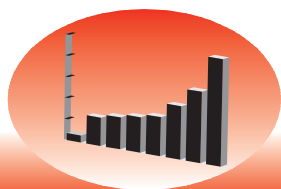


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About this Bulletin...

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The Market Basket Measure— Constructing a New Measure of Poverty

Who is poor in Canada? Ask this question and you will become part of an ongoing debate on the differing concepts of poverty and the ways poverty is measured in this country.

The Federal/Provincial/Territorial Working Group on Social Development Research and Information is developing a new measure of poverty which could achieve greater consensus on this issue. Allen Zeesman, Michael Hatfield and Stéphane Gascon of the Applied Research Branch were assigned the task of drafting a preliminary version of the "Market Basket Measure" (MBM).

Current Measures of Poverty and Low Income

The MBM is best understood in the context of current measures of poverty and low income in Canada. Although Canada has no official measure of poverty, Statistics Canada does calculate two measures of low income:

- ▶ **Low Income Cutoffs (LICOs)**—This cutoff line is the income level where a household will, on average, spend on food, clothing and shelter a share of its pre-tax income that is 20 percent higher than the average family.
- ▶ **Low Income Measures (LIMs)**—The LIMs are equal to half of the median pre-tax income adjusted for family size.



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Canadian newspapers often use the LICOs as a measure of poverty. Because data using the LICOs are readily available and have been collected since the mid-1960s, the media have adopted the LICOs as the “official” measure. In addition, a number of advocacy groups, including the National Council of Welfare, use the LICOs to measure poverty. But not everyone agrees with the approach that forms the basis of the LICOs and the LIMs.

Differing concepts of poverty underlie the disagreement on poverty measurement. One approach sees poverty as a lack of social inclusion. According to this view, people or households are poor if they cannot maintain a standard of living which makes them, in some sense, participating members of their community. The Community Social Planning Council of Toronto periodically calculates budget guides based on this social inclusion approach to measuring poverty.

Another approach sees poverty as an inability to purchase subsistence levels of food, clothing and shelter. This is the concept underlying a measure developed by Christopher Sarlo for the Fraser Institute.

These radically different concepts serve to fuel the debate concerning poverty in Canada. Advocates of a subsistence concept of poverty believe the LICOs and the budget guides of the Community Social Planning Council of Toronto grossly overstate the level of poverty. Supporters of a social inclusion concept, on the other hand, argue that measures such as Sarlo’s glaringly understate the level of poverty. It should come as no surprise, then, that consensus has not formed around any one measure of poverty or low income in Canada to date.

A second level of disagreement is whether poverty measures should be relative or absolute. The LICOs and the LIMs use a *relative* method. Based on a fixed percentage of average or median levels of consumption or income, they measure low incomes in relation to all incomes in the country. An *absolute* measure of poverty, on the other hand, defines a minimum acceptable standard of living, represented by a basket of goods and services. The cost of that basket is then priced over time.

The Federal/Provincial/Territorial Working Group is attempting to construct an absolute measure of a concept of poverty that might achieve greater consensus and serve as a more efficient tool than the existing measures. The Market Basket Measure is based on the concept of “necessaries” which was defined by Adam Smith as “whatever the custom of the country renders it indecent for creditable people, even of the lowest order, to be without.”

The MBM approach is based on the lack of necessities with the key being the interpretation of the word “creditable” in today’s social context. In his definition of necessities, Adam Smith’s creditable person rises above subsistence levels of food, clothing and shelter. It does not, however, imply a standard of living as comfortable as that implied by the concept of social inclusion.

The Gap Filled by the Market Basket Measure		
Concept of Poverty	Method of Measurement	
	Absolute	Relative
Subsistence	Sarlo	
Creditability	Market Basket Measure	After-Tax Low Income Measure (LIM)
Social Inclusion	Community Social Planning Council of Toronto	Low Income Cutoffs (LICOs) and Low Income Measures (LIMs)

The Market Basket Measure

The ability to purchase the market basket will allow a family of two adults and two children to achieve a creditable standard of living. To purchase the market basket, the family must have sufficient income—a “threshold” income—to:

- ▶ **eat a nutritious diet**—The family will be capable of purchasing a Nutritious Food Basket, as defined by Health Canada.
- ▶ **buy clothing for work and social occasions**
- ▶ **house themselves in their community**—The family will have the ability to rent a median-cost, three-bedroom apartment in their community.
- ▶ **pay for other necessary expenditures**—The family will be attributed an amount equal to 60 percent of the combined cost of the food and clothing budgets to cover other necessary expenditures such as personal care, household needs, furniture, telephone service, public transportation, reading, recreation, entertainment and school supplies.

The costs of the items in the preliminary Market Basket Measure vary across the country. In addition, the cost of the basket is adjusted for family sizes and configurations other than the reference family of two parents and two children. To determine the level of income available to consume the market basket items, the following deductions should be made from pre-tax income:

- ▶ income taxes and payroll taxes paid by members of the household;
- ▶ child care costs incurred to enable both parents or a lone parent to work for pay;
- ▶ child support payments made by non-custodial parents; and
- ▶ actual out-of-pocket medically prescribed expenditures for dental and vision care, prescription drugs and prescribed aids for persons with disabilities.

In the preliminary calculations of the MBM, unfortunately only income taxes paid could be deducted due to unavailability of the other data.

Comparing the Market Basket Measure and the LICOs

Conceptually, the Market Basket Measure has a number of advantages over the LICOs. It is more sensitive to geographical differences in real living costs—particularly rents. The derivation of the MBM is more transparent and understandable to the average person. And, it compares the living standard it establishes to the income actually available to purchase the goods and services that fill the market basket. The fact that the Market Basket is related to actual purchasing power makes it sensitive to all changes in government policy including those that affect either the financial resources of or the taxes paid by each family, and those that influence the costs of services such as child care, prescription drugs, dental and vision care, and aids for persons with disabilities.

A comparison of the Market Basket Measure thresholds to the 1996 LICOs reveals a marked difference between the two measures. The national incidence of low income using the LICOs is significantly higher than the incidence of poverty calculated using the MBM—17 percent using LICOs compared to 12 percent using the MBM.

Geographical differences—Rents vary widely across the country. The variations in the costs of food and clothing are much smaller. The overall result is that the Market Basket Measure thresholds in high-rent provinces such as Ontario and British Columbia are much higher than thresholds in low-rent provinces such as Quebec, Manitoba and Alberta. A comparison of the MBM poverty thresholds to the LICOs reveals that the results are closer for the high-rent provinces than for the low-rent provinces. All of the poverty thresholds, however, are lower than the LICOs. (See table next page.)

Children and poverty—The aggregate poverty gap for children—the difference between actual incomes and the thresholds for all Canadian families with at least one child under age 18 with incomes below the thresholds—is significantly smaller using the Market Basket Measure than using the LICOs: for 1996, \$3.3 billion compared to \$6.8 billion.

Low Income Cutoff Levels and Market Basket Measure Thresholds

For Families of Two Adults and Two Children by Province and Community Size

	Population over 500,000	Population 100,000 to 499,999	Population 30,000 to 99,999	Population under 30,000	Rural Communities
Low Income Cutoff Levels (LICOs)	\$32,238	\$27,651	\$27,459	\$25,551	\$22,279
Newfoundland	NA	\$21,234	NA	\$19,986	\$18,714
Prince Edward Island	NA	NA	\$21,310	\$20,074	\$20,074
Nova Scotia	NA	\$21,291	\$19,899	\$21,447	\$19,635
New Brunswick	NA	\$19,230	\$20,742	\$18,474	\$17,982
Quebec	\$19,953	\$19,077	\$18,825	\$18,657	\$17,889
Ontario	\$25,194	\$23,202	\$22,722	\$22,362	\$20,370
Manitoba	\$21,746	NA	\$21,086	\$19,970	\$19,730
Saskatchewan	NA	\$20,582	\$19,190	\$20,162	\$19,226
Alberta	\$19,930	NA	\$19,486	\$19,750	\$17,626
British Columbia	\$25,196	\$24,128	\$22,712	\$22,136	\$20,516

Note: NA indicates that there are no communities of this size in the province.

Source: Federal/Provincial/Territorial Working Group on Social Development Research and Information, *Construction of a Preliminary Market Basket Measure of Poverty*, 1998, p. 20

The composition of poverty—Comparing the LICOs to the Market Basket Measure also affects the composition of the population in poverty. In order to compare the differences in composition for equal levels of poverty, the LICO thresholds were reduced to produce the same 12 percent national poverty rate generated by the Market Basket Measure. The effects on the composition of the poor at the same overall poverty rate are revealed in the table “Percentage Distribution of the Poor.” The MBM shifts the composition of the poor towards Ontario and British Columbia, families with children, and families with earnings as their main source of income.

Work is continuing toward refining the Market Basket Measure in the areas outlined in this article before submitting the measure to public evaluation and comment. It is hoped that one day the MBM may serve as one of several acceptable measures of poverty in Canada.

Percentage Distribution of the Poor

By Province, Family Type and Income Source, 1996

	Adjusted LICOs (Low Income Cutoff Levels)	Market Basket Measure
Provinces		
Ontario and British Columbia	44.9	54.2
Manitoba, Quebec and Alberta	43.0	32.8
Family Types		
Unattached individuals	30.2	25.5
Couples with dependent children	31.7	34.2
Income Sources		
Families whose main source of income is earnings	34.6	36.7
Families whose main source of income is government transfers	60.1	57.7

Source: Federal/Provincial/Territorial Working Group on Social Development Research and Information, *Construction of a Preliminary Market Basket Measure of Poverty*, 1998, pp. 31-33

Are Low-Skilled Workers Losing Ground in Canada?

According to the *OECD Economic Outlook (1997)*, labour market conditions for the least skilled workers have deteriorated in most member countries, including Canada. In some countries, like the United States, an increased wage premium for high-skilled workers is observed, while labour market conditions have worsened not only for the least educated workers, but also for a fairly large segment of the low-skilled adult population.

In a recent analysis from the Applied Research Branch, Daniel Boothby and Yves Gingras look at the changing labour market conditions for Canada's work force. Their analysis does not show any deterioration of labour market conditions for low-skilled Canadian workers in the 20 to 54 age group. However, some data do suggest that there has been a relative decline in access to the labour market and to employment for low-skilled workers 55 years of age and older.

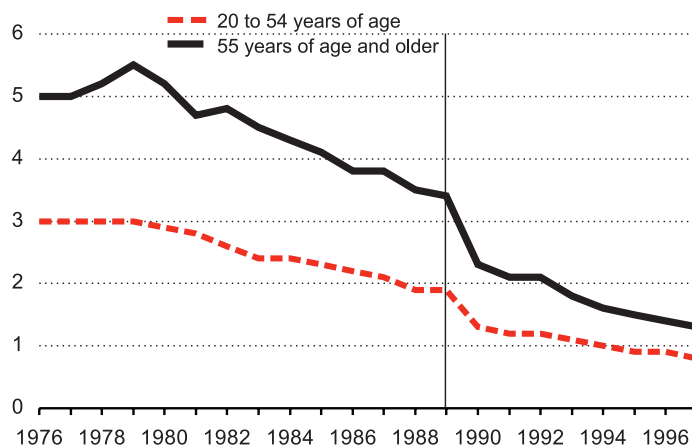
Boothby and Gingras divide the Canadian workforce into two groups: low-skilled workers (those without a post-secondary diploma) and high-skilled workers (post-secondary graduates). They then examine a number of labour market indicators to determine whether the relative labour market conditions for the low-skilled workers have deteriorated over the last two decades.

The indicators used in this analysis may be divided into two categories: those that concern access to the labour market and to employment, and those that concern income-generating capacity. Labour force participation rates and employment rates are used as indicators of access to the labour market and to employment, while weekly wages are used to measure the income-generating capacity. The Boothby-Gingras Report uses the ratio of the value of each indicator for low-skilled individuals to its value for high-skilled individuals to measure relative changes in labour market conditions for the two groups.

Access to the Labour Market

The proportion of low-skilled individuals in the labour force has been steadily declining. In 1976, for example, the low-skilled labour force in the 20 to 54 age group was three times larger than the high-skilled labour force. In 1997, the high-skilled labour force aged 20 to 54 years was larger than the low-skilled labour force in the same age group. For individuals 55 years of age and older, the low-skilled labour force has declined from five times as large as the high-skilled labour force in 1976 to less than one and a half times as large in 1997.

Relative Size of Low-Skilled Labour Force Ratio of Low-Skilled to High-Skilled Individuals



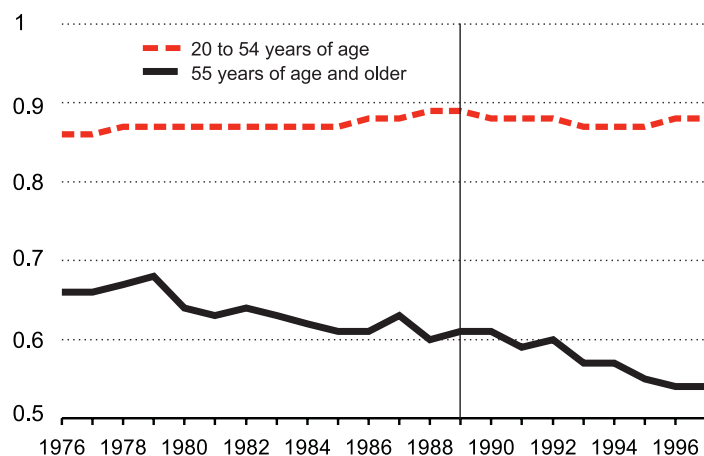
Note: The vertical line at 1989 indicates the last year before changes in the data collection methodology.

Source: Computation from unpublished Labour Force Survey data

The changing ratios between the low-skilled and high-skilled labour forces have been decomposed into the part attributable to changes in the participation rate of each group and the part attributable to changes in the respective populations. For individuals in the 20 to 54 age group, the decline in the relative size of the low-skilled labour force is attributable entirely to the decrease in the size of the low-skilled population, not to an increasing exclusion from the labour market, as is shown by the ratio between participation rates.

Participation Rate Ratio

Low-Skilled to High-Skilled Individuals



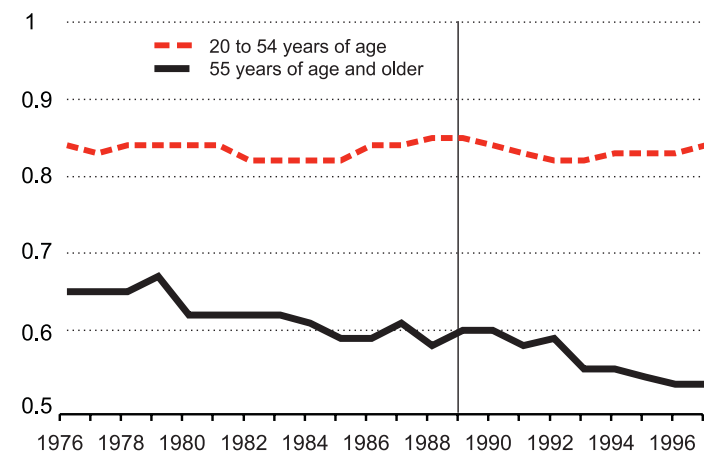
Note: The vertical line at 1989 indicates the last year before changes in the data collection methodology.

Source: Computation from unpublished Labour Force Survey data

For individuals 55 years of age and older, the decrease in the relative population size accounts for more than 83 percent of the change in the relationship between the low-skilled and high-skilled labour forces.

Employment Rate Ratio

Low-Skilled to High-Skilled Individuals



Note: The vertical line at 1989 indicates the last year before changes in the data collection methodology.

Source: Computation from unpublished Labour Force Survey data

Access to Employment

The employment rate for a group is the proportion of the population in the group that holds a job. Consequently, a decline in the ratio of the employment rate of the low skilled to the rate for the high skilled may mean that low-skilled persons are having more trouble finding employment.

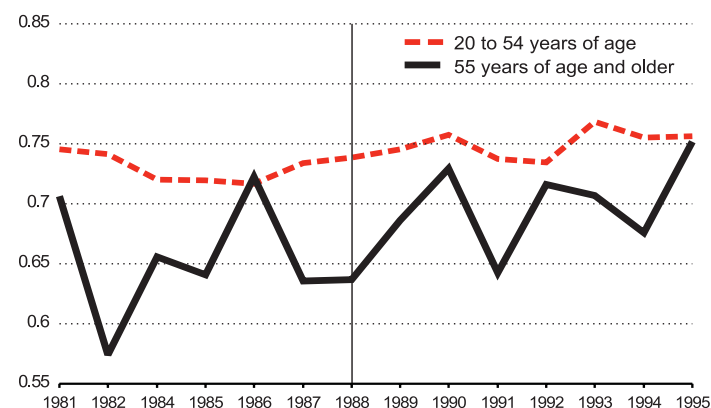
As is the case for differences in the labour force ratios, changes in the low-skilled share of total employment in the two groups are primarily due to changes in the relative size of the low-skilled and high-skilled populations. In the case of workers 55 years of age and older, the relative deterioration in the employment rate of low-skilled workers also contributed to the decline in their share of employment. (See graphic "Employment Rate Ratio.")

Income-Generating Capacity

Another factor that might be disadvantageous to low-skilled workers is the wage they can command for their work. Between 1981 and 1994, there was a slight upward movement of the wage ratio between low-skilled and high-skilled workers in the 20 to 54 age group, a trend which was briefly interrupted by downturns following the recessions of 1981 and 1991.

Ratio of Average Weekly Earnings

Low-Skilled to High-Skilled Workers



Note: The vertical line at 1988 indicates the last year before changes in the data collection methodology.

Source: Computation from unpublished Survey of Consumer Finances

Changes in the Labour Force Survey make it difficult to compare educational levels after 1989 with the earlier years. Consequently, no firm conclusion should be drawn from trends in relative earnings capacity beyond the fact that they do not indicate any deterioration in conditions for low-skilled workers 20 to 54 years of age. There is much more variability in the ratio of weekly earnings for the 55 to 64 age group, making it difficult to identify any trend.

In conclusion, the analysis does not show any deterioration in labour market conditions for the low-skilled segment of the Canadian population in the 20 to 54 age group. Some data do suggest that there has been a decline in access to the labour market and to employment for low-skilled individuals 55 years of age and older.

The most striking findings of this analysis are the very rapid rise in the level of qualifications of the Canadian working-age population and the absence of any deterioration in labour market conditions for low-skilled workers in general.

Job Futures—Matching Career Aspirations with Needs of the Labour Market

Looking for a job? Deciding what to study at school? Up-to-date information about current and future conditions in the labour market is the key to making informed educational and career choices. Canadians can find a wealth of useful information in *Job Futures*, a career counselling product of the Canadian Occupational Projection System of the Applied Research Branch of Human Resources Development Canada (HRDC). In fact, many Canadians are already relying on *Job Futures* for career information. In the one-month period after its release in April 1998, the *Job Futures* website was visited approximately 150,000 times per week.

On average, newcomers and re-entrants to today's job market will discover in *Job Futures* that job opportunities,

relative to the first half of the 1990s, will be improving as we move towards the year 2001. Employment has increased substantially since early 1997 and is expected to remain robust this year and next. Take a closer look, however, and you'll find that labour market conditions vary substantially across occupations. Computer programmers and firefighters, for example, face good work prospects—they're in occupations where workers are in relatively short supply. Biologists and plumbers, on the other hand, may find it tougher to locate work—these occupations are experiencing a relative surplus of workers. These are the details students and other job seekers need to know in order to make a successful transition into the labour market.

Job Futures contains two main components:

- ▶ statistical profiles of some 200 occupations and of recent graduates from 155 major fields of study by level of education, and
- ▶ an assessment of current and future labour market prospects for new entrants to the labour market.

The occupational information and assessment of current and future labour market prospects are arrived at through an analysis of data by a team of HRDC specialists as well as information provided by professional associations, trade associations and industrial organizations in the private sector. A detailed methodology of the derivation of these ratings will be presented in a forthcoming Applied Research Branch publication, *Job Futures (1997-98): Data Dictionary and Interpretative Guide for Analysts*.

Here is a quick overview of the type of information a Canadian searching for a job or choosing a course of study will find on the *Job Futures* website or CD-ROM.

Current Labour Market Conditions

Looking across all occupations, current labour market conditions are considered to be fair. This rating is consistent for all skill levels (education and training groupings) except management, where conditions are good, and occupations at lower levels of education and training, where the

situation is poor. Grouped by broad industry type, workers of all occupations are facing fair labour market conditions except in health (rated good) and art, culture, recreation, sport, trades, transport and equipment operators (all rated poor).

Ratings vary within broad skill groupings. For example, at the professional skill level (university education), the overall skill rating is fair while conditions are considered good for some of these occupations (like human resource professionals, systems analysts, doctors, dentists, electrical and electronic engineers and lawyers) and poor for others (such as life science professionals, including biologists, and creative and performing artists). In sales and service occupations, overall conditions are also considered fair. However, within this skill type conditions are good for police and firefighters and poor for chefs and cooks, child-care and home support workers, and cleaners.

In general terms, the current labour market conditions for recent graduates from the formal school system are fair. This rating is consistent across all types of courses except trade-vocational where the rating is poor, primarily the result of the poor conditions faced by graduates from secretarial programs (16 percent of all 1996 trade/vocational graduates). Looking at fields of study, overall conditions are fair although the ratings vary from poor for arts graduates to good for physical science graduates. This is due largely to the positive conditions being faced by computer science graduates.

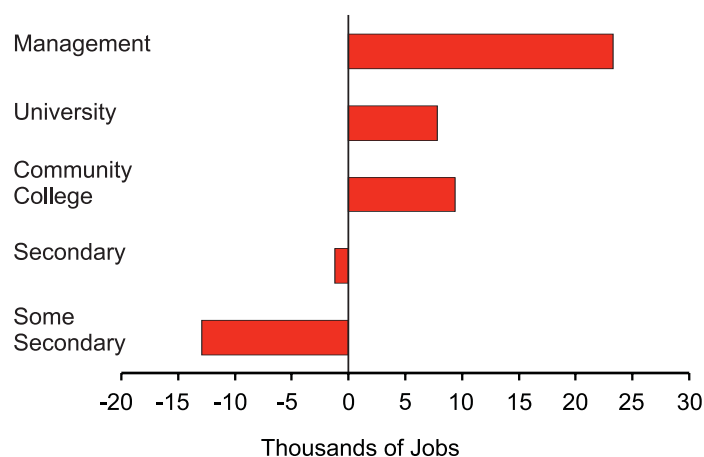
Future Labour Market Conditions—Occupations

It is anticipated that over the 1996-2001 projection period, the number of new job openings will exceed the number of new job seekers (a movement towards excess demand) for management occupations and occupations requiring postsecondary education. Examples of occupations in these two categories include financial managers, human resource managers, chemists/chemical technologists, geologists/geological technologists, machinists and electrical trades and telecommunications workers. The reverse, generally, will hold true for occupations requiring high school completion

or less. Future labour market conditions are expected to worsen for such occupations as mail and message distributors; cashiers; attendants in travel, accommodation and recreation; and machine operators and related workers in metal and mineral products processing.

Projected Average Annual Excess Demand

By Skill Level, 1996-2001



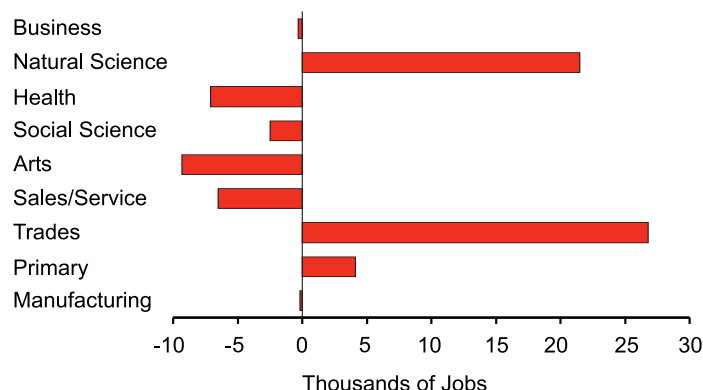
Source: Human Resources Development Canada. *Job Futures*, 1998

Emerging shortages or surpluses will not necessarily translate into unfilled vacancies or unemployment. Adjustments in wages and salaries, training, inter-occupational mobility and changes in production plans will all contribute to resolving these expected imbalances.

Looking at skill types, labour market conditions are expected to remain unchanged in all business, finance and administration occupations except for mail and message distribution where conditions will deteriorate from fair to poor. Conditions in natural and applied sciences are expected to improve from fair to good on the strength of computer scientists, engineers and professional and technical occupations in the physical sciences. No occupation in the natural and applied sciences grouping is expected to face worse conditions in 2001 than they faced in 1996.

Projected Average Annual Excess Demand

By Skill Type, 1996-2001



Source: Human Resources Development Canada. *Job Futures*, 1998

Although the number of new job seekers is expected to exceed the number of new job openings in the health sector, the only occupation group in this sector that is expected to experience worse conditions in 2001 than in 1996 is therapy and assessment professionals. In social sciences, education, government services and religion, the rating deteriorates

from fair to poor for psychologists, social workers, counsellors and ministers of religion.

The largest movement toward a labour surplus occurs in the art, culture, recreation and sport sectors where conditions worsen from fair to poor for announcers and other performers, athletes, coaches, referees and related occupations. Over the projection period, conditions in the sales and service sector are expected to remain fair although there will be a deterioration from fair to poor for cashiers and attendants in travel, accommodation and recreation. No occupation in the sales and service group is expected to be in a better labour market situation in 2001 than it is currently.

In the trades and transport sectors, conditions will improve for machinists, electrical trades and telecommunications workers. In the primary sector, labour market conditions are expected to improve for supervisors in logging and forestry, logging machine operators, and mining occupations, and remain poor or worsen for occupations related to agriculture and fishing. Over the projection period, conditions in the processing, manufacturing and utilities sector are expected to improve for central control and process operators and worsen for machine operators in the metal and mineral products industry.

Prospects for Selected Occupations

For the Year 2001

Good Work Prospects

Aircraft mechanics and inspectors
Chemical, geological and geophysics technologists and technicians
Engineers
Industrial electricians
Machine operators – chemical, plastic, rubber, pulp and paper
Mathematicians, systems analysts and computer programmers
Mechanical, electrical and electronic assemblers
Pharmacists, dietitians and nutritionists
Physicians, dentists and veterinarians
Tool and die makers

Poor Work Prospects

Agriculture and horticulture workers
Bricklayers and drywall installers
Chefs and cooks
Cleaners
Creative designers and craftspersons
Fishing – deckhands and trappers, fishing vessel masters and skippers
Masonry and plastering trades
Plumbers, pipefitters and gas fitters
Secretaries – general, legal and medical
Trades helpers and labourers

Prospects for Selected Fields of Study

For the Year 2001

Good Work Prospects

Auto mechanic, auto body (Trade-vocational)
Business (Masters)
Computer science (All levels)
Dental hygiene (Trade-vocational)
Dentistry (Undergraduate)
Engineering, engineering technologies (All levels)
Law (Undergraduate)
Medicine (Undergraduate)
Machinist (Trade-vocational)
Veterinary science, medicine (Undergraduate)

Poor Work Prospects

Agriculture (All levels)
Arts (All levels)
Biology (Undergraduate)
Cooking (Trade-vocational)
Psychology (Undergraduate)
Religion and theological studies (University)
Secretarial (All levels)
Service industry technologies (Community college)
Social work (University)
Welding (Trade-vocational)

Future Labour Market Conditions—Fields of Study

Job Futures also estimates the future labour market situation of graduates by program of study. Generally, conditions are expected to remain fair for recent graduates although these results vary across individual fields of study. Improvement, from poor to fair, is expected for:

- ▶ trade-vocational arts graduates, primarily due to such personal arts fields as hairstyling and cosmetology;
- ▶ community college graduates in business, largely the result of an improved outlook for retail sales, marketing and financial management graduates; and
- ▶ community college primary technologies graduates, due to an improved outlook for geology and prospecting; and drilling, extracting, mining, petroleum, environment, conservation and forestry technology graduates.

Conditions will improve from fair to good for master's, undergraduate and community college graduates in engineering or engineering technologies. Alternatively, the situation is expected to deteriorate from good to fair for master's graduates in social science (the result of a worsening situation for psychology and social work graduates) and from fair to poor for undergraduate university applied arts graduates. Conditions are expected to remain good for

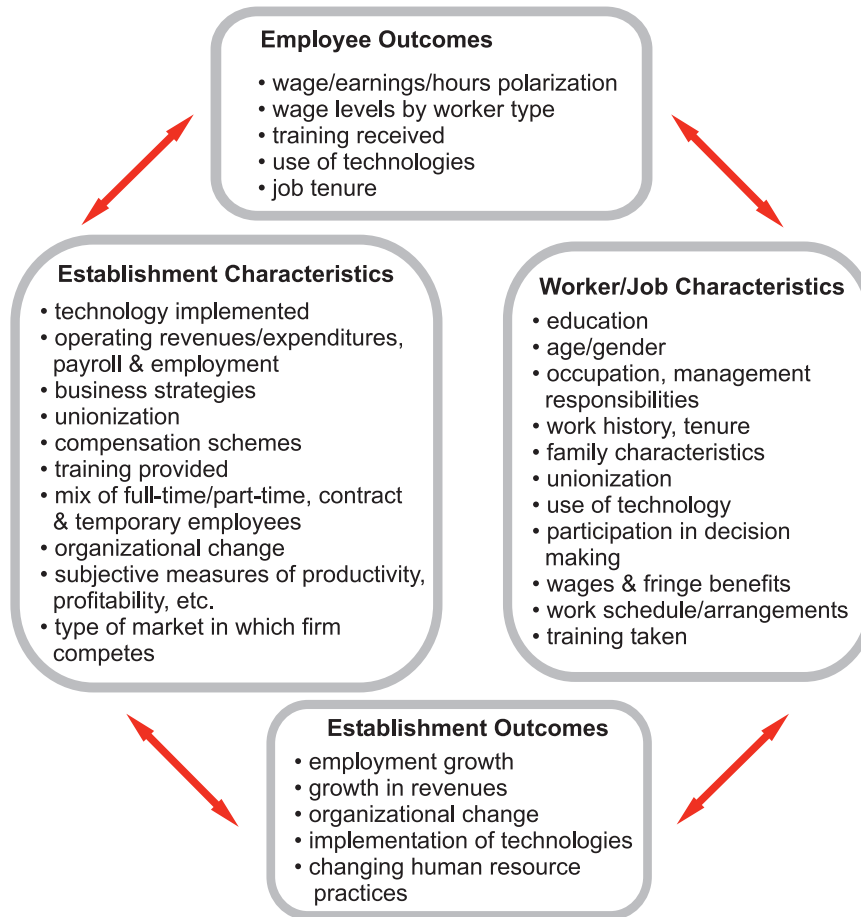
university graduates in business and physical science; fair for undergraduate university graduates in education, humanities, life sciences and health; and fair for trade-vocational graduates in engineering technologies. The situation will remain poor for:

- ▶ community college graduates in arts, especially those in commercial and promotional arts, and creative and design arts;
- ▶ trade-vocational graduates in business, mainly due to the poor outlook for graduates from the secretarial programs; and
- ▶ primary technology graduates, largely the result of the weak outlook for agricultural and food processing technology graduates.

The Evolving Workplace—The Workplace and Employee Pilot Survey Results

A recently released report, *The Evolving Workplace*, provides a first glimpse of the breadth and depth of information that can be generated by the planned Workplace and Employee Survey (WES). And that first look,

The Linked Survey



Note: This chart illustrates the key benefit of the linked survey format of the Workplace and Employee Pilot Survey (WES). The chart summarizes the content of the surveys of establishments and workers and connects that information to outcomes for both employees and establishments. What sets WES apart is the ability to analyze the events that occur in establishments not only by the characteristics of the establishment, as has been done in other firm surveys, but also by the characteristics of the workers and their jobs. The same can be done when examining worker outcomes. Data has always been available on workers themselves. Now, however, information concerning establishments can be used to analyze worker outcomes. Courtesy of the WES, we have the ability to look at the world of work from both the supply and the demand side of the labour market.

Source: Statistics Canada and Human Resources Development Canada, *The Evolving Workplace*, 1998, p.4

resulting from the pilot survey conducted by Statistics Canada in partnership with Human Resources Development Canada and with funding support from Industry Canada, reveals the considerable potential of the WES to explore links between events occurring in establishments and the outcomes for workers.

The WES marks a significant change in the way information is collected about establishments and the workers they employ. For the first time in Canada, researchers are examining how the characteristics, decisions, and behaviours of employers and employees affect one another. Until now, most research has focused on what is going on with the supply of labour, giving us a solid understanding of workers' outcomes—wages, job stability, training and unemployment, for example. What has been missing, however, is the ability

to link these changes to events taking place within establishments.

The WES also contributes to a better understanding of how establishments are dealing with change. There is a general sense that the pace of change, spurred by technological innovations and global competition, has accelerated in recent years. Just how many companies have implemented new information technologies, and on what scale? What kind of training is associated with new technologies? What types of business strategies are firms using to thrive in this period of change? Do these strategies vary dramatically across firms? These are the kinds of issues the WES addresses.

The pilot survey was tailored to provide an evaluation of the methodology and research potential of the WES. It

obtained in-depth information from 12 types of industries, included a survey of 748 establishments conducted by personal interview and a telephone survey of 1,960 workers in the sampled establishments. The full-scale production survey, planned for early 1999, will sample up to 7,500 establishments and 40,000 workers.

The overview report focuses on establishments, since less is known about them than about workers. Here is a quick sampling of some of the findings:

Business Strategies

The pilot survey reveals that companies select many different roads to reach their goals. It distinguishes four types of business strategies:

- ▶ **cost-reduction strategies**—These strategies are very important to a substantial number of establishments, particularly large firms and those in construction, communications, education and the financial sector. The use of downsizing appears to be an important component of the cost-reduction strategy. An interesting result—the use of part-time, temporary or contract workers, often thought to be employed by firms attempting to reduce labour costs, did not come out as dominant in this survey. In fact, it was one of the least often reported forms of organizational change.
- ▶ **human resource development strategies**—These strategies—for example, increasing employee skills and enhancing relations between labour and management—are often seen as partners to the implementation of new technologies. What's really happening? These strategies were more important in high-technology, higher-skilled sectors, including the financial sector, communications and education, than among sectors where lower-skilled workers still predominate. Sectors with more highly educated or skilled workers train at higher levels than those with a less skilled workforce. Not surprisingly, larger establishments tended to place more importance on human resource development strategies than smaller ones.

- ▶ **product development and R&D**—Considered an important determinant of growth, these strategies are restricted to a small set of establishments. Approximately 12 percent indicated that product development and R&D were very important or crucial, while nearly 40 percent said they held no importance for their establishment. Establishments adopting these strategies tended to be in manufacturing and business services. Firms conducting product development and R&D tended to charge higher than average prices, have a broad market base, be engaged in active recruitment and have unfilled vacancies. The linked nature of the WES provides a look at the workers in these firms. These workers tended to be educated to a higher level, to receive more training, to have longer job tenure and to earn higher wages than workers in firms that do not focus on these strategies.

- ▶ **quality-related strategies**—Half of all establishments cite improvements to product or service quality and/or improvements in customer and supplier relations as a fundamental component of their overall business strategy. Firms which use quality-related strategies employ about 75 percent of workers. There is a positive relationship between the incidence of adoption of quality-related strategies and establishment size; that is, as incidence increases, the number of employees working in the establishment increases.

Establishments that consider quality-related strategies crucial to their overall business success are more likely than establishments not concerned with quality issues to engage in product development strategies, to value human resource management strategies and to be concerned with cost reduction.

Technology Adoption and Organizational Change

Technological change is difficult to measure, but the pilot survey establishes some basic facts via straightforward questions on technology adoption and the way it is associated with worker and establishment outcomes.

The use of information technologies is widespread, with almost two-thirds of workers reporting using a computer. A little over one-third of all establishments, accounting for 55 percent of employment, reported the implementation of information technologies during the three years prior to the survey. Thirteen percent of establishments reported implementing some other form of technology. Fifteen percent of establishments, representing 29 percent of workers, reported a product, service or process innovation over the same period. About half of all establishments, accounting for one-third of workers, reported neither the implementation of new technology nor any other innovation. Research is now underway to address questions about the intensity of use of technology.

And what of the links between technological and organizational change? As expected, re-engineering of the business process is strongly associated with the adoption of technologies. In general, establishments that adopted a computer-based technology were more likely to have made an organizational change—other than downsizing—than those that did not. Preliminary results show little association between downsizing and the adoption of computer-based technologies, suggesting that most downsizing was not in response to the implementation of technology.

Training and Establishment Practices and New Technologies

The WES links training to several other variables, providing researchers access to more information than ever before and permitting deeper analysis of the subject. In fact, the pilot study illustrates that surveys of establishments or workers, in isolation, can lead to potentially misleading results.

For example, the proportion of establishments that train, a commonly used measure in surveys of establishments, suggests that training is particularly high in the financial, communications and education sectors: approximately 90 percent of these establishments train (compared to 38 percent overall). However, the WES finds that when workers in these same establishments are asked who receives

training, there is much less variation among industries. Overall, according to workers, 41 percent receive training; and in the high-intensity industries just mentioned, from 53 to 63 percent of workers are trained. In some industries, such as product-differentiated manufacturing, the WES shows that an above average proportion of firms train (71 percent) but a below average share of the workers receives training (29 percent). Incidence of training reported by workers seems to be a much better reflection of training activity than incidence of training reported by establishments.

In addition to providing a knowledge base to support the implementation of the production version of the survey planned for 1999, the pilot survey raises as many questions as it answers, laying the groundwork for significant research in the future. Stay tuned!

The New Face of Shiftwork

In recent years, the use of shift scheduling outside the standard 9:00 to 5:00 workday has been on the rise. In 1995, 3.5 million employees worked a non-day schedule, up from 3 million in 1991. Forecasts indicate that the need for shiftworkers will continue to grow as organizations respond to global market pressures and the need for round-the-clock customer convenience.

Who are the shiftworkers of the 90s? What are the effects of shiftwork on employee well-being? In a report written for the Applied Research Branch, Karen Johnson of Carleton University's School of Business answers these questions. Johnson employs data from the Survey of Work Arrangements and her own in-depth survey of 270 men and women working in a modern, high technology industry.

The well-being of shift workers is reflected in their morale and may be compromised by having to work schedules that are not synchronized with the rhythms of society leading to stress, fatigue and interference with family time and relationships.

Much of what we have known about the effects of shiftwork on individual employees is based on fairly traditional shiftworking populations—primarily factory workers and nurses. Such limited samples no longer capture the occupational and demographic diversity of the modern shiftworker. Today, only 14 percent of shiftworkers are employed in those occupations. According to the 1995 Survey of Work Arrangements, the majority of shiftworkers are in professional, managerial and service jobs. As well, the typical shiftworker is no longer a male factory worker with a wife at home to see to the needs of the family. In 1995, women accounted for 46 percent of shiftworkers.

Johnson's own survey taps a sample more representative of modern shiftworkers. Using established measures from the work and family-balance literature, she compares work attitudes, personal life, and the ability to balance work and family for rotating shiftworkers and employees on daytime schedules.

Quantitative analysis of her survey data suggests that rotating shiftworkers experienced significantly greater work-family conflict than dayworkers, had greater difficulties in individual time management, and held significantly less favourable work attitudes. Rotating shiftwork seemed to be most problematic for women, parents and those with little control over scheduling of their work hours.

Qualitative data collected through interviews suggest that low control over work hours is a major contributor to the adverse effects of shiftwork. The rigid time and place constraints associated with shiftwork highlight the disparity between a workplace that is rapidly changing and an infrastructure that lags behind. Operating hours that continued to expand with no parallel increase in support for workers affected by the changes further illustrate workplace change whose morale-reducing effects have not been addressed. In addition, few adjustments to accommodate changed work hours had been made at home, which leaves shiftworking mothers to cope as best they can with the "double day" of paid work and household labour.

Disadvantages of shiftwork generally outweigh the advantages. The following negative points were cited: 46 percent of shiftworkers said that they seldom saw their children while on the late shift and 30 percent said that they missed having dinner hour with the family. When it came to the advantages, the greatest number of shiftworkers recognized economic factors—54 percent mentioned the shift earnings differential during evening hours. As well, 42 percent said that it was helpful to be able to shop and run errands during non-peak hours. A quarter of the shiftworkers said daycare costs were reduced by their shiftwork. While day workers involved in the study were 75 to 95 percent satisfied with their work schedules, only 10 to 15 percent of shiftworkers rated their schedules as appealing.

***More employee involvement in
scheduling work hours would help
ensure shiftwork is beneficial to both
employees and organizations.***

Shiftworkers said they felt "steamrolled" into shift assignments because there was seldom any consultation. The Johnson report states that "individual needs were virtually invisible to those doing the scheduling." The study suggests that more employee involvement in scheduling could result in higher output for the organization. Experimenting with scheduling strategies and giving employees more input into their work hours would be a significant step towards ensuring shiftwork is equally beneficial to employees and the organizations they serve.

The findings of this research illustrate some of the needs of the modern shiftworker at the confluence of labour force, social and economic changes with increased pressure from work and home domains. According to the study, if industry hopes to remain competitive and ensure equity and the well-being of employees, "Employers need to respond to the changing needs of today's shiftworkers."

Can Organizational Change Resolve the Productivity Paradox?

Large investment in information technology, particularly in the service sector over the past two decades, has not led to productivity growth commensurate with earlier significant technological advances such as electricity. This “productivity paradox” and the degree to which it may relate to organizational change is the subject of a recent literature review by Andrew Sharpe of the Centre for the Study of Living Standards (CFSLS). This review builds upon the findings of an international conference organized by the CFSLS in Ottawa in April 1997.

Sharpe defines Information technology (IT) as including “computers of all types, hardware and software; communications networks, from those connecting two personal computers to the largest public and private networks; or computer equipment used primarily in offices

in the business sector, including personal computers, workstations, minicomputers, servers, mainframes and related equipment.”

The 1994 General Social Survey conducted by Statistics Canada found that 49 percent of the employed population used a computer on the job, up from 35 percent in 1989. Seventy-one percent of white-collar workers had either a computer or terminal assigned to them to perform work-related tasks.

Sectors with the largest computer investment tend to have the weakest total factor productivity growth.

Over the 1992-95 period, paradoxically, there was a negative relationship between total factor productivity growth and

Computer Investment and Total Factor Productivity Growth

In Service Industries

	Computers as a Percentage of Total Investment, 1995	Percentage Change in Real Computer Investment, 1992-1995	Percentage Change in Total Factor Productivity, 1992-1995
Transportation and Storage	3.4	86.8	6.8
Communications and Other Utilities	7.8	108.3	9.7
Wholesale	14.7	59.1	-0.6
Retail	16.5	351.4	-0.2
Finance, Insurance and Real Estate	13.4	85.8	-0.8
Business Services	55.8	3.2	-15.6
Government Services	6.6	45.2	0.1
Educational Services	7.3	67.0	-2.2
Health and Social Services	7.5	97.2	-4.6
Hotels and Restaurants	5.4	3.4	4.2
Total Service Sector	9.8	64.2	1.2

Note: Telecommunications equipment is excluded.

Source: Centre for the Study of Living Standards, based on Statistics Canada data

computer investment. Sectors that had the largest computer investment as a share of total investment tended to have the weakest total factor productivity growth. In business services, for example, 55.8 percent of investment went to computers in 1995, yet total factor productivity fell 15.6 percent. On the other hand, only 3.4 percent of total investment in transportation and storage went to computers, yet total factor productivity grew by a strong 6.8 percent.

The CFSLS conference concluded that the “productivity paradox” could be captured by three basic hypotheses:

- ▶ **“The benefits of IT are already here,” or the mismeasurement hypothesis.** These benefits are not showing up in official statistics because statistics have failed to capture them.
- ▶ **“The benefits of IT are coming,” or the lagged-benefit hypothesis.** The gains are not here yet but will become evident as we learn how to use computers effectively. The possible link between organizational structures and productivity gain is an aspect of this hypothesis.
- ▶ **“The benefits of IT are never coming,” or the exaggerated-benefit hypothesis.** The gains will never arrive because computers are not very important to productivity.

The Centre for the Study of Living Standards review concludes that there is likely no single explanation for the paradox and that in fact, the various hypotheses may be capturing different aspects of the phenomenon. However, the study does conclude that a stronger case can be made for the mismeasurement and exaggerated-benefit hypotheses over the lagged-benefit one.

For many tasks and activities, computers are a boon for productivity, as they reduce human toil. Quantifiable indicators of output such as transactions processed indicate that productivity showed marked gains when computers were introduced into the telecommunications sector. When output is not measured by clear performance indicators, as in banking and public administration, productivity is seen as stagnant. Thus, output mismeasurement creates an underestimation of the benefits of IT.

IT may produce qualitative benefits for managerial and professional activities, such as for example more aesthetically pleasing presentations, which are not directly measurable as output. For these kinds of benefits it is not possible to measure additions to output in an objective way.

For the exaggerated benefit hypotheses, it is necessary to consider the small share of IT investment in overall investment and its even smaller share of the capital stock, given the rapid depreciation of computers (25 percent per year). Given this reality, high expectations for productivity advance for IT appear unrealistic.

Sharpe concludes that the main reason that the lagged-benefit hypothesis explains less of the productivity paradox than the other two hypotheses is that computers are now widely diffused. It is difficult to believe that barriers to their effective use have not largely been overcome. The author notes that an exception to this conclusion may reside in the potential complementarity between investment in IT and organizational change. That is, for IT to pay off there may be other necessary ingredients—new organizational structures, new ways of interacting, new ways of managing people. And, while the lagged benefit hypothesis may not hold large validity at the level of the economy as a whole, at the level of an individual firm the contribution of this factor may be great.

Information technology is no panacea for improved productivity.

The CFSLS review suggests that, in order for information technology to improve productivity, human resource management and organizational strategies must be considered in the implementation. Also, as Scott Morton concludes in the Centre for the Study of Living Standards report, “None of the potentially beneficial enabling aspects of IT can take place without clarity of business purpose and a vision of what the organization should become...a clear mission.... It appears particularly important to invest a large

amount of time and effort in getting the organization to understand where it is going and why.”

Sharpe concludes his review by pointing to the need for research to further explore the relationship between IT investment, other organizational structures and productivity growth at the firm level. In this respect, he suggests that the proposed Workplace and Employee Survey piloted by Statistics Canada and Human Resources Development Canada will add greatly to our knowledge. (See the fourth article in this issue of the *Bulletin*.)

Is High School Enough?

More young Canadians than ever before are completing high school and going on to postsecondary education. In fact, young people appear to be aware that as Canada’s economy becomes increasingly knowledge-based, more jobs require higher levels of education and skills. A report released recently by Human Resources Development Canada and Statistics Canada, *High School May Not Be Enough*, sheds more light on the nature of young people’s education, training, and labour market experiences in the 1990s.

As previously noted (*Applied Research Bulletin*, Vol. 3, No. 1), the 1991 School Leavers Survey (SLS) indicated that 18 percent of 20-year-olds had left high school without receiving a high school diploma or its equivalent. Four years later, the 1995 School Leavers Follow-Up Survey (SLFS) revealed that a good portion of these leavers had returned to the classroom. By 1995, the rate of school leavers had dropped to 15 percent among this same group of young people at age 24. Looked at another way, one in four of those who were leavers in 1991 had returned to school and become a graduate by 1995.

Completing High School a Longer Process for Some

Young people chose many different pathways to make their school-work transitions. Among youth aged 22 to 24 who

were high school graduates as of 1995, 11 percent graduated at age 20 or older. Institutions and programs that make high school studies or equivalencies accessible to adults likely played an important role for these older graduates. High school non-completion rates for youth at ages 20 and 24 varied considerably by province. Saskatchewan and Alberta had the lowest proportions of school leavers; Prince Edward Island, Newfoundland and Quebec had the highest.

High School Non-Completion Rates of Youth

	Age 20 in 1991 (Percentages)	Age 24 in 1995 (Percentages)
Canada	18	15
Newfoundland	24	19
Prince Edward Island	25	21
Nova Scotia	22	17
New Brunswick	20	16
Quebec	22	19
Ontario	17	14
Manitoba	19	14
Saskatchewan	16	11
Alberta	14	11
British Columbia	16	13

Source: Human Resources Development Canada and Statistics Canada, *High School May Not Be Enough. An Analysis of Results from the School Leavers Follow-up Survey, 1995*, 1998, p. 10

Many Young People Still Have Low Levels of Education

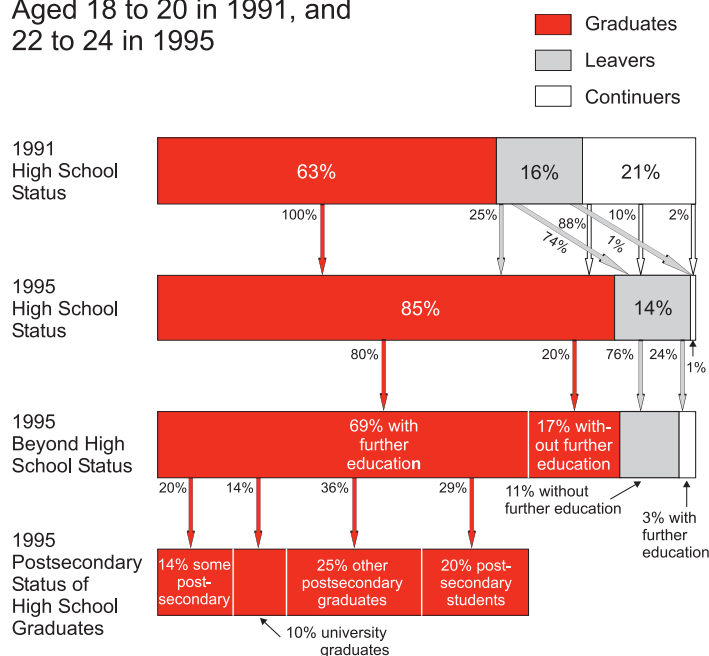
Despite high levels of postsecondary participation among Canadian youth, 11 percent of the 1991 cohort were high school leavers without further education or training. Another 17 percent were high school graduates without any further education or training. Taken together, nearly three in ten people, aged 22 to 24, had relatively low levels of educational attainment.

In an increasingly highly educated society, having “low education” could be considered to include not just high school leavers, but also youth who complete high school but do not pursue further education or training. Some of

these less educated youth appear to be constrained by their backgrounds. For example, youth with less education tend to come from families with less education.

Educational Flow of Youth

Aged 18 to 20 in 1991, and
22 to 24 in 1995



Low Levels of Education = Low Levels of Skill Use

Analysis which examined various factors associated with skill use for the 22- to 24-year-olds concluded that education and employment status are both extremely important. Young people who were employed or who were postsecondary students were most likely to have reported higher levels of skill use and self-assessed skill abilities.

Entering the Labour Market

As a result of the economic recession and the subsequent slow recovery period, transitions were more difficult for many young people during the first half of the 1990s. The observations from the 1995 School Leavers Follow-Up Survey research supports findings from the 1980s that transitions from school to work had become quite complex, that there

was no clear point of transition from school to work, and that young people combined work and studies in many diverse ways. This pattern has continued in the 1990s.

After high school, 23 percent of all 22- to 24-year-olds had never had a job that lasted at least six months and involved 20 hours of work or more. The incidence of never having had such a job was highest among those who were postsecondary students at the time of the survey (42 percent) and among women without a high school diploma (33 percent). Over one-third of all youth aged 22 to 24 had such a job within the first six months of leaving high school.

Quality of Youth Employment

Non-standard employment (part-time work, temporary employment and self-employment) represented 41 percent of total youth employment. When students were excluded, the percentage was 36 percent. This compares to a total of 31 percent for the work force as a whole during 1995.

In 1995, one in four 22- to 24-year-olds with jobs was employed part-time. This proportion was higher than for the labour force as a whole (19 percent). Excluding students, however, only 15 percent were in part-time jobs. Attendance at school or training programs was the largest single reason for part-time employment.

After high school, many first jobs that lasted at least six months and involved 20 hours of work or more were really still "student" jobs. Over time, young people who gained the appropriate skills and experience tended to move out of these "student" jobs and into other sectors. There was also evidence of some movement from lower to higher levels of skill, especially among youth with postsecondary qualifications.

Overall, 41 percent of young people with jobs had taken career or job-related education or training such as programs, courses, workshops, seminars, and tutorials. The rate was lowest for high school leavers (28 percent) and highest for postsecondary students (60 percent). Most job-related training by young Canadians is undertaken by those who already have higher levels of education.

Labour Market Outcomes Vary Considerably by Educational Status

There were some advantages in having a high school diploma—even for those who did not undertake further education. For example, graduates found jobs more quickly than leavers and spent less time being unemployed. However, high school graduates who had postsecondary education or training were substantially better off than both leavers and those graduates who did not pursue further education. For example, postsecondary graduates had a higher labour force participation rate than leavers and high school graduates, and they also enjoyed a lower unemployment rate.

Labour Force Status of Youth, Ages 22 to 24 In the Week Before the Survey

	Labour Force Participation Rate (Percentages)	Unemployment Rate (Percentages)
School Leavers	81	21
High School Graduates	85	13
University Graduates	96	9*
Other Postsecondary Graduates	96	10

* The asterisk indicates a coefficient of variation between 16.6% and 33.3%. This figure is less reliable than the others.

Source: Human Resources Development Canada and Statistics Canada, *High School May Not Be Enough. An Analysis of Results from the School Leavers Follow-up Survey, 1995*, 1998

Work Ethic Is Strong in Young Canadians

An extremely small percentage of youth were not looking for work because they “believed no work was available,” or because they were simply “not interested in finding work.” This is consistent with other studies that have found that the work ethic among young Canadians is strong.

High School Completion Is Important—But Is It Enough?

At age 22 to 24, the young people under study were still very much in the midst of their transitions. Nevertheless, the analysis of the School Leavers surveys adds to a growing body of literature suggesting that in today’s economy, higher education is the key to improved labour market and life circumstances. This fundamental truth should underpin decisions made by individuals as well as policy makers.

Youth with a high school diploma and no more still do somewhat better than youth without a high school diploma. And, by opening the door to further studies, high school graduation is a critical step in gaining access to high-skill, higher paying work for those who aspire to it. In an increasingly knowledge-based economy and society, high school may not be enough.

But the pathway from school to work involves far more than educational attainment. Other conditions are also necessary for our young people to make successful school-work transitions. Developmental factors, the quality of educational experiences and the availability of work for young people

About the Surveys

Between September and December 1995, Statistics Canada, in partnership with Human Resources Development Canada, conducted the School Leavers Follow-up Survey (SLFS). The initial 1991 School Leavers Survey interviewed nearly 10,000 young people aged 18-20 to document their characteristics and the circumstances of their leaving school. Four years later, the 1995 SLFS re-interviewed about two-thirds of the same respondents, by then aged 22 to 24, to explore the school-work transitions of young people beyond high school. The survey was designed to examine transitions not as a one-way movement from school into the world of work, but as a variety of movements that can occur between education, training and the labour market.

across the country must also be considered. Analysis concerning many of these critical factors will become available through the National Longitudinal Survey of Children and Youth, as well as through a longitudinal survey on youth in transition now being developed by Human Resources Development Canada together with Statistics Canada.

Learning from Experience— The Nova Scotia School-to- Work Transition Project

How can today's young people be helped to make appropriate and realistic career choices? In light of the rapidly changing nature of the industrialized economies, this question is more pressing than ever for several reasons. First, parents today feel ill-equipped to provide advice or guidance to their children about their work future; they can offer little more than simple encouragement and support for whatever choice their children make. For example, in the Nova Scotia School-to-Work Transition (NSSWT) project only about three in every ten parents could provide a job title or a job description when asked what job they would prefer their son or daughter to have after completing all their education. Over half admitted having "no idea." Contrast this with a study conducted in the mid-1970s that found that at least four in every five parents of 17-year-old children could give a job title or a job description when asked what job they would prefer their son or daughter to have.

Second, some of the jobs readily available to youth today (such as flipping hamburgers and babysitting the kids next door) are not likely the ones that will help them make future career choices. These probably sound like pretty good jobs to high school students looking to earn a few extra dollars. Talk to the students, however, and you will likely be told that jobs like these—the types of work typically available to high school students—are very different from the types of jobs they envision for their future. So different, in fact, that their forays into the workforce may be of minimal value

in preparing students for the world of work.

Are there programmes and structures which can provide meaningful work experience that can pave the way from school to work, enhancing the effectiveness of youth transitions from school to their first full-time job? Answering this question is one of the main objectives of the NSSWT project. Interim results from this project were previously reported in the *Applied Research Bulletin* (Vol. 3, No. 2). Over 500 Grade 11 Nova Scotia students are involved, half as participants in the NSSWT program and half acting solely as a comparison group. The participants in the program receive, in Grades 11 and 12:

- ▶ in-class practice and instruction on topics such as résumé writing and job interviewing and
- ▶ a supervised work experience.

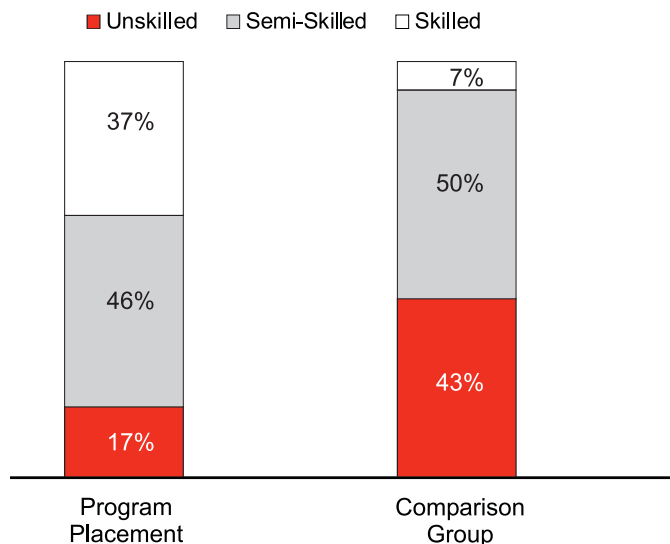
The project co-ordinators attempt to obtain work placements that match the expressed interest of each participant in the NSSWT program.

Work experience will more likely provide an effective learning opportunity if four conditions are fulfilled. First, the actual tasks that comprise the job must be ones that permit the development of work skills. Second, since learning is facilitated by interest, it is desirable that these tasks are ones that young people enjoy. Third, the job itself should be one that presupposes at least a moderate level of skill and that entails diverse tasks. Jobs that are too simple and routine do not provide a learning environment. Finally, since it is likely that the workers of tomorrow will change jobs several times during their working life, the job must develop general, transferable skills.

Was the NSSWT able to develop programming which met these requirements? And could it be used as a model for other jurisdictions wishing to support better school-to-work transitions for their youth populations? A full answer to this question will await the final evaluation. However, the initial information is encouraging. The graphic "Skill Level of Jobs Obtained" systematically compares the skill requirements for the jobs that participants obtained through the NSSWT program with the jobs obtained by the comparison group.

Skill Level of Jobs Obtained

Nova Scotia School-To-Work
Transition Project (NSSWT)



Note: Skill categorization is based on the National Occupational Classification codes, where *unskilled* corresponds to skill level D, *semi-skilled* to skill level C and *skilled* to skill level B.

Source: NSSWT, 1995 cohort, second student questionnaire

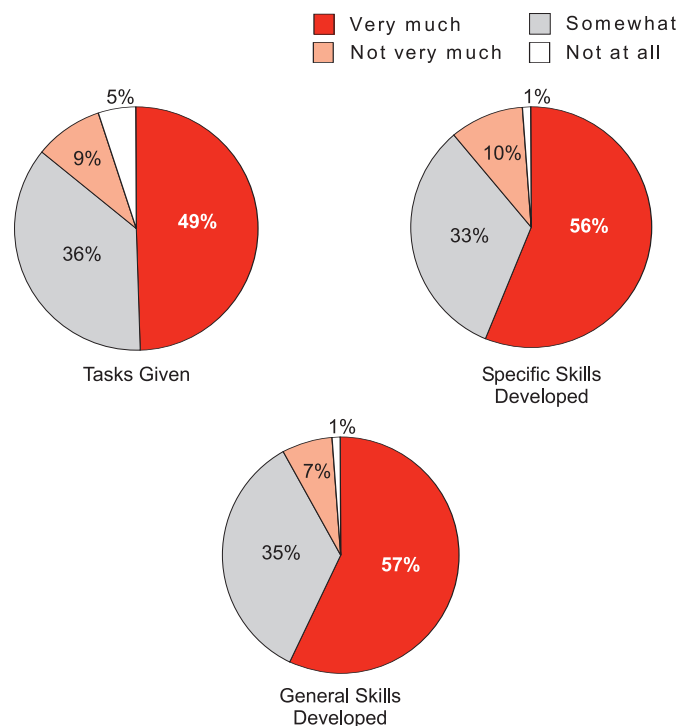
Focussing on jobs that can be classified as skilled, 37 percent of the program placements were in the skilled category, compared to only 7 percent of the jobs obtained by the students not in the NSSWT program. At the other end, less than one in five of the work placements that were part of the NSSWT program were of the unskilled kind. In contrast, more than two in five of the other jobs were of the unskilled kind. Clearly, the project has succeeded in placing most students in the kinds of jobs that augur well for providing learning opportunities, i.e. jobs that permit the development of work skills and jobs with at least a moderate level of skills.

Many participants were placed in skilled jobs and on the whole the students reacted positively to their work placements, as shown in the figure "Extent to Which Participants Liked Aspects of Their Work Experience." Approximately half the participants "very much" liked the tasks they were given, the specific task-related skills they developed, and the more general skills they developed. At the other extreme, only five percent of participants did "not at all" like the tasks they were given, and only one

percent felt that way about the specific and general skills they developed. These results suggest that the conditions necessary for learning from work experience are reasonably well fulfilled in this kind of transition program.

The final results from this project, expected in the fall of 1999, will provide policy makers with a more complete view, enabling them to decide whether general implementation of similar programs is warranted.

Extent to Which Participants Liked Aspects of Their Work Experience



Note: The question asked was: "How much did you like the following elements of the School-to-Work Transition program?"

Source: NSSWT, combined 1995 and 1996 cohort, first student questionnaire

The Nova Scotia School-to-Work Transition Project

The Nova Scotia School-to-Work Transition (NSSWT) project is a research project set up by the Nova Scotia Department of Education and Culture, with the financial assistance and research guidance of Human Resources Development Canada. Over 500 Grade 11 students from six regions of the province are participating. Half of the students in the project are in the NSSWT program, i.e. they receive in-class training and supervised work experiences over a two-year period. Because of the experimental design of the NSSWT project, the other half of the students are not in the program and act solely as a comparison group. Independent information is obtained from students and their parents, educators, site co-ordinators, guidance counsellors and employers. A multi-method research design, which includes questionnaires, interviews, focus groups, official school records and skills tests, provides rich information about the conditions for successful school-to-work transition programs.

developed to assess the performance of 13- and 16-year-old students across Canada in reading and writing, science and mathematics. Mathematics assessments were administered in both 1993 and 1997.

- ▶ **Third International Mathematics and Science Population 3 Study (TIMSS)**—Conducted under the auspices of the International Association for the Evaluation of Educational Achievement in 1995, TIMSS compares the teaching and learning of mathematics and science at the elementary and secondary school levels with that of up to twenty-five other countries. The achievement of Canadian students in their last year of secondary school was compared to the achievement of students from countries such as France, Germany and the United States. The Faculty of Education at the University of British Columbia is managing the implementation and reporting for TIMSS in Canada.

Overview of the SAIP Results for 1997 in Mathematics

Students' mathematics performance in the School Achievement Indicators Program was measured based on five levels of achievement, from level 1 at the lowest end to level 5 at the highest. These five levels represent the continuum of mathematical knowledge and skills acquired by students over their entire elementary and secondary school experience. Educators and experts regard level 2 as the expected achievement for 13-year-olds and level 3, for 16-year-olds.

- ▶ **Mathematics content**—The mathematics content component of the assessment focussed on achievement in areas including numbers and operations, algebra, geometry and statistics. Almost 60 percent of the 13-year-olds demonstrated achievement at level 2 or above in 1997, and roughly the same number of 16-year-olds achieved at level 3 or above.
- ▶ **Problem solving**—The problem solving component assessed the students' abilities to solve problems including formulating them, producing and verifying solutions, and applying a variety of strategies to solve

How do Canadian Students Measure Up in Mathematics and Science?

Parents, taxpayers, members of the business community and others have many questions concerning our children's schooling: "How are our children doing? Is the school system preparing them to participate in the global economy? How well are they performing compared to other children in Canada and in other countries?"

Human Resources Development Canada has supported two recent assessments aimed at answering those questions for mathematics and science performance:

- ▶ **School Achievement Indicators Program (SAIP)**—This Council of Ministers of Education, Canada, program was

them. Approximately 52 percent of 13-year-olds achieved at level 2 or above, and 40 percent of 16-year-olds achieved at level 3 or above.

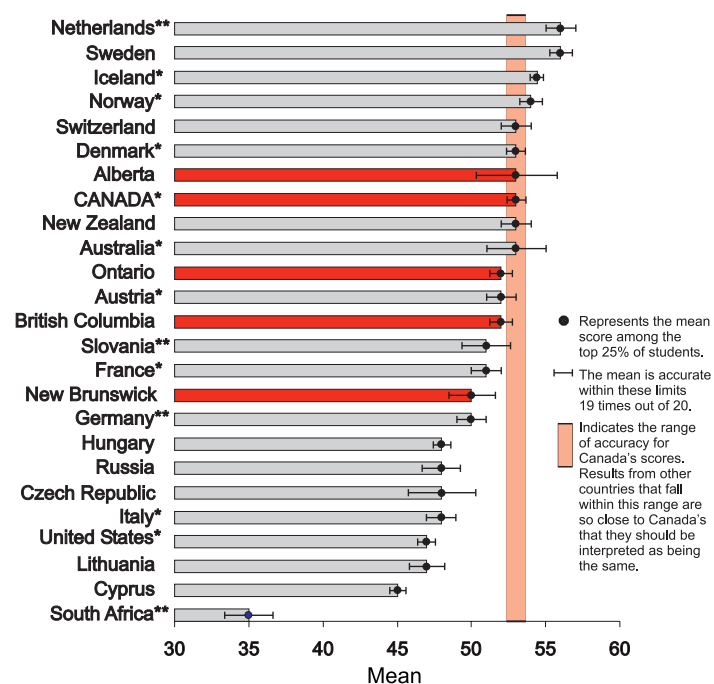
- ▶ **Boys performed better**—Except for 13-year-olds in the mathematics content component, males performed significantly better than females in this assessment. This finding is similar to that of several other mathematics achievement surveys done in Canada and elsewhere.
- ▶ **Stable achievement at higher levels in mathematics content over the years**—The achievement of Canadian students at higher levels in mathematics remained stable between 1993 and 1997. For both age groups, no significant difference in achievement can be observed at level 3 and above.
- ▶ **Mixed results in problem-solving questions**—Four mathematical problems were common to both the 1993 and 1997 assessments. For 13-year-olds, achievement on those four problems was significantly lower in 1997 than 1993. For 16-year-olds, while higher proportions of students performed at higher levels in 1997 in comparison to 1993, higher proportions also performed at lower levels.
- ▶ **Quebec students perform best**—The achievement of 13- and 16-year-old students in Quebec—particularly francophone students—was the highest among all provinces. The runner-up among provinces was Alberta. In general, performance of francophone students from all parts of Canada and English-speaking students from Alberta was significantly better than the national average. Lagging behind the national average were students in Ontario, British Columbia, Prince Edward Island, Newfoundland, and Northwest Territories, and anglophone students in Manitoba and New Brunswick.
- ▶ **Students in full-year courses perform best**—The vast majority of 13-year-olds take full-year courses; a smaller majority of 16-year-olds take semestered courses. In both age groups, students who take full-year courses performed significantly better than those who take semestered courses.

Third International Mathematics and Science Population 3 Study (1995)

For the TIMSS study, the managers selected a nationally representative sample of Canadian students, including public, separate and private school pupils—both French- and English-speakers. Four provinces—British Columbia, Alberta, Ontario, and New Brunswick—elected to “oversample,” selecting samples large enough to permit comparisons to be made at the provincial level.

- ▶ **Canada scores high in mathematics and science literacy**—The mathematics and science literacy component of TIMSS measures the mathematical and science understanding of students; it is not curriculum-based. Canadian students did as well as or better than students from 17 of the other 21 countries participating in the mathematics and science literacy testing.

Achievement in Mathematics and Science Literacy



Notes: * Country did not meet guidelines for sample participation rates.
 ** Country used unapproved sampling plan or failed to meet other sampling guidelines.

Source: Robitaille, D., A. Taylor, G. Orpwood and J.S. Donn. *TIMSS-Canada Report, Volume 4: Senior Secondary*. 1998

- ▶ **Canada performs strongly in advanced mathematics**—Canadian students taking courses in advanced mathematics did as well as or better than students from 13 of 16 other countries that participated in this portion of the study. Students from France, Russia and Switzerland out-performed those from Canada.
- ▶ **Good results in physics**—The scores earned by Canadian physics students were as good as or better than scores for 9 of the 16 countries taking part in this component of the study. Students from the following countries out-performed those from Canada: Norway, Sweden, Denmark, Russia, Germany and Australia.
- ▶ **Differences among the provinces**—There were differences among the oversampling provinces. Scores for students in New Brunswick were lower than the Canadian average for mathematics and science literacy, while scores for students in British Columbia were lower than the national average for advanced mathematics and higher on the physics test. (New Brunswick did not participate in physics.)
- ▶ **Quebec's results above the national average**—Although Quebec did not participate on a provincial level, the significant number of Quebec students involved in this testing allowed for comparison with the national average and the four provinces participating in oversampling. Quebec's results were clearly above the national average and the averages for the four participating provinces, as they were in the SAIP testing.
- ▶ **Gender differences in achievement**—Males generally had better scores than females in all countries and for all three achievement tests. These results contrast with those found in TIMSS assessments of Grades 4 and 8 students, but they corroborate findings from SAIP.

The results indicate that the achievement of Canadian students in mathematics and science compares favourably to that of other countries.

Future Initiatives

Over the coming years, reporting on TIMSS and SAIP will focus not only on how Canadian schools are doing, but also on the factors which help explain students' diverging performance levels. Human Resources Development Canada (HRDC) will continue to be involved with the Council of Ministers of Education, Canada, as plans are laid for a continuation of the second cycle of SAIP testing. A science assessment is planned for 1999. HRDC will also support the Faculty of Education, University of British Columbia, in the 1999 repeat of TIMSS for Grade 8 students. In addition to the national sample, several provinces will participate to ensure provincially representative samples. As we ready our children for the challenges of the real world, explorations are underway to establish how to better capitalize on the research results of these two key initiatives.

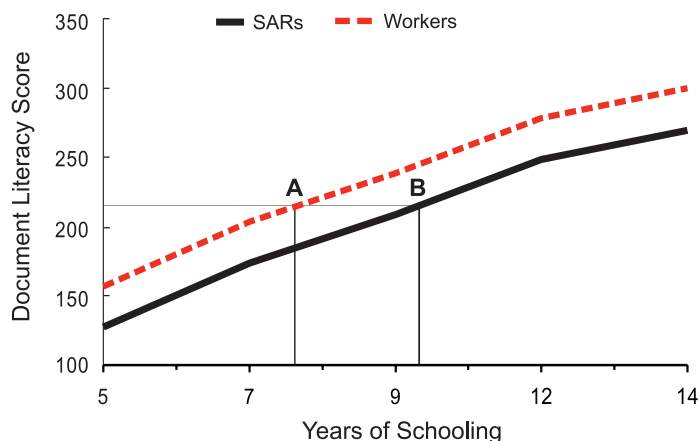
Why Do Welfare Recipients Have Low Literacy Levels Relative to Their Education?

Canadian results from the 1994 International Adult Literacy Survey (IALS) have shown that full-time annual earnings are strongly correlated with the level of literacy—even more strongly than with the level of education. The main reason is that literacy reflects not only the level of education, but also the quality of education and the extent to which literacy skills are maintained and strengthened through regular use. A recent paper by Constantine Kapsalis based on the IALS explores relationships for Canadian social assistance recipients (SARs) among work, literacy, education and non-work activities. The study notes that social assistance recipients who do not work have about a 25 percent lower level of literacy than earners who do not receive social assistance.

The lower literacy level of SARs is in part explained by their lower education level, since education and literacy are highly correlated. However, Kapsalis found that, even at the same level of education as for earners, the literacy of the SARs was about 15 percent lower.

Predicted Document Literacy

By Years of Schooling



Notes: "Document Literacy" is the skill required to locate and use information contained in various formats including job applications, maps and tables. Point A is the number of years of schooling where the literacy score of workers equals the literacy score of social assistance recipients (SARs) at their average number of years of schooling. Point B is the average number of years of schooling of non-working social assistance recipients.

Source: Kapsalis, Constantine. *The Connection Between Literacy and Work: Implications for Social Assistance Recipients*, 1998

SARs are thus at a double disadvantage in trying to obtain employment in the paid labour force. Not only do they have fewer years of formal education, but for any given level of education, they are less literate than earners.

The report suggests two possible explanations for the disparity in literacy levels. First, SARs' quality of education may have been lower than that of earners. Inferior quality of education while in school would account for both difficulties in finding paid work and low literacy levels relative to years of formal education. However, the appropriate data are not available to test this hypothesis.

A second possible explanation is that the absence of work itself has a negative effect on literacy. The study does confirm a correlation between work and literacy, especially among SARs. However, the direction of causality is difficult to determine. One could argue that work increases literacy; on the other hand, one could also argue that higher literacy increases chances of being employed.

What effect does working have on after-work literacy activity? When social assistance recipients work, is the potential positive effect on literacy offset by a reduction in literacy-enhancing activities outside the workplace? The

study found that this was not the case: "Working SARs... (are) more likely to regularly use a public library, do voluntary work, or read a book than non-working SARs." Even after Kapsalis adjusted for differences in education levels, there was "little difference in literacy activities at home between working and non-working SARs."

The policy implications of the paper are clear. If exposure to paid work helps maintain or improve literacy skills and does not reduce literacy-enhancing activities outside the workplace, then significant gains in improving the employability of SARs may be achieved by exposing them to paid work—even work which does not directly involve literacy activities such as reading or writing reports or manuals on a regular basis. However, at this point in the research, the link between literacy and paid work for SARs cannot be assumed to be a cause and effect relationship. Further corroboration is needed.

Making Work Pay for Welfare Recipients

Results of the first 18 months of a Human Resources Development Canada experiment in British Columbia and New Brunswick suggest temporary earnings supplements may be an effective tool to help lone parent social assistance recipients enter the workforce more quickly.

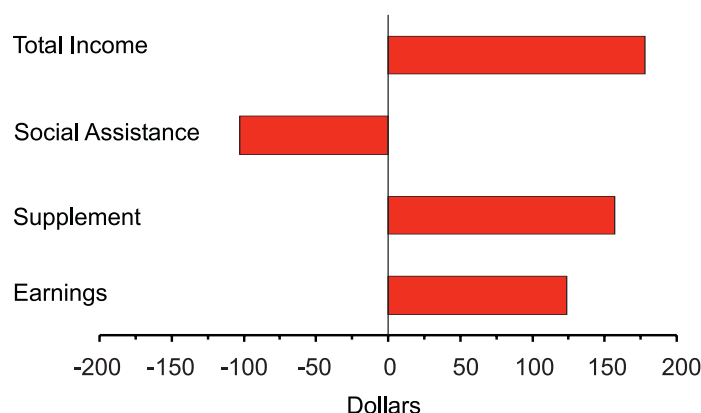
The experiment, called the Self-Sufficiency Project (SSP), divided participants into a *program* group entitled to receive an earnings supplement if they could find a job and a *control* group for the purpose of comparison. (See box.) Control-group participants continued to receive welfare benefits as usual.

Eighteen months after this random assignment, SSP doubled the proportion of lone-parent social assistance recipients who worked full time. Fifteen months after being offered the supplement, 29 percent of program group members were working full time (30 hours per week or more), compared with 14 percent of the control group. This effect was achieved primarily by inducing people to work full time who otherwise would not have worked at all.

SSP raised the average income of the entire program group (both those working and those not working) by \$178 per month. On the other hand, the net cost per person for the program group from a government-budget perspective was \$54 per month. The difference between the increased incomes to the program group and the cost to the government is the additional \$124 per month of earnings. Therefore the “leaky bucket” problem—where a dollar transfer by the government results in less than a dollar increase in the transfer recipients’ income—is solved by SSP. In fact, on average each dollar increase in net transfer payments bought more than two dollars in increased earnings and led to more than three dollars in additional income. Many earlier financial incentive programs yielded less than a dollar increase in income for every dollar of net program spending because earnings declined as transfer payments increased.

Change in Monthly Income

For Program Participants in the Self-Sufficiency Project, at 18 Months



Employment impacts were examined for sub-groups defined by the program environment, family structure, family background, job readiness and barriers to employment. While SSP had larger effects on those sub-groups who were more identifiably job-ready and those who faced fewer employment barriers, it had significantly positive employment effects for all sub-groups. Impacts on SSP participants’ full-time employment levels in British Columbia and New Brunswick were very similar, despite differences in local labour market conditions and in the project’s income assistance levels. The similarity of the impacts in the two provinces means the findings are likely to be applicable to other parts of Canada.

Additional information collected by the experiment suggests how important this initiative is for the lives of those affected. Participants spent a sizeable portion of SSP-generated income gains on basic needs although different groups of families allocated the resources differently. On average, 20 percent of the program group’s additional gross income was spent on taxes; 19 percent was spent on food, children’s clothing, and housing; and the balance provided discretionary income to improve overall quality of life. Moreover, families in New Brunswick with more than one child (the most disadvantaged group) spent 23 percent of SSP-generated gross income gains on food alone. This rise in food expenditure was accompanied by a 10 percentage point drop in the number of program group participants who used food banks and a 5 percentage point drop in those who reported not being able to afford needed groceries or food.

SSP also increased program group members’ likelihood of holding savings accounts and registered retirement savings plans. By setting money aside for the future, program group participants can increase their potential to achieve self-sufficiency over the longer term once the supplement period has ended.

On the other hand, SSP is clearly not a panacea for long term welfare dependency. Although 29 percent of the program group were working full time, about 70 percent were not. The most commonly cited reasons for not taking advantage of the supplement were:

- ▶ inability to find a job or to get enough hours of work (cited by 42 percent of non-takers);
- ▶ personal or family responsibilities (15 percent); and
- ▶ health problems or disabilities (14 percent).

Another caveat is that this was an early point at which to assess the program since none of the participants had yet exhausted eligibility for the supplement at the time of the 18 month study. Long-term benefits and costs will be better known in the millennium year when the project is completed.

Description of the Self-Sufficiency Project

The Self-Sufficiency Project is an experiment to test the use of temporary earnings supplements to help single parents leave welfare and become self-sufficient through employment. The project is currently operating at test sites in New Brunswick (first participants started in November 1992) and in British Columbia (first participants in February 1993) and will run until the year 2000.

Over a two-year period, 6,028 participants were selected from low-income single parents who had received social assistance for at least one year prior to being enrolled in the program (about one-third from N.B. and two-thirds from B.C.). This sample was then divided into a program group, which were offered supplements, and a control group for comparison purposes. Those in the program group are eligible for an earnings supplement for up to 3 years if, within twelve months of being selected for the program, they find full-time work of 30 hours or more per week and remain off social assistance.

The supplement equals half the difference between the earnings of the lone parent and a reference earnings level (\$30,000 in N.B. and \$37,000 in B.C.). For example, a lone mother in New Brunswick who worked 35 hours a week at \$6.00 an hour would have annual earnings of \$10,920 and would receive an earnings supplement of \$9,540 for a total income of \$20,460. Even though both the supplement and the earnings are taxable, this would be a much higher net income than the participants' welfare entitlement. Moreover, the marginal tax-back rate of 50 percent ensures that there is an incentive for the participant to seek earnings gains during the period of eligibility for the supplement.

SSP is sponsored and directed by the Applied Research Branch of Human Resources Development Canada and is conducted by the Social Research and Demonstration Corporation, a non-profit research organization, in collaboration with Statistics Canada and the governments of British Columbia and New Brunswick.

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Recent Publications of the Applied Research Branch/Publications récentes de la Direction générale de la recherche appliquée

Working Paper Series / Série des document de travail

- W-97-1F Concentration de la pauvreté et de la détresse sociale dans les quartiers urbains du Canada (translation/traduction)
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- W-98-1E The Connection Between Literacy and Work: Implications for Social Assistance Recipients
- W-98-1F Le lien entre l'alphabétisme, le travail et les bénéficiaires d'aide sociale (translation/traduction)
Constantine Kapsalis January/Janvier 1998
- W-98-2E Employer-sponsored Health and Dental Plans –Who is Insured?
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