .....	67.97	44	48.5	50
274	"Other" paper converters.....	67.34	45	36.5	23
243	Men's clothing .....	67.14	46	55.5	3
305	Wire and wire products .....	67.04	47	22.5	44
129	Bakeries .....	66.96	48	52.5	31
351	Clay products .....	66.67	49	45.5	48
245	Children's clothing .....	66.34	50	62	1
393	Sporting goods and toys .....	65.50	51	63	14
306	Hardware, tools and cutlery .....	65.49	52	36.5	34
296-8	Non-ferrous metal rolling, casting.....	65.30	53	28.5	53
304	Metal stamping, pressing, and coating .....	64.77	54	33	46
273	Paper boxes and bags .....	64.54	55	40	29
315	Miscellaneous machinery and equipment .....	64.39	55	25	56
271	Pulp and paper mills .....	64.29	57	10	60
309	Miscellaneous metal fabricating .....	63.46	58	39	45
325	Parts and accessories.....	61.92	59	17	38
303	Ornamental and architectural metals.....	61.63	60	51	52
139	Miscellaneous food products .....	61.48	61	45.5	21
244	Women's clothing .....	60.46	62	42.5	2
289	Miscellaneous printing and publishing .....	57.01	63	16	43
286	Commercial printing.....	56.54	64	31	27

Industries employing few women might tend to pay them more in accordance with their male staff or, alternatively, those with a high proportion of female staff might make less use of pay differentials. However, statistical analysis did not indicate any regular relationships between the ratios for female earnings and for female employment.<sup>1</sup> This lack of correspondence may also be seen in the last column of Table 1 where the female employment ratio is ranked, with no noticeable clustering at either end of the ranking based on pay ratio.

The possibility of variation according to the wage scale was also considered. Does the pay ratio differ significantly when one moves from a high-pay industry to a low-pay industry? Again, statistical analysis indicated not.<sup>2</sup> Lack of cluster may also be noted in column 3 (Table 1) where the industries are ranked according to the level of female hourly earnings.

<sup>1</sup> An analysis of variance was performed on the female pay ratio partitioned into three groups according to the value of the female employment ratio. The F test was highly insignificant at the .025 level. Due to space limitations, the detailed tabulations on which the statistical analysis were based have been replaced by rankings which give a more visible picture.

<sup>2</sup> The analysis of variance, performed on the pay ratio of three groups according to the level of average hourly earnings, produced an insignificant F test at the .025 level.

Distribution by province indicated that there were differences in pay ratios for manufacturing as a whole (see Table 2). Women appeared to be paid more like men in Alberta and Saskatchewan, but less so in the Atlantic Provinces, especially in Newfoundland. As with industrial classifications, the ranking appeared to have little connection with the level of earnings or the employment ratio. The grouping of the Atlantic Provinces in the bottom ranks suggests that some of the provincial difference might be caused by social structures or level of economic activity. However, the lack of geographical pattern for the other provincial ranks suggests that much of the variance might be due to industrial mix. It was difficult to eliminate the effect of this mix because no industries were significant in all provinces.

At the major group level, it was possible to segregate the food and beverage industry, getting a different provincial ranking from total manufacturing. However, even at this level, the Atlantic Provinces would be heavily represented by fish processing while the Prairie Provinces would tend towards slaughtering and meat processing. Some more direct comparisons were possible between Quebec and Ontario, using finer industrial detail, and for these comparisons the pay ratio did not appear to be strongly influenced by provincial location. For example, Quebec had higher pay ratios in textiles, knitting and clothing but Ontario was higher in tobacco products and processing.

TABLE 2. Provinces Ranked by Pay Ratio, Level of Female Earnings, and Employment Ratio for Wage-earners in Manufacturing: Canada, 1967

Province	Female to male earnings		Level of female earnings		Rank by female to male employment ratio	Rank by food and beverages pay ratio
	Pay ratio	Rank	Average hourly earnings	Rank		
	I	II	III	IV	V	VI
	%		\$			
Alberta .....	64.8	1	1.69	3	6	1
Saskatchewan .....	64.0	2	1.65	4	7	2
Quebec .....	63.6	3	1.54	5	1	5
Ontario .....	61.2	4	1.72	2	3	7
British Columbia .....	61.0	5	1.94	1	9	8
Manitoba .....	59.8	6	1.46	6	2	6
Nova Scotia .....	54.7	7	1.16	8	4	9
New Brunswick .....	53.6	8	1.19	7	5	3
Newfoundland .....	44.1	9	0.97	9	8	4

### Clerical and Related Employees<sup>3</sup>

The finest occupational grouping available – clerical and related – was still not sufficiently select to indicate job discrimination. However, these data do show what has been happening in an area where male-female jobs are more nearly equal in number and more nearly alike (see Table 3). With one exception (tires and

tubes), female clerks consistently averaged less pay than male clerks and the range in the pay ratios was similar to that shown previously for wage-earners: from 89% down to 55%. Again no significant relationships were found between pay and employment ratios or between the pay ratio and the level of female earnings.<sup>4</sup> Nor was the pay ratio similar for wage-earners and clerical workers in the same industry.

<sup>3</sup> The study also attempted to analyse the segment of the salaried group remaining after the clerical occupations were removed. However, the number of females remaining was insufficient to maintain representative averages.

<sup>4</sup> Analysis of variance performed on the pay ratio showed no significant relationship at the .05 level.

TABLE 3. Manufacturing Industries Ranked by Pay Ratio, Level of Female Earnings and Employment Ratio for Clerical and Related Workers; Canada, 1967

S.I.C. class	Industry	Female to male average hourly earnings		Rank by level of female average hourly earnings	Rank by female to male employment ratio
		Pay ratio	Rank		
		I	II	III	IV
		%			
163	Tires and tubes .....	108.9	1	1	64
318	Office and store machinery .....	88.7	2	9	1
323	Assembling (motor vehicles) .....	80.0	3	2	68
356	Glass and glass products .....	78.2	4	25	35
128	Biscuits .....	77.2	5	28.5	32
375	Paints and varnishes .....	76.9	6	31.5	52
123-5	Grain mill products .....	76.2	7.5	49.5	36
374	Pharmaceuticals and medicines .....	76.2	7.5	16	2
252	Veneer and plywood mills .....	75.5	9	13	31
229	Miscellaneous textiles .....	75.1	10	34.5	5
153	Tobacco products .....	73.9	11	5	22
143	Distilleries .....	72.9	12.5	3	54
305	Wire and wire products .....	72.9	12.5	25	40
145	Breweries .....	72.8	14	4	24
244	Women's clothing .....	72.6	15.5	25	6
273	Paper boxes and bags .....	72.6	15.5	8	38
321	Aircraft and parts .....	72.4	17.5	14	43
376	Soaps and cleaning compounds .....	72.4	17.5	10	27
112	Fruit and vegetable canners and preservers .....	71.5	19	40	17
393	Sporting goods and toys .....	70.7	20	63	19
351	Clay products .....	70.6	21	43.5	30
251	Saw, shingle and planing mills .....	70.2	22.5	37.5	63
271	Pulp and paper mills .....	70.2	22.5	7	65
294	Iron foundries .....	70.0	24	49.5	39
129	Bakeries .....	69.9	25.5	57	11
385	Plastic fabricators, n.e.s. ....	69.9	25.5	52	16
101	Slaughtering and meat processing .....	69.5	27	22	60
141	Soft drinks .....	69.3	28	55	18
139	Miscellaneous food products .....	69.2	29	20.5	8
304	Metal stamping, pressing .....	69.0	30	18.5	46
296-8	Non-ferrous metal rolling, casting .....	68.9	31	18.5	42
291	Iron and steel mills .....	68.6	32.5	11.5	61
332	Major appliances .....	68.6	32.5	31.5	55
311	Agricultural implements .....	68.5	34	37.5	62
381	Scientific and professional equipment .....	68.4	35	20.5	29
169	Other rubber products .....	68.3	36.5	28.5	33
266	Other furniture .....	68.3	36.5	37.5	34
325	Parts and accessories (motor vehicle) .....	67.8	38	11.5	50
2012	Filament yarn and staple fibres .....	67.6	39	59.5	67
2011	Spun yarn and fabrics .....	67.4	40.5	67	37
347	Concrete products .....	67.4	40.5	23	45
239	Other knitting mills .....	67.3	42	64.5	4
339	Miscellaneous electrical products .....	67.1	43	46.5	28
306	Hardware, tools and cutlery .....	67.0	44	33	20
338	Electrical wire and cable .....	66.8	45	37.5	72
309	Miscellaneous metal fabricating .....	66.7	46	46.5	41

**TABLE 3. Manufacturing Industries Ranked by Pay Ratio, Level of Female Earnings and Employment Ratio for Clerical and Related Workers: Canada, 1967 - Concluded**

S.I.C. class	Industry	Female to male average hourly earnings		Rank by level of female average hourly earnings	Rank by female to male employment ratio
		Pay ratio	Rank		
		I	II	III	IV
		%			
289	Printing and publishing .....	66.3	47	41.5	23
131	Confectionery .....	66.0	48	41.5	7
105-7	Dairy products .....	65.9	49.5	70	10
301	Boilers and plate works .....	65.9	49.5	59.5	53
378	Industrial chemicals .....	65.6	51	28.5	44
254	Sash, door and flooring mills .....	65.5	52	61.5	59
315	Miscellaneous machinery and equipment .....	65.1	53	43.5	58
286	Commercial printing .....	65.0	54.5	34.5	9
295	Smelting and refining .....	65.0	54.5	16	70
307	Heating equipment .....	64.9	56	53.5	47
243	Men's clothing .....	64.6	57	58	14
161	Rubber footwear .....	64.5	58	72	49
334	Household radios and TV .....	64.0	59	46.5	48
365	Petroleum refineries .....	63.9	60	6	71
274	Other paper converters .....	63.3	61.5	28.5	21
179	Luggage, small leather goods .....	63.3	61.5	64.5	13
261	Household furniture .....	63.2	63	61.5	25
111	Fish products .....	62.8	64	73	51
174	Shoes, excluding rubber .....	62.6	65	66	26
303	Ornamental and architectural metals .....	62.5	66	56	56.5
193-7	Woollen yarn and cloth .....	61.3	67	68.5	12
327	Shipbuilding and repairs .....	61.2	68	53.5	73
183	Cotton yarn and cloth .....	60.9	69	71	15
302	Fabricated structural metals .....	60.8	70	51	69
335	Communications equipment .....	58.9	71	16	56.5
336	Electrical industrial equipment .....	58.5	72	46.5	66
231	Hosiery .....	54.9	73	68.5	3

The hypothesis that the pay ratio might vary with mechanization was ruled out by testing the pay ratio of an industry against its wage-earner to clerical employment ratio.<sup>5</sup>

One line of investigation had more positive results. Might a relationship be found between the proportion of female clerks on staff and the level of salaries paid by an industry? Table 4, which ranks the two series, suggests that an inverse relationship does exist.<sup>6</sup> This is not readily attributable to higher skill or training of males, unless there is more variation among clerical workers in these respects than we assume. Hence, it would appear

that either there is a strong tendency for female clerical employees to concentrate in the low paying industries, or the employment of a large number of women tends to depress the salary level in that industry.

#### Pay Ratio Trends 1946 - 68

Table 5 presents data for selected years and industries on the female-male pay ratio for wage-earners. Apart from two industries (tobacco products and leather products) there is no substantial improvement to record and in four of the twelve industries in the table, females have lost ground. Overall, for manufacturing as a whole, the pay ratio actually declined and the same is true for the main components - durable goods and non-durable goods.

Pay ratios for clerical workers (see Table 6) have increased somewhat more on the average, and by as

<sup>5</sup> Analysis of variance performed on the pay ratio was insignificant at the .05 level.

<sup>6</sup> A simple correlation coefficient of -.832 between the employment ratio and total average weekly salary was significantly different from zero at the .05 level.

**TABLE 4. Major Groups in Manufacturing Ranked by Employment Ratio and Earnings, Clerical and Related Employees: Canada, 1967**

S.I.C. Class	Industry	Employment ratio	Rank	Average weekly earnings	Rank
		I	II	III	IV
		%		\$	
230 - 239	Knitting mills .....	253.6	1	77.53	21
240 - 249	Clothing .....	208.2	2	84.84	20
280 - 289	Printing, publishing and allied industries .....	170.0	3	86.67	18
380 - 389	Miscellaneous manufacturing industries .....	149.2	4	92.49	14
150 - 153	Tobacco processing and products .....	143.5	5	96.53	11
170 - 179	Leather products .....	139.6	6	85.10	19
180 - 229	Textiles .....	137.8	7	86.33	17
370 - 379	Chemicals and chemical products .....	132.6	8	93.88	13
100 - 139	Food .....	128.0	9	88.63	16
141 - 147	Beverages .....	119.8	10	99.66	6
260 - 269	Furniture and fixtures .....	119.3	11	89.18	15
360 - 369	Petroleum and coal products .....	100.6	12	108.81	3
310 - 318	Machinery other than electric .....	92.0	13	99.30	7
270 - 274	Paper and allied products .....	89.7	14	104.65	5
340 - 359	Non-metallic mineral products .....	84.6	15	95.91	12
300 - 309	Metal fabricating .....	81.3	16	98.56	10
250 - 259	Wood products .....	80.6	17	99.08	9
160 - 169	Rubber products .....	80.3	18	99.12	8
290 - 298	Primary metals .....	73.9	19	107.60	4
330 - 339	Electrical products .....	66.6	20	110.39	2
320 - 329	Transportation equipment .....	66.0	21	114.78	1

**TABLE 5. Female to Male Average Hourly Earnings Ratio for Wage-earners in Manufacturing for Selected Years and Industries: Canada Total**

Industry	Year				
	1948	1953	1958	1963	1968
	per cent				
Total manufacturing .....	N/A	61.9	60.0	59.9	60.4
Foods and beverages .....	64.8	64.8	66.0	64.5	68.3
Tobacco processing and products .....	77.6	79.7	81.5	84.4	88.9
Rubber products .....	67.3	70.6	65.1	64.7	62.7
Leather products .....	65.9	67.5	67.9	69.2	72.3
Textiles .....	77.4	77.8	76.6	76.5	79.9
Furniture .....	76.7	80.7	81.8	79.0	76.7
Paper and allied products .....	56.0	55.3	55.0	54.8	56.2
Printing and allied products .....	51.7	51.1	51.1	50.9	55.7
Transportation equipment .....	73.7	77.8	76.3	68.5	63.9
Electrical products .....	75.2	72.8	71.8	69.6	72.9
Non-metallic mineral products .....	73.7	66.9	71.7	73.0	75.1
Chemicals and chemical products .....	59.2	60.8	59.1	59.9	58.5
Durable goods .....	N/A	72.7	70.7	67.4	66.2
Non-durable goods .....	N/A	61.0	58.9	59.2	60.3



much as 10% in a few industries. But much more substantive increases have occurred in the employment of female clerical workers (see Table 7), and there appears to be no relationship between the two sets of changes.

Some industries with large employment gains show improvement in the pay ratio; others which have gained as much or more in terms of employment show a declining pay ratio.

**TABLE 6. Female to Male Average Weekly Earnings Ratio for Clerical and Related Workers in Manufacturing for Selected Years and Industries: Canada Total**

Industry	Year			
	1951	1957	1963	1968
	per cent			
Total manufacturing .....	62.2	62.7	66.2	65.1
Food and beverages .....	65.0	66.0	67.3	66.5
Tobacco and products .....	59.2	72.8	85.7	71.3
Rubber products .....	65.9	65.9	68.1	77.4
Leather products .....	62.2	64.1	64.4	60.5
Textiles .....	61.4	63.0	69.4	65.9
Clothing .....	64.3	67.8	69.3	66.1
Furniture .....	59.5	64.6	66.0	65.1
Paper and allied products .....	59.2	62.9	68.0	70.3
Printing and related products .....	66.2	68.3	72.4	65.0
Transportation equipment .....	62.5	60.8	67.8	71.5
Electrical products .....	61.0	61.3	60.6	61.5
Non-metallic mineral products .....	64.6	65.6	67.4	68.0
Chemicals and chemical products .....	69.7	69.2	73.6	68.1
Durable goods .....	61.0	61.5	64.9	65.6
Non-durable goods .....	64.1	65.4	69.1	66.0

**TABLE 7. Female to Male Employment Ratio for Clerical and Related Workers in Manufacturing for Selected Years and Industries: Canada Total**

Industry	Year			
	1951	1957	1963	1968
	per cent			
Total manufacturing .....	71.4	76.2	92.6	109.5
Food and beverages .....	70.6	90.7	105.8	149.5
Tobacco and products .....	91.8	120.6	184.9	142.0
Rubber products .....	70.1	75.2	84.2	81.3
Leather products .....	67.1	97.4	108.9	171.9
Textiles .....	86.8	94.8	133.1	158.4
Clothing .....	110.9	155.6	182.8	291.3
Furniture .....	80.2	108.5	100.9	91.4
Paper and allied products .....	64.2	67.4	80.3	83.8
Printing and allied products .....	94.5	136.9	166.1	185.6
Transportation equipment .....	50.8	45.8	58.3	64.3
Electrical products .....	63.3	61.5	71.6	86.7
Non-metallic mineral products .....	68.9	66.1	67.2	93.6
Chemicals and chemical products .....	104.0	115.8	149.8	128.3
Durable goods .....	59.0	57.8	68.2	79.7
Non-durable goods .....	84.4	102.7	123.3	143.6

### Summary

Although one cannot conclude that women fail to get equal pay for equal work, it is clear that they are getting the lower-paying jobs. Moreover, this is a rather "universal phenomenon" in the sense that the pay ratio is independent of employment ratios, size of earnings, relative size of office staff or provincial location.

On the whole no improvement has been made over the 22-year period examined. Although pay ratios have

risen in certain industries in certain time periods, there have been very few industries which showed significant improvement. The situation is as stagnant as a polluted river. The consistency of the pay differentials is particularly interesting in view of the large increases in the number of women working and the technological advances which have opened up new kinds of jobs and produced major changes in the nature of work performed in most, if not virtually all industries.

## PERSONS AT WORK LESS THAN A FULL WEEK: SEASONAL PATTERNS

Peter Hicks\*

Statistics on numbers of employees are often used as approximations of labour input in the economy. When using employment data for this purpose, analysts must keep in mind that employment statistics by themselves do not take account of the varying amounts of overtime worked nor the fact that a substantial and growing portion of the employed are at work less than a full work-week. Moreover, the number of persons not working a full week fluctuates greatly throughout the year. The seasonal patterns of part-time work and of absence from full-time jobs are the subject of this article.

On average in the past few years, about one quarter of Canada's employees worked less than a 35-hour week. This total is about equally divided between employees who regularly work on a part-time basis and employees who regularly work 35 hours or more (full-time employees) but who are absent from work in the reference week for such reasons as illness, job turnover, or vacation.<sup>1</sup> The table below shows the main categories of persons working less than full-time.

\* Labour Division.

<sup>1</sup> These series have been discussed mainly in terms of underemployment or underutilization of manpower. For example, see Nand Tandan, "Underutilization of Manpower in Canada", *Special Labour Force Studies*, No. 8, Statistics Canada (Catalogue 71-513 Occasional) (Ottawa: Information Canada).

The table shows a strong growth in the per cent of employees who are at work less than a 35-hour week. Chart 1 illustrates this growth for part-time workers and for absence among full-time workers due to (a) short-time and turnover or (b) other reasons. The chart also shows that the series have pronounced seasonal patterns. This seasonal pattern is isolated in Chart 2 which plots the seasonal index for 1961, a mid-year in the 18-year series under review. The scale used in the chart for "other reasons" is reduced because of the much greater amplitude of seasonal variation in this series which results from the strong summer peak in vacation-taking.

The seasonal indices shown on the chart are calculated by a computer program<sup>2</sup> which divides a time series into three components: an underlying trend (including cyclical movements), an irregular component and a seasonal component. The seasonal indices show, in per cent terms, deviations from the trend that occur in different months because of seasonal fluctuations.<sup>3</sup>

<sup>2</sup> The X-11 version of the U.S. Census Method II uses 3 x 9 moving averages for calculating seasonal factors in most cases. For details see *The X-11 Variant of the Census Method II, Seasonal Adjustment Program*, Technical Paper No. 15, U.S. Department of Commerce, Bureau of the Census.

<sup>3</sup> To take a concrete example, there were 107,000 persons absent from work in January 1961 because of short-time and turnover. The computer calculated that the trend component of this total was 87,000. The irregular ratio was calculated as 101.3 and the seasonal ratio as 120.9 (87,000 x 1.013 x 1.209 = 107,000). It is this 120.9 that is plotted in Chart 1.

TABLE 1. Employees by Main Reason for Working Less than 35 Hours, Annual Averages for 1953, 1961 and 1970

	1970	1961	1953	1970	1961	1953
	'000			per cent		
Total employees .....	7,879	6,055	5,235	100.0	100.0	100.0
At work 35 hours or more <sup>1</sup> .....	5,666	5,002	4,768	71.9	82.6	91.1
At work less than 35 hours <sup>1</sup> .....	2,213	1,053	467	28.1	17.4	8.9
At work less than 35 hours <sup>2</sup> .....	1,686	908	455	21.4	15.0	8.7
Part-time employees .....	971	476	197	12.3	7.9	3.8
Full-time employees, absent because of short-time and turnover						
Short-time .....	86	77	48	1.1	1.3	0.9
Turnover .....	59	49	32	0.7	0.8	0.6
Turnover .....	28	27	16	0.4	0.4	0.3
Full-time employees, absent because of other reasons <sup>2</sup> .....	631	355	211	8.0	5.9	4.0
Vacation .....	278	170	72	3.5	2.8	1.4
Illness .....	195	100	85	2.5	1.7	1.6
Industrial dispute .....	30	--	--	0.4	--	--
Bad weather .....	35	21	17	0.4	0.3	0.3
Miscellaneous <sup>2</sup> .....	93	60	32	1.2	1.0	0.6

<sup>1</sup> There were more persons absent on holidays in 1970 because of the inclusion of Remembrance Day, Thanksgiving and the May 24th holiday. Thanksgiving and Remembrance Day also affected 1961 figures, although Remembrance Day was a Saturday that year.

<sup>2</sup> Adjustment made to remove the effect of public holidays.

-- estimate less than 10,000.

Source: *The Labour Force*, Statistics Canada (Catalogue 71-001 Monthly) (Ottawa: Information Canada).

CHART-1

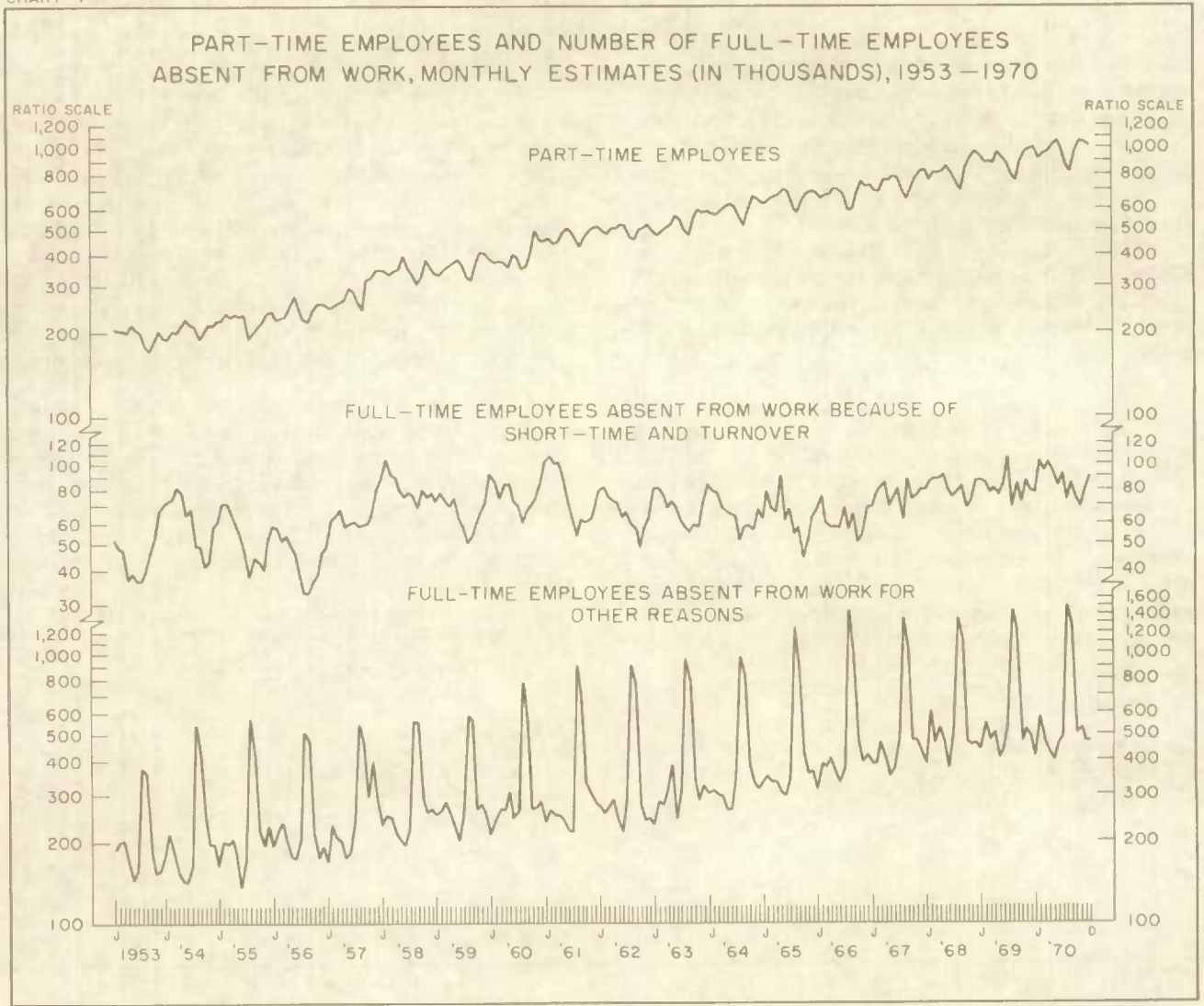
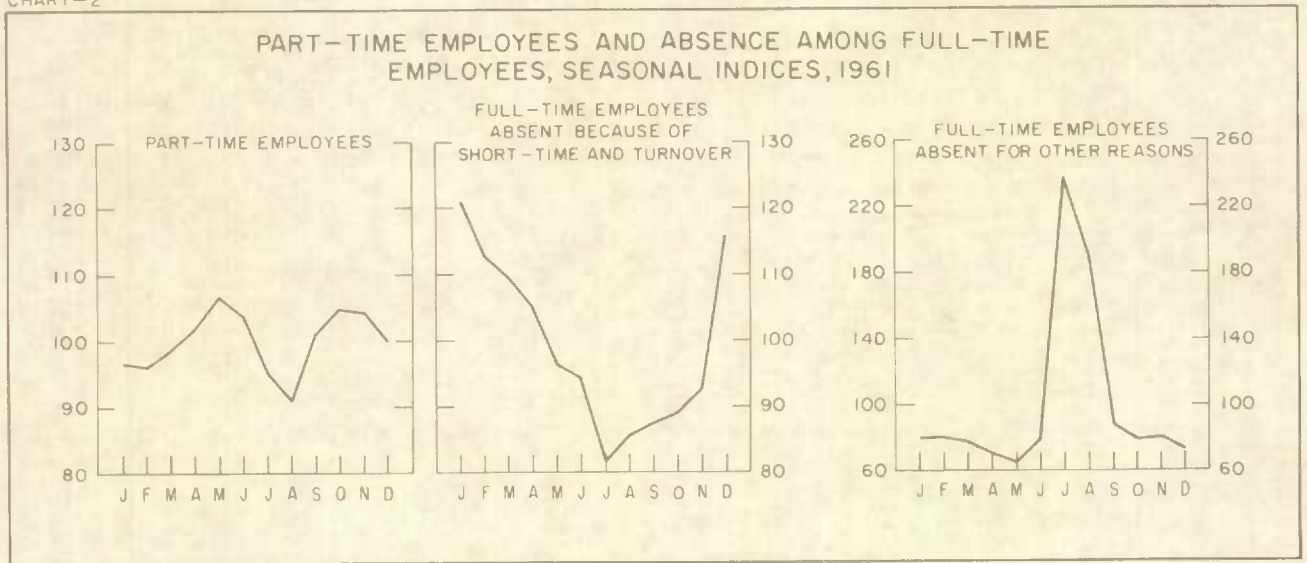


CHART-2



Seasonal fluctuations are those regularly recurring annual variations in a series that are associated with such factors as the effect of the climate on agricultural employment in winter or the effect of school holidays on the influx of students to the labour market. Seasonal patterns change over time and seasonal variations may therefore be defined in terms of "a regularity in behaviour over successive periods of twelve months which is changing in a systematic manner over longer periods".<sup>4</sup> While the method used in estimating this moving seasonality is adequate for most series, problems occur, as is pointed out below, in handling series which are as irregular as many of those presented here, and the resulting seasonal indices must be used with caution.

### Part-time Employees

Part-time workers are defined in the Statistics Canada monthly Labour Force Survey (the source of all data in this article) as those who *usually* work less than 35 hours a week. This definition has been used since 1953 when the survey was first carried out on a monthly basis and has the consequent virtue of historic consistency, although it is becoming increasingly out-dated as more and more groups of "full-time" employees (such as some teachers and government employees) regularly work less than 35 hours a week. The table shows a dramatic tripling since 1953 in the percentage of employees who usually work part-time.

The seasonal pattern for regular part-time employment is unusual in that there are two peaks and two troughs in the year. The peaks occur in April and November. There is a shallow trough in January and a deep one in August. Similar patterns occur for both men and women, although the amplitude of variation is greater among men. Among men, the summer decline in part-time employment is mainly due to students leaving the part-time jobs they held throughout the school year. Among women, the summer dip is due partly to students leaving their part-time jobs and partly to married women leaving the labour force in the summer. In 1970, women accounted for about two thirds of all part-time workers. The greater amplitude of seasonal variation among men is caused by the greater proportion of students holding part-time jobs in the male total. In May 1970, over half the male part-time workers reported that going to school was their major activity, while for women the figure was about 15%. Some 60% of the female part-time workers were married women over the age of 25.

Chart 3, which shows seasonal patterns for men and women, also compares changes from 1954 to 1969. The series that were seasonally adjusted extend from January 1953 to December 1970. But the seasonal ratios

calculated for the end years are not used in this article because the seasonal adjustment program, being based on a moving average technique, gives somewhat less reliable adjustments at the beginning and end of a series where it is not possible to calculate a centred average. The chart shows that the basic pattern remains the same from 1954 to 1969. The August trough has become a little deeper during the period and the autumn peak has grown marginally. The decline in May and the gains in September and October occurred in the 1950's. The December gains took place mainly in the 1960's.

### Full-time Employees Absent Because of Short-time and Turnover

Absence among full-time employees is divided into two groups: those absent from work because of short-time and turnover and those absent for a variety of other reasons. Short-time and turnover are treated as a special class because absence from work for these "economic" reasons involves weakening of job attachments. In most cases of turnover - losing or finding a job - the job attachment has been completely cut. Job attachments may be fairly strong in the case of employees working short-time because of, for example, a shortage of material in their factory. Other cases, such as a layoff where a person expects to be recalled in the near future, are more ambiguous, but the Labour Force Survey counts all persons laid off from their job for the whole reference week as being unemployed because of the uncertain nature of their job attachment. This means that the figures in the table for short-time and turnover include only employees working from 1 to 34 hours. Those in this category who did not work at all in the reference week are counted as unemployed. Persons who are absent for other reasons such as illness, vacation or strike usually have a job to return to and they are included as employed whether they worked 1 - 34 hours or whether they were not at work at all in the reference week. The table shows a sizeable gain of about 80% from 1953 in the number of persons who lost work because of short-time and turnover. In the same period, total employment increased by about 50%.

**Short-time** - Chart 4 examines the changing seasonal patterns of persons absent part of the week because of short-time. In the 1950's the pattern was the familiar one of a trough in summer and a peak in winter. By the late 1960's, the same basic pattern remained except that an isolated peak had arisen in August and a slight trough had occurred in December. Roughly the same patterns exist for men and women although the amplitude of the seasonal pattern is greater for men and the pattern is less irregular. There are more than twice as many men as women in this category and part of the greater irregularity of the indices for women is due to the small size of the estimate. The August peak is mainly the result of short-time in manufacturing industries such as fish processing. Little significance can be attached to the emergence of the December trough because of the erratic nature of the series in December.

<sup>4</sup> Stephen N. Marris, "The Treatment of Moving Seasonality in Census Method II", *Seasonal Adjustment on Electronic Computers*, Organization for Economic Co-operation and Development (1960), p. 261. This article outlines the technical problems associated with seasonal adjustment when there is a large moving seasonality.

CHART-3

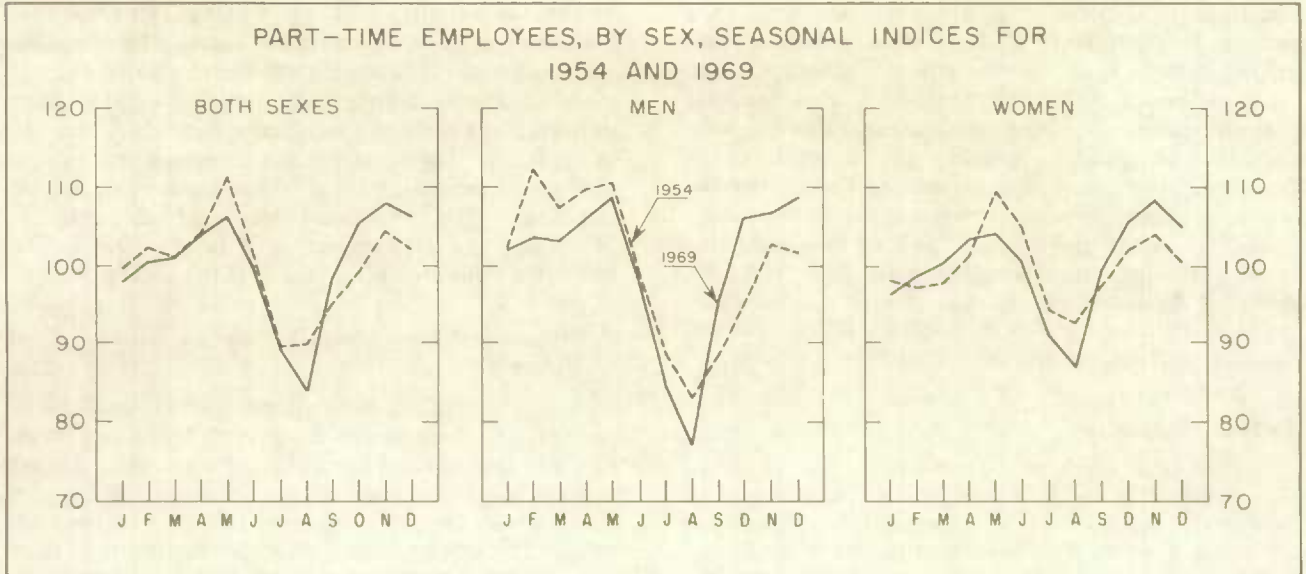
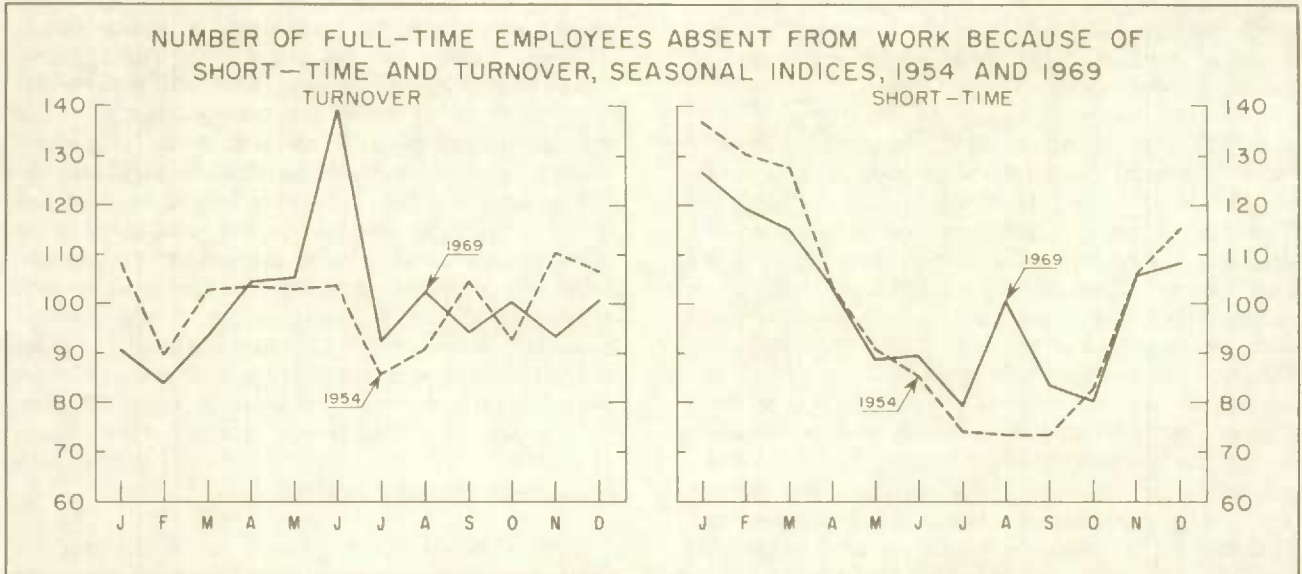


CHART-4



**Turnover** – Chart 4 shows that the main change since the mid-1950's in seasonal patterns in job turnover of full-time employees has been the emergence of a high seasonal peak in June. The pattern for both men and women in both time periods is quite erratic, particularly in the autumn. The cause of this choppiness is the conflicting nature of the seasonal patterns of the three components of turnover: persons laid off, persons who have lost their job and persons who found a job in the reference week. The new June pattern arises in the "finding work" category which is due to the growing influx of students into the labour force at the end of the

school year. In June 1970, close to half the people reporting that they had found a job in June were going to school in May. An August peak in losing jobs is mainly caused by students leaving the labour market at the end of the summer. A jump in layoffs also occurs in August of many years.

**Full-time Employees – Absent for Other Reasons**

The amount of absenteeism among full-time workers for other reasons (often referred to as "non-economic" reasons) has grown very rapidly since the 1950's. Moreover, the data used in this article have been

adjusted to remove the effect of public holidays, an important cause of short work-weeks. Public holidays are not covered consistently by the Labour Force Survey. The twelve labour force reference weeks are spread throughout the year in such a way that some holidays are never included (Christmas and New Years) while others are occasionally included (Easter and Thanksgiving). When a person is absent from a job for more than one reason, such as illness and a public holiday, he is included in the miscellaneous category. In adjusting the data to remove the effects of a public holiday it was not possible to reallocate those employees back into other categories.

**Vacation** – Not unexpectedly, the series that show the greatest amplitude in seasonal patterns are those for employees absent from work for all or part of the week because of vacation-taking. Chart 5 shows that the seasonal pattern in vacation-taking has changed very little, with July and August being the overwhelmingly popular months for vacations throughout the period under review. In fact, the pattern has become slightly more peaked with July increasing slightly at the expense of August and June. The summer peak is somewhat higher for women than for men. The same basic pattern holds for people absent the entire week and those absent only part of the week, although part-week absence is not quite as concentrated in the summer months.

**Illness** – There is a pronounced seasonal element in the amount of time lost from work by full-time employees because of illness. Chart 6 shows a similar pattern for men and women with the amplitude of seasonal variation being somewhat greater for women. In 1954 the peak months for women were February and March. By 1969, January had become the highest month. This growth in the January time-loss among women began in the early 1960's and particularly high January peaks were recorded in 1969 and 1970. For men as well, the annual peak has been in January in the years 1968, 1969 and 1970 and, although it is not reflected in the seasonal factors, this could well be considered to be the beginning of a changed seasonal pattern. Because of the irregular nature of the series, the chart still shows the seasonal peak in February and treats the recent January movements for men as irregular rather than seasonal in nature.

Chart 6 shows the emergence of a small peak in June. Some part of this may be due to the relative decline in vacation-taking among men in June. If a person is ill during his vacation period, he is counted as being absent from work because of vacation, not because of illness. This illustrates the care that must be taken in using these data. The figures on absence from work because of illness reflect not only the incidence of illness among employed persons, but also certain institutional and methodological factors. For example, the seasonal pattern for the overall incidence of illness would doubtless have a shallower summer trough than that shown in Chart 6.

Chart 7 compares persons absent for the whole week due to illness and those absent for part of the week. The amplitude of seasonal variation is greater for persons missing only part of the work week, no doubt because of the greater influence of the climate on such shorter duration illnesses as colds or influenza.

**Bad weather** – Next to vacations, the largest amplitude of seasonal variation is in absence due to bad weather. Chart 8 shows that since 1954 the winter peak has changed from February to January and has grown higher. Also, an isolated peak in September in the chart for 1954 had disappeared by 1969. However, not too much reliance should be placed on these "changed" patterns because the series have been subject to several large irregular year-to-year fluctuations which means that any calculation of a "seasonal" pattern is bound to be arbitrary. For example, the September "peak" occurred only in the years 1954, 1956, 1958, 1961 and 1965. The estimates are too small to allow a meaningful examination of the patterns for men and women.

**Industrial dispute** – While fluctuations in the number of full-time employees absent from work because of strikes and lockouts are largely due to irregular factors, there has been a tendency in recent years for more employees to be away from work because of industrial disputes in the period May through October than in the winter half of the year. This "pattern" emerged during the second half of the 1960's. In the years around 1960 there was little variation in the series that could be attributed to seasonal factors. In the mid-1950's, there was some tendency for more industrial disputes to occur in the period from October to January.

## Summary

The number of employees absent from work due to bad weather, short-time and illness follows the familiar pattern of a trough in summer and a peak in winter. The pattern of absence due to vacations is the opposite, with a very high summer peak which has little change over time. Absence because of job turnover has a choppy pattern over the year and is considerably influenced by entrants to the labour force at the end of the school year. The seasonal pattern for regular part-time employment is bi-modal with a main trough in the summer, peaks in the autumn and spring, and a secondary trough in winter.

Overall, the effect of vacation-taking predominates and fewer persons work a full work-week in summer than in other seasons. For example, in the five years from 1966 to 1970, persons working less than 35 hours represented 19% of total employees in January and 27% of employees in July. This indicates the problems of using statistics in numbers of employees (or even of hours paid for) as an indication of labour input or man-hours worked.

CHART-5

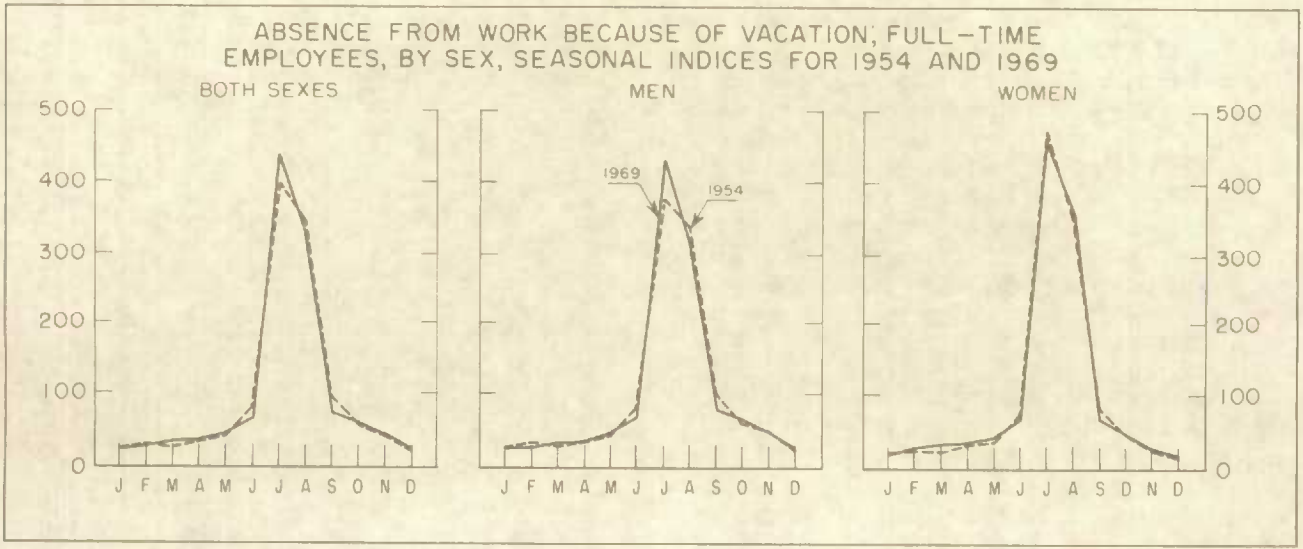


CHART-6

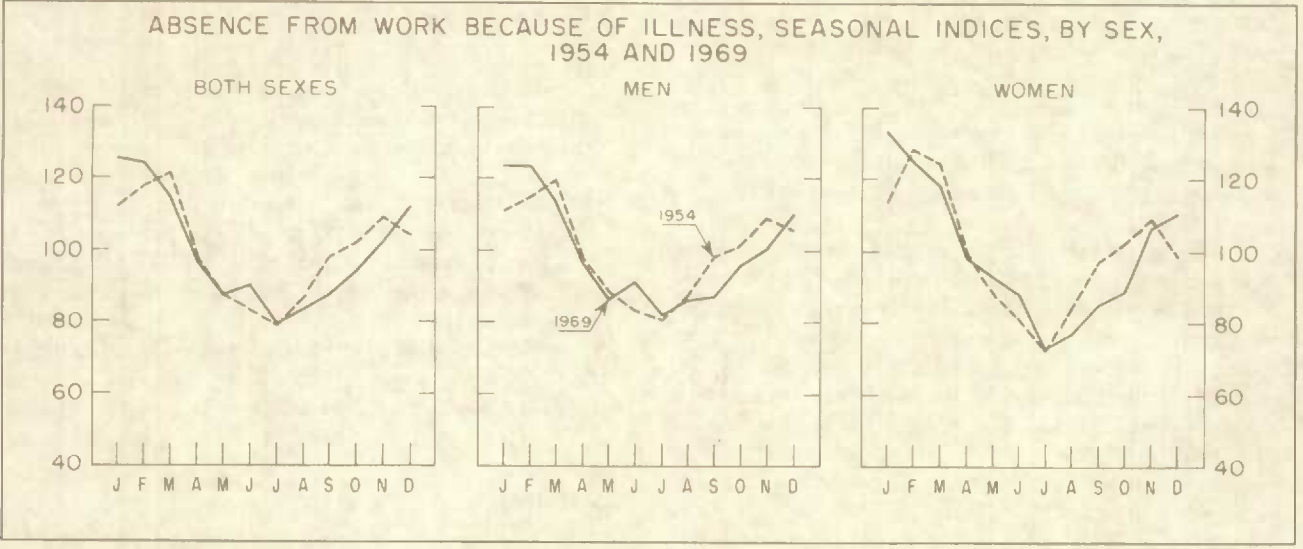


CHART-7

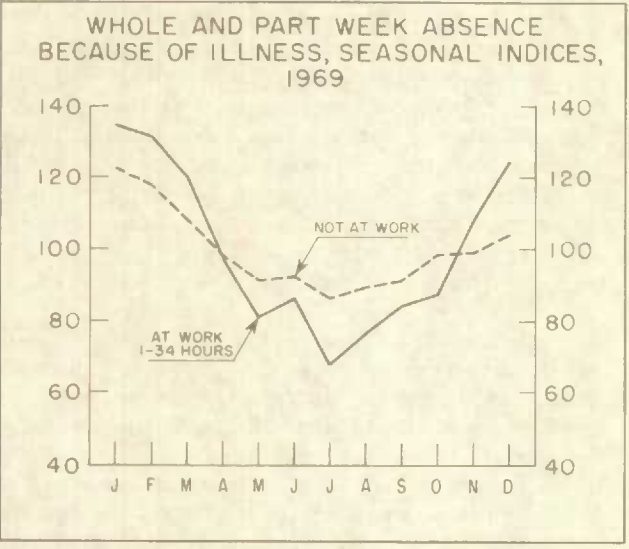
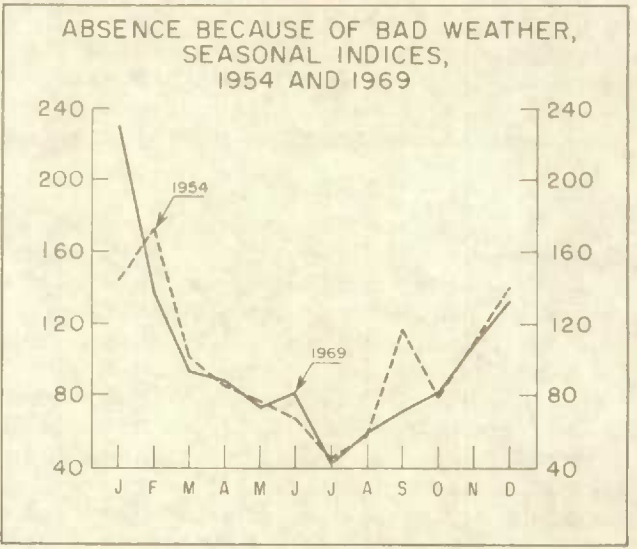


CHART-8





## JOB SEARCH PATTERNS

Ian Macredie\*

In January 1969 the Labour Force Survey was used to collect information on the work experience of the Canadian population during the twelve months of 1968.<sup>1</sup> As part of this survey, additional questions were put to persons with job-seeking experience to elicit the methods of search used, the timing of the search, and its outcome. This note reports on the findings.

Since the "job search" survey was confined to persons experiencing five or more weeks of unemployment, it does not, in fact, cover all job-seekers in 1968. Nevertheless, at just under 800,000 - which is 9% of all persons with labour force experience in the year - the surveyed population does represent a sizeable number. It is also heavily weighted by persons with extensive job-

seeking experience, more than half the total reporting anywhere from 14 up to 52 weeks of unemployment (see Table 1).

### Time Elapsed before Looking for Work

Time elapsed was determined from the question: "How long after losing your job did you begin looking for another job?"<sup>2</sup> The estimates, cross-tabulated by sex and age, are given in Table 2 below.

For male seekers, more than 50% in each age group began searching "immediately" or one day after losing

<sup>2</sup> The loss of a job referred to is the one associated with the respondent's longest (or only) period of unemployment. The time elapsed question was not applicable to all persons in the survey group. Two per cent expected to be called to their former jobs and did not look for work. A further 13% had no previous job and a residual class of those who did not specify an elapsed time or did not look for some other reason made up 6%. Accordingly, the number in the "time elapsed" class covers 79% of those surveyed.

\* Manpower Research and Development Section, Labour Division.

<sup>1</sup> Analysis of these data will be made available in a forthcoming study by N.H.W. Davis in the *Special Labour Force Studies* program.

TABLE 1. Weeks of Unemployment in 1968<sup>1</sup>

Sex	Weeks of unemployment					Total
	5-8	9-13	14-26	27-39	40-52	
	'000					
Male .....	115	154	191	77	53	590
Female .....	47	55	58	28	21	209
<b>Totals .....</b>	<b>162</b>	<b>208</b>	<b>249</b>	<b>105</b>	<b>74</b>	<b>799</b>

<sup>1</sup> The following question was asked for each quarter of 1968:

- "In how many weeks did you  
 (1) do some work?  
 (2) look for work?  
 (3) neither work nor look for work?"

These were asked so as to be mutually exclusive. The sum of the 3 responses would then add up to 13 weeks for each quarter.

The definition of unemployment implicit in the "look for work" question differs from the definition used in the *Labour Force Survey*, since the latter includes those on "temporary layoff up to 30 days" whether or not they were looking for work.

TABLE 2. Time Elapsed before Starting to Look for Work, by Sex and Age

Sex and age	Time elapsed			Total	
	Less than 2 days	2-14 days	2 weeks or more	'000	%
	per cent <sup>1</sup>				
Male:					
14-19 years .....	58.1	24.2	17.7	62	100.0
20-24 " .....	56.4	29.7	13.9	101	100.0
25-44 " .....	67.7	22.1	10.3	195	100.0
45-64 " .....	67.7	19.8	13.5	111	100.0
65 years and over .....	--	--	--	15	100.0
Female:					
14-19 years .....	50.0	--	--	30	100.0
20-24 " .....	38.5	25.6	35.9	39	100.0
25-44 " .....	41.7	22.9	35.4	48	100.0
45-64 " .....	63.0	--	--	27	100.0
65 years and over .....	--	--	--	--	100.0

<sup>1</sup> Percentages may not add to 100 due to rounding.  
 -- estimate less than 10,000.

TABLE 3. Time Elapsed before Looking for Work, by Marital Status and Age

Marital status and age	Time elapsed			Total	
	Less than 2 days	2-14 days	2 weeks or more	'000	%
	per cent <sup>1</sup>				
Single and other: <sup>2</sup>					
14-24 years.....	55.0	27.8	17.2	180	100.0
25-44 ".....	58.3	22.9	--	48	100.0
45-64 ".....	57.7	--	--	26	100.0
65 years and over.....	--	--	--	--	--
Total.....	55.6	26.5	17.9	257	100.0
Married:					
14-24 years.....	47.1	25.5	27.5	51	100.0
25-44 ".....	63.9	21.6	14.4	194	100.0
45-64 ".....	67.3	19.5	13.3	113	100.0
65 years and over.....	--	--	--	13	100.0
Total.....	62.0	21.6	16.4	371	100.0
<b>Totals.....</b>	<b>59.4</b>	<b>23.6</b>	<b>17.0</b>	<b>628</b>	<b>100.0</b>

<sup>1</sup> Percentages may not add to 100 due to rounding.

<sup>2</sup> Includes widowed, divorced and separated.

-- estimate less than 10,000.

their former jobs, and over 80% postponed their search less than two weeks. In addition, more men started to look for work after only 2 to 14 days compared to those waiting two weeks or more. Women, on the other hand, seemed more inclined to let some time pass before beginning their search. This may be seen in the generally lower percentages of females, relative to males, starting immediately. Also, where comparisons can be made, the percentage of females waiting two weeks or more is approximately two and a half times as large as the corresponding male percentages.

On *a priori* grounds one would expect that married persons would be less inclined to postpone their search than single persons. The data do support this expectation to some extent, particularly in the relative percentages of those starting their search immediately. However, a larger percentage of single people started their search in 2 to 14 days and fewer of them waited two weeks or more.

#### Methods of Search

In this survey, the respondents identified one or more of the ten methods of search listed in the questionnaire (see Table 4) as having been used by them in their longest (or only) period of unemployment. These results are tabulated against four levels of education (Table 4) and nine occupational groupings (Table 5).

The column totals at the bottom of the table indicate that the overall usage of the ten methods varied widely. By far the most popular method -- named by 79% of all seekers -- was contacting a Canada Manpower Centre. The second most widely used method was checking with local employers (69%), followed by checking with friends and relatives (59%). The utilization

rates of the other seven methods were all substantially below these three.

Perhaps the first observation to be drawn concerning the influence of education is that the number of methods increased on the average with increasing levels of education. Specifically, persons with "elementary or less" used an average of 2.9 methods of search; those with "some secondary" used 3.4 methods, and those with "secondary complete" and "university" used 3.9 and 4.2 methods respectively.<sup>3</sup>

It may also be inferred that certain methods are related to the level of education. The use of private employment agencies, for example, reported by only 17% of job seekers in the lowest education category, rose to 38% in the highest. Similar patterns are apparent in contacting employers in other communities, placing or answering newspaper advertisements, and writing letters of application. If the difference in the percentage between the lowest and highest education groups may be taken as measuring the strength of the relationship, then writing letters of application appears to be the method most strongly associated with education.

The reverse relationship -- declining usage with increasing education -- is not readily apparent in the table, although it might be found in the trade union category (small cell size prevented the use of the full data set).

By combining these observations on how education is related to the number of methods and to the

<sup>3</sup> The average number of methods is calculated by dividing total methods by total seekers for each level of education. The overall average number of methods was 3.3.

TABLE 4. Methods of Search by Level of Education

Level of education	Methods <sup>1</sup>										Total <sup>2</sup> methods	Total <sup>2</sup> seekers
	CMC	Private employment agencies	Local employers	Outside employers	Local papers	Outside papers	Letters of application	Friends and relatives	Trade union	Other action		
	per cent										'000	
Elementary or less .....	77.3	17.1	65.5	26.0	16.8	5.9	14.8	54.9	14.1	--	893	304
Some secondary .....	78.9	18.3	72.0	29.7	33.0	9.3	25.1	60.2	11.8	--	947	279
Secondary complete .....	82.4	25.0	69.9	32.4	45.6	13.2	45.6	61.8	11.0	--	527	136
University .....	74.5	36.2	74.5	38.2	52.7	--	58.2	61.8	--	--	229	55
<b>Totals .....</b>	<b>78.5</b>	<b>20.4</b>	<b>69.2</b>	<b>29.3</b>	<b>30.2</b>	<b>8.9</b>	<b>27.0</b>	<b>58.5</b>	<b>12.1</b>	<b>--</b>	<b>2,596</b>	<b>775</b>

<sup>1</sup> The methods of search as they appeared on the questionnaire:

- Contact Canada Manpower Centre;
- Contact private employment agencies;
- Check with employers in your area;
- Check with employers outside your area;
- Place, or answer, advertisements in local papers;
- Place, or answer, advertisements in papers outside your locality;
- Write letters of application;
- Check with friends or relatives;
- Check with trade union;
- Other action;
- No action taken.

<sup>2</sup> Refers to the total number of methods used by all persons in each education category.

<sup>3</sup> Refers to the number of persons in each education category **excluding** (1) those who did not specify a method of search, (2) those who explicitly stated that they took no action. Since each respondent could specify one or more methods of search the sum of the methods tried is greater than the population trying them. It follows that it applies to the percentage distribution as well.

-- estimate less than 10,000.

TABLE 5. Methods of Search by Occupation

Occupation	Methods										Total <sup>1</sup> methods	Total <sup>1</sup> seekers
	CMC	Private employment agencies	Local employers	Outside employers	Local papers	Outside papers	Letters of application	Friends and relatives	Trade union	Other action		
	per cent										'000	
Professional and managerial .....	65.7	40.0	68.6	42.9	51.4	--	57.1	57.1	--	--	142	35
Clerical .....	84.2	31.6	69.7	23.7	56.6	--	44.7	57.9	--	--	292	76
Sales .....	75.0	--	68.8	34.4	50.0	--	40.6	65.6	--	--	120	32
Service .....	78.3	20.5	63.9	22.9	33.7	--	27.7	57.8	--	--	267	83
Transportation and communications .....	84.4	--	73.3	40.0	28.9	--	28.9	57.8	--	--	161	45
Farming, fishing, logging, mining .....	78.2	--	69.1	25.5	--	--	--	--	--	--	148	55
Craftsmen, production process, and related workers .....	78.8	15.2	68.8	32.9	21.6	8.7	19.0	55.8	22.9	--	748	231
Labour .....	79.5	19.3	73.5	30.1	21.7	--	18.1	62.7	--	--	269	83
Never worked <sup>2</sup> .....	76.5	21.3	68.4	23.5	33.1	7.4	30.1	62.5	--	--	450	136
<b>Totals .....</b>	<b>78.6</b>	<b>20.4</b>	<b>69.2</b>	<b>29.4</b>	<b>30.2</b>	<b>8.9</b>	<b>27.0</b>	<b>58.4</b>	<b>12.1</b>	<b>--</b>	<b>2,596</b>	<b>775</b>

<sup>1</sup> See footnotes 2 and 3, table 4.

<sup>2</sup> Many persons who have never worked have no identifiable occupations.

-- estimate less than 10,000.

usage of specific methods, one could infer something about how job search behaviour varies, on average, with the level of education of the seeker. Excluding the special circumstance of membership in a trade union, it would seem that the highly-educated tend to use much the same methods as other seekers, but they use more methods on average and the additional ones are concentrated on certain types.

If, for each occupation group, we rank the methods of search by the magnitude of their utilization rate, we find a surprising uniformity. For every group except "professional and managerial", contacting a Canada Manpower Centre was the most commonly

used method, and for the sole exception, the difference between its leading method and the CMC was only 3 percentage points.

Again with "professional and managerial" excepted, checking with local employers was the second most popular method throughout and, without exception, checking with friends and relatives ranked third. It is only in the fourth method that any real divergence appears: for occupations which could be loosely classified as "white-collar" (the first four groups in Table 5) it was placing or answering advertisements in local newspapers; for "blue-collar workers" (Groups 5 through 8) it was canvassing employers in other communities.

In spite of this uniformity in the ranking, certain methods are definitely favoured by some occupation groups compared to others. For example, 84% of "clerical" and "transportation and communications" workers contacted a Canada Manpower Centre but only 66% of "professionals and managers" did so. As one might expect, there was a relatively large spread in the use of private employment agencies - from 40% in "professional and managerial" to 15% for "craftsmen, production processing and related workers". Even greater variations, in the range of 35 to 40 percentage points, are apparent in the use of local newspapers and in the writing of letters of application.

The methods with the least spread were checking with local employers and with friends and relatives.

### Successful Methods of Search

Respondents who were successful in finding a new job were asked to indicate which method was the one through which they found employment. Table 6 shows the percentage distribution of successful seekers by successful method of search.<sup>4</sup> The occupation and

<sup>4</sup> This table contains the data only for those methods where the estimates for successful seekers are not less than 10,000. Accordingly, any ranking of the data is somewhat biased since the excluded methods cannot be included in the hierarchy. However, the ranking procedure is still valid in the sense that it correctly ranks the most popular of the methods. A similar proviso also applies to Table 7.

education breakdowns have been dropped in the interests of maximizing the number of methods which can be included in the analysis or, in other words, minimizing the number of unusable small cells.

Checking with local employers was the successful method for the largest percentage of successful seekers and asking friends and relatives placed second. CMC's, local papers, and trade unions respectively, accounted for the third, fourth and fifth ranking percentages.

Of course this kind of ranking conveys a very partial picture. If the use of a given method was very high it would account for a large percentage of successful seekers even if the success rates (i.e., successful seekers divided by total seekers) of all methods were equal. Accordingly, success rates have been calculated and, as given by the first row of Table 7, the most successful method was checking with local employers. More than one quarter of the persons who used this method found employment that way. The second most effective method seems to have been checking with friends and relatives (24%). Checking with a trade union (17%) and placing or answering ads in local newspapers (15%) ranked third and fourth respectively.

Contacting a Canada Manpower Centre was well down the list in terms of effectiveness (11%) although it was the leading method in terms of use.

TABLE 6. Successful Method of Search: Successful Seekers

	CMC	Private employment agencies	Local employers	Outside employers	Local papers	Outside papers	Letters of application	Friends and relatives	Trade union	Other action	Total successful seekers	
	per cent										'000	%
Totals .....	15.8	2.7	34.4	4.5	8.7	--	3.2	25.7	4.0	--	404	100.0

-- estimate less than 10,000.

TABLE 7. Success Rates by Method of Search

Class of seeker	CMC	Private employment agencies	Local employers	Outside employers	Local papers	Outside papers	Letters of application	Friends and relatives	Trade union	Other action
	per cent									
All seekers .....	10.7	7.4	26.5	8.1	15.1	--	6.3	23.6	17.1	--
Successful seekers .....	21.1	13.3	48.0	13.6	25.6	--	10.3	40.9	28.5	--

-- estimate less than 10,000.

The surveyed population contains persons with a wide variety of individual characteristics such as age, sex, level of education, employment experience and so forth. In other words, there is a wide range in the "employ-

ability" of the individuals and their job search success is likely to vary accordingly. However, there is no reason to believe that individuals with a given degree of "employability" are distributed among the job search

techniques in equal proportions. To allow for this, the second row of Table 7 shows the success rates of each method for successful seekers only. That is, for each method the success rate is the number of persons who found that method successful divided by the number of persons who tried that method but found **some other method** successful.

Although this results in some alteration in the relative size of the success rates, the changes are not sufficiently large to change the ranking from that obtained for the success rates of all seekers.

### Intensity of Search

Another variable which describes job search behaviour is the total number of methods of search used by a given seeker. This is a rather unsatisfactory definition of intensity since a more complete measure would include the number of times each method was used, as well as the length of the search. Unfortunately, the latter data were not available for this study.

Insofar as the number of methods is a measure of intensity, one might expect that the intensity of the search would vary positively with the number of weeks of unemployment experienced - for obvious financial reasons.<sup>5</sup>

<sup>5</sup> In addition, the design of the survey would contribute to this expectation. Specifically, the job search questions referred to the respondent's longest (or only) period of unemployment, and the longer this reference period, the more time the seeker would have to apply a wide variety of methods, especially in a sequential fashion. On an individual basis a long reference period is not necessarily associated with a large number of weeks of unemployment in the year (those unemployed for 52 weeks excepted) but in most cases this association is likely to hold true.

Such an association is not evident in Table 8. In fact, the opposite seems to hold true: 27% in the category with the least unemployment used five or more methods of search, while just 22% of those with 40 to 52 weeks of joblessness conducted a search with this intensity. This conflict can perhaps be reconciled by reference to the last three rows of Table 9.

It can be seen here that, overall, 29% of those using five or more methods found jobs while only 22% of those who did not find jobs used as intensive a search. It is possible that the amount of unemployment is inversely associated with intensity of search because the more intensive seekers tended to find new jobs more quickly.

Table 9 has been constructed so that the influence of the intensity on job search success can be distinguished from the influence of the level of education on success. It can be readily seen that for each level of education up to university the percentage of successful seekers using five or more methods exceeds the percentage of unsuccessful seekers employing as intensive a search. In other words, it can be inferred from this data that the more intensive the search, the greater the likelihood of finding employment.

An examination of the data in Table 10 reveals rather weak support for the hypothesis that married males would conduct a more intensive search (five or more methods) than single males. In the case of females however, 27% of single women used five or more methods as compared with only 18% of married women. Probably the husband's income reduced the need and desire for employment and modified the intensity of the search accordingly.

TABLE 8. Intensity of Search by Weeks Unemployed in 1968

Weeks of unemployment in year	Intensity		Total	
	1 - 4 methods	5 or more methods	'000	% <sup>1</sup>
	per cent <sup>1</sup>			
5- 8 weeks .....	72.8	27.2	158	100.0
9- 13 " .....	73.6	26.4	201	100.0
14- 26 " .....	75.4	24.6	240	100.0
27- 39 " .....	73.8	26.2	103	100.0
40- 52 " .....	77.8	22.2	72	100.0

<sup>1</sup> Percentages may not add to 100 due to rounding.

TABLE 9. Intensity of Search by Education and Result

Level of education and result (found job)	Intensity		Total	
	1-4 methods	5 or more methods		
	per cent <sup>1</sup>		'000	% <sup>1</sup>
Elementary or less:				
Yes .....	81.0	19.0	153	100.0
No .....	85.9	14.1	128	100.0
Other .....	87.0	--	23	100.0
Some secondary:				
Yes .....	72.1	27.9	147	100.0
No .....	76.4	23.6	110	100.0
Other .....	81.0	--	21	100.0
Secondary complete:				
Yes .....	55.7	44.3	79	100.0
No .....	66.0	34.0	50	100.0
Other .....	--	--	--	--
University:				
Yes .....	53.8	46.2	39	100.0
No .....	--	--	11	100.0
Other .....	--	--	--	--
Totals:				
Yes .....	70.8	29.2	418	100.0
No .....	78.0	22.0	300	100.0
Other .....	80.7	19.3	57	100.0

<sup>1</sup> Percentages may not add to 100 due to rounding.

-- estimate less than 10,000.

TABLE 10. Intensity of Search by Marital Status and Sex

Sex and marital status	Intensity		Total	
	1-4 methods	5 or more methods		
	per cent <sup>1</sup>		'000'	% <sup>1</sup>
Male:				
Single and other .....	73.3	26.7	258	100.0
Married .....	72.8	27.2	313	100.0
Female:				
Single and other .....	73.5	26.5	98	100.0
Married .....	81.9	18.1	105	100.0

<sup>1</sup> Percentages may not add to 100 due to rounding.



