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The impact of factors on trajectories that lead to a high school diploma and to participation in post-secondary education among those with low reading competencies at age 15

REPORT

by:

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Meta Research and Communications
and Dalhousie University

prepared for:

Learning Policy Directorate
Strategic Policy and Research

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Executive Summary

This report analyses the educational pathways of 6,342 Canadian youth who at age 15 scored below the level considered necessary for effective functioning in a knowledge-based society. For this purpose, it utilizes cycles 1 to 3 of the Canadian longitudinal Youth in Transition Survey (YITS). Despite their relatively low reading achievement scores, only 15% dropped out of high school by age 19, and almost two-fifths had enrolled in post-secondary institutions.

The fruitfulness of the concept of educational resilience is assessed to account for the fact that a substantial portion of young people overcame the barriers of below-average reading achievement as tested at age 15. The richness of the YITS data permitted a detailed examination of the multiple effects of two components of resilience on educational outcomes: a) the availability of social and institutional supports, such as peers, parents, teachers, and the community, and b) youth's approach to life and participation in various activities that enabled some of them to overcome the obstacle associated with their limited reading performance. The analysis focuses specifically on the social supports and enabling mechanisms that were measured at age 17, with some comparisons to changes that occurred between age 15 and 17.

Comparative profiles of high school leavers, graduates, and participants of postsecondary education indicate that both social supports and personal enabling actions appear to have beneficial consequences on subsequent educational pathways. In general, dropouts report having the fewest social supports and are least likely to exhibit resilient approaches to their educational careers. In contrast, those who pursued postsecondary education appear to have many social supports and are most likely to have engaged in enabling practices and orientations to life. Typically, high school graduates who did not pursue any postsecondary education by the age of 19 were in between these two groups. The social/institutional supports significantly associated with educational trajectories are:

- People that could be counted on in times of trouble, in whom one could trust, confide, and obtain advice;
- Parents who value education;
- A network of friends who consider education important;
- Teachers who treat students with respect, are considered fair, and provide extra help when needed;
- Schools that provide activities to learn about work and education; and
- Participation in volunteer work and extracurricular activities, both at school and in the community.

The social and institutional supports are ones over which the individual student may have little control, and although their absence may pose additional barriers for the child, these are far from decisive. The student's own beliefs, behaviours, and decisions matter. In addition to social supports, numerous personal enabling mechanisms appear to be consequential:

- Taking personal initiative to acquire information and skills;
- Academic effort in the form of not skipping classes and putting more time into homework;
- Not giving up when encountering difficult school work; and
- Avoiding risky behaviours such as drinking alcohol (as well as exercising moderation when one does drink), using marijuana or hash, intensive paid employment during the school year, and sexual activity leading to parenthood.

Not surprisingly, the analyses show that two components of solid academic performance in school, especially in the final year of secondary school, are of paramount significance: overall marks, and whether math and language subjects were taken at a university-preparatory level. The multivariate analysis shows that part of the underlying dynamics by which resiliency improves educational outcomes is through improved academic performance. That is, youth with more social supports and who exercised a variety of enabling mechanisms are able to convert these resources into improved academic performance. At the same time, the presence of social supports and the exercise of enabling behaviours seems to act both as further protection against dropping out and as encouragement to pursue postsecondary education, even after the effects on academic performance have been taken into account. In other words, even with equal grade-point average and academic program (university-preparatory or other), resilient youth are less likely to drop out and more likely to pursue postsecondary education than are youth who do not enjoy as many social supports and/or have not activated enabling mechanisms.

Additionally, anything students do to improve their academic performance translates directly into better educational trajectories. Of some significance in this regard is the fact that earlier academic performance is not as consequential as later performance, although the earlier performance leaves its mark and cannot be totally erased. Like their parents, the students' own aspirations are vital, and have an effect additional to that of their parents.

Educational pathways are unevenly distributed between schools, since about a third of the variation in educational pathways is found at the school level. As much as half of these school-level differences are due to student composition and selection factors, however, rather than to school effectiveness. Future analyses might fruitfully assess what factors are implicated that might represent differences in school effectiveness.

This report examines how the high school experiences and events that transpired between ages 15 and 17 shaped the decision of low reading achievers to nevertheless complete high school and/or pursue postsecondary education. The findings reinforce the conclusion that, while there are barriers to these young people's ability to achieve their high aspirations, there are also many facilitating factors. From a policy perspective, the complexity of the web of factors documented in this report suggests that no simple policy mechanism would dramatically improve the educational pathways of Canadian youth.

1. Introduction

Research has consistently shown that prior academic performance is the most important predictor of subsequent educational pathways (see the literature review below). This means that certain pathways are typical, in the sense that they are the most likely pathways: low academic performers typically curtail their education, while high performers pursue postsecondary education (PSE), especially in university programs. At the same time, prior academic performance is far from deterministic nor does it work the same way for all adolescents. Numerous protective factors can be encountered along the way. Protective factors provide youth with personal controls (such as moderate hours of employment in the labour market, positive academic self-concept, and school engagement and attachment) combined with solid social controls (for example, participation in adult-supervised extra-curricular activities, and parental monitoring). As a result, substantial minorities of young people graduate from high school and participate in PSE despite weak earlier academic performance. The importance of the research conducted for this paper is that it focuses squarely on one of the atypical pathways, namely initial low reading achievement followed by subsequent high school completion and participation in PSE.

It is informative to place youth's current educational pathways into historical perspective. Educational aspirations have been rising, and at the time of the baseline Youth in Transition Survey (YITS) survey in 2000, these 15 year olds had remarkably high aspirations and expectations: fewer than one in a hundred said they would be satisfied with less than a high school certificate while two thirds aspired to obtain at least one university degree (Thiessen and Looker 2004). Further, even dropouts virtually unanimously believe that it is necessary to do well in school to be successful in life (Stoner-Eby 2002).

In line with rising expectations is an increase in educational attainments, with about a third of Canadian young adults (aged 24-35) in 1991 having obtained some postsecondary education compared to over half in 2003 (Shaienks, Eisl-Culkin and Bussière 2006:10). At the other end of the educational continuum, the proportion who fail to complete high school has declined. The Canadian dropout rate between the beginning and the end of the 1990s fell by a third, from 18% to 12% (Bowlby and McMullen 2002:26). Part of this decline might be a reflection of labour market conditions, since dropout rates tend to be higher in provinces where the youth unemployment rate is lower (Shaienks, Eisl-Culkin and Bussière 2006:9), but undoubtedly part of it is due to the increasing consensus about the importance of education for young people's future life chances.

A final historical note is the changing nature of school-work transitions. Youth transitions into and out of education and the labour market have become more numerous, protracted, and fluid, showing that decisions to curtail education are reversible, and frequently are reversed. Increasing proportions of dropouts later resume their education, both in the US (Entwisle, Alexander and Olson 2004) and Canada (Shaienks, Eisl-Culkin and Bussière 2006). These findings led to recognition that school-work transitions are better conceptualized as dynamic processes over time, rather than as discrete events. They also suggest that educational pathways may be more individualized today than previously, as argued by some (Furlong

and Cartmel 1997). In line with this, Entwisle et al. (2004:1197) conclude that “dropouts who return possess a resiliency” (measured as teachers' rating of the child at age 14 on happiness, creativity, enthusiasm, withdrawal, and timidity) “that enables them to overcome their earlier academic failures.”

Research using longitudinal designs indicates substantial flux in student attitudes, behaviours, and academic performance over time. Measurements taken later in time prove to have stronger effects than those taken earlier, suggesting that prior negative factors can be overcome by later events (Marjoribanks 2003). However, they also show that the earlier events continue to leave their mark, even when later measurements are included in the model (Marjoribanks 2003). To capture these processes requires longitudinal data, such as YITS, that permits one to track educational pathways over time.

The determinants of educational pathways involve connections between biological, cognitive, psychological, sociological, economic, and cultural factors. These factors operate at multiple contextual levels, such as the individual, their peers, the family, teachers and schools. Both this literature review and the statistical analyses are organized around capital conversion within a resiliency framework. Many influences on educational trajectories can be understood as the conversion of one type of capital into another type of capital: how, under what conditions, and how effectively, are social assets converted to improved educational trajectories? Further, to what extent are the enabling mechanisms effective in helping young people overcome the educational barrier of low reading achievement?

In the context of low reading achievement, effective capital conversion can be conceptualized as educational resilience. Resiliency is generally thought of as the ability to overcome adverse conditions or obstacles (Catterall 1998; Wayman 2002). The “obstacle” considered here is comprised of below-average reading achievement at age 15. Educational resilience would be manifested by better educational outcomes--completing high school and pursuing postsecondary education--than might be expected, given that obstacle.

As Wayman (2002:168) notes, resilience “is a multifaceted, complex phenomenon” with little consensus to date on its components or its measurement. It is fruitful, however, to think of resilience as having two main aspects: social/institutional supports and individual enabling practices. In practice the distinction between these two aspects becomes blurred, since seeking and finding social supports is itself enabling. Nevertheless, the distinction is of some value since social/institutional supports highlight the importance of educationally-relevant social resources; the enabling practices, in contrast, focus on individual behaviours, values, and beliefs through which these assets are converted to human capital. For this report, these two aspects are conceptualized as follows:

Social/institutional supports

- **Friendships:** A sense that one is not alone but can count on others for help.
- **Peer support:** Two aspects of peer support are considered. The first is having a network of friends with high educational aspirations; the second is having peers in whom one can confide and obtain help in times of trouble.

- **Teacher educational support:** Having teachers who have a personal interest and provide help when needed.
- **Parent educational support:** Having parents who consider education to be important.
- **School support:** Participation in school-provided activities to learn about work and education.
- **Volunteer work:** Participation in volunteer activities. This is one form of participation in adult-supervised activities that may increase one's stock of social capital.
- **Extracurricular activities:** This is a second form of participation in adult-supervised activities in which a variety of social skills may be augmented.
- **Paid employment:** Working during high school is a third form of participation in adult-supervised activities that may have a variety of beneficial consequences.

Enabling mechanisms

- **Personal initiative:** Participation in activities on one's own initiative that increase one's knowledge about the world of work and education.
- **Perseverance:** Persistence when facing difficult tasks.
- **Academic effort:** Spending time on homework and not skipping classes.
- **Risk avoidance:** Avoidance or moderate use of alcohol and marijuana or hash. Likewise, unprotected sexual activity that leads to teenage parenthood is a salient risk factor at this age. An additional risk considered here is intensive involvement in paid employment during the school year.
- **Academic self-concept:** Self-assessment of having a solid stock of human capital skills.

At the student level, the analyses focus on those who can be thought of as having below average amounts of human capital at a previous point in time, whether because of limited cognitive abilities or for other reasons. Under what circumstances and through what actions can they nevertheless obtain educational credentials that are likely to increase their human capital skills? Since all capital accumulation requires labour, can they convert increased personal effort in homework, for example, into improved educational pathways. Likewise, can skill in using computers be converted to improve academic achievement and thereby increase educational attainment?

At the household level, parents differ in the amount of economic, cultural, and social capital they possess, and the sheer amounts of these types of capital profoundly affect their children's educational pathways. But in addition, parents can choose to make financial investments of various sorts in their children's education, even when their resources are limited. The question here is which types of investments (such as equipping the home with educational materials and home computers/internet, or enrolment in private schools or music/dancing classes) are efficient vehicles for improving educational outcomes.

At the school level, the question is whether certain schools yield a higher return (in terms of educational outcomes of their students) for identical volume of capital contained in the intake composition of their students.

The life course perspective focuses on important transitions (and their sequences) such as leaving the parental home, forming relationships, and residential/school moves. It sensitizes us to the “linked lives” of youth with that of their parents, peers, and teachers, and that their educational decisions are embedded in a matrix of institutional parameters, such as the distinctly different transitions between high school, CEGEP, and universities in Quebec. Given the age of the sample being studied here, few will have experienced some of the transitions known to be important, such as parenthood. Findings from the older YITS cohort reveal that dropouts were almost three times as likely as graduates to be married or living with a partner, and also substantially more likely to be parents (Bowby and McMullen 2002).

2. Literature Review

In an important sense, the issues investigated in this paper are novel. This is because educational pathways are explored focusing specifically on young people who at a previous point in time showed signs of being at risk of poor educational outcomes. The literature uncovered few studies that examined educational pathways specifically among young people whose prior academic performance (whether assessed on the basis of standardized achievement scores or marks obtained in school) was relatively poor. The task of this paper is to uncover those factors that led to success despite the obstacle of low prior reading achievement. As Crosnoe et al. (2002:701) admonish, “more attention needs to be paid to the success stories—those adolescents who succeed” despite various barriers.

2.1 Determinants of educational pathways

This section provides a review of empirical studies that have investigated the effects of factors considered in this report to be aspects of resiliency on educational pathways. Except where otherwise noted, the findings indicate unique effects, since they remain after a variety of statistical controls have been introduced.

2.1.1 Academic effort and interest

A key question is the extent to which individual effort can overcome the barriers often associated with low educational attainment. A variety of different aspects of academic effort have been employed, ranging from the amount of homework done, skipping classes or truancy, to interest in, enjoyment, and participation in classroom discussions. These have generally had independent effects on subsequent educational pathways (Bowlby and McMullen 2002; Dinovitzer, Hagan and Parker 2003; Gilbert et al. 1993; Lambert et al. 2004; Stearns, Moller and Blau 2004; Stoner-Eby 2002). In a longitudinal study, Meltzer et al. (2004) compared the processes of academic achievement among students with learning disabilities with those not having such disabilities. They found that students who perceive themselves as less competent view the tasks as more difficult and therefore “give up” more easily (make less effort) and through this reduced effort their subsequent achievement is reduced. In this context, an important finding is that academic achievement was found to be related to parental rating of their child’s perseverance in the face of difficulties (Eccles, Vida and Barber 2004), which the authors considered to be a form of resiliency.

2.1.2 Participation in adult-supervised activities

Extracurricular participation, both inside and outside of school, is positively associated with educational pathways (Aschaffenburg and Maas 1997; Butlin 1999; Mahoney 2000; Videon 2002). It is known that students coming from privileged homes are both more likely to participate in extracurricular activities and to score higher on standardized achievement tests. Consequently, statistical controls on these factors reduce—but do not eliminate—the magnitude of the association of extracurricular participation with educational pathways. This suggests that spending time in adult-supervised activities increases the likelihood of good educational trajectories.

Like extracurricular activities, participation in volunteer work implies time spent in adult-supervised activities. This may be the reason why volunteer work is found to be associated with increased engagement in school and a sense of self-worth. Participation in volunteer work also appears to have beneficial effects on various educational outcomes, including marks and educational attainment. However, these effects diminish substantially after including controls on parental education and social status (Eccles and Barber 1999), suggesting that it may not have independent effects.

2.1.3 Peer influence

Two aspects of peers have been implicated in studies of educational attainment. First are the educational plans of one's friends. Zaff (2003) found that students who reported that at least one friend dropped out were less likely to pursue PSE. Likewise Tomkowicz (2003) reports that the likelihood of immediate participation in PSE steadily increases with the number of friends planning to participate in PSE. Second is the academic orientation of one's peers. Having friends who took school seriously was related to high attainment, and more young women than young men had peer groups that took school seriously (Tinklin and Croxford 2000); the latter finding might be one of the reasons females generally have both more resilience and better educational outcomes than males (Eccles, Vida and Barber 2004; Wasonga 2002).

2.1.4 Parental educational support

It is well known that parental income, education, and occupation have relatively strong effects on all markers of educational attainment, such as dropping out (Bowlby and McMullen 2002; Crowder and Teachman 2004; Dinovitzer, Hagan and Parker 2003; Pong and Ju 2000; Stearns, Moller and Blau 2004; Stoner-Eby 2002; Teachman, Paasch and Carver 1997) and pursuing postsecondary education (Butlin 1999; Cheung and Andersen 2003; Crosnoe, Mistry and Elder 2002; Lambert et al. 2004; Zaff et al. 2003). As important as parental socioeconomic status may be, the aspirations and expectations they hold for their children's education appear to be even more pivotal, with a recent review of the literature finding them to be the most salient form of parental influence (Fan and Chen 2001). While parental expectations are tempered by reality constraints, such as the child's

academic performance and engagement in school as the child progresses through the school system (De Broucker 2005; Looker and Thiessen 2006), these expectations nevertheless appear to exert a strong independent effect on educational pathways after controlling for marks and parental SES (Crosnoe, Mistry and Elder 2002; Tomkowicz and Bushnik 2003).

2.1.5 Teacher support

Bouchey and Harter(2005:680) document in a longitudinal study of middle school children that support from both parents and teachers is important for subsequent academic performance and that “perceived support from teachers had a direct effect on math/science performance.” Likewise Hymel and Ford (2003) found that even after controlling for cognitive ability, later school performance is linked to the early influences of teachers as well as parents. Crosnoe et al. (2004) found only a modest relationship of teacher support with academic achievement.

2.1.6 Paid employment

It is well known that intensity of employment during high school has a curvilinear effect on dropout rates, with those not working at all as well as those employed for more than 20 hours per week being more likely to drop out than those who work a moderate amount (Bowlby and McMullen 2002; Tomkowicz and Bushnik 2003). Two reasons have been suggested for the effect of intensive employment. First, it seemed likely that intensive employment would interfere with school performance, affecting hours of homework, absenteeism, and marks. However, Warren (2003) failed to find these connections. A second reason is selection effects: intensive employment is pursued by students who already have disengaged from school. The evidence in favour of this explanation is mixed, since it has been found that intensive working in the last year of high school has a negative effect on *completion* of both community college and university, but especially for university. (Butlin 2000). This implies that dynamics other than disengagement from educational institutions is behind the relationship. An important additional finding is that those who worked during the school year prior to dropping out were more than twice as likely to return as those who did not work (Entwisle, Alexander and Olson 2004). This suggests that the labour market did not "pull" students out of school. Rather, it suggests that those who were able to combine work with school had greater motivation or self-discipline, or recognized that their jobs would not improve unless they returned to school.

2.1.7 Risk avoidance

Peer influence is also connected with involvement in risky behaviours. In a longitudinal study Sussman et al. (2004) found that youth in alternative high schools who reported that they intended not to use soft drugs during the next year were more likely to have graduated from high school five years later. The authors interpret this from a resiliency point of view.

From a life course perspective, early initiation of sexual activity is a risk factor with respect to educational trajectories. For the older cohort of the YITS, Bowlby and McMullin (2002) found that youth who had become parents were more likely to drop out of high school; the same holds true for those who formed marital-type relationships. Similarly Krahn (2006) found that early transitions to marriage reduced the likelihood of earning any PSE credential. Not surprisingly, early parenthood is more deleterious for girls than for boys; among females, those who expressed the intention to postpone parenthood until after the age of 24 had higher educational attainments than those who intended to have children earlier, whereas among males there was no association (Scott 2004). It should be kept in mind that previous studies often were not based on a longitudinal design. Those that were, generally showed that youth who became teenage parents had lower academic performance before the pregnancy occurred (Furstenberg 2003:28). There appear to be relatively large school and neighborhood effects on both alcohol/marijuana use and early onset of sexual activity (Sampson, Morenoff and Gannon-Rowley 2002; Teitler and Weiss 2000).

2.1.8 Academic performance

While the above literature review documents the relevance of resiliency to educational outcomes, ultimately how well one performs in class is paramount. Research consistently shows that all aspects of academic performance are crucial for understanding subsequent educational transitions (Butlin 2000; French and Conrad 2001; Glick and White 2004; Lambert et al. 2004; Stearns, Moller and Blau 2004; Stoner-Eby 2002; Tomkowicz and Bushnik 2003; Zaff et al. 2003). Yet many young people with sufficiently high marks to complete high school and to enroll in postsecondary education don't. This raises the question of whether resiliency operates simply by improving academic performance, or whether it has additional direct beneficial effects on keeping young people from dropping out and encouraging them to pursue postsecondary education.

Many gender differences are found in young people's academic performance, attitudes and beliefs, activities, and efforts. Girls have higher educational aspirations, work harder to achieve their ambitions, and consequently perform better academically, enabling them to pursue PSE (Finnie, Lascelles and Sweetman 2005; Marjoribanks 2003; Thiessen and Looker 2004).

2.1.9 School and neighborhood effects

Schools differ in how much they facilitate their students' educational progress (Attewell 2001; Audas and Willms 2001; Cook et al. 2002; Gamoran 1996; Morgan 2001; OECD 2001; Sullivan 2001; Willms 2004; Zhang 1999). Once the intake characteristics have been controlled, some types of school advantages evaporate, such as the higher reading achievement scores in private schools (Willms 2004). Nevertheless, there are genuine school effects that enable some schools to essentially yield higher rates of returns for their students. That is, after controlling for the intake characteristics of students, schools differ in their effectiveness of producing improved educational outcomes, as well as in minimizing inequalities of outcomes due to parental SES (Tinklin and Croxford 2000; Willms 2004). Since above-average students appear to do relatively well regardless of the school, it is how schools help struggling students that is particularly important. Attempts to uncover the attributes that define "value added" schools have been only partially successful. Willms (2004) concludes that successful schools differ in several small but perhaps important ways, such as greater teacher autonomy, formal student assessments, and a strong disciplinary climate.

3. *The data and measures*

This report analyses data from cycles 1 to 3 of the Youth in Transition Survey (YITS)/Program of International Student Assessment (PISA) survey of students who were 15 years of age in the baseline survey. The analyses are restricted to the 6,342 youth who scored below Level 3 on the reading achievement test administered during the first cycle in 2000 and who provided information on educational pathway at cycle 3. The outcome variable is the educational pathway of these young people at cycle 3, when they were 19 years old. For the purposes at hand, three groups are of particular interest: dropouts, high school graduates who did not pursue PSE, and those who participated in PSE.¹ Table 1 provides the definition of these groups, as well as their distribution.

Table 1		
Definition of educational pathways and their distribution		
Group	%	Definition
High school dropouts	15	Did not complete the requirements for a high school graduation certificate or its equivalent and are currently not enrolled in any educational program. It excludes those who participated directly in a PSE program without graduating from high school.
High school graduates	49	Obtained a high school completion certificate or its equivalent but have not participated in any PSE program. This group includes those currently enrolled in a high school or its equivalent.
PSE participants	37	Currently or previously enrolled in, or completed, a PSE program.

¹ About one in ten young people at age 19 had not completed the requirements of a high school completion certificate, but were still pursuing such. These are considered the equivalent of high school graduates because they have not made the decision to drop out. Given their age, they represent those whose high school completion has been delayed for reasons such as grade retention, prior dropping out and returning, or disabilities that have delayed the normal progression through the school system.

4. Findings

The first section of the analysis profiles how dropouts, high school graduates, and those who pursued postsecondary education (PSE) by age 19 differ. The profiles are based on cycle 2 (age 17) data, focusing primarily on high school activities, beliefs and attitudes, and academic performance. This will show which of these activities, attitudes, and beliefs appear to function as facilitators of good educational outcomes.

For some of the variables, identical information is also available for cycle 1. In some instances it is instructive to compare the profiles at the two time points. Changes between age 15 and 17 may suggest possible dynamics during the crucial high school years. For example, it may be that those who pursued a PSE became more engaged in various pro-social activities during their high school careers. In some of the graphs and tables, this longitudinal comparative perspective will be shown.

Following the profiles, the results of multinomial regression analysis that contrasts the three groups defined above will be presented. Here the question addressed is which of the possible facilitators identified in the profile analysis have direct effects on educational pathways once the demographic and other baseline variables have been statistically controlled.

4.1 Description of low reading achievers

Before profiling the educational pathways taken by low reading achievers, it is important to sketch how low reading achievers differ as a group from their high reading achievers counterparts. A first important difference is that low achievement on the reading test is intimately connected with low outcomes on all other measures of academic performance among 15-year olds. Low reading achievers obtained lower marks in all subjects, were less likely to be taking either math or a language class at the Grade 10 level, were less likely to be taking either math or language classes at a university-preparatory level, and obtained lower math achievement test scores. These academic difficulties were long standing for many of them, since they were also more likely to have repeated a grade in elementary school. In short, performance in reading is not an isolated event, but rather one component of poor academic performance generally.

A second important difference is that low reading achievers scored lower on all those factors that can be considered to be either the causes or the consequences of their low reading results. These include less pleasure in reading, less academic interest and effort, lower self-assessed academic ability and confidence, less time spent on homework, lower educational aspirations, more pessimism about their job future, and less likely to consider education to be important to themselves or to their parents. Respondents in this group are more likely to report having violated school rules and therefore also more likely to have been expelled. Not surprisingly in light of these problems, they believe the teacher-student relationships are not as good in their school. They come from lower SES homes, with fewer cultural possessions and educational resources, and participate in fewer cultural activities. These differences suggest that low reading performance has pervasive causes and

consequences. Individual effort, aspirations, and beliefs are consequential, but so is the socio-economic situation of their parents and the material and cultural resources they provide.

Three demographic factors are also unequally distributed between high and low achievers: youth with health problems, visible minorities and immigrants are over-represented in the low reading achievement sample. It should be noted that none of the other attributes of the home situation appear to be of much consequence to reading achievement. For example, differences in family structure, number of siblings, and residential or school moves have trivial (although sometimes statistically significant) effects.

4.2 Profiles of educational pathways

In this section, the social supports, high school activities, beliefs and expectations of low reading achievers are profiled in relation to their educational pathways. The analyses are based on student reports when they were 17 years old, i.e., using cycle 2 data. In some instances where comparisons are possible and revealing, changes between ages 15 and 17 are highlighted.

4.2.1 Social and institutional supports

A key assumption of the resilience framework is that social supports are vital for overcoming barriers of any kind. Such buffers can come from a variety of different places, such as teachers, parents, peers, and community adults. In this section the apparent effect of each of these sources of social support on educational trajectories at age 19 are documented.

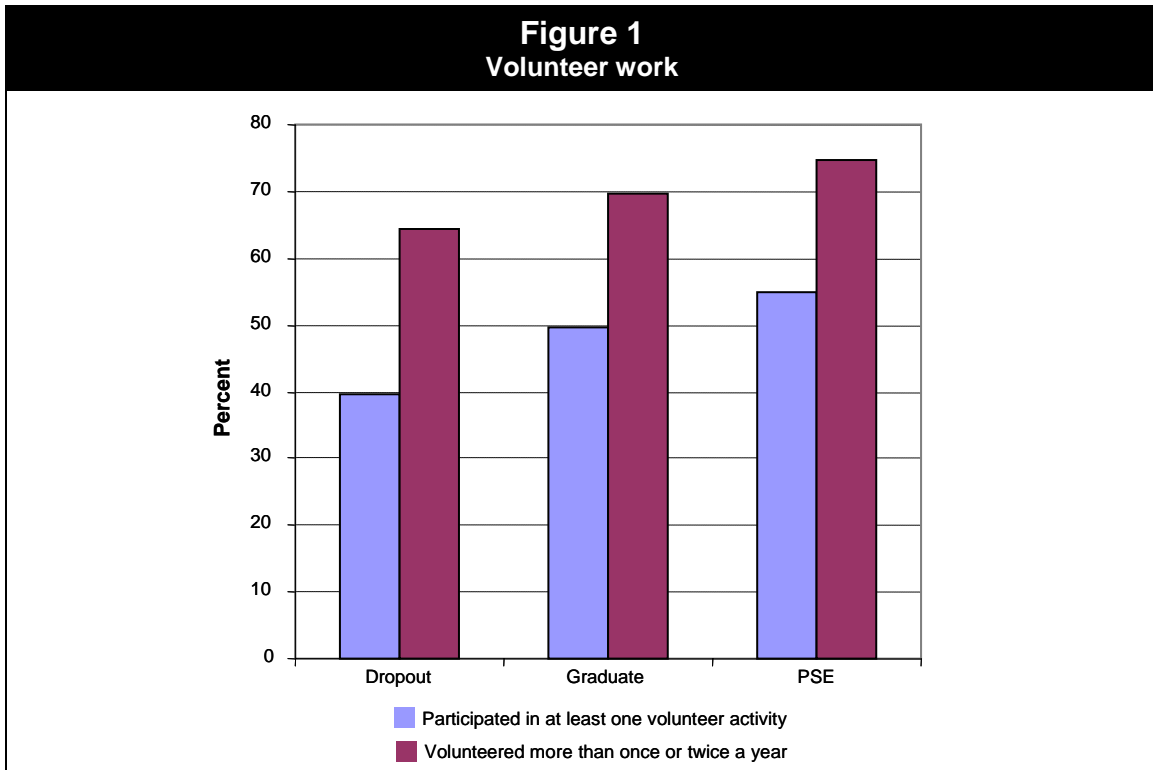
Perceived social supports

The theoretical literature argues that young people who believe they can trust someone and turn to them when they face adverse events become resilient. This expectation is supported in that Table 2 shows a consistent pattern: Dropouts were least likely to report knowing someone who would help them in times of trouble, or whom they could trust or feel comfortable discussing their problems. On all six measures, those who participated in PSE were most likely to report having these types of social supports. The difference in perceived social supports between dropouts and participants of PSE is between 10 and 16 %. While this is not huge, the consistency of the pattern suggests that a sense of not having social supports may be an important factor in these young people's decision to persist in their educational career.

Table 2			
Perceived social supports			
Percent who strongly agree that ...	Dropout	Graduate	PSE
If something went wrong, someone would help me*	33	36	44
I have family and friends who help me feel safe, secure and happy	41	47	56
There is someone I trust whom I would turn to for advice if I were having problems	41	46	54
There is someone I feel comfortable talking about problems with*	26	31	39
There is someone I feel close to*	27	34	43
There are people I can count on in times of trouble	32	37	42
* This item was phrased in the negative but is reversed here for consistency.			

Volunteer work

Young people on the whole are active in volunteer work. The reasons for their participation are varied, ranging from a desire to learn some job-relevant skills, to simply being interested in a given cause. Volunteer work is generally assumed to have positive consequences for the young people themselves, since it exposes them to adult role models in civic/community organizations. From a social capital point of view, young people active in volunteer work are developing their stock of social capital—adults who may be useful sources of information. The question here is whether participation in volunteer work provides social buffers that translate to increased likelihood of pursuing one’s education. Figure 1 indicates that participation in volunteer activities is indeed related to educational outcomes among low reading achievers. While only two in five dropouts participated in any type of volunteer work, this figure rises to 55% among PSE students. This figure also shows that those who volunteered more frequently are more likely to have better educational outcomes.



Participation in extracurricular activities

As important as participation in volunteer activities may be, participation in extracurricular activities appears to be an even more important form of resiliency among low reading achievers. Participation in both school-based and community-based extracurricular activities seems to act as a buffer against dropping out. Stated differently, young people who participate in extracurricular activities at age 17 are decidedly more likely to obtain a high school completion certificate, and even more likely to pursue PSE. Table 3 shows that among those who pursued PSE, only 13% did not participate in any extracurricular activities, whereas over half (56%) participated in both school- and community-based extracurricular activities. In contrast, about a third of high school dropouts did not participate in any extracurricular activities and only three in ten participated in such activities both in school and in the community.

Table 3
Participation in extracurricular activities

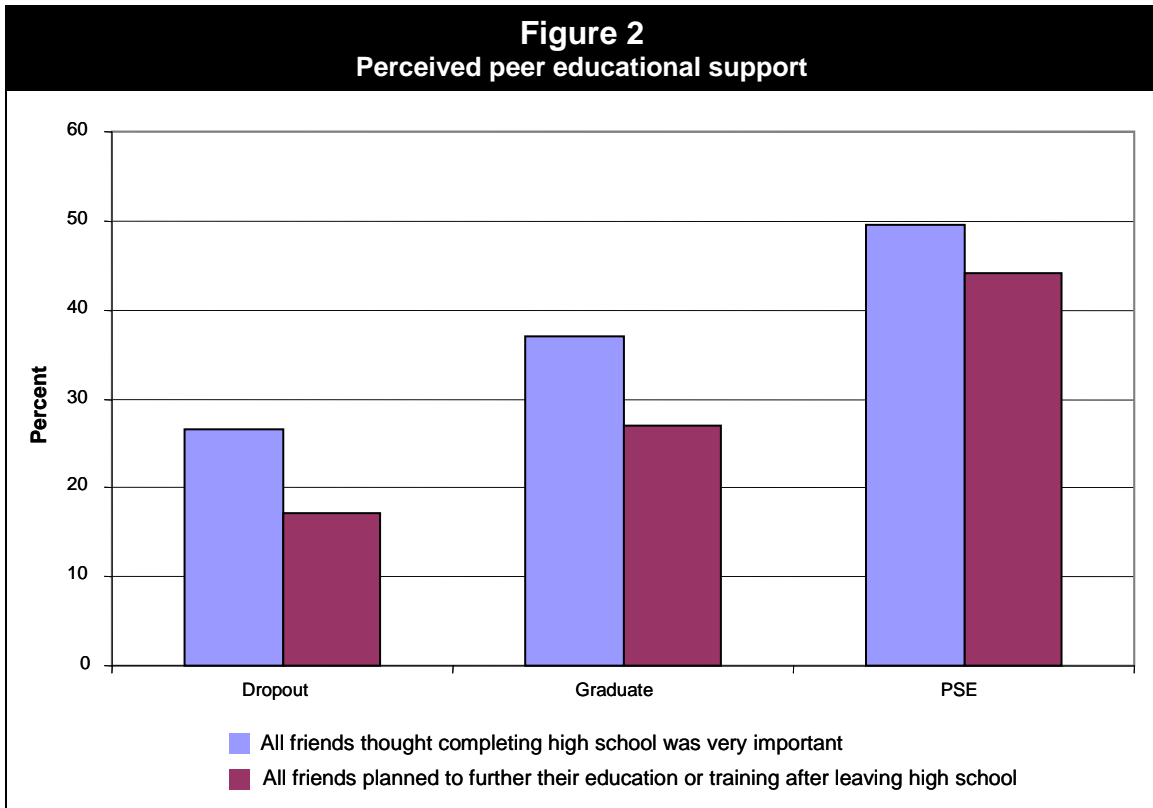
	Dropout	Graduate	PSE
Did not participate in any extracurricular activities	32	23	13
Participated in either school or non-school	38	34	31
Participated in both school and non-school	30	44	56
Total	100	100	100

What participation in volunteer work and extracurricular activities have in common is that both represent time spent in organized and adult-supervised activities. Additionally, neither of them is directly considered an educational activity in the typical meaning of the word. Yet both appear to improve the educational trajectories of young people. In short, the findings suggest that the greater the involvement of young people in organized adult-supervised activities, the better are their future educational outcomes.

Perceived peer support

The literature on peer influences points to their potential negative effect on young people's academic performance and educational pursuits. Peer cultures are often described as standing in opposition to normative activities. Yet peers can also be instrumental in supporting academic and educational pursuits. The data shows little variation in perceived peer support. Regardless of their educational pathways, upwards of about nine in ten respondents felt they had friends at school with whom they could talk about personal things, and who could help them with their school work if needed. Because of the near-universal peer support, it has little effect on educational pathways.

The significance of peers on educational trajectories is in the area of their educational plans. Young people with low reading achievement scores may be encouraged to continue their educational careers if they have friends who value education and who are planning to pursue postsecondary education. As Figure 2 shows, half of those who pursued postsecondary education reported that their school peer network was one in which all of their friends thought completing high school was very important. Compare this with the dropouts, where only about a quarter (27%) reported having such a network of friends. A similar pattern appears with respect to the perceived postsecondary education plans of their peers. Specifically, more than twice as many of those who themselves pursued postsecondary education had a peer network comprised of friends who all planned to pursue postsecondary education than did those who dropped out prior to completing high school (44% versus 17%). These findings confirm that a positive peer network appears to be a vital educational resource for young people whose prior performance in reading was below average.



Teacher support

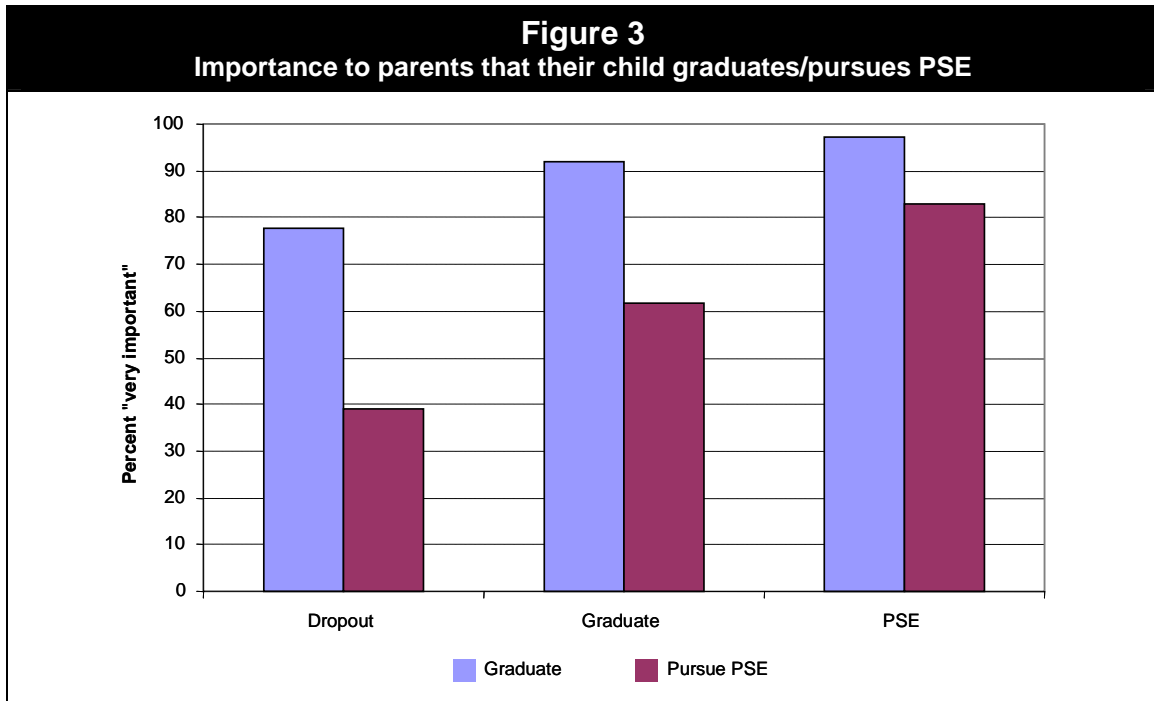
On the whole, low reading achievers feel that their teachers care about them, treat them fairly and with respect, and provide them with extra help when needed. However, such feelings are more prevalent among young people with better educational outcomes, although the differences are modest, with typically a ten percentage point difference between dropouts and PSE participants (see Table 4).

Table 4
Teacher supports

Percent agreeing or strongly agreeing that ...	Dropout	Graduate	PSE
I got along well with teachers	67	77	83
I was treated with as much respect as other students in my class	76	86	90
Most of my teachers really cared about me	83	88	91
There were teachers or other adults in my school whom I could talk to if I had a problem	89	90	89
People at school were interested in what I had to say	80	84	86
Most of my teachers really listened to what I had to say	77	85	87
If I needed extra help, I received it from my teachers	82	89	92
Most of my teachers treated me fairly	81	91	93

Parent support

The literature review indicated that parental valuing of education is one of the more important influences on their children’s educational pathways. This finding is corroborated here: over four in five youth who participated in postsecondary education, in contrast to less than half that proportion among dropouts, felt that it was “very important” to their parents that they pursue PSE (Figure 3).²



School support

A final type of support is the institution of the school itself. Schools differ in the extent to which they provide learning opportunities that prepare their students for either work or postsecondary education. One might think that schools would focus especially on students who are at risk of dropping out and/or not pursuing postsecondary education for instruction on preparing for the world of work. This is not totally born out by the data. As Table 5 shows, those who dropped out of school by the age of 19 were least likely to have participated in *any* of the school-provided activities that might prepare them for either work or further education.

² This finding is not an artefact of selective perception, since a similar relationship was found using parents’ own report from cycle 1 data.

Percent who ...	Dropout	Graduate	PSE
Were taught how to write a resumé	70	83	86
Were taught how to search for a job	72	79	78
Were taught how to prepare for an interview	68	78	79
Were taught about jobs they may be interested	77	83	85
Met with a school counsellor about future education/work	57	69	81
Completed a questionnaire about interests/abilities	55	61	67
Used the internet to help decide college/university programs	29	48	61
Obtained information on student financing	19	32	42
Went on a campus tour	14	19	29
Attended a presentation by people working in various jobs	46	55	59

Given that schools have special curricular programs for those who appear to be headed for a direct school to work transition, it is surprising that those who pursued postsecondary education were nevertheless the most likely to have participated in school-provided job-preparatory activities such as learning to write a resumé, how to search for a job, how to prepare for an interview, and attending a presentation by people working in various jobs. How can one make sense of this? One possibility is that resilient young people take advantage of opportunities to prepare for their future, including participation in activities that are not currently pressing, such as obtaining job seeking skills and career information.

One school-provided activity, namely meeting with a school counselor about either education or work, should be important to all students, regardless of whether they are planning to pursue postsecondary education. On this measure more than 20 percentage points differentiate dropouts from postsecondary students. This supports the interpretation that resilient youth take advantage of available resources, and through this, are able to overcome the educational disadvantages that accrue to low reading achievement.

Of some importance is the fact that the largest difference between dropouts, graduates, and postsecondary students with respect to their participation in school-provided activities is the use of the internet to obtain information on postsecondary programs; less than a third (29%) of those who dropped out used the internet at school for such a purpose, compared to about three-fifths (61%) of those who subsequently enrolled in a postsecondary program. This finding is one of several suggesting that computers and computer skills play a significant role in the educational pathways of young people.

4.2.2 Personal enabling mechanisms

The previous section painted a consistent picture showing that social supports of all types appear to act as resources that facilitated students with below-average reading skills to nevertheless complete high school and, for some, to pursue a postsecondary education. The findings on young people's participation in school-provided activities reported above suggested that resilient youth were particularly likely to take advantage of any available resources. This section continues that theme, by looking at possible enabling mechanisms that might account for good educational outcomes among young people who have below-average reading skills.

Personal initiative to acquire skills

In the second cycle of YITS, respondents were asked which activities they had engaged in on their own initiative over the past year to acquire skills for a job or career. Personal initiative is considered by resilience researchers to be an outstanding attribute. The results, shown in Table 6, support the contention that personal initiative may be an attribute of educational resilience in young people. At the same time, they suggest that personal initiative is but a modest factor. On some activities, such as watching others work or receiving advice/assistance from them, there is no statistically significant relationship with educational pathways. On the activities for which there is a significant relationship, the contrast is between dropouts and all others; i.e., there is no difference on these personal initiative measures between high school graduates and postsecondary students. This is in contrast to most of the other findings presented so far, which documented differences between all three educational pathways.

Percent who, on their own initiative ...	Dropout	Graduate	PSE
used the internet to learn or acquire skills for a job or career	29	43	45
read books, manuals or other written materials to learn or acquire skills for a job or career	43	54	54
used a computer assisted teaching software to learn or acquire skills for a job or career	19	29	28
used videos, cassettes, CDs, television, radio or DVDs to learn or acquire skills for a job or career	20	25	25
watched others work, or received advice or assistance from others to learn or acquire skills for a job or career	75	71	73
participated in any other learning activities to learn or acquire skills for a job or career	9	10	11

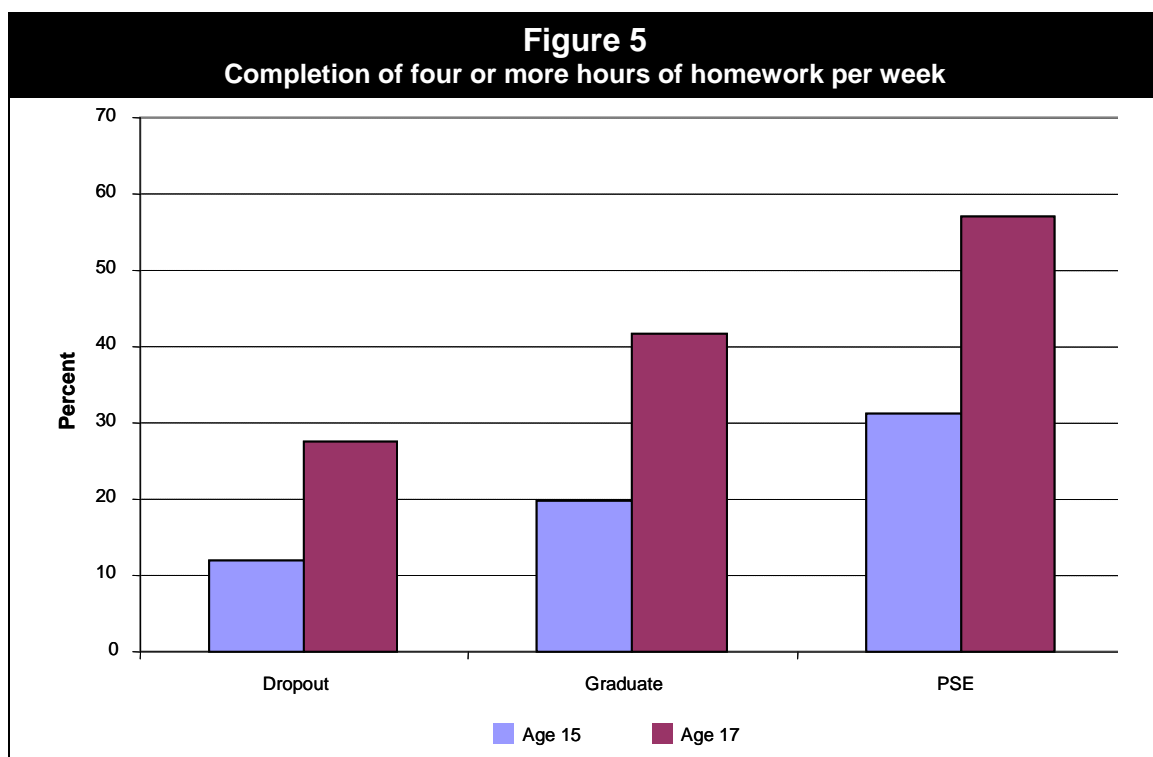
The largest difference in the effect of personal initiative concerns the use of the internet: Less than three in ten dropouts (29%) used the internet to learn or acquire skills for a job or career, compared to 45% of postsecondary students. This is the second indication that the acquisition of computer skills has the potential to improve educational outcomes.

Academic effort

A second form of initiative is to put effort into one’s school work. Two aspects of such effort are examined here: attending classes and doing homework. Starting with attendance, Figure 4 shows that at both age 15 and 17, low reading achievers who had better educational pathways at age 19 attended classes more regularly. Note that for all groups, skipping classes became more frequent over their high school careers. However, and perhaps most importantly, the better the educational pathway, the less likely it was that students would skip classes more frequently. This can be seen by comparing the age 15 and age 17 bars for each group. Among those who ultimately dropped out, 18% fewer (53-35=18) attended classes regularly at age 17; in contrast, among PSE students, this decline amounted to only 7%. It appears that low reading achievers who persist in attending classes regularly are able to convert their academic self-discipline into improved educational outcomes.

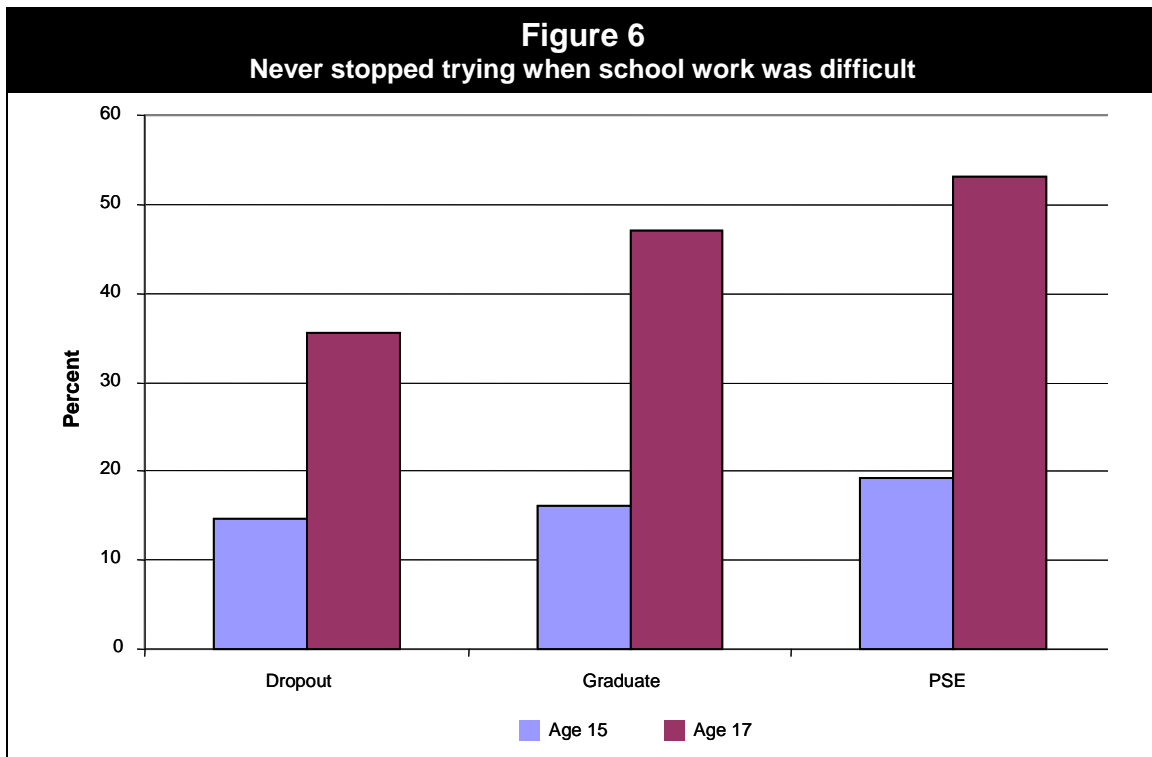


Figure 5 provides parallel information with respect to the amount of homework completed. While the previous figure showed that regular attendance declined over the course of the high school years, this figure shows that homework increased for all educational trajectories. Again, at both points in time, the more homework done, the better the educational outcome. For example, at age 17, less than three in ten (28%) dropouts report having put in four or more hours of homework during their last year of high school. This compares to about two-fifths (42%) of high school graduates, and almost three-fifths (57%) of those who pursued postsecondary education. Furthermore, as was found for class attendance, youth on better educational trajectories became even more likely over time to increase the amount of effort they put into homework than did those who dropped out. Among dropouts, only 16% more put in at least four hours of homework per week, compared to 26% among postsecondary students.



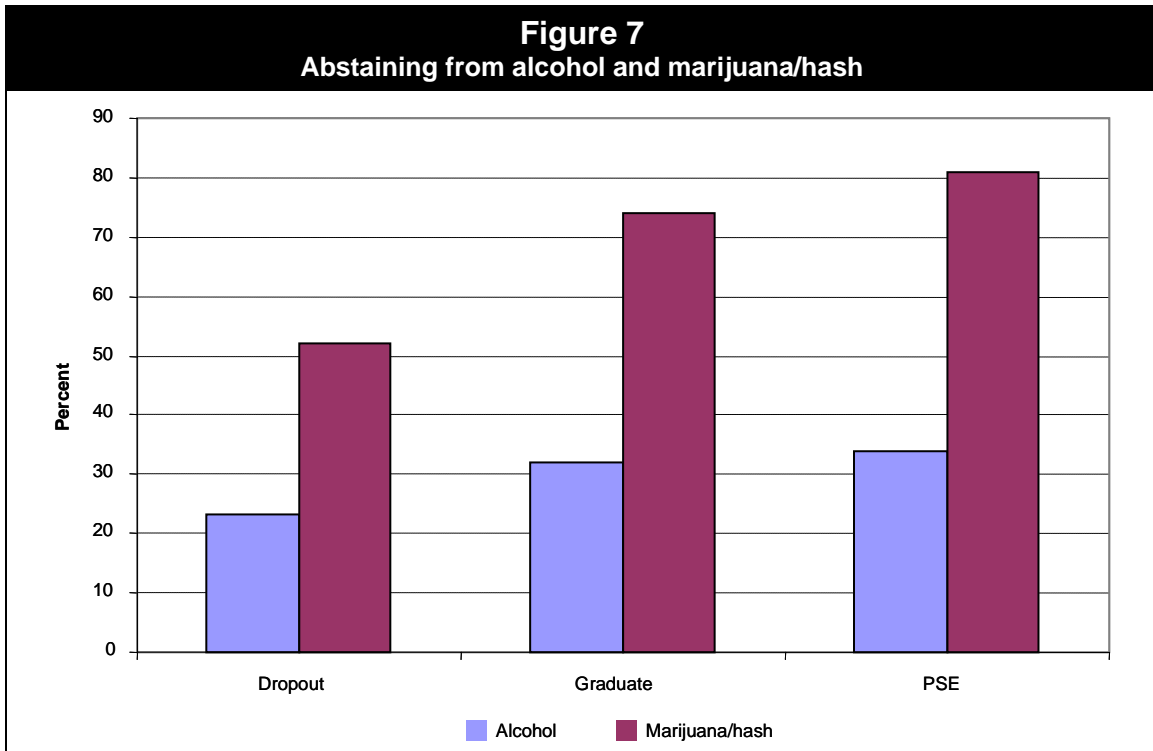
Perseverance

Academic perseverance is defined as not giving up when faced with difficult school work. At age 15, low reading achievers differed little in their self-reported perseverance, with an insignificant four percentage points separating those who had dropped out by age 19 from those who pursued post-secondary education (Figure 6). Two years later, the differences in academic perseverance are substantial: Only 36% of dropouts never stopped trying when school work was difficult, compared to 53% of those who participated in postsecondary education. It is not clear what transpired in those two years in the lives of those with better educational outcomes, but it appears that this form of resiliency played a significant role in their educational trajectories.



Risk behaviours

One aspect of resilience is the avoidance of risky behaviours. During high school, the use of alcohol and marijuana or hash constitutes two such possible risky behaviours. While a large majority of youth at age 17 report having consumed alcohol, there is an association between drinking and educational outcomes; only 23% of dropouts reported not having consumed alcohol at age 17, whereas this is so for about a third of both high school graduates and postsecondary students (see Figure 7). However, it appears to be more than just a question of abstinence. There is a clear indication that young people with better educational outcomes have also learned to drink more responsibly. This is inferred from the fact that the average consumption of alcohol among postsecondary student non-abstainers is 4.6 drinks; among high school graduates this rises to 5.3 drinks, and among dropouts to 6.4 drinks (data not shown). Like class attendance and effort put into homework, these findings suggest that educationally resilient youth have learned greater self-discipline.



Self-reported use of marijuana and/or hash is substantially less frequent than alcohol, but its use shows the same pattern as was found for alcohol use: About half (48%) the dropouts report not having used marijuana or hash, compared to about four-fifths of postsecondary students.

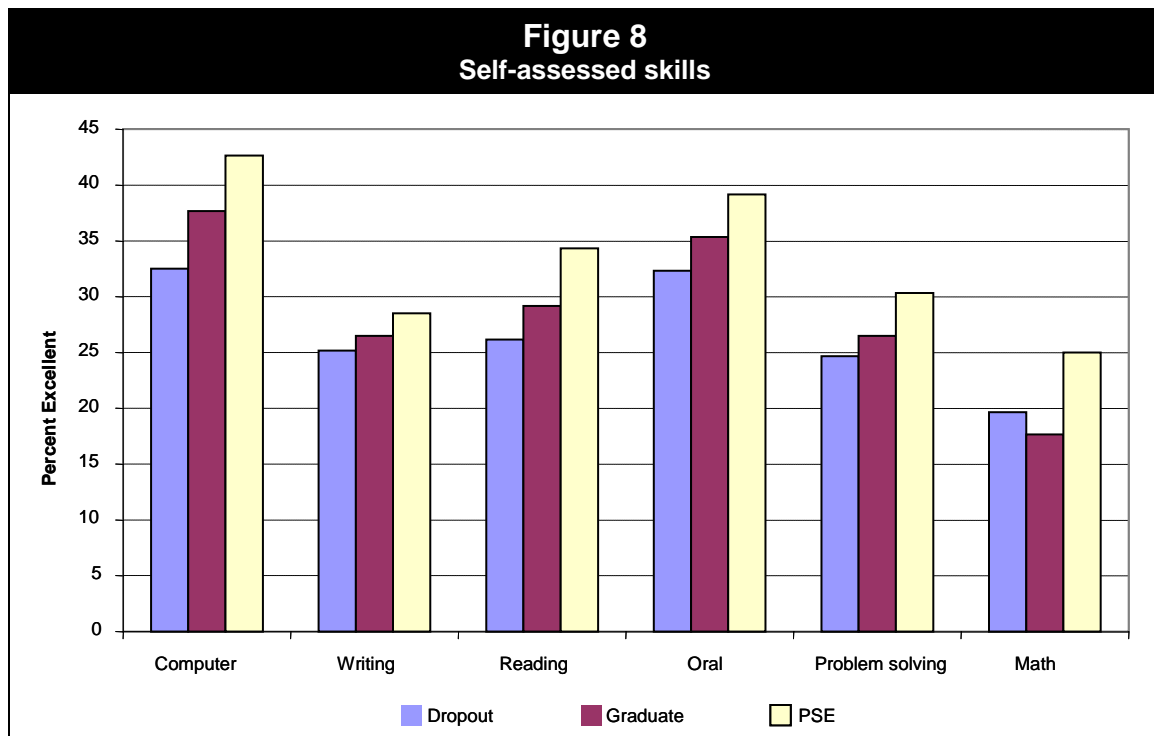
Few young people in this sample (less than 1%) are teenage parents. However, engaging in unprotected sex that results in parenthood has dire immediate consequences with respect to dropping out of high school, especially for teenage mothers. Among teenage mothers, two-thirds did not complete high school, and almost all others did not pursue PSE (not shown). Considering the consistency of the patterns, it is reasonable to conclude that educationally resilient youth are more likely to avoid risky behaviours, at least with respect to early initiation of unprotected sexual activity and alcohol/marijuana use.

Academic self-concept

The review of the literature documented that, for young people generally, those who perceive themselves as having greater ability are more likely to pursue postsecondary education. What is not known is whether this finding can be generalized to those young people who previously performed below average on standardized tests, such as the reading achievement test used for this report. The resilience literature suggests that one aspect of resilience is the belief that one has valuable skills that can be applied to one's academic pursuits. This expectation is tested next.

At age 17, respondents were asked to rate to how good they were in six human capital skill domains that arguably represent the skills most necessary for doing well educationally. Figure 8 shows the percentage of dropouts, graduates, and postsecondary students who responded that they had “excellent” skills in each of the six domains. Several important patterns emerge. First, for all skill domains (with the partial exception of math skills), the following inequalities can be observed:

Dropouts < Graduates < Postsecondary students.



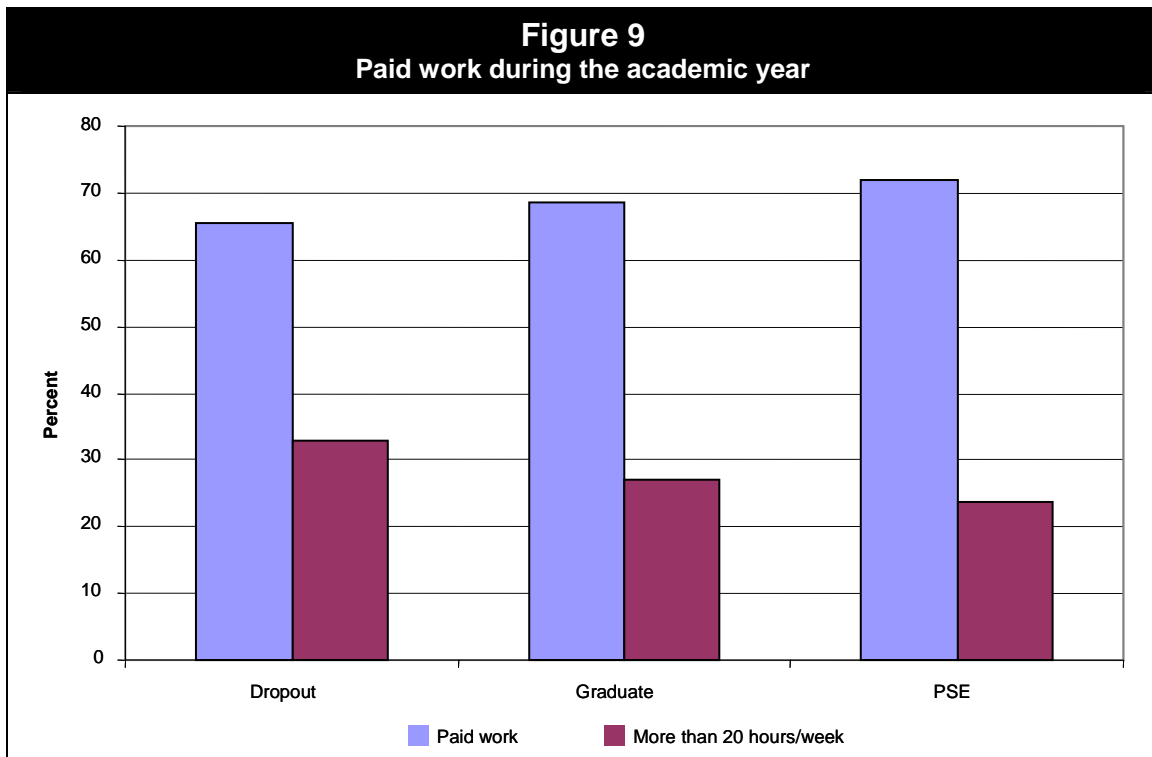
While these inequalities are relatively consistent, the magnitude of the differences are small, usually under 10 percentage points. This suggests that academic self-concept is only a minor factor in young people’s decisions about dropping out or pursuing postsecondary education.

Second, computer skills are remarkable in two respects. They represent the skill domain in which young people with below average reading achievement scores are most likely to consider themselves to be excellent. Further, it is the only domain in which the percentage difference between dropouts and postsecondary students exceeds ten points. This is the third indication that computer skills play a substantial role in these young people’s educational trajectories.

Finally, math is the domain in which these students have the least confidence. This is surprising since the criterion for inclusion in this report was below-average reading achievement. Despite this, the respondents are more likely to assess their reading skills than their math skills as excellent. Note that this is also the only domain in which high school graduates express even less confidence than dropouts. It may be that high school graduates who think they lack math skills are dissuaded from attempting postsecondary education.

Paid work

Dropping out of high school is a process rather than a discrete event, implying that some students disengage from school over a period of time. It is unclear, however, whether engaging in paid work is one indicator of such a process of disengagement, or whether it is a cause of dropping out. While this issue cannot be totally resolved even with the available longitudinal data, Figure 9 reveals two relevant patterns. First, high school dropouts were the *least* likely to have paid employment during their academic school year at age 17, with 65% of them compared to 72% of postsecondary students. While this is not a large difference (although it is statistically significant), it is perhaps another indication that involvement in adult-supervised activities of any sort, including paid employment, has beneficial effects on subsequent educational pathways.



While postsecondary students are most likely to have had paid employment, they are the least likely to have worked excessively: one quarter (24%) of postsecondary students reported working more than 20 hours per week, compared to a third of high school leavers. This pattern suggests that one sign of disengagement from school among dropouts is intensive involvement in paid work.

4.2.3 Academic performance

Given the numerous forms of resiliency that the profile analysis showed to be connected to educational trajectories, the academic performance of youth with good educational outcomes should be solid. Two aspects of academic performance are investigated: taking language and math classes at a university preparatory level and the overall marks

obtained. As expected, Figure 10 shows that less than one in five dropouts took their last math or language class at a university-preparatory level, compared to more than half the PSE participants. Of course, the decision to take classes at a university-preparatory level is unlikely to rest solely with the student; it is likely the culmination of a process that takes heavily into account the student's overall interests and prior academic performance.

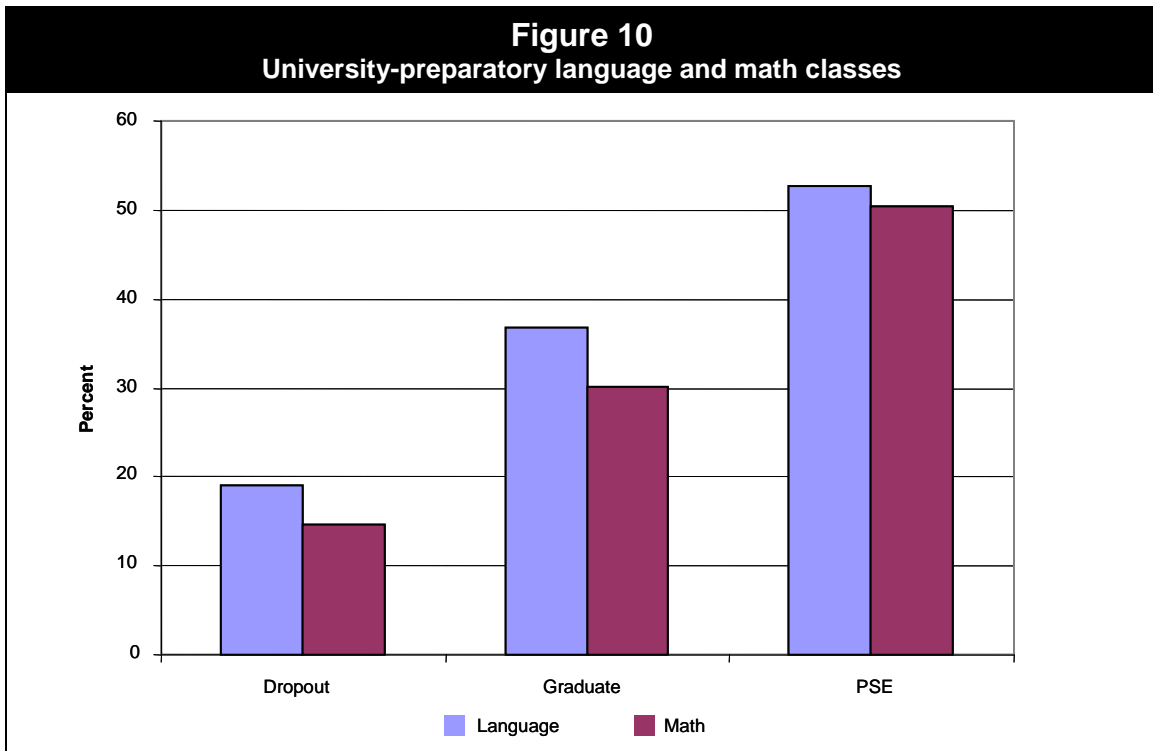
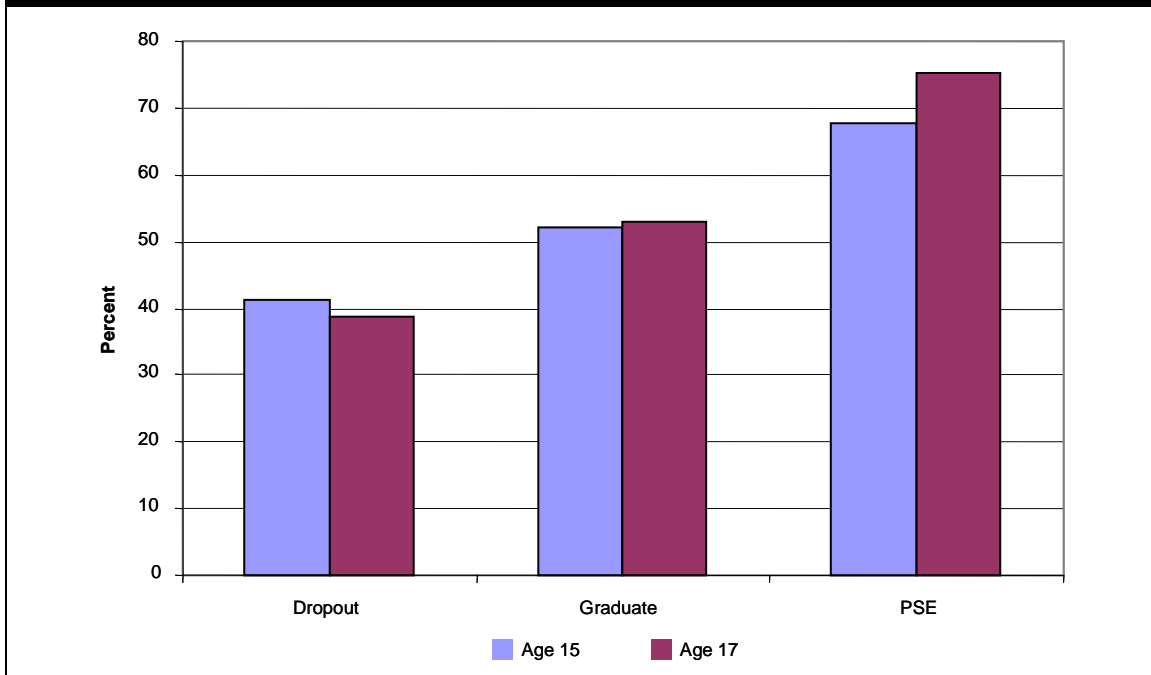


Figure 11 provides an interesting perspective on the progression of student marks in relation to their educational trajectories. At both age 15 and 17, the likelihood of having obtained a GPA of B is higher the better the educational trajectory. Note, however, that among those who pursued PSE, the likelihood of obtaining a solid GPA increased between age 15 and 17, whereas among dropouts it decreased slightly. It may be precisely the improvement in marks obtained that gave these young people the incentive to pursue their education further.

Figure 11
GPA of B or better



4.3 Multivariate Analyses

Multivariate analyses permits an assessment of the unique and indirect effects of all variables included in a given model. Multinomial logistic regression was used to contrast three educational pathways: 1) High school dropouts, 2) high school graduates with no further PSE, and 3) participants in PSE. The measure of educational pathway was constructed from cycle 3 data, when the respondent was 19 years old. Three cumulative models are assessed: resiliency, high school academic performance, and socio-demographic effects. The resiliency model is comprised of those aspects of resiliency that are simultaneously significantly related to educational pathways. It answers the question of which components of resiliency appear to uniquely affect subsequent educational trajectories. In this model, all measures of resiliency are constructed from the information contained in cycle 2, when respondents were 17 years old. Excluded from this model are those resiliency components that do not attain statistical significance in the presence of the other resiliency components.

Model 2 adds high school academic performance, in the form of marks obtained and program level (university-preparatory or other). Educational aspirations are included in this model, in order to assess whether such aspirations have positive effects even after controlling for academic performance.³ That is, are students with higher educational ambitions but with equal high school marks and in the same academic program more likely to complete high school and/or to pursue postsecondary education? Academic performance and educational aspirations are measured at age 17. This model addresses

³ Some scholars consider aspirations to be a form of educational resilience. However, since aspirations differ sufficiently from the other forms of resiliency considered here, it was decided to include them as part of the academic performance model.

the issue of whether resiliency operates to improve academic performance, or whether it has additional beneficial effects on young people's decision to complete high school and/or to enroll in postsecondary institutions.

Previous research indicates that many influences on educational trajectories start quite early in a child's educational career. A variety of prior socio-demographic characteristics of students and their parents affect educational pathways both directly and indirectly. For example, the children of parents who have attained higher levels of education also have higher educational attainments. It is likely that parental education increases some of the resiliency mechanisms. Hence it is important to assess whether resiliency has any effects after controlling for these socio-demographic characteristics. Model 3 includes a variety of socio-demographic characteristics that were measured when the respondent was 15 years old. Including these controls in the final model informs which components of resiliency have any independent effects on educational pathways taken by age 19.⁴

Table 7 provides the parameter estimates contrasting dropouts with postsecondary participations, while Table 8 gives the comparable information contrasting high school graduates with postsecondary participants. In these tables, odds ratios express the odds of a given educational pathway (relative to the comparison pathway) for a one unit change in the independent variables of interest. An odds ratio of 1.0 indicates that the odds are equal (i.e, there is no difference associated with the given independent variable). Odds ratios greater than 1.0 indicate that the outcome is increasingly more likely with increased values of the independent variable, while odds ratios less than 1.0 indicate the reverse. The odds ratios statistically control (or hold constant) the values of all other variables included in a given model. To get a sense of the magnitude of an effect, it is important that the metrics of the independent variables are clearly understood. Three types of metrics are used in the multivariate analyses. First, continuous variables, such as the scales of academic effort and years of parental education, were standardized (mean=0; standard deviation=1). Odds ratios for such variables can be interpreted as the relative odds associated with a one standard deviation increase of that variable. As an example, for the resiliency model of Table 7, a one standard deviation increase in social support is associated with a 15% ($1 - .848 \approx .15$) reduction in the odds of dropping out rather than pursuing PSE. For such variables, it should be remembered that approximately 95% of respondents can be expected to be within two standard deviations of either side of the mean. Second, indicator variables, such as whether the respondent worked during the school year, are labelled in the direction in which they were measured. Hence the odds ratio for indicator variables simply express the effect of membership in that category compared to non-membership. In the resilience model, the odds of dropping out among those who had paid employed are estimated to be 46% lower than among those who did not work ($1 - .54 = .46$). Finally alcohol/marijuana use, extracurricular activities, and university-preparatory classes have three values ranging from zero to two. Since the odds ratios for these variables also indicate the effects of a one unit change in the independent variable, the *maximum* effect for these variables is twice the reported odds

⁴ Although the respondents in this report were selected on the basis of their low reading achievement at age 15, analyses indicated both reading and math achievement remained significantly related to their educational pathways. For this reason they were included as control variables in Model 3. Additionally, to retain a representative sample, means were substituted for missing values and a missing value index included as a control variable.

ratios.⁵ The statistical significance for each variable is given in the second column of each model (labelled **p**).

Table 7						
Multinomial models of dropping out versus PSE						
	Resilience		Academic performance		Background	
Dropout versus PSE	Odds ratio	p	Odds ratio	p	Odds ratio	p
Intercept	0.948	0.838	0.606	0.095	0.161	0.000
Social supports	0.848	0.035	0.948	0.513	0.986	0.872
Academic effort	0.520	0.000	0.660	0.000	0.633	0.000
Alcohol/marijuana use	1.364	0.000	1.355	0.000	1.324	0.000
Peer educational support	0.745	0.000	0.793	0.001	0.846	0.017
Extracurricular activities	0.684	0.000	0.817	0.042	0.804	0.039
High school job/education preparation	0.669	0.000	0.644	0.000	0.609	0.000
Paid employment	0.540	0.000	0.615	0.004	0.678	0.025
Employed 20 or more hours/week	1.693	0.004	1.421	0.056	1.344	0.130
Parenthood	35.905	0.000	33.405	0.000	22.458	0.000
Parental educational support	0.437	0.000	0.465	0.000	0.504	0.000
Educational aspirations			0.468	0.000	0.575	0.000
University-preparatory classes			0.456	0.000	0.584	0.000
GPA			0.561	0.000	0.570	0.000
Changed high school					2.097	0.000
Parental education					0.536	0.000
Availability of home computers					0.852	0.003
Income (in quintiles)					0.854	0.009
Female					0.829	0.272
Canadian-born					2.303	0.009
Visible minority					0.309	0.002
Two biological parents					0.561	0.001
Reading achievement					0.802	0.004
Math achievement					0.572	0.000
Nagelkerke Pseudo R ²	.195		.300		.378	

The results for Model 1 (resilience) show that ten aspects of resilience appear to have effects independent of each other with respect to the likelihood of dropping out versus enrolling in a postsecondary program.⁶ These include all three aspects of risk avoidance: The relative odds of dropping out are 36% higher for those who did not abstain from alcohol/marijuana, 69% higher for those who were employed 20 or more hours per week during the school term, and 36 times as high for those who were parents by the age of

⁵ A description of the variables included in the multivariate analyses is provided in the appendix.

⁶ Factors that appeared to be related in the bivariate profiles but have no independent positive effects are: participation in voluntary activities, initiative, perseverance, peer support, and teacher support.

17.⁷ By not engaging in risky behaviours, low reading achievers were often able to overcome the obstacle presented by their reading performance and, defying the odds, pursued postsecondary education.

Not surprisingly, academic effort in the form of class attendance and doing more homework, also differentiates strongly between dropouts and postsecondary participation. That is, by putting in more time on homework and attending classes regularly, low reading achievers substantially increased their chances of enrolling in PSE. Both the perceived educational plans of one's close friends and the importance of education to the parents make a difference on whether a young person drops out or pursues further education. Note that respondents with paid employment are predicted to be more likely to pursue PSE, as are those who participated in extracurricular activities. Taken together, these latter findings suggest that time spent in adult-supervised activities has salutary consequences that enable young people with low reading achievement to extend their educational career.

The importance of taking advantage of school-provided activities that prepare one for further education and the world of work has substantial effects on the likelihood of dropping out rather than pursuing PSE: a one standard deviation increase in such participation is predicted to decrease the odds of dropping out rather than pursuing PSE by 37%. Clearly, the provision of such activities in the high school curriculum appears to have beneficial educational consequences.

The academic performance model expands our understanding of how young people manage to get on superior educational pathways in several respects. First, it indicates, as expected, that young people with low reading achievement who manage to obtain solid marks in their classes and who take math and reading classes at a university-preparatory level are substantially more likely to pursue postsecondary education than to drop out. For example, one standard deviation increase in GPA decreases the odds of dropping out by 56%. Second, high educational aspirations have a strong effect even after controlling for high school academic performance, with a one standard deviation increase in aspirations being associated with a decline of 47% in the odds of dropping out (versus participating in PSE). Third, three aspects of resiliency (social supports, academic effort and participation in extracurricular activities) operates partly through increasing academic performance. This is seen by the fact that the odds ratios are substantially closer to 1.0 in this model than they were in Model 1. Note that resilience in the form of social supports appears to operate totally through improved academic performance, since this coefficient is no longer statistically significant in Model 2. Finally, the remaining components of resilience appear to affect educational pathways by directly affecting the decision to complete high school and to pursue postsecondary education, rather than through improved academic performance. This is inferred from the fact that the corresponding odds ratios in Model 2 are not substantially closer to 1.0 than they were in Model 1.

⁷ A main reason for the extremely high effect of the transition to parenthood is that few respondents had children by the age of 17, and most of them were concentrated among dropouts. Nevertheless, this finding suggests that early transition to parenthood has extraordinary consequences on subsequent trajectories. The effect of parenthood differs by gender. Parallel analyses separately for males and females (not shown) indicate that the effect of parenthood is concentrated among females.

Is resiliency simply a by-product of various socioeconomic advantages that accrue from such factors as growing up with both biological parents, having well-educated and wealthy parents who equip the home with computer technology? Or is resilience in its varied forms assessed here able to provide young people of below-average reading achievement the personal resources that enable them to achieve better than expected educational outcomes even after controlling for any home advantages? Model 3 assesses this question. It shows quite unequivocally that resilience as measured here represents enabling factors that, to a surprisingly high extent, operate in addition to the socio-demographic factors that previous research has documented to be consistently, and strongly, related to educational attainment. It is true that some of the odds ratios of the resilience measures move in the direction of being closer to 1.0 in Model 3 compared to Model 2, indicating that their effects are reduced once socio-demographic factors are controlled. However, others do not change appreciably. Indeed, all resiliency factors found to be significant in Model 2 remain significant in Model 3. The strong conclusion is that young people with limited reading achievement can initiate a series of behaviours between the ages of 15 and 17 that enable them to complete high school and even pursue postsecondary education. Further, such resiliency is only minimally due to selection factors associated with prior home advantages.

On the whole, the effects of socio-demographic characteristics on educational trajectories among low reading achievers are in accord with what has been documented for young people generally. The one partial exception is gender: after controlling for resilience and academic performance (both of which are higher among females than males), the odds of females dropping out rather than pursuing PSE are not significantly different from that of males.

Changing high schools doubles the odds (2.097) of curtailing one's education prior to completing high school. The precise reasons for this curtailment of one's education cannot be addressed here. It could be due to difficulties in making new friends, the stress associated with moving, or general adjustment difficulties to a new school environment.

Three forms of parental resources increase the odds of pursuing PSE rather than dropping out: parental cultural capital in the form of their education, household income, and the frequency of the availability of a computer for the youth's use. Family structure also has an independent effect on educational outcomes among low reading achievers; the odds of youth dropping out rather than pursuing PSE are estimated to be 44% higher if they live with both biological parents. Previous literature has debated whether other types of family structures are "deficient" with respect to their social capital, or whether the family structure effect is an artefact of lower parental economic resources. Since economic resources have been held constant here, the conclusion seems to be that it is not totally due to economic resources. It may well be that parental monitoring of their children's out-of-school activities is more effective when both biological parents are present.

As a group, Canadian-born youth might be thought of as being relatively advantaged with respect to how well they do educationally, since they are immersed in the Canadian culture right from birth. From this vantage point it is therefore interesting to see that the odds of dropping out is more than twice as high (2.303) among them than among immigrants, who have to adjust to both the Canadian culture and the Canadian school system. It is known from other studies that immigrants to Canada have especially high aspirations for their children. The findings here reinforce that, but also suggest that immigrant parents exercise greater

influence over their children's educational pathways than do native-born Canadians (since parental educational aspirations are already held constant in Model 3).

The same argument applies to the finding that visible minorities are more likely to pursue PSE, and vice versa, less likely to drop out of high school. The odds of visible minorities dropping out rather than participating in PSE are estimated to be about a third (.309) of that of youth who are not members of a visible minority. These findings are testimony to the fact that certain types of potential disadvantages can be not only overcome, but actually produce educational outcomes superior to those not facing such potential barriers.

Many of the same resiliency factors also differentiate between high school graduates and participants in postsecondary education (Table 8). Since completing high school can be thought of as an educational pathway that is in between dropping out and pursuing PSE, it is to be expected that the odds ratios in Table 8 are consistently smaller (i.e., closer to 1.0) than the corresponding parameters in Table 7. Hence these will not be discussed except to point out those factors that appear to operate differently between the two tables. One such difference is that drinking alcohol and using marijuana/hash do not appear to be salient factors when contrasting high school graduates with participants in PSE. This may be an indication that a negative peer subculture increases only the odds of dropping out; if a young person manages to persist until at least high school completion, then the negative peer effects seem to evaporate. Similarly, the positive effects of working and the negative effects of working intensively seem to hold only with respect to dropping out; among those who completed their high school, these no longer influence the decision to pursue PSE. The fact that family structure has no apparent effect among high school graduates with respect to pursuing PSE reinforces the interpretation that family structure is important primarily by providing effective parental monitoring during the teenage years. Family structure does not appreciably affect the educational trajectories of young people who have successfully completed high school. The same is true for immigrant status: Canadian-born young people who manage to complete high school are not significantly different from their immigrant counterparts in their likelihood of pursuing PSE. Finally, gender now shows the typical relationship: low reading achieving females are more likely than males to pursue PSE, given that they have graduated from high school.

Table 8
Multinomial models of high school graduates versus PSE participants

Graduate versus PSE	Resilience		Academic performance		Background	
	Odds ratio	p	Odds ratio	p	Odds ratio	p
Intercept	4.280	0.000	3.900	0.000	2.216	0.003
Social supports	0.894	0.044	0.930	0.208	0.972	0.642
Academic effort	0.720	0.000	0.825	0.001	0.812	0.000
Alcohol/marijuana use	0.985	0.758	0.977	0.630	0.966	0.495
Peer educational support	0.810	0.000	0.826	0.001	0.848	0.003
Extracurricular activities	0.806	0.002	0.906	0.144	0.906	0.158
High school job/education preparation	0.867	0.032	0.847	0.016	0.842	0.018
Paid employment	0.791	0.031	0.827	0.092	0.874	0.245
Employed 20 or more hours/week	1.253	0.040	1.161	0.181	1.118	0.336
Parenthood	8.379	0.000	8.383	0.000	6.474	0.000
Parental educational support	0.646	0.000	0.650	0.000	0.690	0.000
Educational aspirations			0.739	0.000	0.799	0.000
University-preparatory classes			0.702	0.000	0.799	0.001
GPA			0.680	0.000	0.711	0.000
Changed high school					1.334	0.018
Parental education					0.799	0.000
Availability of home computers					0.895	0.007
Income (in quintiles)					0.863	0.000
Female					0.752	0.004
Canadian-born					1.209	0.274
Visible minority					0.638	0.015
Two biological parents					0.885	0.295
Reading achievement					0.790	0.000
Math achievement					0.629	0.000
Nagelkerke Pseudo R ²	.195		.300		.378	

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Appendix:

Definitions of constructed variables

Academic effort (IRT scale)

A previously constructed scale of academic engagement, comprised of items such as amount of time spent on homework and frequency of skipping classes.

Alcohol/marijuana use (index)

Use of alcohol (f2q76) and marijuana/hash use (f2q78) were recoded and combined such that a score of 0 indicates neither and a score of 2 indicates having consumed both.

Extracurricular participation (index)

Participation in school (f2q56b) and non-school based (f2q57) were recoded and combined, such that a score of 0 indicates neither and a score of 2 indicates participation in both.

High school job/education preparation (standard score)

The number of job/future education preparatory activities provided by their school (d2q07a - d2q16) that respondents had participated in were counted and then converted to standard scores.

Peer educational support (standard score)

Responses to how many of their peers the respondent thought completing high school was important (f2q76) and how many planned to pursue PSE (f2q78) were combined.

Employed 20 or more hours per week (indicator variable)

Constructed from a derived variable (hpdhsd2), such that a score of 1 indicates having worked at least 20 hours per week.

Parental educational support (index)

How important the respondent believed it was to their parents that they complete high school (u2q57) and to pursue PSE (u2q58) were recoded and combined so that a score of 0 indicates neither was very important and a score of 2 indicates both were very important.

Educational aspirations (standard score)

M2q31 was first recoded into approximate years of education the respondent desired and then transformed into a standard score.

Home ICT (standard score)

Responses were as how often a computer was available at home for their use (r2q07). Responses were converted into standard scores.

University-preparatory classes (index)

A score of 0 indicates that neither the last math nor language class was taken at a university-preparatory level, whereas a score of 2 indicates that both were taken at a university-preparatory level.

Marks (standard score)

The mean of student's self-reported average marks and mark obtained in math and language. Parallel measures were constructed for marks at ages 15 and 17.

Canadian born (indicator variable)

Parent report was used in the first instance. Where parent information was not available, student report was substituted (swt16q01).

Parental years of education (standard score)

Parental level of education was derived from gender and relationship of PMK to child (and from spouse of PMK). Where information from the PMK was not ascertained, the youth report was substituted. The level of education was then converted to estimated number of years of education. The mean of mother's and father's estimated years of education was then computed to represent parental years of education.

Household income (quintiles)

Household income was derived from the parent questionnaire. Income was recoded into quintiles to remove the problem of outliers and skewed distribution.

Missing value indicator

A missing value indicator was constructed on the basis of the presence of missing values on those variables that had the highest proportion of missing information (parental SES, peer support, and participation in extracurricular activities).

Math/language classes at grade level (index)

A score of 0 indicates that neither math nor language was taken at the Grade 10 level at age 15, while a score of 2 indicates that both were taken at that grade level. A parallel measure was constructed for age 17.

GPA (standard score)

The mean of student's self-reported average marks and mark obtained in math and language was converted into standard scores. Parallel measures were constructed for marks at ages 15 and 17.

Enriched/remedial programs (indicator variables)

PMK report was used in the first instance. Where parent information was not available, student report was substituted (st23, st24).

Table 9
Descriptive information for measures included in the multivariate analyses

	Mean	Standard Deviation
Social Supports	-0.24	0.869
Academic effort	-0.20	0.950
Alcohol/marijuana use	2.14	1.010
Peer educational support	-0.29	1.066
Extracurricular participation	1.29	0.672
Number of missing values	0.44	0.777
High school job/education preparation	-0.17	1.026
Worked during school year	0.75	0.434
Worked 20 or more hours per week during school year	0.22	0.414
Parenthood	0.01	0.087
Parental educational support	1.27	0.834
Educational aspirations	-0.37	0.947
University-preparatory classes	0.75	0.846
GPA	-0.56	0.907
Changed high schools	0.21	0.408
Parental education	-0.35	0.955
Availability of home computers	-0.21	1.268
Income (in quintiles)	1.68	1.288
Female	0.40	0.489
Canadian-born	0.74	0.437
Visible minority	0.12	0.329
Two biological parents	0.57	0.496
Math achievement	-0.66	1.025
Reading achievement	-1.25	0.589