

A second chance at education for early school leavers

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June 2011

Preliminary Version

Abstract

Despite efforts to keep youth in school, many still dropout, which potentially reduces their life prospects. In this paper we examine the factors that affect the chances of re-engaging early school leavers in education using data from three cohorts of the Longitudinal Survey of Australian Youth survey and duration models. We find evidence of negative duration dependence with only a narrow window before the chances of re-engaging diminish sharply. Our results suggest that school programs that help youth at risk develop post-school career plans may be more effective than programs that focus on improving numeracy and literacy scores.

JEL classifications: I20, J01

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*The authors assume jointly first authorship of the paper. This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). This research was funded by the Australian Government Department of Education, Employment and Workplace Relations (DEEWR) under the Social Policy Research Services Agreement (2005–12) with the Melbourne Institute of Applied Economic and Social Research. The views expressed in this report are those of the authors alone and do not represent those of FaHCSIA, the Melbourne Institute or DEEWR.

1. Introduction

For those who do not finish school, findings from the literature suggest that they face poorer prospects than youth who do. In the labour market, early school leavers have much greater difficulty in finding and retaining employment and are more likely to be in low-paid jobs (Heckman and Rubinstein 2001, Rumberger and Lamb 2003). Difficulties finding and keeping work can spill-over into social and health problems, such as depression, substance abuse, criminal behaviour and suicide (see, for example, Morrell et al. 1998; Fergusson et al. 2001; Hammarstrom and Janlert 2002).

Over the last decade or longer, OECD governments have introduced a number of school policy reforms, such as greater school accountability, early numeracy and literacy interventions and more integrated vocational programs, which have aimed at improving engagement in education, especially of those at risk of dropping out. However, despite these reforms, school completion rates in OECD countries have improved only modestly from 74% to 80% between 1995 and 2008 (OECD 2010). While efforts to keep youth in school are important, these statistics suggest that it is also important to design policies to help re-engage those who leave school early.

The aim of this paper is to help contribute to the policy debate on how to encourage early school leavers to return to study by examining their patterns of re-engagement in post-school courses. A better understanding of such patterns is a first-step to designing measures to encourage further qualification acquisition of this group. This paper contributes to this literature in three ways. First, this study fully examines the role of duration dependence, or how the time out from school affects the chances of re-engaging early school leavers. To do this, we estimate several duration models that control for unobserved individual heterogeneity. A previous study by Black, Polidano and Tseng (2010) using the Household Income and Labour Dynamics Australia (HILDA) survey found evidence of negative duration dependence (declining chances of engagement over time), but did not control for school experiences, school achievement or unobserved individual heterogeneity. With limited individual controls, we cannot be sure that the reason for the estimated negative duration dependence is spuriously related to the fact that more highly motivated students re-engage early. Cleansing estimated duration dependence from the effects of individual heterogeneity is important in choosing an appropriate policy response. For example, if after controlling for individual heterogeneity, negative duration dependence persists, an appropriate response may be to coerce early school leavers back to education early; if it does not, programs aimed at changing individual traits may be more effective. A second contribution is that we are able to get around the small sample problems encountered by previous studies (Rumberger and Lamb 2003; Hill and Jepsen 2007; Black,

Polidano and Tseng 2010) by using three cohorts (1995, 1998 and 2003) of the Longitudinal Survey of Australian Youth (LSAY). LSAY is a large nationally representative panel dataset that tracks youth from around 15 until around 24 years of age. Third, we take advantage of the detailed school experience information in LSAY to more fully examine the impacts that schools and school programs, such as vocational programs, can have on the chances of re-engaging in education after leaving school. We hypothesise that helping youth at risk decide on a post-school career plan is an important way to encourage them back to education if they eventually dropout.

2. Data

The primary data source for this report is the Longitudinal Survey of Australian Youth (LSAY). LSAY is a longitudinal survey tracks the same individuals (panel dataset) from Year 9 (around age 15) to around 24 and is comparable to the National Longitudinal Survey of Youth 1997. There are 5 different LSAY cohorts (1995, 1998, 2003, 2006 and 2009) each starting with a sample of around 10,000 students. There are differences in the sampling methodology between cohorts. The 1995 and 1998 cohorts are nationally stratified samples of 300 schools, where schools from small states were over-sampled, and those from larger states were under-sampled. The three school sectors: government, catholic and independent schools were used as a minor stratum, with the number of schools chosen at random from each sector being proportional to the relative size of the sector. From each school, two Year 9 classes were chosen at random and their students surveyed. Instead of being a survey of Year 9 students, the 2003 cohort is a nationally representative sample of 15 year-old students who were selected to participate in the OECD PISA data collection. The sample comprised 355 schools from all states and territories, and was designed to be representative of students across Australia using state/territory, school sector and region (metropolitan or non-metropolitan) as strata. Within each school 50 students aged 15 years were selected at random. For schools with fewer than 50 students, all 15 year olds were selected. Smaller states and Indigenous students were over-sampled to ensure that reliable results could be produced by state and Indigenous status. For more information on the LSAY survey methodology, visit the LSAY website (<http://www.lsay.edu.au/publications/index.html>).

To maximise the sample size, we use data from the three cohorts for which there is at least 5 years of post-school data — 1995, 1998 and 2003 cohorts. Because at the time only 7 waves of the 2003 cohort were available, we restrict the sample for the 1995 and 1998 cohorts to the first 7 waves as well, which is when most youth in the sample are 21 years old, or around 5 years after compulsory education.

In the context of this study, LSAY’s rich data on involvement in school programs (e.g. vocational programs), school achievement (e.g. numeracy and literacy scores) and post-school outcomes (e.g. timing of exit from school, timing of re-engagement in education, employment outcomes, reasons for leaving school early) makes it ideal for examining issues related to transition from school. A limitation of LSAY, that is common to many other panel datasets, is attrition. If the attrition is non-random, there is a risk that results will be biased. From analysis of the data presented in Appendix A, we find no strong evidence of bias related to non-random attrition.

2.1 Defining early school leavers

We define early school leavers as those who left school after the legal minimum age for leaving school, but before attaining their High School certificate.¹ In essence, this means that those who stayed in school to the end of Year 12 (last year of secondary school) and did not receive a High School certificate are treated as early school leavers because they are academically equivalent to those who left in Year 11.² Also, those who left school, but later returned to complete their High School certificate are also treated as early school leavers. We note that there are a small number of early school leavers who completed a vocational qualification before leaving school as part of a VET in schools program. Most of those for whom we can identify an outcome, report completing a certificate level I and are treated as non-completers, while those who report completing a certificate level II are treated as completers.³ The numbers of early school leavers in each cohort are presented in Table 1.

Table 1: Sample of early school leavers in LSAY

	1995 cohort		1998 cohort		2003 cohort	
	Count	%	Count	%	Count	%
Early school leavers	2 648	28	2 043	25	1,902	23
Year 12 completers	6 763	72	6 295	75	6,337	77
Total	9 411	100	8 338	100	8 239	100

The school year in which early school leavers exit is presented in Table 2. The timing of exit is important because it may affect the possible motivations for re-engaging in education at a later date.

¹ For most of the time period spanning the data collection period, the minimum legal age for leaving school was 15 or 16, depending on the state or territory. From January 2006 and January 2010, the minimum leaving age in Western Australia and New South Wales respectively was increase to 17 years. Those who left school before the minimum leaving age were omitted from the sample.

² They will not receive a High School certificate because they did not fulfill the academic requirements (such as school attendance).

³ Certificate II is widely regarded as a secondary school equivalent.

All else being equal, it is possible that those who leave school later may be better equipped to participate in education after school. The earliest youth are observed leaving school is during Year 9 (after completing Year 8). These students left school at age 15, which at the time was the minimum age for leaving school in their state. Students are asked the secondary school year in which they left school in the survey following school dropout.⁴ An exception is in wave 2 of the 1998 cohort, in which the question is not asked. For this wave, we assign school year of exit based on the date in which early school leavers exit school. Therefore, we assume that among those who left school in this wave, those whose date of exit was prior 1996 left school in Year 9, while those who left school in 1996 are assumed to have left in Year 10.⁵ From Table 3, we can see that the majority of early school leavers (60-70%), for which there are data, leave in senior school (Year 11 and Year 12).

Table 2: Early school leavers by the year of secondary school completed in LSAY

	1995 cohort		1998 cohort		2003 cohort	
	Count	%	Count	%	Count	%
<i>Year left school</i>						
Year 9	65	3	31	2	16	1
Year 10	917	35	617	30	422	22
Year 11	1070	40	946	46	878	46
Year 12 ^a	596	23	449	22	586	31
Sub-total	2648	100	2043	100	1902	100.0

^aThose who left in Year 12 did not meet the requirements to receive a Year 12 certificate, either because they left school before the end of the academic year or did not perform to the required standard to be awarded the certificate.

2.2 Re-engaging in education

In Australia, there is no specially designed education pathway, such as the General Educational Development (GED) test in the United States, for early school leavers to return to education to attain a secondary school certificate equivalent. Instead, there are various pathways that involve either continuing school education or commencing a course in vocational education and training (VET)

⁴ There are some anomalies in the data. First, in most waves, there are individuals who did not answer the question of whether or not they were in the survey in the previous year. In these cases, we assume that they are still in school. Second, in the 1995 cohort (wave 2), there are a number of double responses to the question of whether they have left school (report both yes and no). If they report the date they left school, then we assume that they have left, otherwise, we assume that they are still in school. Third, in wave 3 in the 1995 and 1998 cohorts, because of the increase in the sample size in this period (and to some extent the wording of the survey in this period) it is possible that there is some double counting of the exits in wave 3.

⁵ For those who report leaving school since the last interview, we observe the month and year they left. For convenience, we assume that they left on the first day of each month. In wave 2 of the 1995 cohort, individuals who left school were not asked the date they left. To fill this missing information, it was assumed that they left on the first of January 1996. In waves 2 and 4 of the 1998 cohort, there are a significant number of individuals with erroneous dates. These are treated as missing observations and are omitted from the sample.

that may or may not be part of an apprenticeship or traineeship. Popular courses for those not involving an apprenticeship are business, tourism, IT, hospitality and community services (National Centre for Vocational Education and Research (NCVER) 2010). Generally speaking, the cost of VET courses is heavily subsidised by government, with students only paying a notional amount. The courses are also available at a range of levels to cater for all educational and skill levels.

Re-engagement is defined as the first enrolment in education, including a return to secondary studies, since leaving school for the first time. In LSAY, an enrolment is identified by whether an individual reports currently being in study or enrolled in a course since the last interview. The data in Table 3 suggests that the most popular pathways back into education are those that involve VET (around 90%) and not those that involve a continuation of secondary studies (10%). Around half of those who choose VET are studying as part of an apprenticeship/traineeship and the other half are not. When re-engaging in VET courses, early school leavers are choosing to make decisions to pursue a certain vocational career path rather than continue in general education. For those who are not sure which path to follow, it is rational that many early school leavers will delay the decision to re-engage until they have better information.

Table 3: Early school leaver education re-engagement pathway in the first 7 years after leaving school

	Count	%
Return to school	38	1
Continue secondary education at VET Institution	358	8
VET as part of an apprenticeship	1296	29
VET as part of a traineeship	745	17
VET unrelated to an apprenticeship/traineeship	1959	45
Count	4396 ^b	100

^a94% of enrolments are VET qualifications – certificates I-IV, Diploma or Advanced Diploma. The remainder is bachelor degrees. ^bThere are 4683 early school leavers observed to re-engage, but only 4396 have information regarding the timing of re-engagement. Source: LSAY 1995, 1998 and 2003 cohorts, waves 1-7.

Overall, 84% of early school leavers are estimated to re-engage (at least once) in the first 7 years after leaving school (Table 4). More than half of all early school leavers are estimated to re-engage within the first 6 months and 75% within the first 2 years. The high rate of re-engagement in the first 6 months out from school suggests that many youth leave school with the intention of going on to further study. To gauge how the probability of re-engaging early school leavers changes over time, we present a hazard function in Figure 1.⁶ The definition of hazard function is originally linked to the medical literature and it can be interpreted as the probability that a certain event (for example the

⁶ The figure is a non-parametric hazard smoothed using a gaussian kernel density approach.

death of a patient) occurs at a certain point in time, given that it has not yet occurred. In the context of this report, the hazard function represents the probability that an early school leaver will re-engage in education, given that they are yet to do so.

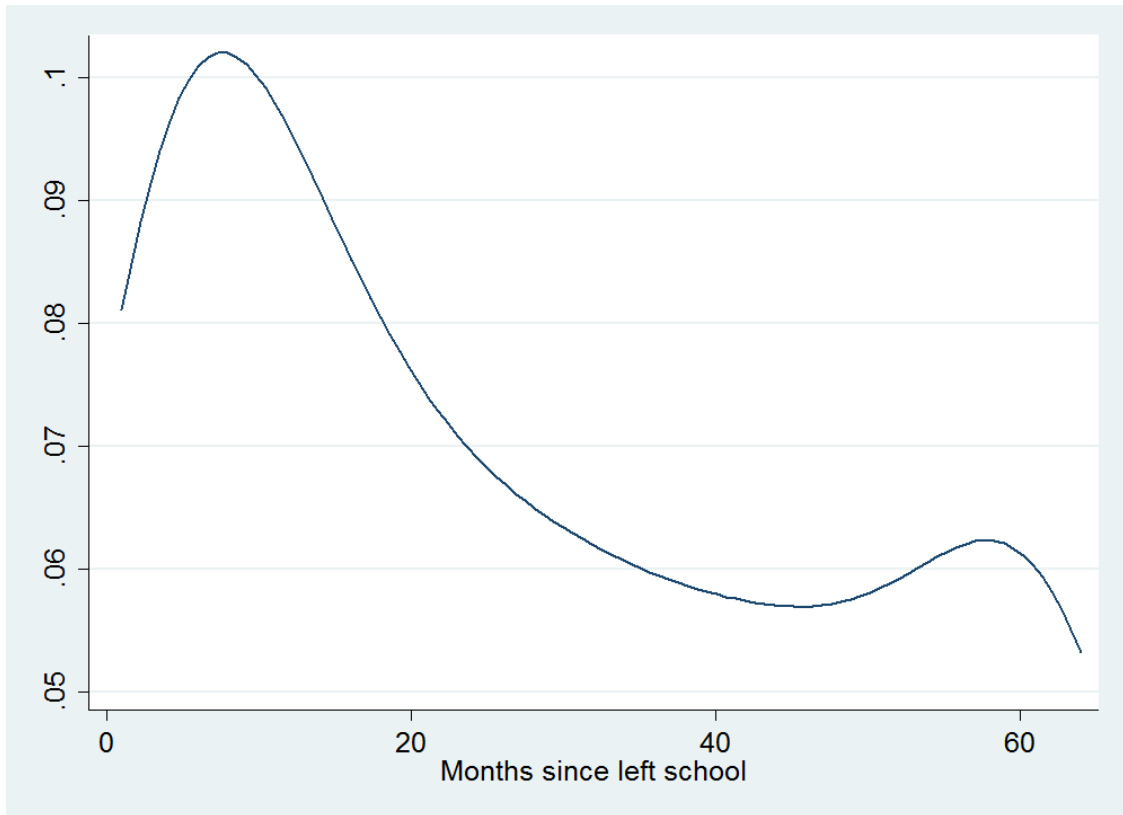
Table 4: Proportion of early school leavers who re-engage in education in the first 7 years after leaving school^a

	Proportion who re-engaged	Cumulative proportion
	%	%
<i>Time since left school</i>		
Within 1 month	20	20
1-6 months	35	56
7-12 months	11	66
12-18 months	5	71
19-24 months	4	75
24 months-7 years	9	84

^aThese statistics are estimated on a sample of 3546 early school leavers who remained in the sample until wave 7. Source: LSAY 1995, 1998 and 2003 cohorts, waves 1-7.

From the shape of Figure 1, there is evidence of both positive and negative duration dependence (how the chances of re-engaging change over time) in the first 7 years out from school. In approximately the first 10 months out from school it appears that the chances of re-engaging for the first time increases with time; after this initial period they fall rapidly and only resume toward the end of our period of analysis, around 4 years after having left school. However, we should keep in mind that this function does not account for individual heterogeneity and it is premature to conclude whether duration dependence exists or not.

Figure 1: Hazard function of re-engagement for early school leavers up to 7 years after leaving school



Source: LSAY 1995, 1998 and 2003 cohorts, waves 1-7.

3. Modelling re-engagement

In this paper, we model the patterns of re-engagement using duration models rather than using binary outcome models (re-engage or not) because duration analysis:

- 1) allows for separating the effect of duration dependence from the effect of the inter-temporal change in the covariates; and
- 2) does not rely on the assumption that the time to an event (conditional on the set of covariates we are controlling for) follows a normal distribution, which is a highly restrictive (and very often not reasonable) assumption (Cleves, Gould and Gutierrez 2008).

Because LSAY contains information on the month that individuals left school and the month that they re-engaged, we can identify the time in months to re-engagement, and hence the dependent

variable (time to first re-engagement, given no prior re-engagement) can be treated as a continuous variable.

A key consideration when estimating duration models is the choice of functional form. The naïve hazard function presented in Figure 1 suggests that the underlying hazard function may be non-monotonic, which points to the use of flexible models. We estimate a log-normal parametric model, which is more flexible than other commonly-used parametric models such as the Weibull and the logistic model and a semi-parametric piecewise-constant model. For both we assume an unobserved individual heterogeneity term that follows a Gamma distribution and is uncorrelated with the other explanatory variables.⁷

To allow the effects of variables to vary by gender, we estimate models separately for males and females and for the entire sample of early school leavers.

3.1 Model explanatory variables

The models estimated in this paper are reduced-form in that they do not explicitly model course supply and course demand, but just the realisation of the two. That said, because the education pathways open to early school leavers are highly accessible, we assume that most of the variation in re-engagement among early school leavers is due to differences in demand-side factors, in particular, by differences in human capital motivations (Becker 1962).⁸ Under the human capital model, an individual decides to undertake further education or training (or to complete a course if enrolled) if the expected discounted future utility of doing so outweighs the cost, where the expected future benefits may include finding a job, finding a more satisfying job, higher wages and the (dis)utility of study itself. Costs of studying are likely to depend mainly on the opportunity cost of time, or the value of time foregone to undertake study, and tuition fees and non-tuition costs, such as equipment and transport. The opportunity cost of time is likely to vary according to individual circumstances, which affects what individuals have to give up.

When deciding upon which factors to include in the models to represent the costs and benefits of further study, we also have to take into account the number of missing observations that the variable has and how it may impact on the sample size and robustness of results if it is included. For instance, some variables may have considerable missing observations because information was only collected

⁷ We also estimated a Cox proportional hazard model with gamma distributed unobserved individual heterogeneity, but it would not converge, possibly because of the small sample size.

⁸ Course availability is not fixed, but set according to projected course demand. Unlike Higher Education, VET courses cater for all educational backgrounds. As part of the Australian government's Compact with Youth initiative, a government-funded place in education or training is guaranteed for all 15-24 year olds.

in some of the cohorts, such as parents' educational aspirations, or because of high numbers of non-response, for example, income earned from employment that could have been used to generate wage rates (a measure of the opportunity cost of time). Descriptive statistics of all the explanatory variables can be found in Appendix C.

The perceived benefits of acquiring post-school qualifications are likely to depend on having a well established career plan. Given that early school leavers are forced to make career choices from a young age, it is likely that many may not be well-placed to make good decisions. When faced with uncertainty about a suitable career path, many may delay their decision until they have a better idea on what path to follow, which may or may not involve further study. Alternatively, those who leave school with a clear idea of what they'd like to do longer-term may be more motivated to re-engage and complete further study. To capture the effect that having a career plan can have on acquisition of post-school qualifications, we include information on the reasons for leaving school. The reasons for leaving school are grouped into the following categories: Employment (to get an apprenticeship/traineeship, already had an apprenticeship/traineeship or wanted to earn money), Problems at school/not doing well, Training not offered at school, Teachers told you to leave, Financial reasons and Other (having Year 12 wouldn't help you get a job, don't need Year 12 to go onto further study, other).

From a policy perspective, an important question is how schools may prepare youth at risk of dropping-out so that if they do exit early, they may return to education at a later stage. One way that schools help youth at risk develop post-school plans is by offering vocational courses while in school. We identify participation in two types of VET in school courses, those that involve courses associated with an apprenticeship or traineeship and those that are not. While those who undertake VET in schools as part of an apprenticeship or traineeship may have already decided on a post-school career path that involves further study, those who take courses unrelated to an apprenticeship or traineeship may be tasting different types of vocational courses to decide upon an appropriate career and whether to pursue post-school study and if so, which course.

An important school factor that determines the effort and cost of re-engaging for early school leavers is school-aged academic achievement. All else being equal, the net benefits of further study should be greater for higher achieving early school leavers. In this study we proxy academic achievement by combining each individual's Year 9 numeracy and reading scores. The scores in each cohort are measured on different scales and to make them comparable, we divide the combined numeracy and reading scores of all Year 9 students in each cohort into quintiles. Therefore, by construction, an early school leaver who is in the bottom quintile in numeracy and reading is in the bottom quintile

for *all* Year 9 students in their cohort, not just in the bottom quintile for early school leavers. Alternative treatments of numeracy and reading scores were trialed, including percentiles of combined numeracy and reading scores and separate percentile scores for numeracy and reading. The former alternative made no difference and the latter alternative lead to problems with multi-collinearity. As well as including information on numeracy and reading, we also include information on the highest year of secondary school education attained.

Related to non-cognitive skills, we test whether an individual's attitude to education while in school affects the chances of re-engagement. Early school leavers who may have poor attitudes to education while in school may also not be able to properly evaluate the benefits of further study after leaving school or not apply the required effort to complete. Student attitudes to education are individual average responses to a series of 16 statements on teachers, education in general and the school environment asked in Year 9.⁹ For each statement, individuals are asked to report the degree to which they agree with the statement (where 1 is totally disagree and 4 is totally agree). Before deriving the average scale, the responses to negatively worded statements were recoded to ensure that the resulting index is positively coded. Initially, we performed a factor analysis to derive 3 factors that were loaded according to their broad classification (attitude to teachers, education in general and the school environment). However, none of the scores were individually significant in the model and were combined for the sake of parsimony.

A key finding from Black, Polidano and Tseng (2010) is that employment outcomes of early school leavers are important to their chances of completing further study, which maybe because time in work helps early school leavers develop the confidence and career path needed to return to study. We include many of the same employment variables, such as labour market status and job satisfaction, measured as whether the job is one that they would like as a career. Consistent with the notion that finding a career path is important to the chances of re-engaging, we expect that those who find a job that they would like as a career are more likely to re-engage. Also included is a measure of the regional unemployment rate from the Australian Bureau of Statistics (ABS) (2011), which is either the relevant capital city rate if the individual lives in a capital city or the relevant rate for the remainder of the state if they do not. To try and avoid reverse causation, where re-engaging affects labour market outcomes, all employment variables are lagged by one year.

⁹ Statements related to life at school are: I learn important things, I learn to work hard, I feel happy, teachers listen, I achieve a standard satisfactory to me, I like learning, I enjoy being there, school is a good preparation for the future, I like to ask questions, I get the marks I deserve, I learn useful skills, I complete my work to a satisfactory standard, I do extra work, teachers take a personal interest in me, I like to go to school, I enjoy the work I do, I try to do my best, school will help me in adult life, I can cope with the work, teachers help me, I get excited about work, learning is fun, I get to do interesting work, I can be successful, learning is worthwhile, I feel safe and secure and I am treated fairly in class.

A limitation of LSAY is that we do not have information on parents' income. To measure family socio-economic status (SES), we used parents' highest education. The variables were entered in both models one at a time and both together and a variable that was the higher of the two. However, we found consistently that only mother's education had an impact on the chances of re-engaging and the other measures were omitted, which is consistent with results from Hill and Jepsen (2007).

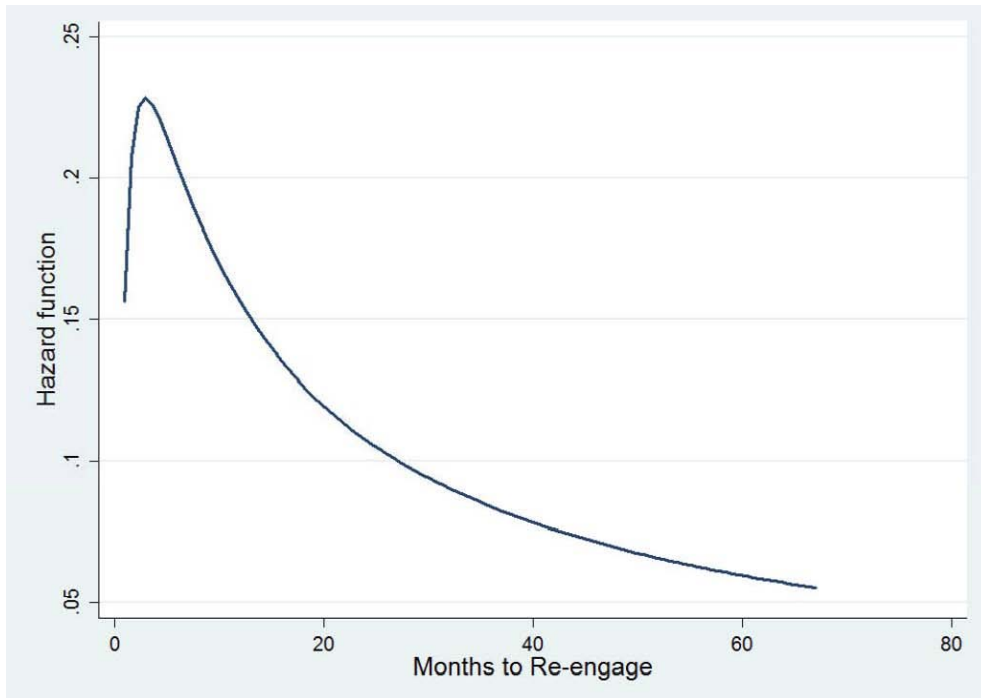
4. Results

Results presented in this section are from the log-normal duration model with unobserved individual heterogeneity. Results from the piecewise constant model are consistent with those of the log-normal model and are presented in Appendix B.

An important motivation of this report was to examine the effect of duration dependence or the effect that time out from school has on the chances of re-engaging in education. The presence of duration dependence matters because it affects the optimal timing of measures to encourage re-engagement. For example, the presence of negative duration dependence — the chances of re-engaging for the first time fall with the time out from school — suggests that governments should intervene early to return early school leavers back to education. The hazard function presented in Figure 1 suggests that duration dependence is positive up to around 2 years out from school, after which it becomes negative. However, the hazard model in Figure 1 is a naïve estimate of duration dependence because it does not control for other factors, such as employment outcomes that may be correlated both with time out from school and with the chances of re-engaging.

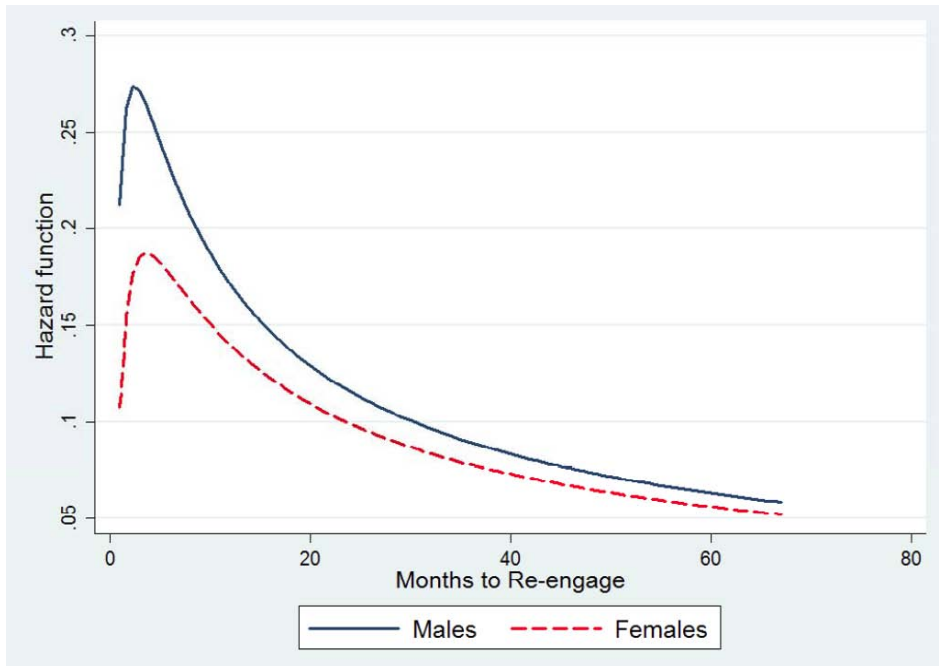
To estimate 'real' duration dependence, we use results from the log-normal duration model of re-engagement to plot a hazard function for an early school leaver up to 7 years after leaving school with all other characteristics held constant at sample average levels (Figure 2). Plotting a hazard function in this way allows us to examine the effect of time on the chances of first re-engagement separate from the effect that other factors may simultaneously have on both time and the chances of re-engagement. From Figure 2, we can conclude that there is evidence of positive duration dependence up until 4 months out from school, possibly reflecting the delay in re-engagement associated with waiting till the next academic year to commence study. Consistent with findings from Black, Polidano and Tseng 2010, we find evidence of negative duration dependence after 4 months, which may be related to the expectation that as time passes early school leavers will become financially independent. After controlling for individual heterogeneity, the presence of negative duration dependence points to the importance of policies that aim to encourage an early return to study.

Figure 2: Predicted hazard function of re-engagement for an average early school leaver up to 7 years after leaving school



Source: predicted from the log-normal duration model for an individual with average characteristics.

Figure 3: Predicted hazard function of re-engagement for an average early school leaver up to 7 years after leaving school



Source: predicted from the log-normal duration model for a male and female with average characteristics.

4.1 Time ratios

To examine the effects of other factors on the chances of re-engagement, we present estimated time ratios and t-statistics (Table 5).¹⁰ A time ratio is the proportional change in the expected time-to-failure for a one unit change in an explanatory variable, keeping all other factors constant. Time ratios are commonly used in the medical literature to estimate the effect of a treatment on the time-to-failure (death) of patients after a treatment. A time ratio greater (less) than one means that receiving a treatment is expected to delay (bring forward) time-to-failure relative to receiving a control; in simple terms, the treatment improves the life expectancy of patients. Another way of thinking about it, is that the hazard function (or chances) of death in the years after treatment is lower for the treated than for the control group.¹¹ In the context of this study, time-to-failure is the time to first re-engagement; therefore, the time ratios can be defined as the proportional change in the time to first re-engagement for a one unit change in an explanatory variable. A time ratio less (greater) than 1 means that a change in the explanatory variable brings forward (delays) the time to re-engagement, or in other words, increases (reduces) the hazard of re-engaging.

The χ^2 values at the bottom of Table 5 are results from the log-likelihood ratio test for the presence of unobserved heterogeneity. For each of the models, the values suggest that unobserved heterogeneity is significantly different from zero, which underlines the importance of controlling for these factors when examining patterns of re-engagement of early school leavers.

¹⁰ The reported t-statistics are based on the original, not exponentiated, coefficients. This means that they can take on negative values when the time ratios are between 0 and 1. The t-statistics associated with the original coefficients are asymptotically equivalent to t-statistics for exponentiated coefficients, but the former are preferred as they tend to perform better on small sample samples.

¹¹ Because death is inevitable, over time the hazard functions between the treatment and control groups will converge.

Table 5: Results for the log-normal re-engagement duration model

	All		Males		Females	
	Time ratio	t-stat	Time ratio	t-stat	Time ratio	t-stat
<i>Socio-economic and demographic factors</i>						
Female	1.464***	4.00
Dependent children	1.174	1.38	1.167	1.23	0.991	-0.06
Female × Children	0.832*	-1.66
Mother's highest qualification (ref. case: less than Year 11)						
Year 11 or 12	0.851**	-2.12	0.892	-1.21	0.866	-1.25
Completed secondary school	0.807***	-2.64	0.899	-1.08	0.796*	-1.78
VET qualification	0.801**	-2.36	0.798**	-2.04	0.941	-0.40
Higher education	0.787***	-2.85	0.928	-0.71	0.699***	-2.81
Unknown	0.894	-0.91	0.973	-0.19	0.781	-1.19
Living with Parents	0.880	-1.50	0.810*	-1.72	0.929	-0.66
State of residence (ref. case: NSW)						
Victoria	1.007	0.09	0.884	-1.24	1.206	1.45
Queensland	1.106	1.07	0.853	-1.39	1.400**	2.37
South Australia	1.095	0.94	1.059	0.5	1.152	0.92
West Australia	0.880	-1.37	0.752**	-2.36	0.949	-0.39
Tasmania	0.961	-0.36	0.928	-0.58	1.038	0.23
ACT	1.270	1.39	1.157	0.68	1.315	1.04
North Territory	1.105	0.61	0.912	-0.46	1.351	1.18
Type of residential area (ref. case: metropolitan)						
Regional	0.967	-0.50	0.981	-0.24	1.002	0.00
Rural	0.924	-0.97	0.968	-0.33	0.898	-0.86
Aboriginal or Torres Straight Islander	0.914	-0.80	1.049	0.32	0.778	-1.59
English as first language	1.088	0.63	1.119	0.73	1.116	0.49
<i>School factors</i>						
Main reason for leaving school (ref. case: employment ^a)						
Problems at school/Not doing well at school	1.313***	3.73	1.323***	2.99	1.19	1.59
School didn't offer training/courses	1.264***	2.69	1.226	1.64	1.20	1.50
Teachers told you to leave	0.851**	-1.99	0.988	-0.12	0.738**	-2.41
Financial reasons	1.255*	1.66	1.269	1.58	1.164	0.63
Other	1.369**	2.22	1.075	0.44	2.100***	3.39
Year 9 numeracy and reading score (ref. case: lowest quintile)						
2nd quintile	1.019	0.27	1.005	0.06	0.975	-0.24
3rd quintile	1.023	0.31	1.192**	2.02	0.858	-1.32
4th quintile	0.949	-0.57	1.018	0.17	0.82	-1.36
Highest quintile	0.981	-0.17	0.909	-0.68	1.009	0.05
Year left school (ref. case: Years 9 or 10)						
Year 11	1.117	1.57	0.956	-0.53	1.320**	2.53
Year 12	1.391***	2.84	1.517***	2.77	1.404**	1.97

Table 5 cont.

	All		Males		Females	
	Time ratio	t-stat	Time ratio	t-stat	Time ratio	t-stat
Positive attitude toward education (1-4)	0.986	-0.22	0.950	-0.67	1.033	0.33
Intention to complete school (reported in Year 9)	1.029	0.50	1.067	0.97	0.944	-0.64
VET in Year 11 or 12 (ref. case: none)						
VET not part of an apprenticeship/traineeship	0.956	-0.58	1.066	0.68	0.879	-1.02
VET part of an apprenticeship/traineeship	0.751*	-1.92	0.879	-0.77	0.713	-1.29
Type of school attended (ref. case: Government)						
Catholic School	0.925	-1.02	0.825**	-2.15	1.082	0.64
Independent School	1.005	0.05	1.021	0.19	1.00	0.00
<i>Employment factors</i>						
Regional unemployment rate (%)	0.964	-1.34	0.997	-0.1	0.918**	-1.97
Lagged employment status (ref. case: unemployed)						
Not in the Labour Force	0.753***	-3.62	0.709***	-3.51	0.813*	-1.74
Ongoing Part-time	0.786*	-1.75	0.683**	-2.24	0.929	-0.35
Ongoing Full-time	0.841	-1.48	0.745**	-2.08	1.036	0.19
Casual Part-time	0.710***	-3.42	0.651***	-3.32	0.843	-1.14
Casual Full-time	1.112	0.8	1.083	0.52	1.049	0.21
Lagged attitudes to work (ref. case: employed in a career job)						
Not employed in a career job	1.334***	3.49	1.321***	2.66	1.278**	1.99
Uncertain whether it is a career job	1.510**	2.24	1.418	1.49	1.639*	1.8
<i>Other factors</i>						
LSAY cohort (ref. case: 1995)						
LSAY 1998 cohort	1.283***	2.67	1.369***	2.64	1.066	0.45
LSAY 2003 cohort	1.253	1.43	1.402*	1.75	1.039	0.16
σ^b	0.915		0.758		0.972	
Log likelihood	-2640.7		-1402.3		-1201.6	
χ^2c	183.5		102.8		104.1	
Observations	3257		1712		1545	

^aIncludes those who report leaving school to start an apprenticeship or traineeship or to find work and those who report leaving to look for employment or an apprenticeship. ^bIs an ancillary parameter that affects the shape of the log-normal survival function. ^cChi-squared statistic for the log-likelihood ratio test for the presence of unobserved heterogeneity. These values suggest that for each model, unobserved heterogeneity is significantly different from zero.

***Significant at 1%, **significant at 5%, significant at 10%.

4.1.1 Socio-economic and demographic factors

The significant interaction term between gender and dependent children suggests that males and female patterns of re-engaging may depend on the presence of children. For early school leavers without children, we estimate that males are estimated to re-engage in education 46% earlier than females. The lower rate of re-engagement among female early school leavers is likely to be because apprenticeships, an important path back to education for early school leavers, is a less attractive option for females than for males. For early school leavers with children, we estimate that males re-engage 30% earlier than females. The smaller discrepancy in the time to re-engagement for those with children is because fathers are more likely to take-on the role of financial provider, which means delaying re-engagement.

Socio-economic status, as measured by mother's highest education attainment is estimated to not only affect the chances of school completion (Marks and McMillan 2001), but also the chances of re-engaging in post-school education.¹² In particular, the chances of re-engaging are greater for early school leavers whose mothers completed at least some senior secondary school education (Year 11 or Year 12) relative to those who did not. Youth whose mothers went on to complete school or post-school qualifications are just as likely to re-engage as those whose mother completed some senior school education. Lower re-engagement rates among low SES may be due to lower parental educational aspirations for their children.

Besides setting expectations, parents, especially parents of males, can potentially play an important role in helping early school leavers return to study by providing them with a supportive place to live. We estimate that male early school leavers who are still living at home re-engage on average at 19% earlier than males who live away from home. Males may benefit from extra support and guidance because evidence points to young males having lower stocks of non-cognitive skills (Jacob 2002).

4.1.2 School factors

An important contribution of this paper is that we are able to examine not only how post-school outcomes affect the chances of re-engaging early school leavers, but also how the chances of re-engagement are shaped by forces while in school. Understanding the role of such forces is important to help schools better prepare students intent on leaving.

¹² Education and occupation categories of both parents were trialed in the model, but only mother's education was significant.

Results from Table 5 suggest that reasons for leaving school are important in explaining the chances of re-engaging in education. Early school leavers who report leaving school mainly for employment reasons (around half) are much more likely to re-engage than those who report leaving for reasons unrelated to furthering study. For example, for those who are yet to re-engage, those who leave school for employment reasons are estimated on average to re-engage 31% earlier than those who leave school because they either had a problem with school or were not doing well at school. This result suggests that because they know what they want to do longer-term, the perceived benefits and motivation for further study are greater for students who have a career plan than for those who do not have a plan. An alternative explanation is that those who report leaving for employment reasons are leaving school to start an apprenticeship or traineeship, which is associated with further education. This alternative explanation was tested by re-running the re-engagement models on a sample *without* those who re-engaged in traineeships or apprenticeships and found much the same results, which does not support this alternative hypothesis.¹³

Differences in the ability of individuals to set plans may be related to their stock of non-cognitive skills (Carneiro and Heckman 2003; Heckman, Lochner and Todd 2006). Under social cognitive model of self-directed motivation, self-esteem (or perceived self-efficacy) is important to the establishment of challenging goals that drives self-regulated motivation (Zimmerman 1989). Using data from wave 2 of the 1998 LSAY cohort, it is shown (Table 6) that on average those who leave school because they want to find employment or continue studying are statistically more confident, agreeable, calm and hardworking than those who leave for other reasons.¹⁴

¹³ The magnitude of the time ratios was much the same, but with larger standard errors due to the smaller sample size. Results are available upon request from the authors.

¹⁴ If the non-cognitive skills that affect reasons for leaving school also independently affect the chances of re-engagement then reasons for leaving school would be endogenous and the results biased. To test this, we omitted reasons for leaving school and re-estimated the model. Results, available upon request from the authors, were almost identical to those presented in the report, which suggests that there is no strong evidence of bias and that the main channel for non-cognitive skills to affect re-engagement is through reasons for leaving school.

Table 6: Average personality traits of early school leavers by reason for leaving school, LSAY 1995 cohort

	Reason for leaving school early		Difference
	Employment or study reasons	Other	
Confidence	3.255	3.119	0.136***
Agreeableness	3.208	3.140	0.068**
Openness	3.376	3.343	0.033
Calmness	3.168	3.017	0.151***
Hardworking	3.573	3.492	0.081**
Outgoing	3.373	3.362	0.011
Count (N)	1118	790	-

Note: These personality traits are only available in wave 2 of LSAY 1995. The personality scores were derived by asking individuals to report on a scale of 1 to 4 (where 1 is very and 4 is not at all) how they viewed themselves on these 6 traits. The individual scores are reverse coded, so that the higher the score, the more positive their response. The significance of the difference in the average traits between the two categories of early school leavers is derived using a t-test. ***Significant at 1%, **significant at 5%, significant at 10%.

Also consistent with the importance of non-cognitive skills, we find that male early school leavers from Catholic schools are more likely to re-engage than their male Government school counterparts. Coleman and Hoffer (1983) proposed that the high performance of Catholic schools relative to public schools in the United States is because they do better at developing non-cognitive skills in students, which was confirmed in a paper by Peterson and Viarengo (2009).

We find no evidence that a positive attitude to education while at school has any affect on their chances of re-engaging in post-school education. Neither do we find any difference in the rates of re-engagement between early school leavers who did and did not intend completing school when in Year 9. This finding suggests that attitudes to education formed while at school may not translate into attitudes to post-school education.

Although early school leavers, compared to school completers, are more than twice as likely to be in the bottom quintile of Year 9 numeracy and reading scores, we find no evidence that low numeracy and reading skills affects their chances of re-engaging in education. To test the robustness of the results presented in Table 5 we also tried entering numeracy and reading scores, together and independently, as percentiles and omitting all other variables from the model (to test for the presence of multicollinearity), but did not find any significant effects. Assuming that Year 9 numeracy and reading scores are a good measure of numeracy and reading levels at the time of exit from school; we can explain the insignificant results in two ways. First, because lower levels of VET courses in Australia have no minimum academic requirements, pathways back into education for early school leavers are highly accessible, even for those with poor numeracy and literacy. Second, the

insignificant impacts of ranking in numeracy and reading may be related to the strong performance of Australian students in the Program of International Student Assessment (PISA) numeracy and reading tests (Thomson et al. 2011), so that even the lowest quintile in Year 9 is still able to participate in post-school education, regardless of the fact that they didn't finish school.

We estimate that the likelihood of re-engagement decreases with years of schooling, which suggests that early school leavers substitute time in school for time in tertiary study. On average, we estimate that those who leave school in Year 9 or Year 10 re-engage in education 39% earlier than those who leave in Year 12. This poses the question of whether having accessible post-school education pathways in Australia may decrease the rates of school completion.

Evidence that participation in VET in schools programs improves the engagement in post-school education and training of early school leavers is mixed. We find that undertaking VET subjects taken as part of an apprenticeship or traineeship while in senior school (Year 11 and Year 12) does improve the chances of re-engaging in post-school education, but we find no impact for those who undertake VET subject that are not associated with an apprenticeship or traineeship. Early school leavers who undertook VET subjects as part of an apprenticeship or traineeship are estimated to re-engage 25% earlier than early school leavers who undertook no VET in schools. From sensitivity analysis, we find no evidence that the insignificant effect of undertaking a VET subject that is not part of an apprenticeship or traineeship is confounded with the effect for reason for leaving school.¹⁵ Further, we find no evidence that the effects of VET in school varies by state. These results are consistent with the findings of Anlezark, Karmel and Ong (2006), which found no difference in post-school participation between early school leavers who undertook VET courses in senior school and early school leavers who left before senior school. A possible reason why VET in schools may not open up post-school education pathways for early school leavers is because it's offered too late.¹⁶ From the data used in this study (Table 2), around 30% of early school leavers dropout of school before reaching senior school and for those who reach senior school, experiences in VET may be too late to affect their career choices. This is consistent with the findings of a recent study by Nguyen (2010)

¹⁵ The relationship would be confounded if by participating in VET programs, students decided to commence an apprenticeship or traineeship after leaving school. In this case, participating in VET programs that are not part of an apprenticeship or traineeship would be correlated with reasons for leaving school. To test this, we re-estimated the model, but excluding the reasons for leaving school variable. Results for this model were much the same as those reported in Table 10.

¹⁶ Encouraging participation in post-school education is one of the prime objectives of VET in schools program, as set out in the 'Common and Agreed National Goals for Schooling in the Twenty-first Century', which were endorsed at the April 1998 Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) meeting - www.curriculum.edu.au/verve/_resources/natgoals_file.pdf.

who found that undertaking VET subjects in senior school had little effect on reported career plans because by senior school, student career plans are fairly stable.

4.1.3 Employment outcomes

Regardless of the type of contract and the hours of employment, we find for both males and females that the chances of re-engaging early school leavers are positively linked with finding a job that meets their career aspirations. On average, those who report finding a job that they would like as a career are estimated to re-engage 33% earlier than those who work in a job that they do not want as a career and 55% earlier than those who are unsure whether it is a career job. These results suggest that finding a job that matches the career aspirations of early school leavers is an important motivator for returning to study, possibly because it reduces the uncertainty of the benefits from re-engaging. Those who are unsure about whether the job is one that they would like as a career may be least likely to re-engage because their career aspirations are unclear.

Overall, we find that independent of one's own employment status, the likelihood of re-engagement is not significantly linked to the rates of unemployment.¹⁷ However, this result masks differences in the effects between males and females. We estimated that for every 1 percentage point increase in the regional unemployment rate, there is a 9% increase in the speed in which females re-engage. This result points to the demand for jobs performed by female early school leavers (clerical, sales and personal assistants) being more sensitive to cyclical trends in labour demand.

5. Conclusions

Overall, results presented in this study support the view that schools can play a crucial role in helping prepare youth 'at risk' by assisting them in developing a post-school career path. Around 90% of early school leavers return to study via vocational education rather than return to general education (school), suggesting that the decision is associated with a choice of career path. Underlining the importance of career preparation, we find that early school leavers who report leaving school for employment reasons are more likely to return to study than students who leave for other reasons, for example, because they didn't like school. Further, independent of career plans upon leaving school; those who are successful in finding a job that they would like as a career are estimated to be more likely to re-engage in education. School programs that help prepare youth at risk for life after school may focus on providing career information and on developing non-cognitive skills that affect career aspirations, especially self-esteem.

¹⁷ During the period of the survey, the national unemployment rates in Australia have declined from around 8.2 percent in 1995 to around 5.6 percent in 2009 (ABS 2010b), with considerable regional variation.

A common way in which schools help youth at risk develop appropriate career paths is through VET in schools programs. However, evidence presented suggests that while early school leavers who start an apprenticeship or traineeship as part of a VET in schools program are more likely to re-connect with study after leaving school, there is no strong evidence that those participating in more general VET in school programs are more likely to re-engage or complete than those who do not participate in VET in schools. A possible explanation is that while apprentice and trainee programs are for those with a clear idea about what they want to do after school, more general programs are designed as ‘taster’ courses for students unsure about their future career path, but their introduction is too late to have an impact. VET in schools programs are not available to at least a third of early school leavers who leave school before commencing Year 11.

Results suggest that school numeracy and literacy programs are not likely to improve the chances that youth at risk will return to education if they choose to leave school early. We find no evidence that poor numeracy and reading skills is a barrier to re-engaging and in further study. We suggest two possible reasons why this may be the case. First, by international standards Australian students perform well in numeracy and reading (Thomson et al. 2011), so that even those in the lowest quintile (and percentile) in Year 9 may be still able to participate in further education, regardless of the fact that they didn’t finish school. Second, post-school education options for early school leavers in Australia are available at a wide range of levels, making the acquisition of post-school qualifications possible for people from all education backgrounds.

After controlling for individual heterogeneity, this is the first study to find evidence of duration dependence in the decision of early school leavers to return to study. We find that initially, the chances of re-engaging increase with the time out from school (positive duration dependence), but after around 4 years out, the chances of re-engaging decline rapidly (negative duration dependence). This result suggests that there is a limited window of opportunity to re-engage early school leavers before the opportunities diminish. By controlling for observed and unobserved differences in individual characteristics that affect the chances of re-engagement, we are able to demonstrate that duration dependence is real. These results support government measures, such as the Australian Government’s ‘Learn or Earn’ requirements, that coerce early school leavers back into education early.¹⁸

¹⁸ Under the Learn or Earn requirements, those under 21 on income support without a Year 12 qualification or equivalent are required to be in full-time study, employment or a combination of the two.

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Appendix A: LSAY and attrition

The original sample the 1995 and 1998 cohorts of LSAY are around 14,000 and the sample size for the 2003 PISA cohort is around 10,000 (Table A.1). A limitation of all panel datasets is that they are affected by attrition, or individual's leaving the survey. In the first 7 waves of the LSAY surveys, spanning the period from pre-compulsory education (Year 9) until after school ends, 51%, 42% and 53% of the original sample remains in the 1995, 1998 and 2003 cohorts respectively (Table A.1). From Table A.1, it is clear that the highest rates of attrition occurred in the second waves of the 1995 and 1998 cohorts, which is likely because of the use of paper-based survey. Annual rates of attrition are slower after the introduction of computer-assisted telephone interview from 2003.

Table A.1: Survey size and response rates in LSAY, wave 1-7

	wave 1	wave 2	wave 3	wave 4	wave 5	wave 6	wave 7
	1995 cohort						
Survey Year	1995	1996	1997	1998	1999	2000	2001
Avg. age (June 30)	14.5	15.4	16.4	17.4	18.4	19.4	20.4
Sample size (N)	13,613	9,837	10,307	9,738	8,783	7,889	6,876
Wave 1 retained (%)	100.0	72.3	75.7	71.5	64.5	58.0	50.5
Attrition rate (%)	-	27.7	-4.8	5.5	9.8	10.2	12.8
	1998 cohort						
Survey Year	1998	1999	2000	2001	2002	2003	2004
Avg. age (June 30)	14.5	15.5	16.5	17.5	18.5	19.5	20.5
Sample size (N)	14,117	9,289	9,548	8,777	7,762	6,905	5,979
Wave 1 retained (%)	100.0	65.8	67.6	62.2	55.0	48.9	42.4
Attrition rate (%)	-	34.2	-2.8	8.1	11.6	11	13.4
	2003 cohort						
Survey Year	2003	2004	2005	2006	2007	2008	2009
Avg. age (June 30)	15.7	16.7	17.7	18.7	19.7	20.7	21.7
Sample size (N)	10,370	9,378	8,691	7,721	6,658	6,074	5,475
Wave 1 retained (%)	100	90.4	83.8	74.5	64.2	58.6	52.8
Attrition rate (%)	-	9.6	7.3	11.2	13.8	8.8	9.9

Notes: Only respondents in each wave are used to calculate average ages and figures are unweighted. For 1995 cohort, 586 individuals have 'missing' DOB (age); only respondents in each wave are used to calculate average ages and figures are unweighted. For 1998 cohort, 1,017 individuals have 'missing' DOB (age); 86 individuals have 'missing' sex; only respondents in each wave are used to calculate average ages and figures are unweighted.

While attrition may reduce the precision of model estimates, the bigger problem in the context of this study is the potential bias from non-random attrition. Bias is present in the re-engagement results presented in this report if there is a relationship between the re-engagement model explanatory variables and attrition that is driven by unobserved factors that affect both attrition and the chances of re-engaging early school leavers in education. To test whether the attrition in LSAY is non-random, we compare the average values of the explanatory variables for those in the sample to those that attrited. If there are no clear differences in the average values of the explanatory variables between those who do and do not attrite, we may conclude that bias due to non-random attrition may not be a problem in this study.

How to deal with attrition within endogenous attrition with a duration model framework is not well established in the literature. To our knowledge, the only paper to deal with this issue is by Van den Berg, Lindeboom and Ridder (1994), who incorporate a sample selection equation into a standard Weibull duration model. However, the non-monotonic nature of the underlying hazard of re-engaging makes fitting a monotonic Weibull model unsuitable. Another option to deal with attrition is to apply the provided LSAY sample attrition weights, as suggested by Sheldon (2009). However, such an approach is not likely to resolve any attrition bias in this study because the weights are derived from Year 9 numeracy and reading scores, which are controlled for in the model. Winship and Radbill (1994) argue that when the variables used to derive the weights are the same as the independent variables included in a multivariate model, it is preferable to unweight data.

Appendix B: Sensitivity analysis

Table B.1: Results from alternative models

	Log-normal		Piecwise Constant		Cox	
	Time ratio	t-test	Hazard ratio ^a	t-test	Hazard ratio ^a	t-test
<i>Socio-economic and demographic factors</i>						
Female	1.464***	4.00	0.660***	-3.84	0.748***	-3.20
Dependent children	1.174	1.38	0.782**	-2.23	0.838*	-1.85
Female × Children	0.832*	-1.66	1.192	1.49	1.147	1.38
Mother's highest qualification (ref. case: less than Year 11)	-	-	-	-	-	-
Year 11 or 12	0.851**	-2.12	1.255**	2.56	1.182**	2.40
Completed secondary school	0.807***	-2.64	1.295***	2.73	1.241***	2.88
VET qualification	0.801**	-2.36	1.400***	3.15	1.299***	3.09
Higher education	0.787***	-2.85	1.251**	2.28	1.148*	1.83
Unknown	0.894	-0.91	1.049	0.33	1.046	0.39
Living with Parents	0.880	-1.50	1.033	0.39	1.029	0.41
State of residence (ref. case: NSW)	-	-	-	-	-	-
Victoria	1.007	0.09	0.921	-0.87	0.920	-1.12
Queensland	1.106	1.07	0.780**	-2.33	0.845**	-2.01
South Australia	1.095	0.94	0.831*	-1.65	0.858*	-1.75
West Australia	0.880	-1.37	1.129	1.13	1.049	0.57
Tasmania	0.961	-0.36	1.018	0.15	1.020	0.21
ACT	1.270	1.39	0.852	-0.80	0.871	-0.88
North Territory	1.105	0.61	0.904	-0.53	0.941	-0.39
Type of residential area (ref. case: metropolitan)	-	-	-	-	-	-
Regional	0.967	-0.50	1.031	0.39	1.042	0.66
Rural	0.924	-0.97	1.165	1.64	1.121	1.54
Aboriginal or Torres Straight Islander	0.914	-0.80	1.202	1.42	1.146	1.32
English as first language	1.088	0.63	1.046	0.29	1.058	0.47
<i>School factors</i>						
Main reason for leaving school (ref. case: employment ^b)	-	-	-	-	-	-
Problems at school/Not doing well at school	1.313***	3.73	0.701***	-4.25	0.806***	-3.29
School didn't offer training/courses	1.264***	2.69	0.741***	-2.94	0.836**	-2.26
Teachers told you to leave	0.851**	-1.99	1.276***	2.61	1.199**	2.45
Financial reasons	1.255*	1.66	0.663***	-2.63	0.790*	-1.95
Other	1.369**	2.22	0.657**	-2.56	0.760**	-2.11
Year 9 numeracy and reading score (ref. case: lowest quintile)-	-	-	-	-	-	-
2nd quintile	1.019	0.27	0.987	-0.16	1.005	0.08
3rd quintile	1.023	0.31	1.003	0.03	1.045	0.66
4th quintile	0.949	-0.57	1.077	0.69	1.047	0.54
Highest quintile	0.981	-0.17	1.081	0.60	1.060	0.57

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Table C.1 cont.

	Lognormal		Piecewise Constant		Cox	
	Time ratio	t-test	Hazard ratio	t-test	Hazard ratio	t-test
Year left school (ref. case: Years 9 or 10)	-	-	-	-	-	-
Year 11	1.117	1.57	0.860*	-1.95	0.911	-1.54
Year 12	1.391***	2.84	0.781*	-1.83	0.852	-1.46
Positive attitude toward education (1-4)	0.986	-0.22	1.000	-0.00	0.980	-0.37
Intention to complete school (reported in Year 9)	1.029	0.50	0.922	-1.22	0.932	-1.34
VET in Year 11 or 12 (ref. case: none)	-	-	-	-	-	-
VET not part of an apprenticeship/traineeship	0.956	-0.58	1.057	0.59	1.016	0.22
VET part of an apprenticeship/traineeship	0.751*	-1.92	1.341*	1.65	1.189	1.22
Type of school attended (ref. case: Government)	-	-	-	-	-	-
Catholic School	0.925	-1.02	1.124	1.33	1.098	1.34
Independent School	1.005	0.05	1.104	0.89	1.097	1.06
<i>Employment factors</i>						
Regional unemployment rate (%)	0.964	-1.34	1.043	1.37	1.020	0.75
Lagged employment status (ref. case: unemployed)	-	-	-	-	-	-
Not in the Labour Force	0.753***	-3.62	1.222**	2.37	1.030	0.40
Ongoing Part-time	0.786*	-1.75	1.134	0.95	1.073	0.62
Ongoing Full-time	0.841	-1.48	0.986	-0.12	1.009	0.09
Casual Part-time	0.710***	-3.42	1.279**	2.48	1.171*	1.85
Casual Full-time	1.112	0.80	0.817	-1.51	0.873	-1.18
Lagged attitudes to work (ref. case: employed in a career job)	-	-	-	-	-	-
Not employed in a career job	1.334***	3.49	0.771***	-3.31	0.828***	-2.83
Uncertain whether it is a career job	1.510**	2.24	0.711*	-1.86	0.792	-1.47
<i>Other factors</i>						
LSAY cohort (ref. case: 1995)	-	-	-	-	-	-
1998 LSAY cohort	1.283***	2.67	0.707***	-3.45	0.813**	-2.57
2003 LSAY cohort	1.253	1.43	0.834	-1.18	0.930	-0.58
σ^c	0.915	-	-	-	-	-
Log likelihood	-2640.7	-	-2766.8	-	-12046.4	-
χ^{2d}	183.5	-	2080.3	-	130.8	-
Observations	3257	-	3777	-	3257	-

^a Hazard ratio represents the proportional change in the probability of re-engaging in the next period, given that an individual has not re-engaged to date, for a one unit change in the explanatory variable, all else equal. Therefore, a hazard ratio greater (less) than 1 represents an increase (decrease) in the probability of re-engaging for a one unit increase in the explanatory variable. ^bIncludes those who report leaving school to start an apprenticeship or traineeship or to find work and those who report leaving to look for employment or an apprenticeship. ^cIs an ancillary parameter that affects the shape of the log-normal survival function. ^dChi-squared statistic for the log-likelihood ratio test for the presence of unobserved heterogeneity. These values suggest that for each model, unobserved heterogeneity is significantly different from zero. ***Significant at 1%, **significant at 5%, significant at 10%.