Catalogue no. 81-595-MIE — No. 004
ISSN: 1704-8885
ISBN: 0-662-34214-3

Research Paper

Education, skills and learning – Research papers

Learning, Earning and Leaving: The relationship between working while in high school and dropping out

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Education, skills and learning
Research papers

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Published by authority of the Minister responsible for Statistics Canada

May 2003

Catalogue no. 81-595-MIE2003004

Frequency: Irregular

ISSN 1704-8885

ISBN 0-662-34214-3

Ottawa

La version française de cette publication est disponible sur demande (nº 81-595-MIF2003004 au catalogue)

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Acknowledgements

TThe author wishes to thank all those involved in the development and production of the Youth in Transition Survey at Statistics Canada and Human Resources Development Canada.

The assistance of many people was critical to the production of this report and the author gratefully acknowledges their contributions. In particular, Ruth Martin and the analytical team in Special Surveys Division, Lynn Barr-Telford and the team in the Analysis and Dissemination Section in the Centre for Education Statistics, Michelle Simard, Yves Lafortune and Owen Phillips in Social Survey Methods Division, and Urvashi Dhawan-Biswal at Human Resources Development Canada. A special thank you is extended to Danielle Baum for her indispensable help in preparing the manuscript for publication.

Note of appreciation

Canada owes the success of its statistical system to a long-standing co-operative effort involving Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued co-operation and good will.

Table of Contents

Summary

This study uses data from the Youth in Transition Survey (YITS) to examine the characteristics of high school leavers and high school graduates who worked (or not) during their last year in high school and to investigate the relationship between working while in high school and dropping out.

The study found that the majority of students, both males and females, worked during their last year in high school. Whether a student worked or not varied by a number of characteristics including age, language, cultural background, province, the presence of dependent children, and whether or not their parents worked.

While most students worked, they did not necessarily work the same number of hours. Over half of all students worked anywhere from one to thirty hours per week, less than ten percent worked more than thirty hours per week, and just over a third of students did not work at all. Male students worked longer hours than female students.

When hours of work and dropping out were examined together, it was found that the proportion of leavers varied among hours of work. Further analysis identified a number of other factors – including demographics, family background, and high school experience – that were also associated with dropping out.

When these other factors were controlled, the relationship between hours of work and dropping out remained significant. Specifically, compared to students who worked one to less than twenty hours per week, students who did not work at all were more likely to drop out and students who worked thirty or more hours per week were the most likely to drop out of high school. While there was a clear relationship between the number of hours worked and dropping out, the study did not conclude that this was a simple cause-and-effect relationship. In fact, previous research suggests that dropping out of school is best viewed as a process.

1. Introduction

Early labour market participation by students is often seen as a means to gain valuable exposure to the culture and context of work. This experience may generate long-term benefits such as smoother transitions from school to full-time work, practical skill development, and higher future earnings. Participation may, however, entail some costs. For example, working while still in high school has been linked to a decline in a student's academic performance, disengagement from school, and even dropping out. Using the Youth in Transition Survey data for 18 to 20-year-olds collected in 2000, this study investigates the relationship between working during the last year in high school and leaving school before graduation.

Research over the years has revealed that the profile of students who work can vary. Survey data from the 1980's and the early 1990's in the United States showed that male students were more likely to work than female students (Schoenhals, Tienda & Schneider, 1998; Steinberg, Greenberger, Garduque & McAuliffe, 1982) and to work more hours (Schoenhals, Tienda & Schneider, 1998; Ruhm, 1997). In Australia however, Robinson (1996) found that by the early 1990's, gender differences in participation in part-time work among older secondary students had disappeared. Robinson also found that students from non-English speaking backgrounds had consistently lower levels of participation in part-time work, and that Australian students who worked were generally from mid-range socio-economic backgrounds.

For the most part, research has shown it is the *number* of hours worked that is related to dropping out. Not only are students who work a moderate number of hours at a reduced risk of dropping out of school (Dagenais, Montmarquette, Parent, Durocher & Raymond, 1999; Sunter, 1993; Gilbert, Barr, Clark, Blue & Sunter, 1993), they may, in fact, be more likely to graduate (Ruhm, 1997) . Students who work more than 15 to 20 hours per week, however, are at a higher risk of dropping out (Sunter, 1993; Gilbert & al, 1993; Barro & Kolstad, 1987; D'Amico, 1984), particularly male students (McNeal, 1997).

Who is considered a high school leaver or graduate in this study?

A *high school leaver* is an 18 to 20-year-old who was not in high school in December 1999 and had not already met the minimum requirements for high school graduation.

A *high school graduate* is an 18 to 20-year-old who had met the minimum requirements for high school graduation by December 1999.

Working while in high school is not the only factor that has been shown to be related to school leaving. Low family or parental socio-economic status has consistently been found to be related to a higher likelihood of dropping out (HRDC, 2000; Chen & Kaufman, 1999; McNeal, 1995; Gilbert et al, 1993; Barro & Kolstad, 1987; Kaufman & Bradbury, 1992). Other factors connected to school leaving include: gender, geographic location, family composition, large number of school changes, grade repetition, having an older sibling who has dropped out, poor attitudes toward school, misbehaviour, and low overall grades.

This report looks at the work activities during the last year in high school of high school graduates and high school leavers and the impact of working on dropping out. In particular, it seeks to answer the following questions: who was working, how many hours did they work, and how were these hours of work related to dropping out of school when other factors were taken into account.

What is YITS?

The Youth in Transition Survey (YITS) is a new Canadian longitudinal survey designed to examine the major transitions in young people's lives, particularly with respect to education, training and work. Survey results provide a deeper understanding of the nature and causes of challenges young people face as they manage these transitions. The survey will help support policy planning and decision making that addresses these problems.

YITS will examine key transitions in the lives of youth, such as the transition from high school to postsecondary education and from schooling to the labour market. The factors that determine high school completion are examined, as well as the effects of school experiences on educational and occupational outcomes, and the contribution of work experience programs, part-time jobs, and volunteer activities. To collect this information, current plans are to survey the same group of young people every two years, over a period of several years. The first survey cycle of YITS took place in early 2000 and the second cycle followed in 2002.

Two different age groups are participating in YITS, the 18 to 20-year-old cohort, and the 15-year-old cohort; the latter also participated in the Programme for International Student Assessment (PISA). Results for the 18 to 20-year old cohort can be found in *At a Crossroads: First results for the 18 to 20-year-old cohort of the Youth in Transition Survey* (81-591-XIE, free) available through the Internet at www.statcan.ca. An overview of the YITS survey design can be found in Appendix A in this paper.

2. A portrait of high school workers

Who is considered a worker or non-worker in this study?

A *worker* is an 18 to 20-year-old who worked at a job for pay during their last year in high school.

A *non-worker* is an 18 to 20-year-old who did not work at a job at all during their last in high school.

For more information about how students were grouped into these two categories, see Section 1 in Appendix B.

The majority of students worked during their last year in high school

Working at a job was quite popular among young people in Canada. Almost two-thirds of 18 to 20-year-olds worked at a job during their last year in high school (see Table C1 in Appendix C). And contrary to some findings in the United States, the same proportion of male and female students worked.

The work status of students varied by age, language, cultural background and the presence of dependent children

Compared to younger students, a higher proportion of older students worked. While 69% of students who were 18 and older during their last year in high school worked, less than half of the students who were 16 and under had jobs. A higher proportion of students whose first language was English (71%) worked as compared to those students who had first learned French or another language (52%). Smaller proportions of visible minority[1] and aboriginal students worked. The same proportion of students who were living with a partner[2] worked as those students who were single. However, a much smaller proportion of students who had a child during high school worked compared to students who were child-free.

Living with a parent and having parents who worked was related to a students' labour market activity. More students who lived with both parents (65%), a single parent (58%), or in a split custody arrangement (62%) had jobs in their last year in high school compared to students who did not live with parents (36%). A higher proportion of students had a job if their parents worked, regardless of the type of job held by either parent, when compared to students whose parents had never worked. And, roughly the same proportion of students worked, regardless of whether their parents were high school graduates or not.

More students worked in provinces with lower unemployment rates

Job-holding also varied by province. A higher proportion of students worked in Ontario, Manitoba, Saskatchewan and Alberta. The same proportion of students in British Columbia worked as those who lived in either Nova Scotia or New Brunswick. And the lowest proportion of student workers was in Newfoundland.

Data from Canada's monthly Labour Force Survey[3] (LFS) were used to examine the effects of labour market conditions on students' work activity[4]. When the provincial unemployment rates produced by the LFS for 15 to 24 year-olds

were compared to the proportion of students who worked in each province (as reported in the YITS), a relationship between the two was clear. A higher proportion of both male and female students worked in the provinces with lower unemployment rates (Figures 1 and 2). Ontario, Manitoba, Saskatchewan and Alberta had the lowest unemployment rates and were also the provinces where more students worked. A smaller proportion of students in Newfoundland and Quebec worked and these provinces had the highest unemployment rates. It is interesting to note that although the overall unemployment rate at the Canada level was slightly higher for young men, the same proportion of male and female students worked.

Figure 1

Proportion of male students who were working (YITS) and provincial unemployment rates (LFS)

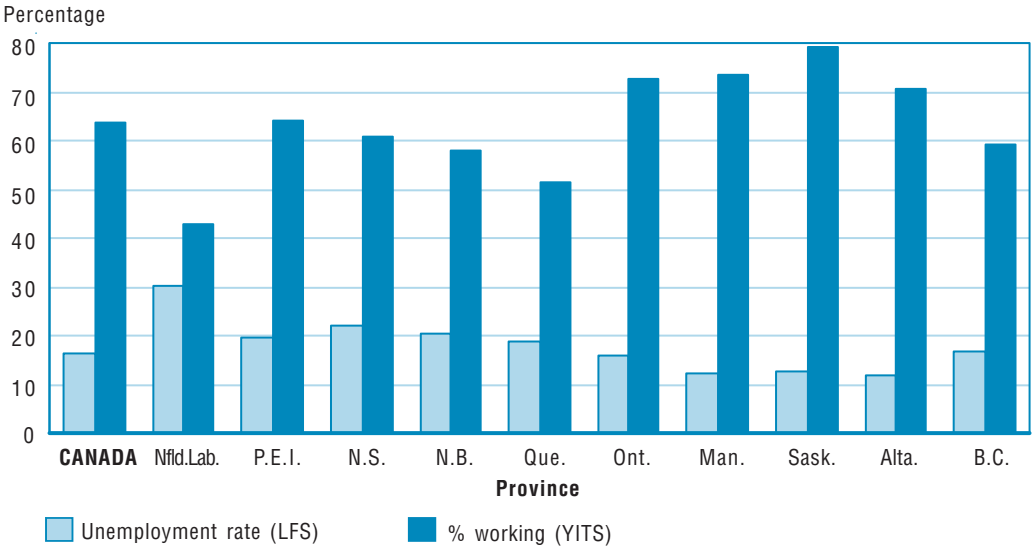
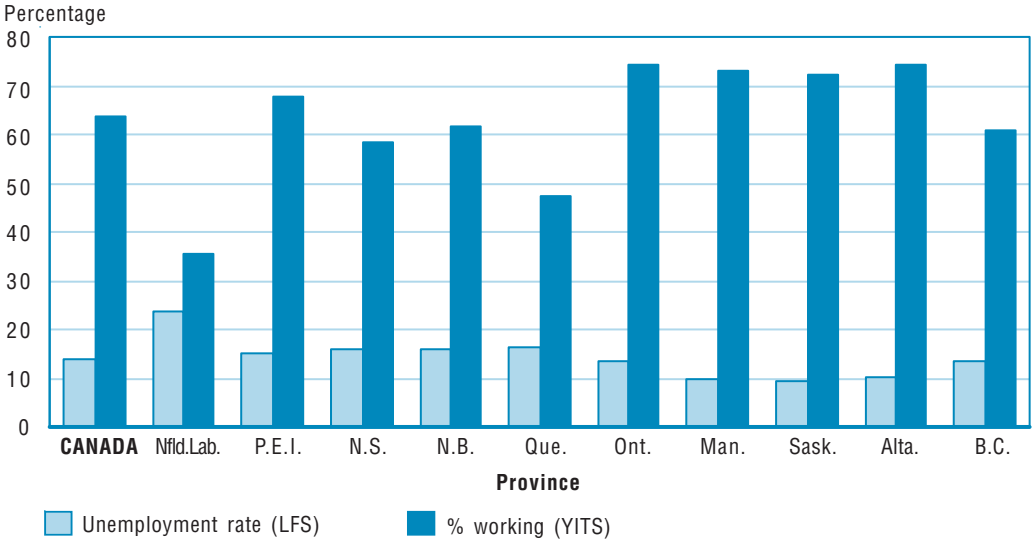


Figure 2

Proportion of female students who were working (YITS) and provincial unemployment rates (LFS)



3. Dropping out was related to the number of hours worked

What are moderate, moderate-to-heavy, and heavy workers?

During the last year in high school…

…*moderate* workers worked 1 to less than 20 hours per week.

…*moderate-to-heavy* workers worked 20 to less than 30 hours per week.

…*heavy* workers worked 30 or more hours per week.

Prior research findings reveal that the relationship between working and dropping out is related to the number of hours worked; that is, those students who work a moderate number of hours per week are less likely to drop out while those who work many hours, or none at all, are more likely to do so.

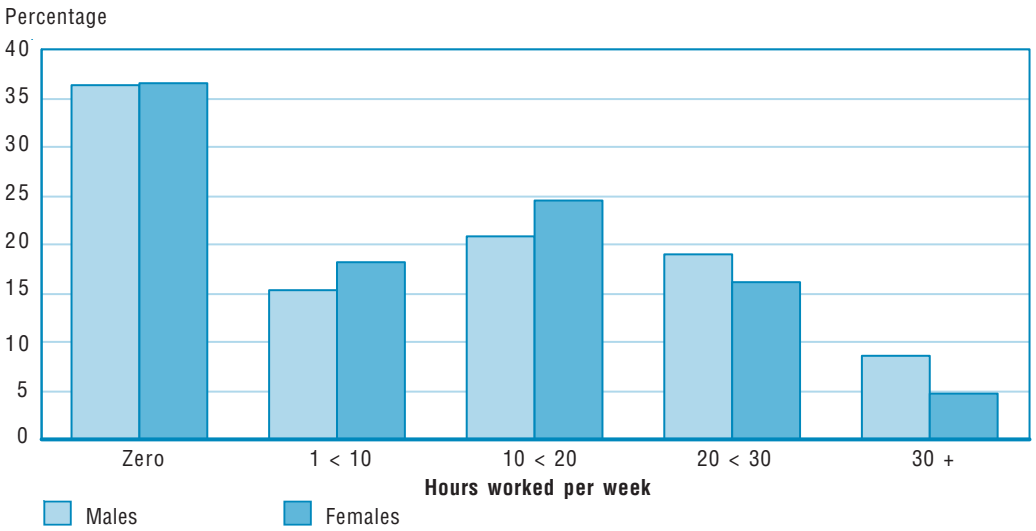
Although the majority of students worked 1 to 30 hours per week, male students worked more hours than female students

Of the students included in this study, most were either moderate or moderate-to-heavy workers. Over half of all students worked anywhere from one to thirty hours per week. Slightly more than a third of students did not work at all, and less than 10% of students were heavy workers.

Young men tended to work more hours than young women. About 28% of male students worked more than 20 hours per week as compared to 21% of female students (Figure 3). Provincially, longer hours were worked in Ontario, Manitoba, Saskatchewan and Alberta (see Table C2 in Appendix C).

Figure 3

Hours worked per week by sex



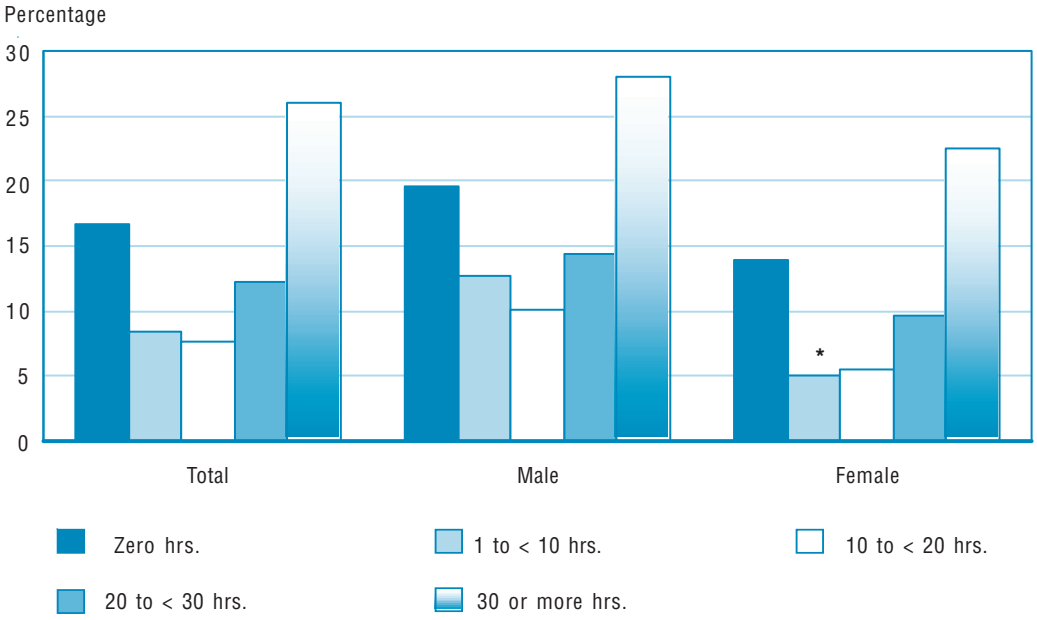
Catalogue no. 81-595-MIE2003004

Consistent with previous research, the YITS data show that the number of hours worked was related to dropping out. Figure 4 presents how the proportion of leavers[5] varied among hours of work. It is clear that the highest proportion of leavers, both male and female, were those students who worked more than 30 hours per week (28% and 23%, respectively), followed by those students who did not work at all. The lowest proportion of leavers were those who worked 1 to less than 20 hours per week[6].

The highest proportion of leavers were students who worked 30 hours or more per week, followed by those students who did not work at all

Figure 4

Proportion of leavers by weekly hours of work, total and by sex



* Indicates a coefficient of variation (CV) between 16.6% and 25%. The CV is a measure of sampling error

4. Dropping out was also related to other factors

Although the highest proportion of leavers were students at the two extremes of work activity (none or many hours), previous research points to other factors that are related to dropping out of high school. When the characteristics of the high school leavers and graduates were compared, significant differences were found that were consistent with previous research findings (see Table C3 in Appendix C for the profile of high school leavers and graduates included in this study, and section II of Appendix B for concepts and definitions).

High school leavers did not share the same demographic profile with high school graduates

A higher proportion of male students than female students dropped out of school (16% versus 10%). Compared to graduates, a higher proportion of school leavers were of Aboriginal origin, had first learned French, had a child or was living with a partner during the last year in high school. School leavers tended to come from larger families where they had four or more siblings whereas more graduates had only one sibling. Fewer school leavers were from a visible minority group.

From a provincial standpoint, the highest proportions of leavers were in Quebec, Manitoba and Alberta and lowest in New Brunswick and Saskatchewan. These proportions, however, do not take into account "second chance educational opportunities"[7].

Parents' education and occupation levels and their opinions about education were related to dropping out

Research shows that family socio-economic status is almost always related in some way to dropping out and the YITS data confirm this. A significantly higher proportion of leavers than graduates had a mother or father who had not graduated from high school, or had a mother or father who worked in an occupation associated with lower educational requirements. A higher proportion of leavers reported that their parents and friends felt that graduating from high school or pursuing further education was not very important.

Grades of school leavers tended to be lower than those of graduates, and a higher proportion of leavers had repeated a grade in elementary school

Although the majority of school leavers were not failing in their last year of high school, compared to graduates a much higher proportion of leavers reported an average of less than 60%. One-third of school leavers self-reported having repeated a grade in elementary school whereas only 6% of graduates reported having done so. And, although few graduates (10%) had attended a private school, even fewer leavers (4%) had done so.

Leavers were less academically and socially engaged in their last year of high school compared to graduates

Academic engagement refers to a student's identification with and behavioural involvement in the academic aspects of school including their dealings with teachers, curriculum and school governance.[8] In their last year of high school, school leavers reported being much less academically engaged than graduates. Leavers were also less socially engaged in school; that is, they identified less and were less involved in the social aspects of school life. Social aspects of school life include informal, out-of-classroom interests and activities associated with school such as students' relationships with peers and their extracurricular activities.[9]

Although most students were not using substances regularly, leavers did drink and use marijuana more frequently than graduates

Most students said they rarely drank or used marijuana during their last year in high school, but this behaviour was more prevalent among the school leavers. Twice as many leavers as graduates had an alcoholic drink more than once a week and almost four times as many leavers used marijuana or hash more than once a week.

Extracurricular activities did not attract many leavers

Neither school-related clubs nor clubs or teams outside of school attracted many school leavers. Two-thirds of school leavers did not participate in any activities organised by the school, and more than one-half did not participate in non-school clubs or teams. In contrast, one-third of graduates did not participate in either non-school or school-related activities.

5. After controlling for other factors, hours of work continued to be significantly related to dropping out

Dropping out is a process

Dropping out of high school is more of a process than a decision made at a particular moment in time (Gilbert et al, 1993). And this process is made all the more complex because school leavers are not a single, homogeneous group. Despite a common outcome, not only do leavers differ among themselves with respect to their characteristics, attitudes, and motivations, they also differ with respect to how and why they eventually drop out of school.

This analysis focuses not on the process of dropping out, but on one specific relationship; that is, the relationship between working while in high school and dropping out. Exploring the process of dropping out would involve examining relationships such as: the direct relationship between each factor and dropping out, the interactions between factors, and how these interactions indirectly relate to dropping out.

The number of hours worked during the last year in high school was clearly related to dropping out but so were several other factors. To determine the independent relationship between hours worked and dropping out, a logistic regression model was used. This model establishes the effect of the number of hours worked on dropping out while taking into account other factors. However, the model does not attempt to evaluate the *process* of dropping out (see box at top of page).

Table C4 in Appendix C lists the variables (these are defined in section II in Appendix B) that were considered for the model that generated the results presented below. Detailed information about the methodology used for the model can be found in Appendix D.

What does the "odds of dropping out" mean?

The "odds of dropping out" refers to the interpretation of the odds ratios that are presented in Table C5.

Odds ratios allow the user to interpret the *independent* effect of a variable on the outcome in a regression model. An odds ratio is generated for each category within a variable, with one category selected as the "reference category" so that each odds ratio within the variable is interpreted relative to the reference category.

More information about the interpretation of the odds ratios in this analysis is presented in Appendix D.

The first-stage model controlled for gender only. When compared to moderate workers, non-workers and heavy workers were significantly more likely to drop out (see Table C5 in Appendix C). In fact, the odds of dropping out for non-workers were twice as high, and the odds of dropping out for heavy workers were almost four times as high as those for moderate workers. Moderate-to-heavy workers were only slightly more likely to drop out than moderate workers.

With gender taken into account, students who did not work at all and students who worked 30 hours or more per week had significantly increased odds of dropping out

The second-stage model controlled for demographics, and the relationship between hours of work and dropping out remained strong (see Model A, Table C5). The likelihood of dropping out for non-workers and heavy workers, however, was slightly reduced once these factors were taken into account.

The odds of dropping out given differing hours of work continued to be reduced as the socio-demographic, parental and peer influence, school-related and engagement variables were taken into account in the model.

Taking into account other factors related to dropping out, compared to students who worked moderate hours the odds of dropping out were 1.5 times higher for non-workers and 2.4 times higher for heavy workers

In the final-stage model, once all factors were taken into account (see Model G, Table C5), the odds of dropping out for non-workers were 1.5 times higher, and the odds of dropping out for heavy workers were 2.4 times higher than those of moderate workers (whereas it was 2 times and 4 times, respectively, in the first stage model). Thus, the independent relationship between hours of work and dropping out remained significant even after taking into account a number of other factors.

6. Conclusion

Consistent with prior research, this analysis confirms that there is a significant relationship between the number of hours worked during the last year in high school and dropping out. Having controlled for a number of characteristics including demographics, socio-demographics, parental and peer influences, school-related and engagement in school, substance use and other extracurricular activities, students who did not work at all or those who worked more than 30 hours per week were at a higher risk of dropping out than those students who worked moderate hours.

Students who worked 30 hours or more were at the highest risk of dropping out. There are many possible explanations for this. Some students may have been far enough along in the dropping out process to prefer working to schooling. Some students may have needed money and decided that the opportunity cost of staying in school was too high. These ideas are supported by the fact that 44% of heavy workers reported that they had dropped out because of "wanting to work" or "having to work/money problems." Although there is not a simple cause-and-effect relationship, knowing that working many hours *is* related to dropping out could help to identify those students who are at a higher risk of leaving school without graduating.

Though the analysis controlled for a number of factors in order to isolate the relationship between the number of hours worked and dropping out, it did not examine how these factors and others interact with one another nor did it identify the relative contribution of each to the decision to drop out. This type of analysis would be a fruitful direction for future research.

Perhaps it is a "balance" in life that is one of the reasons moderate workers had the lowest risk of dropping out. These students had the advantages of a paying job – some money, autonomy, and skill development – with the advantage of a high school diploma.

In summary, the present analysis suggests that working and finishing high school can mix, if working is done in moderation. Having students who work a moderate number of hours could result in a generation of young people equipped and ready for the many challenges facing them as they continue their life transitions.

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Endnotes

1 The concept of visible minority applies to persons who are identified according to the Employment Equity Act as being non-Caucasian in race or non-white in colour. Under the Act, Aboriginal persons are not considered to be members of visible minority groups.

2 Living with a partner can mean married, living common-law, or living with a girlfriend or boyfriend.

3 For more information about the Labour Force Survey, see the Guide to the Labour Force Survey, available free through the Internet at www.statcan.ca.

4 A 48 month average of the monthly unemployment rate for 15 to 24-year-olds for the period 1996 to 1999 was calculated for each province using Labour Force Survey data. This four year period was used because most respondents included in this study were last in high school sometime during these four years.

5 The proportion of leavers was calculated by dividing the total number of leavers by the sum of the total number of leavers and the total number of graduates.

6 Although the proportion of leavers at 1 to < 10 hours and 10 to < 20 hours look dissimilar, a test of the difference between them using p <= .05 determined that these differences are not statistically significant.

7 At a Crossroads (2002) refers to the "second chance educational opportunity"; that is, the opportunity for high school leavers to either return to secondary school at a future date, or to enroll in courses at the post-secondary level. The Quebec school leavers included in this analysis represented the bulk of leavers who took such a "second chance educational opportunity". Specifically, as of December 1999, 11% of Quebec leavers had attended a community college or CEGEP by December 1999.

8 Definition by L. Barr-Telford and C. Norris, Statistics Canada (1998). Their work is based on the work of J. Finn (1993), K. Voekl (1995), and the Atlantic Centre for Policy Research in Education (University of New Brunswick, Canada, 1997)

9 Definition by L. Barr-Telford and C. Norris, Statistics Canada (1998).

APPENDIX A

The Youth in Transition Survey

Survey Concepts, Methodology and Data Quality

The following information should be used to ensure a clear understanding of the basic concepts that define the data provided in this report, of the underlying methodology of the Youth in Transition (YITS) survey, and of key aspects of the data quality. This information will provide a better understanding of the strengths and limitations of the data, and of how they can be effectively used and analysed. The information may be of particular importance when making comparisons with data from other surveys or sources of information, and in drawing conclusions regarding change over time, differences between geographic areas and differences among sub-groups of the target population.

For more detailed information about the YITS sample design, weighting and variance estimation, see Appendix A in *At a Crossroads: First results for the 18 to 20-year-old Cohort of the Youth in Transition Survey*.

Survey objectives

The Youth in Transition Survey is a new Canadian longitudinal survey designed to examine the major transitions in young people's lives, particularly with respect to education, training and work.

Target population

The target population for the 18 to 20-year-old cohort is all residents of the ten provinces of Canada who were born in the calendar years 1979 to 1981, excluding full-time members of the armed forces, inmates of institutions and residents of Indian reserves and Crown lands.

Sample design

Given the important differences among the educational systems in Canada, the sample was designed to generate estimates at the province level, particularly estimates of proportions of at-risk groups. The initial YITS sample comprised a set of 36 household groups, each in itself a probability-based sample of the population. The households in this series of samples were in the Labour Force Survey (LFS) between January 1997 and December 1999.

From the initial sample of 29, 950 households, 786 were eliminated from the YITS sample – for the majority this was due to their participation in another longitudinal survey. The final stage of sampling for YITS was the selection of one household member in the YITS target population from each of the 29,164 households. In the minority of households that had more than one person in the YITS target population, one was selected with equal-probability systematic sampling. In total, 23,592 persons participated in the survey, for an overall response rate of 80.9%. See Table 1 for the sample and response rate distribution by province.

Table 1

Response rates by province of LFS household

Province	Persons sampled	Respondents	Response rate (%)
Newfoundland and Labrador	1,411	1,238	87.7
Prince Edward Island	780	652	83.6
Nova Scotia	1,826	1,523	83.4
New Brunswick	1,715	1,367	79.7
Quebec	5,881	4,644	79.0
Ontario	8,520	6,720	78.9
Manitoba	1,952	1,649	84.5
Saskatchewan	2,105	1,772	84.2
Alberta	2,380	1,942	81.6
British Columbia	2,594	2,085	80.4
All provinces	**29,164**	**23,592**	**80.9**

Weighting and variance estimation

Each respondent included in the YITS data file has been assigned a specific weight. The weight assigned to each respondent estimates the number of other young people in the population that respondent represents. For variance estimation, 1000 bootstrap weights have also been added to the file. Due to the complexity of the YITS sample design, it is important that these bootstrap weights be used for variance estimation of calculated estimates.

Collection

The Youth in Transition Survey respondents completed a 40 minute computer-assisted telephone interview. Questions were asked about secondary and post secondary school experiences, labour market activities, and a number of other related matters such as skills, training, volunteering, and educational and occupational aspirations. For more information on the content of the YITS see *Youth in Transition Survey: Project Overview.*

APPENDIX B

Definitions and Concepts

I. How was the labour market activity of high school graduates and leavers defined?

The Youth in Transition Survey (YITS) asked about two types of work during the respondent's last year in high school: paid work; and unpaid work in a family's business or farm. Figure 1 displays the combinations of responses for the school graduates and school leavers considered in this study.

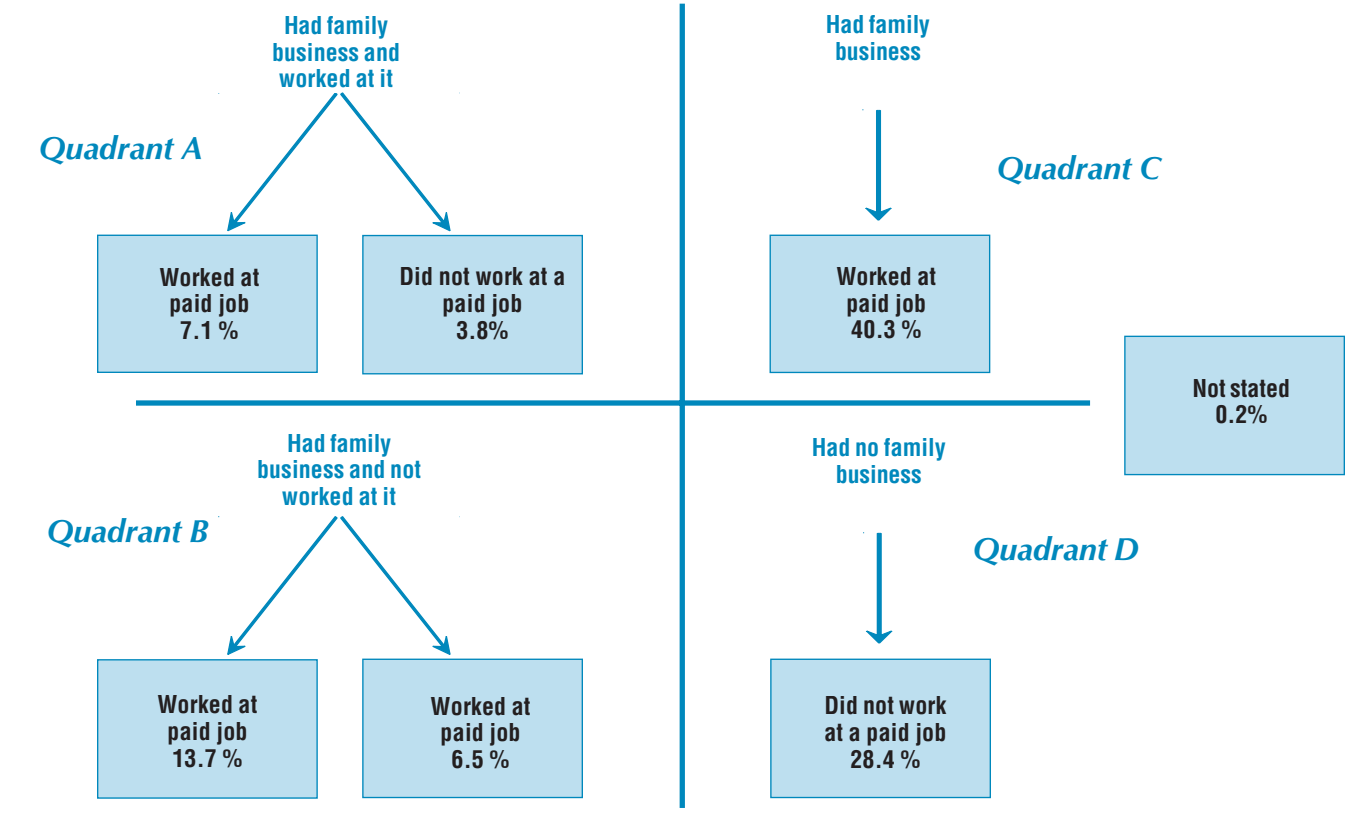
Previous research has indicated that job type may have an impact on the influence that part-time work during high school may have on various academic and social outcomes (McNeal 1997). The YITS data does not include information about the type of job held during most of high school, only whether the work was paid or unpaid in a family business or farm. It was decided that the work experience of a respondent who did unpaid work only *is* different from the work experience of a respondent who did paid work. To keep unpaid workers together with paid workers might conceal job type effects that cannot be controlled for. For this reason the analysis excludes those respondents who did unpaid work only.

What about those students who did paid and unpaid work at the same time? An analysis of this group revealed that they are more similar to paid workers and therefore these respondents are included in the group for whom hours of work is calculated.

Looking at Figure 1, respondents found in Quadrants A1, B1, & C are considered paid workers and have hours of work greater than zero. Respondents with zero hours of work (did not work at all for pay) are those in Quadrants B2 & D. Respondents in Quadrant A2 are unpaid workers only and are excluded. Thus, only 3.8% of the overall sample of graduates and school leavers has been excluded.

Figure 1

School graduates' and leavers' labour market activity during their last year in high school



II. Variables included in the analysis

There are two types of variables included in this analysis: variables that are simply the direct response given to a specific question in the questionnaire; and variables that represent the combination of responses given to more than one question (known as *derived* variables). Both types are defined in the following section. Note that all questions were asked in the context of "last year of high school" except for aboriginal status, number of siblings and visible minority status.

Hours worked during high school: This variable was derived using the respondents' reported weekly hours of work at a job for pay and their unpaid work at the family business or farm (see Figure 1).

Age last year in high school: This variable was derived using the respondent's date of birth and the date the respondent was last in high school.

Language first learned and still understood: Respondents were asked to indicate the language they first learned at home in childhood and still understood.

Visible minority status: This variable was derived using the respondents' answers when asked their cultural or racial background. The concept of visible minority applies to persons who are identified according to the Employment Equity Act as being non-Caucasian in race or non-white in colour. Under the Act, Aboriginal persons are not considered to be members of visible minority groups.

Aboriginal status: Respondents who selected the category "Aboriginal, that is North American Indian, Métis, or Inuit" when asked their cultural or racial background.

Siblings (total): this variable was derived by combining the answers to the questions regarding the number of older, same age and younger siblings of the respondent.

Marital status in high school: This variable was derived using the year the respondent reported getting married[1], living common-law or living with a boyfriend or girlfriend and the date last in high school.

Dependent children in high school: This variable was derived using the years the respondent's dependent children were born and the date last in high school.

Province of high school: Respondents were asked the province of their last high school.

Living arrangement during most of high school: this variable was derived using responses regarding which parents and/or guardians lived in the family home with the respondent during most of high school.

Parents' highest level of education: this variable was derived using each parent's highest level of education combined with their presence in the home with the respondent. A variable was created separately for the mother and the father.

Parents' occupational skill level: this variable was derived using each parent's main occupation during most of the respondent's time in high school combined with their presence in the home with the respondent. The parents' occupation was first coded to the Standard Occupation Classification system (SOC 1991) and then coded to the National Occupational Classification coding system (NOC). The NOC codes were then assigned to the appropriate skill level. Level A includes managerial and professional occupations. Level B includes technical, paraprofessional and skilled occupations. Level C includes intermediate occupations. Level D includes labouring and elemental occupations. A variable was created separately for the mother and the father.

Friends planning on furthering their education: Respondents were asked how many of their friends were planning on furthering their education or training beyond high school.

Importance of high school graduation: Respondents were asked the degree to which their parents or guardians thought graduating from high school was important.

Education after high school: Respondents were asked the degree to which their parents thought getting more education after high school was important.

Talking about future plans: Respondents were asked how often their parents spent discussing the respondent's future education or career options with them.

1 Marital status was asked at time of interview. If the respondent had been married, then divorced, then got married again, the marriage information supplied by the respondent would apply to the second marriage and not the first. If the first marriage took place during high school and the second marriage took place after high school, the derived variable for "marital status in high school" would erroneously categorize the respondent as having married after high school. However, given that the respondents were only 18 to 20 years of age at the time of interview, it is likely that the above situation and others like it would be rare enough to have little impact on the analyses.

Overall grade average: Respondents were asked the range in which their overall grade average (as a percentage) fell in their last year in high school.

Repeated a grade: Respondents were asked if they had ever repeated a grade in elementary school.

Type of school: Respondents were asked whether their last high school was a private school.

Class in career planning: Respondents were asked if they had taken any classes in career planning, how to search for job, write a résumé or prepare for an interview while in high school or junior high.

Academic engagement scale: This variable was derived using the respondents' levels of agreement with the following statements: I got along well with teachers; I did as little work as possible - I just wanted to get by; I paid attention to the teacher; I was interested in what I was learning in class; I completed my homework on time; I thought that many of the things we were learning in class were useless; and, school was often a waste of time. It also included the number of times per month the respondent reported skipping class without permission. IRT (Item Response Theory) was used to calculate a single continuous scale variable using the responses to all of the items. For this analysis, a categorical variable was then derived from this continuous variable. The category "very engaged" includes those responses that fell above plus one standard deviation from the mean; "not very engaged" includes those responses that fell below minus one standard deviation from the mean; and "engaged" includes the responses that fell within plus or minus one standard deviation from the mean.

Social engagement scale: This variable was derived using the respondents' levels of agreement with the following statements: I felt like an outsider at school or like I was left out of things at school; I was treated with as much respect as other students in my class; I had friends at school whom I could talk to about personal things; and, people at school were interested in what I had to say. IRT (Item Response Theory) was used to calculate a single continuous scale variable using the responses to all of the items. For this analysis, a categorical variable was then derived from this continuous variable. The category "very engaged" includes those responses that fell above plus one standard deviation from the mean; "not very engaged" includes those responses that fell below minus one standard deviation from the mean; and "engaged" includes the responses that fell within plus or minus one standard deviation from the mean.

Frequency of alcohol consumption: Respondents were asked how often per month they drank alcoholic beverages.

Frequency of drug use: Respondents were asked how often per month they used marijuana or hash.

Participation in school extracurricular activities: Respondents where asked how many total hours per week they usually spend participating in school clubs, teams or other school organizations.

Participation in non-school extracurricular activities: Respondents where asked how many total hours per week they usually spend participating in non-school clubs, teams, volunteer work or other organizations.

APPENDIX C

Tables

Table C1

Student characteristics by work status

	Workers	Non-workers	Total
	%	%	
All respondents	**64**	**36**	1,018,000
Gender			
Males	**64**	**36**	504,000
Females	**64**	**36**	514,000
Age last in school			
16 and younger	**43**	**57**	89,000
17	**60**	**40**	359,000
18 and older	**69**	**31**	569,000
Language first learned			
English	**71**	**29**	635,000
French	52	48	262,000
Neither English nor French	52	48	117,000
Visible minority status			
Visible minority	48	52	125,000
Not a visible minority	**66**	**34**	889,000
Aboriginal status			
Aboriginal	54	46	27,000
Not aboriginal	**64**	**36**	986,000
Number of siblings			
Zero	53	47	73,000
One	**62**	**38**	413,000
Two	**66**	**34**	305,000
Three	**67**	**33**	128,000
Four or more	**66**	**34**	95,000
Marital status			
Was living with a partner during high school	**64**	**36**	23,000
Single	**64**	**36**	946,000
Children			
Had a child during high school	**35**	**65**	14,000
No child	**64**	**36**	981,000
Province of high school			
Newfoundland and Labrador	**39**	**61**	24,000
Prince Edward Island	**66**	**34**	5,000
Nova Scotia	**60**	**40**	30,000
New Brunswick	**60**	**40**	26,000
Quebec	49	51	267,000
Ontario	**73**	**27**	357,000
Manitoba	**73**	**27**	37,000
Saskatchewan	**76**	**24**	35,000
Alberta	**72**	**28**	102,000
British Columbia	**60**	**40**	133,000

Table C1 (concluded)

Student characteristics by work status

	Workers	Non-workers	Total
	%	%	
Living arrangements in high school			
Two parents	**65**	**35**	799,000
Single parent	**58**	**42**	186,000
Split custody	**62**	**38**	21,000
No parents	**36**	**64**	7,000
Parents' highest level of education[1]			
Mother is a high school graduate	**65**	**35**	761,000
Mother not a high school graduate	**61**	**39**	133,000
Father is a high school graduate	**66**	**34**	626,000
Father not a high school graduate	**64**	**36**	150,000
Parents' occupational skill level[1]			
Mother worked in a professional, managerial, technical paraprofessional or skilled occupation	**67**	**33**	438,000
Mother never worked	**57**	**43**	124,000
Father worked in a professional, managerial, technical paraprofessional or skilled occupation	**66**	**34**	537,000
Father never worked	**46**	**54**	12,000

Note: Estimates in bold indicate a significant difference (p <= .05) between workers and non-workers.

1 Respondents who reported "no mom" or "no dad" were removed from the totals on which these percentages are based.

Table C2

Province of high school by weekly hours of work

	Zero hours	1 < 10 hours	10 < 20 hours	20 < 30 hours	30 + hours	
	%	%	%	%	%	Total
Province of high school						
Newfoundland and Labrador	61	14	14	8 ***	3 **	24,000
Prince Edward Island	34	16	25	18	6 *	5,000
Nova Scotia	40	19	18	17	5	30,000
New Brunswick	40	17	21	17	6	26,000
Quebec	51	16	20	10	3	267,000
Ontario	27	15	27	23	8	357,000
Manitoba	27	19	25	20	9	37,000
Saskatchewan	24	21	25	20	10	35,000
Alberta	28	20	21	20	10	102,000
British Columbia	40	19	20	15	6	133,000

* Indicates a coefficient of variation (CV) between 16.6% and 25%. The CV is a measure of sampling error.

** Indicates a CV between 25% and 33.3%.

*** Indicates a CV over 33.3%. Caution should be used when interpreting these results.

Table C3

Characteristics of high school graduates and leavers, by sex

	Total		Males		Females	
	Graduates	Leavers	Graduates	Leavers	Graduates	Leavers
All students in the study	885,000 (87%)	133,000 (13%)	422,000 (84%)	82,000 (16%)	463,000 (90%)	51,000 (10%)
Demographics	%		%		%	
Age last in high school						
16 and younger	**6**	**26**	**6**	**26**	**7**	**25**
17	**36**	**31**	34	31	**38**	**30**
18 and older	**58**	**44**	**60**	**43**	**55**	**45**
Language first learned and still understood						
English	**64**	**56**	**64**	**53**	63	61
French	**25**	**33**	**24**	**35**	25	30
Visible minority	**13**	**8**	**13**	**7**	13	10 *
Aboriginal	**2**	**6**	**2**	**5**	**3**	**9**
Number of siblings						
None	7	8	8	8	7	8 *
One	**42**	**34**	**44**	**36**	**40**	**31**
Two	30	29	30	30	31	28
Three	12	14	12	14	13	15
Four or more	**9**	**15**	**7**	**12**	**9**	**19**
Was living with a partner during high school	**2**	**6**	1 *	2 *	**2**	**11**
Had a child during high school	**1**	**5**	**1** **	**2** *	**1**	**12**
Province of last high school[1]						
Newfoundland	**89**	**11**	**85**	**15** *	**94**	**6** *
Prince Edward Island	**88**	**12** *	**85**	**15** **	**91**	**9** *
Nova Scotia	**89**	**11**	**84**	**16**	**94**	**6** *
New Brunswick	**91**	**9**	**89**	**11**	**93**	**7** *
Quebec	**83**	**17**	**77**	**23**	**89**	**11**
Ontario	**90**	**10**	**88**	**12**	**91**	**9**
Manitoba	**84**	**16**	**82**	**18**	**86**	**14**
Saskatchewan	**92**	**8**	**89**	**11**	**94**	**6** *
Alberta	**84**	**16**	**82**	**18**	**86**	**14**
British Columbia	**88**	**12**	**84**	**16**	**91**	**9**
Socio-demographics						
Living arrangements – most of high school						
Lived with two parents	**81**	**63**	**82**	**64**	**80**	**61**
Lived with one parent	**16**	**33**	**15**	**33**	**18**	**34**
Parents' education[2]						
Mother did not graduate from high school	**12**	**26**	**10**	**24**	**14**	**30**
Father did not graduate from high school	**16**	**33**	**14**	**33**	**18**	**31**
Parents' occupation[3]						
Mother worked in an intermediate, labouring or elemental occupation	**36**	**48**	**34**	**45**	**39**	**54**
Father worked in an intermediate, labouring or elemental occupation	**25**	**40**	**24**	**40**	**26**	**40**
Influences						
Few/no friends were planning on furthering their education	**7**	**23**	**8**	**26**	**6**	**19**
Parents thought graduating from high school not very important	**6**	**36**	**7**	**38**	**6**	**33**
Parents thought getting more education after high school not very important	**27**	**60**	**29**	**62**	**24**	**56**
Parents never talked about future education or career options	**2**	**9**	**2**	**8**	**2**	**9**

Table C3 (concluded)

Characteristics of high school graduates and leavers, by sex

	Total		Males		Females	
	Graduates	Leavers	Graduates	Leavers	Graduates	Leavers
School-related	%		%		%	
Overall grade average						
80-100%	**42**	**12**	**36**	**10**	**48**	**16**
70-79%	**43**	**35**	**46**	**32**	41	40
60-69%	**14**	**35**	**18**	**39**	**10**	**29**
59% and under	**1**	**18**	**1**	**20**	**1** *	**15**
Repeated a grade in elementary school	**6**	**33**	**7**	**36**	**5**	**28**
Last high school was not a private school	**90**	**96**	**90**	**95**	**90**	**97**
Did not take a course on career planning	**32**	**45**	**32**	**46**	**31**	**43**
Engagement						
Academic Engagement						
Very engaged	**16**	**6**	**11**	**4**	**21**	**9** *
Engaged	**73**	**50**	**73**	**44**	**73**	**59**
Not very engaged	**11**	**44**	**16**	**52**	**6**	**32**
Social engagement						
Very engaged	**19**	**7**	**16**	**7**	**22**	**8** *
Engaged	**71**	**62**	**73**	**63**	**68**	**59**
Not very engaged	**10**	**31**	**11**	**30**	**10**	**33**
Substance use						
Had an alcoholic drink more than once a week	**9**	**17**	**14**	**21**	**5**	**11**
Used marijuana or hash more than once a week	**6**	**22**	**8**	**27**	**4**	**14**
Extracurricular activities						
Did not participate in school clubs, teams	**36**	**66**	**38**	**64**	**34**	**71**
Did not participate in non-school clubs, teams	**35**	**56**	**33**	**55**	**37**	**59**

Note: Estimates in bold indicate a significant (p <= .05) difference between leavers and graduates.

1 The estimates for province are unique in this table. They represent the proportion of students in each province that are either leavers or graduates. Therefore the estimates add up to 100% within each province as opposed to 100% across all provinces.

2 Respondents who reported "no mom" or "no dad" were removed from the totals on which these percentages are based.

3 Respondents who reported "no mom" or "mom never worked" or "no dad" "dad never worked" were removed from the totals on which these percentages are based.

* Indicates a coefficient of variation (CV) between 16.6% and 25%. The CV is a measure of sampling error.

** Indicates a CV between 25% and 33.3%.

Table C4

Variables considered for dropout model

Hours worked

Demographics
Gender
Age last in high school
Language first learned and still understood
Visible minority status
Aboriginal status
Number of siblings
Lived with a partner in high school
Children in high school
Province of high school

Socio-demographics
Mother's highest level of education
Father's occupational skill level

Influences
Friends planned on furthering their education
Parents' opinion on importance of high school graduation
Parents' opinion on importance of education after high school
Spoke with parents about future plans

School-related
Repeated a grade
Private school
Took class in career planning

Engagement
Academic engagement
Social engagement

Substance use
Alcohol consumption
Drug use

Extracurricular activities
Hours spent in school activities
Hours spent in non-school activities

Table C5

Dropout model – results

	Base Model	Model A	Model B	Model C	Model D	Model E	Model F	Model G
	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios
Hours worked								
Zero hours	**2.28 ***	**1.87 ***	**1.69 ***	**1.62 ***	**1.58 ***	**1.55 ***	**1.54 ***	**1.48 ***
1 < 20 hours	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
20 < 30 hours	**1.54 ***	**1.56 ***	**1.50 ***	**1.51 ***	**1.56 ***	**1.45 ***	**1.40 ***	**1.34 ***
30 or more hours	**3.74 ***	**3.56 ***	**3.33 ***	**3.01 ***	**3.15 ***	**2.57 ***	**2.50 ***	**2.38 ***
Variables that are controlled for:								
Gender	✓	✓	✓	✓	✓	✓	✓	✓
A. Demographics								
Age when last in high school		✓	✓	✓	✓	✓	✓	✓
Visible minority status		✓	✓	✓	X	X	X	X
Aboriginal status		✓	✓	✓	✓	✓	✓	✓
Total number of siblings		✓	X	X	X	X	X	X
Marital status		✓	✓	✓	✓	✓	✓	✓
Dependent children		✓	✓	✓	✓	✓	✓	✓
B. Socio-demographics								
Mother's highest level of education			✓	✓	✓	✓	✓	✓
Father's occupational skill level			✓	✓	✓	✓	✓	✓
C. Influences								
Friends planning on furthering their education				✓	✓	✓	✓	✓
Parents' opinion on the importance of graduating				✓	✓	✓	✓	✓
D. School-related								
Repeated a grade in elementary school					✓	✓	✓	✓
Attended a private school					✓	✓	✓	✓
Took a course in career planning					✓	✓	✓	✓
E. Engagement								
Academic engagement						✓	✓	✓
Social engagement						✓	✓	✓
F. Substance use								
Frequency of use of marijuana or hash							✓	✓
G. Extracurricular activities								
Hours spent participating in school-related activities								✓
R^2	0.028	0.103	0.146	0.197	0.218	0.248	0.253	0.259

Notes: Reference category for hours worked is in italics. Odds ratios in bold indicate they are significantly different from the reference category at p <= .05.

The ✓ denotes inclusion in the model and that the variable is statistically significant at p<= .05. An X denotes inclusion in the model but that the variable is no longer statistically significant at p <=.05.

APPENDIX D

Analytical Methodology

For the purposes of this study, respondents were chosen based on their work activity and high school status as of December 1999. In total, 16,004 school graduates and 2,374 school leavers were included in this study[2].

The Youth in Transition Survey's (YITS) complex design requires that the sample weights be used in all analyses. This analysis was no exception, so all findings expressed in this paper are based on weighted estimates. Further, all calculations of variance were done using the 1000 bootstrap weights that were included on the YITS data file. For more details about the YITS survey methodology, please see Appendix A in this report.

Testing for significant differences in Tables C1 and C3

Ninety-five percent confidence intervals were calculated for all estimates of proportions in Tables C1 and C3 using the bootstrap weights. If the confidence intervals around the worker/non-worker and graduate/leaver estimates clearly did not overlap, then the estimates of proportions were considered to be significantly different at $p <= .05$. If the confidence intervals *did* overlap or they *almost* overlapped, a t-test was done to calculate the significance of the difference (at $p <= .05$) between the proportions.

All estimates that appear in bold indicate a significant difference between the two groups at $p <= .05$.

Steps in preparation for the logistic regression model

Several things were done to prepare for regressing dropout behaviour and these are outlined below.

Separate models by sex were deemed unnecessary

Because male and female students differed with respect to the number of hours worked and in the prevalence of various characteristics, it was necessary to determine if separate regressions for male and female students were required. This was done by loading hours of work and gender, along with hours of work*gender as the interaction term, into a logistic regression. Both hours of work and gender independently affected the odds of dropping out, but the interaction between them was insignificant at $p > = .05$. Therefore, it was decided that gender would be

2 High school continuers - those who were still in high school as of December 1999 but had not yet met the minimum requirements for high school graduation - were excluded.

sufficiently controlled for by simply including it as an independent variable in the one regression model, and separate regression models by gender were unnecessary.

Response categories were combined

Because of the number of independent variables with multiple response categories, the significance of the differences among all categorical estimates within each of the variables was tested. If the difference between two response categories in a given variable was not statistically significant and if combining them made sense conceptually, then the two categories were combined. The following variables were affected: hours worked, age last in high school, drug use, and parents' thoughts on the importance of high school graduation.

Highly correlated variables were identified for exclusion

As the intention was to control for all other factors to uncover the independent relationship between hours worked and dropping out, all factors were cross-tabulated with the number of hours worked to check for possible correlations. If the correlation between hours worked and any other independent variable was greater than .20, this variable was excluded from the model. Such a correlation was found between province of high school and hours worked so province of high school was excluded from further analyses. To evaluate the impact of excluding this variable, it was added to the final regression model to see if there was a significant impact on the hours of work odds ratios. There was not.

The other independent variables were cross-tabulated with each other to identify the magnitude of correlations between them. Any correlation with the coefficient $\Phi > .30$ was examined closely. Such a correlation was found between overall grade average and academic engagement. Consequently, only academic engagement was selected for inclusion in the regression because there was little non-response to this variable (less than 1 %) as compared to grade average (10% non-response overall, and the majority of the non-response was attributed to school leavers).

Parents' highest level of education was correlated with parents' occupational skill level (the occupational skill levels were assigned based on the estimated *education* level required to do a particular job). Analysis revealed that the mother's highest level of education contributed more to the model than her occupational skill level whereas the opposite was true for the father. Therefore, mother's highest level of education and father's occupational skill level were the two variables loaded into the model. It should be noted that mother's education and father's occupation were still correlated ($\Phi = .30$) but together they improved the model's prediction.

In addition, the following variables were not included because of the degree of their correlation with other variables that were kept in the model: language first learned; parents' opinion regarding more education after high school and parents talked to student about future education and plans; frequency of alcohol consumption; and time spent doing non-school related activities.

It should be noted that although the following pairs of variables were also correlated at $\Phi > .30$ – marital status with dependent children, and academic with social engagement – they all represented substantively different concepts so all were kept in the model.

The final model

The dependent variable that was used in the model was high school leaving versus high school graduating, with school leaving as the outcome of interest.

The independent variables were those retained after the correlation analysis. They were separated into the groups outlined in Table C4 in Appendix C. A logistic regression was then conducted with the independent variables loaded in the following blocks: hours of work was loaded first, then demographics, followed by socio-demographics, influences, and so on. After each stage of loading, the effect on the odds ratios of hours worked was noted. If any variable became statistically insignificant at the p <= .05 level, this was also noted. As groups of variables were added, the intensity of the hours of work/dropping out relationship was reduced. The final model contained all variables regardless of whether their significance met the p<=.05 cut-off and their insignificance was noted with an "X".

The final model had an R^2 of .259 which means that the included variables accounted for 26% of the variability between graduates and leavers. The model was able to correctly predict 47% of leavers as leavers.

How to interpret the odds ratios in Table C5

A standard output from logistic regression is the odds ratio.

As mentioned in the textbox in Section 6, odds ratios allow the user to interpret the *independent* effect of a variable on the outcome in a regression model. An odds ratio is generated for each category within a variable, with one category selected as the "reference category" so that each odds ratio within the variable is interpreted relative to the reference category.

When the odds ratio for a specific category – say, category X - in a given variable is greater than "1", it means that the odds are *more* in favour of the predicted outcome for category X as compared to the reference category. Conversely, if the odds ratio is less than "1", then the odds are *less* in favour of the predicted outcome for category X as compared to the reference category.

The odds ratios results for hours worked presented in Table C5 had "1 to less than 20 hours per week" as the reference category, and all of the other categories' odds ratios were greater than 1. This means that as compared to students who worked 1 to less than 20 hours per week, students who did not work, or worked more than 20 hours per week had greater odds of dropping out. All of these odds ratios were significantly different (in bold and marked with an asterisk) from the reference category.

Limitations to the study

Although many variables in the YITS dataset were included in the regression model, the model was still not very good at correctly predicting leavers as leavers. There are a few explanations for this. The number of leavers was small, which made it difficult to model their dropout behaviour. Also, it is possible that certain characteristics, attitudes or behaviours that were a part of these students' decisions to leave school were not included in this analysis. Future analysis that includes additional variables such as community level factors might result in improved predictability of leaving behaviour.

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81-595-MIE2003003	Finding their way: a profile of young Canadian graduates
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