Educational Attainment and Employment Income: Incentives and Disincentives for Staying in School

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Analysis of 1980, 1985, and 1990 Canadian census data shows the relationship between educational attainment and employment income. The data show trends similar to those found elsewhere, especially in the United States. They also reveal some lower-than-expected trend changes in the 1990 data, particularly increases in employment-income differentials associated with secondary-school completion, but equal or greater decreases in earning power for the young between 1980 and 1985. Average employment earning losses for the young during the 1980s remain generally greater than increases in the employment income premiums associated with various levels of educational attainment. Finally, young secondary diploma holders had increased marginal employment earning but greatly decreased real-dollar income.

L'analyse des données des recensements canadiens de 1980, 1985 et 1990 met en évidence la relation entre le niveau de scolarité et le revenu d'emploi. Les données indiquent des tendances semblables à celles trouvées ailleurs, notamment aux États-Unis. Elles révèlent aussi des augmentations dans les écarts entre les revenus d'emplois associés à l'obtention d'un diplôme d'études secondaires, mais des diminutions égales ou supérieures dans la rémunération des jeunes entre 1980 et 1985. Les pertes moyennes de gains provenant d'un emploi pour les jeunes au cours des années 1980 demeurent généralement supérieures aux augmentations des primes de revenu d'emploi associées aux divers niveaux de scolarité. Enfin, les jeunes ayant un diplôme d'études secondaires avaient un revenu d'emploi légèrement supérieur, mais inférieur en termes de revenu disponible.

Global restructuring has fired interest in the evolving relationship between educational attainment and income. Following the lead of educationally conservative experts, governments and analysts have returned with a vengeance to human-capital logic by blaming public education for a lack of competitiveness in a global marketplace (Adler, 1982; Levin, 1993; National Commission on Excellence in Education, 1983; Premier's Council, 1990; Radwanski, 1988). The dominant claim of causality in such analysis and policy making is that higher average educational attainment across the population causes higher personal and social incomes, and so promotes prosperity. A key related claim is that by raising average educational achievement levels, nations can compete more effectively in the global economy. This reasoning has been the foundation of recent educational policy reform in Canada and elsewhere (see examples in Paquette, 1994).

At the same time, the more vulnerable assumptions of human capital methods, focused on generic indicators of educational attainment, have been laid bare. Not only has the analysis of much data failed to converge on *consistently verifiable* models of human capital contribution to economic productivity, but the assumption of stable long-term relationships among age, educational attainment, and income has become particularly questionable in current labour conditions. Klees (1991) noted that

> The connection between education and economic growth was the subject of much study in the early days of the field but, in many ways to no avail. By 1970 Blaug's introductory textbook summarized the conclusion of many when he shredded that literature: the correlational studies could easily support any causal direction, the regression studies used nonsensical models that produced a bewildering array of results, and E. F. Denison's version of a production function approach simply assumed what it wished to prove. (p. 724)

A rate-of-returns analysis of private and social returns to secondary education by the Conference Board of Canada (1992), a recently published internal rate-of-return study carried out by Vaillancourt (1995), and the work summarized by Cohn (1997) show strong returns in Canada to secondary-school completion. Here I examine evidence on the evolving relationship between employment income and educational attainment in Canada, since a key assumption underpinning all rate-of-return analyses is that this relation remains relatively stable, particularly, as Blaug (1968, pp. 232–233) points out, for the period immediately following the data-source year. The results of my analysis, however, show considerable volatility during the 1980s in patterns of relationship between employment income and educational attainment across age and sex.

In particular, although in 1990 the employment-income advantage associated with a secondary diploma had, even for young adults, increased somewhat from what it was in 1980 (in 1985, however, that advantage had nearly disappeared), *this gain in income advantage was much smaller in magnitude than the real-dollar employment-income loss suffered by the young over the decade.* In short, Canadian census data suggest that the experience of young Canadians might have attuned them more to their general loss of employment income than to the growing "income advantage" of secondary graduation. As a result, these census data suggest that academically marginal students guided by the average labour-market experience of young Canadians would likely be more aware of the overall loss of earning power of their generation than of the gains between 1980 and 1990 in the *relative* employment-earning advantage of a secondary diploma. If high-school students' perceptions of the medium-term employment-income benefits of staying in school shape their decision to leave or remain in school, potential dropouts may be influenced at least as much by very strong drops in

the earning power of young people, including high-school graduates, as by the graduates' relative employment-income advantage.

Dropping out of school is generally acknowledged to have complex multiple causes, though in their own accounts of why they left school before graduation dropouts frequently point to "boredom," "not enjoying school," dissatisfaction with programs, and conflict with teachers (Coulter, 1991; Devereaux, 1993, pp. 4–5, 27–32; Radwanski, 1988). Nonetheless, most serious analysis and modelling of early school leaving considers labour-market involvement and prospects an important element in the decision to leave or stay in school.

RECENT CENSUS EVIDENCE

I examined average employment income data for persons with different educational attainment levels calculated from the 1980, 1985, and 1990 Canadian census data sets (unfortunately, parallel data from the 1995 census will not be available until first quarter 1999 and older data sets are not directly comparable).[1] I have tried to consider the incentives these data imply to marginally successful students for and against remaining in school.

The Evolving "Income Premium" of a Secondary Diploma

According to the census data for the entire working population (i.e., people having some employment income) across both sexes and all ages, a high-school diploma corresponded to 0.3% more employment income than elementary-only education in 1980, to 5.3% more in the 1985 data, and to 11.6% more in the 1990 data. "Some high school without a secondary school certificate" corresponded to more than 6% less average employment income than "less than Grade 9" for both the 1985 and 1990 censuses. When young people weigh the economic merits of dropping out of school or continuing their education, however, they likely consider the earning "payoff" they believe is associated with a higher level of educational attainment rather than the relationship of their potential immediate earning power to that of people with less education. Across both sexes, as Table 1 shows, people with employment income who have a secondary diploma averaged 10.5% more than those with some secondary schooling only in 1980, 12.3% more in 1985, and 18.2% more in 1990. This represents a slight improvement in the employment-income advantage of a secondary-school diploma between the 1980 and 1985 censuses, and a markedly greater gain between the 1985 and 1990 censuses. The advantage was much greater for females than for males, although the average real-dollar employment-income levels of females in these educational attainment groups is only about one-half to less than two-thirds that of their male counterparts.

TABLE 1

Population 15 Years and Over with Employment Income by Sex, Highest Level of Schooling, and Employment Income Groups for Canada, Provinces, and Territories: Percentage of Advantage Over Category 2 (Some High-School)

Census Year	Female	% Advantage Over #2	Male	% Advantage Over #2	Both	% Advantage Over #2
	2. Grade 9–13 without secondary school certificate					
1980	$7,518		$14,998		$11,859	
1985	$7,619		$14,177		$11,362	
1990	$7,897		$13,766		$11,224	
	3. Grade 9–13 with secondary school certificate					
1980	$9,306	23.8	$17,069	13.8	$13,109	10.5
1985	$9,352	22.7	$16,228	14.5	$12,759	12.3
1990	$10,138	28.4	$16,607	20.6	$13,263	18.2

*2% census data sample for 1980 and 1985, 3% for 1990; Public Use Micro-Data File Tapes; 1981 dollars.

Relative Income Premiums Associated with Educational Attainments Beyond Secondary-School Completion

For the same period, census data on employment incomes for educational achievement levels beyond secondary-school completion (see Table 2) show that workers with a trades certificate or diploma averaged about one-third more employment income than those with a secondary diploma only in 1980 ($17,380 versus $13,109) but only one-fourth more in 1985 ($15,901 versus $12,759) and 1990 ($16,834 versus $13,263).[2] Males enjoyed by far the greatest income benefit associated with a trades certificate or diploma (the benefit was 16%–18% for males, 5%–9% for females). Taken across both sexes, the incremental value in average wages of a non-university certificate or diploma remained relatively steady at about 20% over the three censuses.

In 1980, however, finishing "some university" (but no formal certificate or diploma) corresponded to a 2.6% employment-income advantage over secondary-school completion. That advantage had become a 3.5% *disadvantage* in 1985 and a 7.1% disadvantage in 1990. Substantial average employment income benefits for education beyond Grade 9 go to people with university certificates and degrees, although the global "university degree" category of census data conceals the bleak employment and earning prospects in Canada for social sciences and humanities graduates (Department of Secretary of State, 1991).

TABLE 2

Population 15 Years and Over by Highest Level of Schooling and Average Employment Income for Canada: Percentage Change from 1980 to 1990

Highest Level of Schooling	*1980*	*1985*	*% Change from 1980 Census*	*1990*	*% Change from 1985 Census*	*% Change from 1980 Census***
1. Less than Grade 9	$13,076	$12,114	–7.4	$11,888	–1.9	–9.1
2. Grade 9–13 w/o sec. cert.	$11,859	$11,362	–4.2	$11,224	–1.2	–5.4
3. Grade 9–13 w sec. cert.	$13,109	$12,759	–2.7	$13,263	4.0	1.2
4. Trades cert. or diploma	$17,380	$15,901	–8.5	$16,834	5.9	–3.1
5. Other non-university w cert. or dip.	$15,977	$15,290	–4.3	$16,185	5.9	1.3
6. Some university w/o cert. or deg.	$13,454	$12,315	–8.5	$12,315	0.0	–8.5
7. Some university w cert.	$19,228	$17,805	–7.4	$18,178	2.1	–5.5
8. University w bach. degree	$21,882	$21,050	–3.8	$21,640	2.8	–1.1
9. University w grad. degree	$31,591	$30,320	–4.0	$30,185	–0.4	–4.5

*2% census data sample for 1980 and 1985, 3% for 1990; Public Use Micro-Data File Tapes; 1981 dollars.
**Excluding both part-time and full-time students from this analysis alters only very slightly the percentage change values between 1980 and 1990. No attendance variable is available for the 1985 data.

In 1980, people with a university certificate short of the bachelor level enjoyed a 46.7% employment income advantage over those with only a secondary-school diploma. By 1990 that advantage had declined to 37.1%. In 1990, the employment-income advantage of Canadians with bachelors' degrees over secondary-school graduates was 63.2%, down about 2% from the previous census and 3% from the 1980 census. For those with advanced degrees, the advantage over secondary-school graduates declined over the three censuses from 141% in 1980 to 127.6% in 1990.

So far, then, the data suggest that the relative employment-income value of a secondary diploma was increasing (slightly during the early 1980s, more rapidly during the late 1980s), whereas the income premiums attached to other educational attainments below the university degree were in relative decline and the employment-income premium of university degrees was decreasing slightly. That decline in university degree premiums, however, is very small when compared to their relatively strong enduring real-dollar education premium.

Longitudinal Income Trends Within Educational Attainment Categories

The less lustrous face of the education-premium coin appears when one compares changes in real-dollar average employment incomes for each census educational-attainment category across the three census years 1980, 1985, and 1980. Observed across all ages and both sexes for the entire working population as in Table 2, mean employment incomes decreased between 1980 and 1985 for every census educational-attainment category. Declines were strongest for those with trade certificates (–8.5%) and for those with some university education but no degree or certificate (–8.5%). The least overall decline (–2.7%) was for those with a secondary-school diploma only. Nonetheless, real-dollar employment earnings for secondary graduates increased by 4.0% between 1985 and 1990, giving a total change over the decade of about +1.2%. Put otherwise, for all ages and both sexes combined, the mean real-dollar employment earning power associated with a secondary-school diploma declined somewhat during the 1980s only to return in 1990 to just $154 above its 1980 starting point ($13,263 versus $13,109).

The census data reveal a fairly severe decline, however, in employment earnings associated with most other Statistics Canada educational-attainment categories. In most cases the patterns mirror that of the secondary-diploma: considerable decline to 1985 and various degrees of recovery between 1985 and 1990. Other than secondary-school graduates, however, only people whose highest attainment was “other non-university with certificate or diploma” experienced a net gain in employment earnings over the decade as a whole. The most severe declines for the decade were for people with less than Grade 9 (–9.1%) and with some university but no certificate or degree (–8.5%).

Given the Canadian Occupational Projection System’s (COPS) data on changes in occupational demography (Canadian Occupational Projections System, 1990), the relative employment income premiums (and penalties) associated with census educational-attainment categories may be skewed by age. COPS data suggest that a rapid decline in traditional manufacturing and resource sector employment during the 1982 and 1989 recessions limited entry of the young into traditional sources of mass wage employment and tended to restrict employment in these sectors to older workers with considerable seniority (Paquette, 1994, 1995). Other entry-level employment is similarly restricted (Department of Secretary of State, 1991).

The work-experience histories of other young persons with and without high-school diplomas, rather than those of the whole population, are likely to form the backdrop of employment earning information young persons perceive as relevant when they consider dropping out of secondary school. To understand their economic motivation for dropping out of versus staying in school, then, one must examine the distribution of employment income premiums associated with the secondary diploma for relatively young workers.

Canadian census data can be used to break down by selected age cohorts the employment income premium associated with a secondary-school diploma for the decade between 1980 and 1990. Taken together for both sexes these data show that, for 20- to 34-year-olds, the differential between average employment income for high-school graduates and for those with some high school but no diploma varies between about 3% and 13%, with the greatest advantage among the youngest cohorts. For 25- to 34-year-olds, the secondary-school income premium increased from 1980 to 1985, then retreated in 1990. For 20- to 24-year-olds, the relative employment benefits climbed about 3% between each of the two censuses (from 7.3% in 1980 to 11.0% in 1985 to 13.3% in 1990). If students are excluded from each cohort of working young, the percentage advantages in 1980 and 1990 (the only years for which a school-attendance variable is available) remain very similar (less than 0.5% difference) for young workers aged 20 to 34.

Worth noting are particularly high differences in earning power between young females who have and have not completed their secondary-school studies. The income premium associated with secondary-school graduation ranged from 18.8% ($7,575 versus $6,378) for 20- to 24-year-olds in 1990 to 26.9% ($10,185 versus $8,027) for 25- to 29-year-olds in 1985. This range is from one-third higher to double the comparable advantage for males. Even though the absolute values of female average incomes are much lower than comparable male averages, the relative employment income advantage of a secondary-school diploma for young females is clearly greater than for males. Recently reported relative declines in male persistence to secondary completion (Ministère de l'Éducation du Québec, 1992) may be, in part, a response to the greater *relative* advantage in employment-income rewards for young female graduates.

Canadian census data on the distribution of mean income across all ages for both sexes combined reveal two important aspects of the changing relationship between secondary-school completion and employment income. First, for young people in the 20- to 24-year-old through 30- to 34-year-old cohorts, the most significant employment-income trend for both those who did and those who did not complete secondary school is a substantial reduction in real-dollar earning power in 1985 and little change between 1985 and 1990. Second, the most significant differences in employment earning power associated with a secondary-school diploma are in the 45- to 54-year-old cohort. Consequently, even if young

people were to assume that the relationship between age and employment income would remain relatively stable into the future (a doubtful assumption, given the realities of global restructuring and quasi-universal secondary education), they would be correct to conclude that the greatest employment-income benefits of secondary completion are many years ahead of them.

Overall, both young secondary-school leavers and young graduates have experienced much larger declines in real-dollar income than increases in relative income benefits associated with secondary-school completion. This decline in real-dollar earnings applies across educational attainments other than the secondary-school diploma: between 1980 and 1985, in fact, loss of earning power dwarfed the small gains in the income premium of the secondary-school diploma — and of other educational attainment levels as well.

Educational Attainment Premiums and Loss of Real-Dollar Employment Earning Power Among the Young, 1980–1985

Historically, more-highly-educated young persons have started their work lives at relatively low initial wage levels. With due allowance for this trend, census data still leave little room for optimism that for the young a secondary-school diploma in itself (or other educational attainment below that of university degree or certificate) will greatly change a rapidly darkening medium-term employment income future. Moreover, there is little in the current "death-of-work" scenario in the workplace to reassure them of long-term benefits (Galbraith, 1996; Menzies, 1996; Rifkin, 1995).

In 1980, secondary-school graduates between 20 and 24 years of age experienced a 7.3% (7.2% if students are excluded) relative employment income advantage over high-school leavers. That income premium for secondary-school graduation had grown to 13.3% (15.9% without students) by 1990, an increase of 6% (8.7% without students). Unfortunately, however, during the same period, 20- to 24-year-old high-school graduates had experienced an average real-dollar income loss of 17.8% as against a 22.2% loss for high-school leavers (13.4% and 19.9%, respectively, if students are excluded). (Values computed from income data for these years; see Tables 3 and 4.) Thus, for young adults in this age range, *real-dollar income losses over the decade were more than twice the increase in relative income advantage over dropouts.* The news was slightly better for those aged 25 to 29 years old during the same period, for whom a gain of about 3% (with or without students) in the income premium associated with a secondary-school diploma nonetheless had to be traded off against a less severe 11.0% (10.5% without students) loss in employment earning power. Even so, *real-dollar income losses for this upper-range cohort of young workers were two-and-a-half times as great as growth in employment-income advantage associated with secondary completion.*

TABLE 3

Working Population 20–34 Years Old by Age, Highest Level of Schooling, and Employment Income Groups for Canada, Provinces, and Territories: Percentage Decline in Average Earnings, 1980–1990

Highest Level of Schooling	*1980*	*1985*	*% Change from 1980*	*1990*	*% Change from 1985*	*% Change from 1980*
			Age 20–24			
1. Less than Grade 9	$7,980	$6,314	–20.9	$6,890	9.1	–13.7
2. Grade 9–13 w/o sec. cert.	$10,157	$7,955	–21.7	$7,905	–0.6	–22.2
3. Grade 9–13 w sec. cert.	$10,901	$8,828	–19.0	$8,958	1.5	–17.8
4. Trades cert. or diploma	$11,284	$8,781	–22.2	$9,432	7.4	–16.4
5. Other non-university w cert. or dip.	$10,623	$8,580	–19.2	$9,088	5.9	–14.4
6. Some univ. w/o cert./deg.	$7,120	$5,028	–29.4	$5,397	7.3	–24.2
7. Some univ. w cert.	$8,734	$6,528	–25.3	$6,172	–5.5	–29.3
8. Univ. w bach. degree	$8,386	$6,949	–17.1	$7,297	5.0	–13.0
9. Univ. w grad. degree	$8,756	$7,492	–14.4	$7,863	5.0	–10.2
			Age 25–29			
1. Less than Grade 9	$10,161	$9,165	–9.8	$8,938	–2.5	–12.0
2. Grade 9–13 w/o sec. cert.	$13,277	$11,730	–11.7	$11,515	–1.8	–13.3
3. Grade 9–13 w sec. cert.	$14,107	$12,924	–8.4	$12,562	–2.8	–11.0
4. Trades cert. or diploma	$16,366	$14,018	–14.4	$14,029	0.1	–14.3
5. Other non-university w cert. or dip.	$15,284	$14,268	–6.7	$14,638	2.6	–4.2
6. Some univ. w/o cert./deg.	$14,717	$12,829	–12.8	$13,042	1.7	–11.4
7. Some univ. w cert.	$14,643	$14,054	–4.0	$13,354	–5.0	–8.8
8. Univ. w bach. degree	$17,204	$15,586	–9.4	$16,086	3.2	–6.5
9. Univ. w grad. degree	$19,876	$17,496	–12.0	$16,986	–2.9	–14.5
			Age 30–34			
1. Less than Grade 9	$12,309	$10,311	–16.2	$10,277	–0.3	–16.5
2. Grade 9–13 w/o sec. cert.	$14,852	$13,429	–9.6	$13,280	–1.1	–10.6
3. Grade 9–13 w sec. cert.	$15,295	$14,856	–2.9	$14,413	–3.0	–5.8
4. Trades cert. or diploma	$18,235	$16,554	–9.2	$16,663	0.7	–8.6
5. Other non-university w cert. or dip.	$17,844	$16,400	–8.1	$16,527	0.8	–7.4
6. Some univ. w/o cert./deg.	$19,139	$17,144	–10.4	$16,207	–5.5	–15.3
7. Some univ. w cert.	$18,132	$16,445	–9.3	$18,029	9.6	–0.6
8. Univ. w bach. degree	$22,735	$21,608	–5.0	$21,373	–1.1	–6.0
9. Univ. w grad. degree	$27,638	$26,048	–5.8	$25,038	–3.9	–9.4

*2% census data sample for 1980 and 1985, 3% for 1990; Public Use Micro-Data File Tapes; 1981 dollars.

TABLE 4

Working Population 20–34 Years Old Not Enrolled in School by Age, Highest Level of Schooling, and Employment Income Groups for Canada, Provinces, and Territories: Percentage Decline in Average Earnings, 1980–1990

Highest Level of Schooling	*1980*	*1990*	*% Change from 1980*
Age 20–24			
1. Less than Grade 9	$8,059	$6,975	–13.5
2. Grade 9–13 w/o secondary certificate	$10,267	$8,223	–19.9
3. Grade 9–13 w secondary certificate	$11,011	$9,531	–13.4
4. Trades certificate or diploma	$11,499	$9,988	–13.1
5. Other non-univ. w certificate/diploma	$11,874	$10,936	–7.9
6. Some university w/o certificate/degree	$11,157	$8,818	–21.0
7. Some university w certificate	**	$10,100	N/A
8. University w bachelor's degree	$11,632	$10,864	–6.6
9. University w graduate degree	**	**	N/A
Age 25–29			
1. Less than Grade 9	$10,154	$8,974	–11.6
2. Grade 9–13 w/o secondary certificate	$13,283	$11,567	–12.9
3. Grade 9–13 w secondary certificate	$14,123	$12,642	–10.5
4. Trades certificate or diploma	$16,468	$14,195	–13.8
5. Other non-univ. w certificate/diploma	$15,261	$14,872	–2.5
6. Some university w/o certificate/degree	$15,560	$14,173	–8.9
7. Some university w certificate	$15,024	$14,268	–5.0
8. University w bachelor's degree	$18,229	$17,650	–3.2
9. University w graduate degree	$22,239	$20,174	–9.3
Age 30–34			
1. Less than Grade 9	$12,326	$10,305	–16.4
2. Grade 9–13 w/o secondary certificate	$14,891	$13,337	–10.4
3. Grade 9–13 w secondary certificate	$15,343	$14,515	–5.4
4. Trades certificate or diploma	$18,218	$16,867	–7.4
5. Other non-univ. w certificate/diploma	$17,804	$16,760	–5.9
6. Some university w/o certificate/degree	$19,635	$16,806	–14.4
7. Some university w certificate	$17,936	$18,683	4.2
8. University w bachelor's degree	$23,255	$22,213	–4.5
9. University w graduate degree	$29,192	$27,110	–7.1

*2% census data sample for 1980 and 1985, 3% for 1990; Public Use Micro-Data File Tapes; 1981 dollars.
**Statistically insignificant (standard error of mean over $500).

of about 3% (with or without students) in the income premium associated with a secondary-school diploma nonetheless had to be traded off against a less severe 11.0% (10.5% without students) loss in employment earning power. Even so, *real-dollar income losses for this upper-range cohort of young workers were two-and-a-half times as great as growth in employment-income advantage associated with secondary completion.*

Between 1980 and 1985, secondary-school graduates approaching middle age, in the 30- to 34-year-old cohort, experienced a substantial improvement in their relative earning power vis-à-vis those who had no secondary diploma. Census data show that the relative employment earning advantage of 30- to 34-year-olds jumped from 3.0% in 1980 to 10.6% in 1985. Moreover, the strengthening of the income value of the secondary-school diploma for this cohort was accompanied by only a relatively small loss (2.9%) in real-dollar employment income.

The census data also show that severe losses in employment earnings between 1980 and 1985 were prevalent across all educational categories for 20- to 24-year-olds. Losses were greatest for people with some university but no certificate or diploma (almost 30%) and least for university graduates (17.1% for those with baccalaureates). Overall, the very young appear to have borne the heaviest burden of employment income loss arising from the 1982 recession restructuring and its aftermath.

Even among 25- to 29-year-olds, income losses between 1980 and 1985 ranged from a low of 4.0% for those with some university or a university certificate short of a bachelor's degree to 14.4% for those with a trades certificate. Overall, then, the first half of the 1980s brought the young modest increases in the relative employment earning value of specific educational attainments, but the general employment-earning power of younger compared to older workers dropped significantly and disproportionately.

A Modest (and Incomplete) Recovery in Earning Power Among the Young, 1985–1990

Despite the onslaught of the 1989 recession, 1990 census data show a modest, though incomplete, recovery in the real-dollar earning power of young people in Canada. That picture, however, is very mixed in terms of both income premiums for specific educational attainment levels and residual income loss. The selected results that follow are presented generally in order of five-year age cohorts from 20- to 24-year-olds to 30- to 34-year-olds, first for secondary graduates and then for those with more advanced levels of educational attainment.

Once again, census data show the situation for secondary-school diploma holders vis-à-vis their age peers who left high-school without a diploma. As shown in Table 5, the trend of an increasing relative income advantage for 20- to 24-year-old secondary-school graduates over high-school leavers of the same age continued at about the same rate (approximately 3%) as over the first half

TABLE 5

Mean Employment Income for Secondary Graduates for Canada, Provinces, and Territories: Percentage of Advantage over Category 2, Some High-School

	1980		*1985*		*1990*	
Age	*Mean Empl. Income*	*% Advantage Over #2*	*Mean Empl. Income*	*% Advantage Over #2*	*Mean Empl. Income*	*% Advantage Over #2*
20–24	$10,901	7.3	$8,828	11.0	$8,958	13.3
25–29	$14,107	6.3	12,924	10.2	$12,562	9.1
30–34	$15,295	3.0	14,856	10.6	$14,413	8.5

*2% census data sample for 1980 and 1985, 3% for 1990; Public Use Micro-Data File Tapes; 1981 dollars.

of the 1980s. For 20- to 24-year-old secondary-school graduates, however, the "recovery" of real-dollar earning power between 1985 and 1990 was only 1.5% (from $8,828 to $8,958). For the decade as a whole, then, secondary-school graduates in this age range were left to balance a 6.0% gain in income advantage over secondary leavers against a 17.8% loss in earning power (from $10,901 in 1980 to $8,958 in 1990). For a potential dropout in tune with the employment-income situation of young adults, then, would the dominant message be "Staying in school is *relatively* profitable" or "Whatever I do, I'm doomed to live with rapidly declining employment income and a rapidly declining standard of living"?

Among 25- to 29-year-olds, the nearly 4% increase between 1980 and 1985 in the advantage enjoyed by secondary-school graduates over secondary leavers began to erode (from 10.2% in 1985 to 9.1% in 1990). Worse, however, an 8.4% loss in employment income during the first half of the decade (from $14,107 to $12,924) grew to 11.0% for the decade as a whole (from $14,107 to $12,562). The same patterns were evident for 30- to 35-year-olds who saw their almost 7% gain in employment income advantage over high-school dropouts during the first half of the 1980s recede by over 2% from 10.6% in 1985 to an 8.5% advantage by 1990. Secondary-school graduates in this cohort, moreover, who had lost 2.9% in average employment earnings during the first half of the 1980s (from $15,295 to $14,856) found that they had lost 5.8% for the decade as a whole (from $15,295 to $14,413).

Table 3 summarizes the extent and magnitude of average employment income loss experienced by the young in Canada between 1980 and 1990. With very few exceptions, these losses are strong enough to correspond to a seriously reduced standard of living. Against such a backdrop, the argument that the secondary-school diploma — or other levels of educational attainment — still represent a net

relative advantage in average employment income may be less compelling as an argument for remaining in school at a time when young people of all educational levels sense their standard of life — and life prospects — in substantial decline.

Census data summarized in Table 6 indicate that, for the Canadian population as a whole, the relative employment-income advantage associated with educational-attainment levels beyond secondary-school graduation is in significant decline. Although the picture is mixed for those with trades certificates (an 8% decline, from 32.6% to 24.6%, in advantage over secondary-school graduates to 1985 followed by a 2.3% recovery to 26.9% in 1990) and similarly mixed for those with other non-university certificates or diplomas (down from 21.9% in 1980 to 19.8% in 1985 with a rebound to 22.0% in 1990), all other attainment categories saw a decline in their relative average employment income advantage over secondary-school graduates in both 1985 and 1990. In short, although the average relative incremental employment earnings value of post-secondary qualifications remains considerable in Canada, they are, in most cases, in decline — and in decline relative to income levels associated with a secondary-school diploma.

A breakdown by age cohort of these data reveals a more detailed picture of the relative employment earning advantage over secondary-school graduation for young people 20 to 34 years-of-age. To conserve space, some of the more salient results of such a cohort-wise analysis are summarized below without presenting the underlying data in tabular form.

For persons in the 20- to 24-year-old group, a trades certificate offered a 3.5% income bonus over secondary-school completion in 1980 (4.4% if students are excluded), a marginal disadvantage in 1985, and a 5.3% advantage in 1990 (4.8% if students are excluded). In general, throughout the decade, males in this age cohort with a trades certificate enjoyed an employment income advantage over those with secondary-school diplomas 5% to 7% superior to that of similarly qualified females (for whom, in both 1980 and 1985 a trades certificate corresponded to a marginal income disadvantage over simple secondary completion).

In all other categories except "other non-university with certificate or diploma," further educational attainment corresponded to strong employment income disadvantages over secondary-school completion. Of particular interest is the relatively strong income disadvantage experienced by young male university graduates in the 20–24 age range whose income disadvantage compared to secondary-school completion was two to three times that of females over the period. Part of these income disadvantages, of course, can be attributed to substantial numbers of students who may be involved in further study. Nonetheless, given the relatively small (although increasing) percentage of baccalaureate degree holders who advance to graduate study, these figures suggest that the young (especially males) continue to experience a substantial reduction in earning power during early adulthood associated with university degree completion.

TABLE 6

Population 15 Years and Over by Sex, Highest Level of Schooling and Employment Income Groups for Canada, Provinces, and Territories: Percentage Advantage over Category #3, High-School Graduation

Census Year	*Female*	*% Advantage Over #2*	*Male*	*% Advantage Over #2*	*Both*	*% Advantage Over #2*
			3. Grade 9–13 with secondary school certificate			
1980	$9,306		$17,069		$13,109	
1985	$9,352		$16,228		$12,759	
1990	$10,138		$16,607		$13,263	
			4. Trades certificate or diploma			
1980	$10,147	9.0	$20,388	19.4	$17,380	32.6
1985	$9,846	5.3	$18,793	15.8	$15,901	24.6
1990	$10,818	6.7	$19,743	18.9	$16,834	26.9
			5. Other non-university with certificate or diploma			
1980	$11,459	23.1	$21,593	26.5	$15,977	21.9
1985	$11,469	22.6	$20,289	25.0	$15,290	19.8
1990	$12,609	24.4	$21,003	26.5	$16,185	22.0
			6. Some university without certificate or degree			
1980	$8,410	–9.6	$16,842	–1.3	$13,454	2.6
1985	$8,371	–10.5	$15,284	–5.8	$12,315	–3.5
1990	$9,052	–10.7	$15,196	–8.5	$12,315	–7.1
			7. Some university with certificate			
1980	$14,537	56.2	**	N/A	$19,228	46.7
1985	$13,867	48.3	**	N/A	$17,805	39.5
1990	$14,877	46.7	$22,764	37.1	$18,178	37.1
			8. University with bachelor's degree			
1980	$15,161	62.9	$26,225	53.6	$21,882	66.9
1985	$15,152	62.0	$25,673	58.2	$21,050	65.0
1990	$16,552	63.3	$26,112	57.2	$21,640	63.2
			9. University with degree or certificate above bachelor's			
1980	$20,252	117.6	$36,097	111.5	$31,591	141.0
1985	$20,387	118.0	$35,044	115.9	$30,320	137.6
1990	$21,938	116.4	$34,988	110.7	$30,185	127.6

*2% census data sample for 1980 and 1985, 3% for 1990; Public Use Micro-Data File Tapes; 1981 dollars.
**Standard Error of the Mean ³ $300.

While the census data used here do not yield significant means for 20- to 24-year-old males if students are excluded, results for both sexes combined but with students excluded show that the relative advantage of a bachelor's degree increased from 5.6% in 1980 to 14.0% in 1990, a much more optimistic outcome for university completion. The whole-cohort income disadvantage experienced by 20- to 24-year-olds with a bachelor's degree, moreover, declined (from –23.1% in 1980 to –21.3% in 1985 and then to –18.5% in 1990)—but not nearly as quickly as average employment earnings for the same group which sank from $8,386 in 1980 to $6,949 in 1985 (a decline of 17.2%) and then recovered marginally to $7,297 in 1990 for a net decline over the period of 13.0% (only 6.6%, however, if students are excluded from sample). In short, for the 20- to 24-year-old cohort, a baccalaureate was associated with about 5% less decline over the decade in earning power than that experienced by secondary-school graduates of the same age who went from $10,901 in 1980 to $8,858 in 1990, a decline of 17.8%. Although that is good news relatively speaking for this cohort of university graduates, it hardly seems an argument that would convince most faltering or unenthusiastic secondary students to stay in school and aspire to university completion.

Census data on the marginal employment income value of educational attainment levels beyond secondary-school graduation can also be extracted for young adults of 25- to 29-years-of-age from 1980 to 1990. For this age cohort, the average employment income value of a trades certificate mirrored that for a similar certificate for the younger age cohorts. Between 1980 and 1985 the average employment income value of such a credential declined from 16.0% over secondary completion to 8.5% and then recovered to 11.7% in 1990. The good news here for young tradespeople is that, in general, a trades certificate continued to be associated with an income premium over the whole period. The bad news was a net decline of over 4% during the period. These statistics may have been cold comfort for female tradespeople in this age range who moved from a marginal disadvantage (–0.3%) to an equally marginal advantage (0.5%).

In this age range, some university without a certificate corresponded to about a 4% income advantage over secondary-school completion at the beginning and end of the decade with a decline to a marginal negative value (–0.7%) in 1985. It is, however, in this age cohort, that the incremental value of a university degree begins to make itself felt strongly—much more significantly, however, for female university graduates who moved from a 41.5% advantage in 1980 over secondary graduates to a 49.2% advantage in 1990 (even though mean employment income for females with a bachelor's degree in 1990 was still only $14,836 as against a male mean of $17,412). Excluding students yields whole-cohort (male and female combined) advantages about 10% higher for both 1980 and 1990. The good news here, in terms of the marginal income value of the university degree, is that, across both sexes, the income premium increased by 8% to 10% over the period.

Not surprisingly, for adults of 30–34 years-of-age, overall patterns of marginal average-income premiums associated with various educational attainment levels above secondary-school graduation are similar to (but at lower average income levels than) those for the whole working population 15 years and over as a whole. The only noteworthy exception is that for "some university" which shows a 15.4% income advantage for both sexes combined in 1985 and a 12.4% advantage in 1990, in comparison with increasing disadvantage for some university in the population-wide data. Otherwise, the only significant departure in the distribution of marginal income benefits to post-secondary educational attainments for this age cohort from those reflected in the population-wide data lies in a much smaller decrease (48.6% to 46.3%) in the income premium associated with a bachelor's (as opposed to a 3.7% decrease from 66.9% to 63.2% for the population-wide data set).

CONCLUSION

Weighing all of this evidence if it were reflected in the life-histories of a "representative sample" of friends and acquaintances, an average potential Canadian dropout might well conclude that staying in school does offer a substantial *relative* employment income advantage over dropping out. Still, she or he would likely conclude that, in itself, it is a questionable way to achieve a decent standard of living, especially in the short term. Even with the advantages further education offers in early adulthood, prospects are not bright. Trade certification offers a modest and unstable income premium at best in early adulthood (whether judged against the entire cohort or only against non-students). Choosing university yields a major employment income penalty during early adulthood for completing a university degree when compared with the entire 20- to 24-year-old cohort. The situation is better if one compares only non-students, especially in 1990 with a 14.0% employment income premium associated with university completion.

When all the preceding income and attainment data are combined with data on labour-force change in Canada (Canadian Occupational Projections System, 1990; Paquette, 1994, pp. 206–210), the evidence of strong ongoing employment-income benefits to a secondary diploma (or other less-than-university-completion attainments) appears at best mixed. The principal evidence cited is rate-of-return projections. *All such projections, however, assume a relationship of employment earnings to educational attainment that will remain stable over time, at best a questionable assumption in this age of globalization, de-skilling, and massive substitution of technology for human labour.* Certainly that relationship was in considerable flux in Canada between 1980 and 1990.

Overall, what conclusions might a potential high-school dropout draw from the type of information presented here? First, the income premium associated

with secondary-school graduation is real and positive. For 20- to 29-year-olds, however, that premium is between two-thirds and one-half of that for the population as a whole. Although the rewards in relative income advantage for post-secondary attainments of most types remain substantial, potential dropouts may find them unconvincing when completing high school seems in doubt.

The young of all educational attainment levels have suffered a real income loss that is both disproportional to that suffered by the population in general and much greater than any increases in income premiums associated with particular levels of educational attainment including secondary graduation. The young have seen their chances of earning a decent living go down and their chances of earning poverty-level wages go up.

In the face of this negative economic feedback, the key economic rationality question in dropping-out of school becomes the relative psychological importance of an 8% to 13% (in general for the young excepting the statistically doubtful case of 15- to 19-year-olds) income advantage of secondary-school completion—an advantage that increased over the 1980s. Only individual young people can balance that positive incentive to staying in school against their perception of declines of much greater magnitude in their real-dollar earning prospects especially during their twenties. The discontent of "Generation X" is at least understandable when the chief advantage of a secondary-school diploma — other than its enduring value as a passport to post-secondary qualifications — seems to be as a modest buffer against substantial decline in earning power and standard of living. If that seems like a rather negative interpretation to derive from the positive and increasing relative income advantage enjoyed during the 1980s by secondary-school graduates in Canada, it should be remembered that the gains have been much far more than offset by net losses in real-dollar income — whether students are excluded or not. The chances of earning only poverty wages, moreover, have risen substantially over the decade for young secondary graduates.

NOTES

[1] Data on income and education published by Statistics Canada based on a 20% sample are incomparable in various ways and hence useless for inter-census comparisons. All figures presented in the tables and discussion that follow were calculated using basic SPSS frequency-distribution tools directly on data in the Statistics Canada individual-file Public Use Micro-Data Files, 2% sample (3% for the 1990 data set). Only groups and categories with relatively large numbers of cases and hence with standard errors of the mean of less than $300 in mean employment income are tabulated or discussed. It should be noted, of course, that the census data used here are subject to all the reporting errors and other problems endemic to census data and do not take into account employment income not reported for income-tax purposes — and hence "black market" earnings.

[2] All dollar amounts are in 1986 constant dollars calculated with the complete Statistics Canada annual Consumer Price Index.

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