LONGITUDINAL SURVEYS OF AUSTRALIAN YOUTH

Does combining school and work affect school and post-school outcomes?

ALISON ANLEZARK

PATRICK LIM

Longitudinal Surveys of Australian Youth

NCVER

Does combining school and work affect school and post-school outcomes?

Alison Anlezark
Patrick Lim

National Centre for Vocational Education Research

Funded by the Australian Government Department of Education, Employment and Workplace Relations with support from state and territory governments.

Publisher's note

Further information regarding the Longitudinal Surveys of Australian Youth (LSAY) can be found at <http://www.lsay.edu.au>.

ISBN 978 1 921809 12 9 web edition
ISBN 978 1 921809 18 1 print edition

TD/TNC 104.12

Published by NCVER
ABN 87 007 967 311

Level 11, 33 King William Street, Adelaide SA 5000
PO Box 8288 Station Arcade, Adelaide SA 5000, Australia

ph +61 8 8230 8400 fax +61 8 8212 3436
email ncver@ncver.edu.au
<http://www.ncver.edu.au>
<http://www.ncver.edu.au/publications/2398.html>

About the research

Does combining school and work affect school and post-school outcomes?

Alison Anlezark and Patrick Lim, NCVER

One of the distinctive characteristics of Australia's secondary schooling system is the sizable proportion of students working part-time. This phenomenon raises important policy issues: does working part-time assist or hinder academic performance? Does it assist the transition to the labour market? This report uses data from the Longitudinal Surveys of Australian Youth (LSAY) of students who were aged 15 in 2003 to look at these questions.

Key messages:

- Students who are combining work and school, on average, work 11–12 hours a week, with more females working than males; however, on average, males who are combining work and school work longer hours.
- Combining school and work has a modest negative impact on school and post-school study outcomes when hours are long (in excess of 15–20 hours a week). Females are better able to balance school and work, with the magnitude of these negative effects generally being less than for males.
- Working for relatively few hours a week (around five hours per week) has a positive impact on post-school full-time employment, compared with not working at all. Females have to work slightly longer hours to realise maximum benefits from working (15–20 hours per week) than males (10–15 hours per week), but the magnitude of the effect is comparable with males.
- While one has to be cautious in attributing causation, it does appear that students who are working lengthy hours in part-time employment are signalling an orientation towards employment and away from formal education.

Tom Karmel
Managing Director, NCVER

Contents

Tables and figures

Tables

Figures

Introduction

Background

The proportion of young people combining school and work is on the increase. Depending on the sources consulted (for example, ABS labour force statistics or LSAY Y03 cohort), the actual proportions of school students working are estimated as at between 30% and 60%.

The increase in young people combining school and work can be explained on the demand side by the changing structure of the Australian workforce, with employers seeking more flexible, casual workers, particularly in the hospitality and retail sectors, for which young people are well suited (Biddle 2007).

On the supply side, there is a plentiful supply of young people who are staying on at school and who see part-time work as a means of gaining some financial independence from their parents. Young people make decisions on whether or not to work, based on the availability of work, their desire for financial independence, their ability to travel to the work location and whether or not their parents want them to work. Rarely are the jobs young people choose to work in while at school selected as intentional career pathways (Robinson 1999; Smith & Green 2005; Howieson, McKechnie & Semple 2006).

We see there is a good match between supply (young people) and demand (employers) for student workers, but is this a good thing for young people? Are students able to manage the competing demands of combining school and work? Does combining school and work have a beneficial or detrimental impact on their school and post-school outcomes? The purpose of this paper is to explore these questions.

The majority of previous Australian (see, for example, Robinson 1996, 1999; Vickers, Lamb & Hinkley 2003) and international research (Howieson, McKechnie & Semple 2006; Marsh & Kleitman 2005; Singh, Chang & Dika 2007) finds that combining school and work has a negative impact on school performance. In general, the more hours worked, the more negative the effect.

It is not difficult to understand why combining school and work can be detrimental to school performance. Hours of study are foregone by working, and students may be distracted by work, or too tired to concentrate properly at school. However, Marsh and Kleitman (2005) take this one step further and suggest that it may also be what young people do with the money they earn that can be detrimental: the researchers find that access to money can lead to an increase in anti-social behaviour such as drug taking and alcohol abuse, which in turn can affect school performance.

But how much is too much work? The Australian studies cited above use different longitudinal datasets to analyse the effects of working in specific (but different) school year levels. These approaches make cross-study comparisons difficult, and it would be naive to assume that the characteristics of students who work in Years 9 or 10 are the same as those who work in Years 11 or 12, and that their effects will be the same. Vickers, Lamb and Hinkley (2003)[1] found that working more than five hours a week in Year 9 had a detrimental effect on Year 12 completion.

[1] Using the LSAY Y95 cohort data, an aged-based cohort who were aged 15 years in 1995.

Robinson (1999)[2] found working more than ten hours a week in Years 11 and 12 negatively affected tertiary entry rank (TER) scores, and working in Year 11 for more than ten hours a week affected Year 12 completion.

A study conducted in the United States by Marsh and Kleitman (2005)[3] found that the number of hours worked per week may be as high as 20 before the negative effects of combining school and work are felt. In this study, students who worked at least 20 hours a week in high school reported fewer hours of homework and lower test scores than students who limited their hours.

Staff and Mortimer (2007)[4] suggest that it may not just be the number of hours, but the intensity and duration of the work, classified as 'occasional', 'sporadic', 'steady' and 'most invested', which affects school performance. This is one of the few studies that finds that combining school and work can improve school outcomes. Their US research reports that part-time work during high school can set good patterns of work–study combinations, and moderate but steady combinations of school and work can facilitate educational attainment for some underperformers.

In addition to hours of work, it is also important to understand the characteristics of those who work when at school. If we find that working when at school is beneficial, then we might want to promote combining school and work to those groups of young people not currently engaged in this activity. Similarly, if we find that combining school and work is detrimental, then we may want to identify those at risk from this activity. It is also important to consider the intensity of work while at school. That is, do young people who work longer hours when at school have different characteristics from those who work fewer hours, or not at all? Are some people able to tolerate work when at school more than others? Research by Shanahan and Flaherty (2001) found that a well-rounded youth often combines some paid work with school extracurricular activities, with no negative effect on school performance.

Most of the benefits arising from combining school and work appear to be for post-school employment rather than any school-related benefits. Marsh and Kleitman (2005) find a reduction in post-secondary unemployment for students who combine school and work. Billett (2006) finds that part-time paid work and school can teach students about the world of work and broaden their understanding of post-school options and pathways, but the types of work seem to matter. Most young people work predominantly in the hospitality (fast food) and retail sectors, which may allow for the development of some 'employability' skills (Biddle 2007). However, many of these jobs require young people to work predominantly with their peers, and there is little evidence that combining school with these types of jobs prepares young people for the world of work (Meyerhoff 2006).[5]

Finally, the advantages and disadvantages of combining school and work are not clear-cut. Some young people are better able to manage the competing demands of combining school and work. Young people from more advantaged backgrounds, who are in general more strongly focused on an academic trajectory, are more likely than their less advantaged counterparts to work, but work for fewer hours, and generally have more positive school and post-school study outcomes anyway. In contrast, youth from more disadvantaged backgrounds and those with poorer grades and lower educational aspirations are more likely to work longer hours when at school and have poorer school and post-school outcomes (Staff & Mortimer 2008). However, we do not know whether their choice to work longer hours is influenced by their poor school performance, or whether their

[2] Using the Youth in Transition 1975 birth cohort in 1994 at age 19 years.

[3] Using the US National Education Longitudinal Survey (NELS) of a 1988 cohort.

[4] Using the US Youth Development Study, a longitudinal survey of 1010 grade 9 students and parents from Minnesota, from 1987, followed from age 19 to 31 years.

[5] The topic of combining school and work is very broad; an area not explored in this paper, but worthy of future research could be to consider *good* work versus *bad* work by considering employment type and when the employment occurs.

poor school performance is the result of longer hours worked. That is, are these individuals already disengaged from schooling, so that, essentially, working does not affect their school outcomes?

In this paper we seek to update the existing research on the impact of combining school and work. Our analysis is disaggregated by gender and provides a more nuanced measure of hours worked and its relationship to outcomes than previous research by looking at the effect at each school year level.

In the first part of the paper we describe the statistical approach, and then quantify and describe the distribution of hours worked when students are at school between Years 9 and 12. This shows how many students are combining school and work and provides an understanding of how hours of work change between the school year levels. We then provide a summary of the characteristics of students who combine school and work to complete the picture.

In the main part of the paper we look at the effect of hours of work on school and post-school outcomes, allowing for the background and aspirational characteristics of the individual. The effect of combining school and work on retention to Years 11 and 12, as well as TER scores, is analysed to measure effects on school outcomes. Post-school outcomes are measured in terms of full-time post-school study and full-time employment for Year 12 completers. We conclude the paper with a discussion on what new evidence this paper brings to the debate on part-time work and school.

Consistent with previous research, we find some negative effects from combining school and work on school and post-school study outcomes for those working longer hours, but positive effects on post-school employment.

Research approach

In updating the previous research, we build on the earlier work of Vickers, Lamb and Hinkley (2003) and Robinson (1999) using longitudinal datasets, but we use a more recent cohort of young people,[6] the Y03 cohort, which is a group of 10 370 young people who were aged around 15 in 2003.

However, comparing the results with the previous research is difficult because different approaches and cohorts were used:

- Vickers, Lamb and Hinkley (2003) used data from the LSAY Y95 cohort, focusing on Year 9 students (the first wave of the cohort) and included the whole cohort and did not exclude early school leavers. Males and females were modelled separately. They did not report on the effects of students working in different school year levels, but focused only on combining school and work in Year 9, and the effect this had on Year 12 completion and post-school employment outcomes in the first few years beyond school. The second part of their study focused on the effect of work on post-school university students.
- Robinson (1999) used data from the Youth in Transition 1975 birth cohort, but took a broader approach and first looked at motivations for working.[7] She then measured the effects of combining school and work in Years 11 and 12 on Year 12 completion and Year 12 results (TER scores), but did not run separate models for males and females. She then went on to look at the effect on post-school outcomes, measured as incidences of unemployment and income and job type.

Both of these previous studies described the characteristics of those who combined school and work, and then controlled for these characteristics in their models.

In this paper we conduct some analysis which has not been previously undertaken, by looking at the effect of working on retention to Years 11 and 12 by gender.[8] We then model the effects of working in Year 12 on TER score in a similar manner to the work of Robinson (1999), but with separate models for males and females.

Post-school outcomes are analysed in a different way from Robinson (1999), by restricting our analysis to Year 12 completers and testing whether working at school in Year 12 has a positive or negative effect on the likelihood of going on to post-school full-time study or full-time employment. This approach provides a more direct relationship between the year the student combined school and work and the post-school outcomes, and explores whether working is beneficial for those not pursuing an academic trajectory after Year 12. Separate models are again run for gender.

We do not consider the effects of working in Year 9 on either school or post-school outcomes (as did Vickers, Lamb & Hinkley 2003), because the Y03 LSAY dataset is an age-based rather than a year-based cohort (as was the Y95 cohort), and there are too few students to analyse in the Y03 cohort in

6 Refer to appendix A for detail on the data and scope.

7 This information was captured from a series of questions asked of the YIT cohort in 1992 (when they were aged 17 years) about their experiences of being a part-time worker. The questions were phrased as a series of statements commencing *with I work because* … These questions are not asked of the current LSAY cohorts (Y95, Y98, Y03, and Y06).

8 We did consider looking at Year 12 completion, but because the majority (98%) of LSAY students who commenced Year 12 completed it, there was little scope for work to affect Year 12 completion.

Year 9. However, we do analyse by school year level rather than age, for consistency with the Vickers, Lamb and Hinkley (2003) study.

Our choice of a measure of work is selected as a range of hours worked in any given year level. This approach provides greater sensitivity than using a single measure of cumulative hours worked across all year levels, or a binary variable of work and no work. Hours of work are summed across all jobs, and because the LSAY interviews are conducted between July and January each year, they may also include school holiday jobs. However, due to the timing of the LSAY interviews, only the September school holidays would be captured for the majority of respondents. We therefore considered it important to include work during this time because this is when most senior school students are preparing for end-of-year exams.

Statistical approach

In this paper we use a series of gender-specific regression models to describe the characteristics of those who are most likely to combine school and work in each school year level between Years 10, 11 and 12. From these models we derive propensity scores to control for background characteristics in the later models of post-school outcomes.

The approach taken in this work is to use a methodology that treats the hours worked in each year level as random treatments. Unfortunately, LSAY is not a traditional experimental design in which each treatment level is randomly assigned to experimental units (individuals). The aim of randomisation is to ensure that any pre-existing background effects (such as achievement, socioeconomic status etc.) are assigned evenly across each of the treatment levels. That is, randomisation would ensure that those who are working in Year 10 are not all from a single socioeconomic status or achievement level. The primary way of achieving this balance in an observational study is to use propensity score weighting (Rosenbaum & Ruben 1983). The propensity scores are fitted as covariates in regression analyses to ensure that the background of individuals is 'balanced' across the treatment groups of interest.

Propensity scores are assigned to each individual in the cohort, where the propensity score is the inverse of the probability of working in the relevant school year level (probability of not working could also be used). For this study, propensity scores were derived for working in each of Years 10, 11, and 12 separately for males and females. A series of logistic regressions, in which the response variable is working or not working, were fitted against the following background characteristics:

- ✧ school sector
- ✧ locality
- ✧ socioeconomic status (parental occupation)
- ✧ academic achievement (in maths, problem-solving, reading and science)
- ✧ participation in VET in Schools in 2004
- ✧ intention to complete Year 12
- ✧ future intentions (study, apprenticeship, other work etc.).

This analysis also enables us to investigate which characteristics are important factors in determining who works while at school. Regression results for Years 10, 11 and 12 for males and females appear in appendix B (tables 15 to 20).

Not all propensity scores appear in all regressions because in an experimental design context it is impossible to randomise across events, particularly for events that have not yet been observed. As propensity scores are acting as a proxy to the experimental design, it is inappropriate to use the propensity of working in Year 12 on a Year 11 outcome. Instead, we consider the propensity scores

in the year immediately before the outcome measure. For example, we use the propensity scores for working in Year 10 when considering a Year 11 outcome.

The final stage of our analysis is to undertake a series of regression models to determine the effect of working hours on school and post-school outcomes. The four investigations undertaken are (separately for males and females):

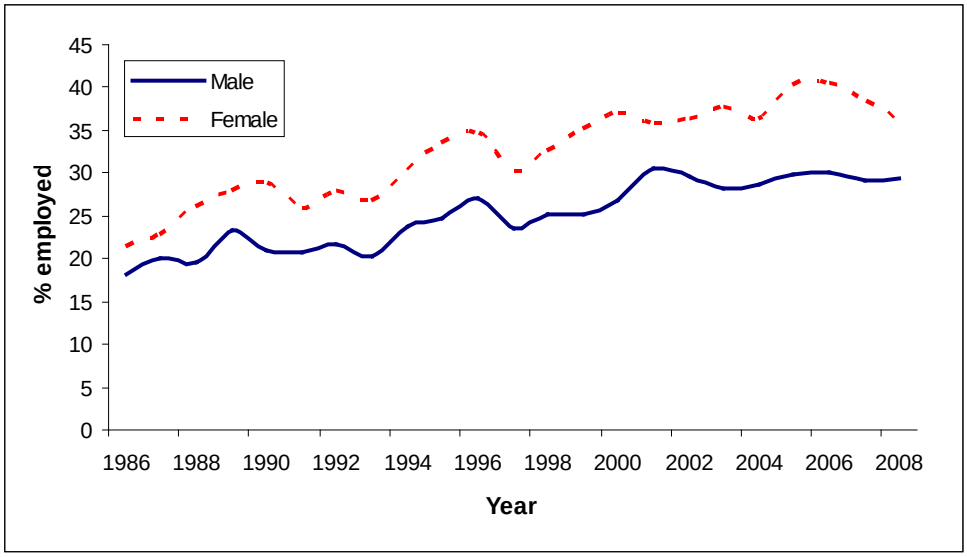
- Year 11 and 12 retention: logistic regression of retention to Year 11, and Year 12 against working hours in Year 10 (for Year 11) and working hours in Year 11 (for Year 12)
- Ordinary least squares (OLS) regression of Year 12 TER score against working hours in Year 12
- Full-time study status in either of the two years post-Year 12 completion: logistic regression against working hours in Year 12
- Full-time employment in 2007 (including apprenticeships and traineeships) for those who did not undertake any full-time study in the two years after completing Year 12: logistic regression against working hours in Year 12.

Each regression model uses one or a combination of treatment variables, which categorises the number of hours worked in each school year level between Years 10, 11 and 12.

How many students are working?

The Australian Bureau of Statistics (ABS) reports participation in employment amongst 15 to 19-year-olds still at school in its monthly labour force survey. In August[9] 2008, for the 800 000 15 to 19-year-olds who were still at school, around a third (or 297 000) of them were working (in either full-time or part-time employment). The proportions combining school and work are illustrated in figure 1.

Figure 1 Proportion of 15 to 19-year-olds at school who are employed, August 1986–2008



Source: ABS labour force status (ST LM3) by sex, age (15–24), age 15–19 years only, at school, from April 1986.

Females are more likely to work than males, increasing by around ten percentage points per decade since 1986. Their rates have declined, however, since peaking at 40.5% in 2006. The trend for males is similar to females, although a little more modest, peaking at 30.5% in 2001. The proportion of males combining school and work has remained relatively constant over the last two years.

The Y03 LSAY cohort is asked at the time of their annual interviews, *Do you currently work in a job, your own business or on a farm?* Details of up to three jobs are recorded, and the main job is identified. They are then asked, for each job, *Altogether, how many hours do you usually work each week in your present job?* If hours vary, they are asked, *In your last four weeks of work, how many hours per week, on average, have you worked including paid holidays?* The salary is also recorded. In this report we use the average weekly hours summed across all the jobs a young person works. By combining their self-reported work activity across the survey waves (as this is an aged-based cohort), we are able to assess the proportion of students combining school and work in a given school year level. Since the majority of students left school in 2008, we use 2007 as the cut-off point.

[9] August is selected because it coincides with the predominant LSAY survey period.

Table 1 Percentage of respondents working in each school year level, Y03, 2003–07

Working	Year 9	Year 10	Year 11	Year 12
Average age at interview	**15.7**	**16.7**	**17.7**	**18.7**
Males (n)	204	1903	2069	1654
% working	39.3	47.1	51.0	51.9
Average hours worked*	11.8	12.8	12.4	12.1
Females (n)	168	2193	2623	2230
% working	45.3	54.4	60.3	62.4
Average hours worked*	9.9	11.4	11.2	10.8
All (n)	**372**	**4096**	**4692**	**3884**
% working	41.8	50.7	55.8	57.4
Average hours worked*	10.9	12.1	11.7	11.4

Note: * Based on only those who are in employment while undertaking the given school year level. It also excludes those whose working status is undefined, or who stated they worked for more than 40 hours a week when at school.

For the Y03 cohort, around half of senior secondary students indicated that they had employment while at school, and this proportion rises with increasing school year level.

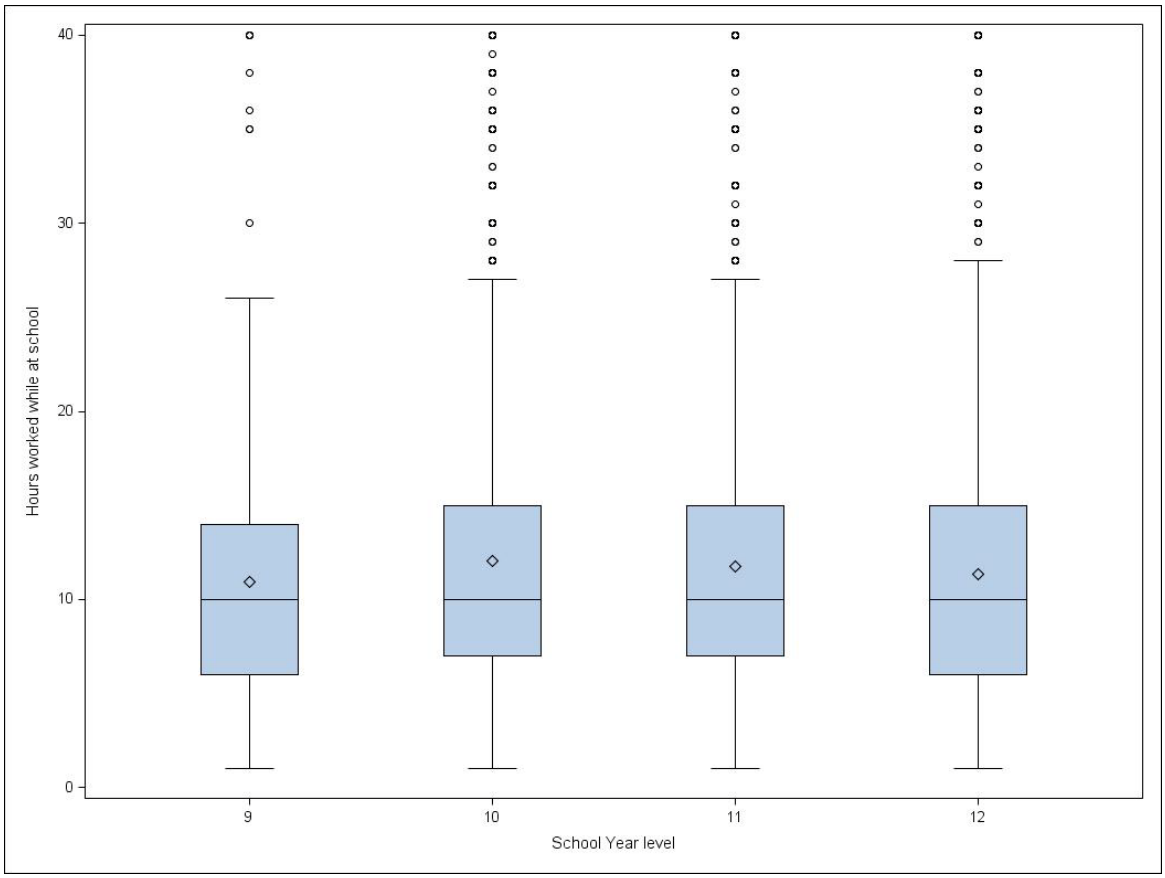
As illustrated by comparing figure 1 with table 1, the LSAY data report more work activity by school students than the ABS labour force data. This has also been the case with previous LSAY research. Vickers, Lamb and Hinkley (2003) reported that 25% of school students in Year 9 in 1995 combined school and work, while Robinson (1996) reported that 30.5% of males and 40.3% of females who were aged 17 in 1992 and in Years 11 and 12 combined school and work.

Two explanations come to mind: the first relates to differences in the sample populations, the second to the definition of 'work'. The focus of this paper is the effect of working while at school on outcomes: while we acknowledge differences in the estimates of the proportions of school students working, these absolute differences are not an important factor for this research.

Distribution of hours worked

Figure 2 shows the distributions of the hours worked in each school year level for all students in the LSAY Y03 cohort between 2003 and 2007 (with separate analysis in appendix A for males and females). The box plots describe the distribution of hours worked, with the tails describing the range (smallest and largest) of hours worked, and the box describing the lower quartile, median and upper quartile. The '+' is the mean value. The hours of work in excess of 40 hours have been considered outliers and have not been included in the box plots.

Figure 2 Box plot of working hours for all respondents by school year level, Y03 cohort



As illustrated in figure 2, the distribution of hours worked across the school year levels is virtually the same between Years 9 and 12. Overall, the distribution of hours worked does not appear to vary greatly between school year level, with the mean number of hours worked being between 11 and 12 hours for each of the four school year levels. The students who work in Year 12 work marginally fewer hours than those who work in Year 10.

Table 2 presents the sample sizes and mean hours worked for all respondents in Years 9 to 12, as well as the number of students who are working longer hours (≥ 15 hours per week). Of all those working, up to 20% are working more than 15 hours per week, although there is a slight decline in this percentage for students who are in Year 12. For those who are working more than 15 hours per week, they are working on average up to 20 hours per week.

Table 2 Summary statistics of working and working hours by year level, Y03 cohort

	Year 9	Year 10	Year 11	Year 12
No. in year level	890	8077	8405	6762
No. working in year level	372	4096	4692	3884
% of all students working	41.8	50.7	55.8	57.4
Mean working hours (for those working)	10.9	12.1	11.7	11.4
No. working ≥ 15 hours per week	57	817	874	664
Mean working hours (≥ 15 hours per week)	20.2	20.4	20.1	20.7
% of all students working ≥ 15 hours per week	6.4	10.1	10.4	9.8
% of working students working ≥ 15 hours per week	16.7	21.0	19.2	17.7

Note: All figures are unweighted to provide an indication of the absolute level of working and working hours.

Figure 2 and the box plots by gender in appendix A demonstrate that males on average work longer hours than females, but a higher proportion of female students combine school and work, with 52% of males and 62% of females working in Year 12. The analysis of the Y03 data finds that slightly more young people work when in Year 12 than in Year 11. This is consistent with Robinson (1996), using data from the Youth in Transition surveys,[10] who concluded that in the mid-1990s a quarter of students combined school and work in Years 9 and 10, rising to a third of students in Years 11 and 12.

[10] Prior to the current program, LSAY was based on two other annual surveys; the Australian Youth Survey (AYS, 1989–97), and the Youth in Transition survey (YIT), both of which were age-based cohorts.

Who combines part-time work and school?

We use previous research to select the characteristics for modelling who is most likely to combine school and work (by school year level), and from these models use the propensity scores to control for background characteristics in the later outcomes modelling. The characteristics of those most likely to combine school and work identified in previous research have generally been consistent, and are summarised in table 3.

Table 3 Summary of characteristics of those who combine school and work from previous research

Study	Data	Population	Proportion working part-time	Characteristics of those who combine school and work
Biddle (2007)	Census (characteristics for 2001 census, proportions working provided for 1986, 1991, 1996 & 2001)	15 to18/19-year-old high school students	1986: 10% males, 14% females, 12% overall 1991: 15% males, 22% females, 18% overall 1996: 19% males, 28% females, 24% overall 2001: 23% males, 32% females, 28% overall Two-thirds work less than 10 hours per week	✧ Females > males ✧ 17 yr olds < 18 yr olds ✧ ACT > Qld > NT > Vic.= WA > NSW > SA > Tas ✧ ESB > NESB ✧ Non-Indigenous > Indigenous ✧ Govt school > Catholic > independent school ✧ High SES > low SES ✧ Income in 3rd and 4th quartile work longer hours ✧ Parents have no degree > parents with secondary education or higher ✧ Couples > single parent families ✧ Metro > rural, but longer hours in rural area ✧ ESB > NESB, but those in NESB who work, work longer hours ✧ Longer hours for those whose parents have no degree and those who live in remote areas ✧ Students in retail (food) work longer hours
Howieson et al. (2006)	10% survey of S3 to S6 students in Scottish state and independent schools N = 20 700 surveyed between 2003 and 2006	School levels S3 to S6, students aged 15–18, comparable to Y9–Y12 Australian school years	S3 48%, S4 56%, S5 64%, S6 83% 59% overall Average hrs per week: S3 7.3%, S4 9.3%, S5 10.7%, S6 12.5% 2/3 worked 1–10 hours per week	✧ Rural > metro ✧ Females > males ✧ Little difference by SES, but those in lowest SES < others ✧ Those with more certain career plans > those with no clear idea of career path ✧ Disenchantment with school not related to part-time work ✧ More active social life > less active social life
Vickers et al. (2003)	Y95 LSAY cohort	Y9 in 1995	26.1% males, 23.7% females Average hours of work = 8.6 hours	✧ Males > females ✧ ESB > NESB ✧ Rural > metropolitan ✧ Low SES < other quartiles
Robinson (1999)	Youth in Transition (YIT) survey, precursor to current LSAY, year-based cohorts	Aged 17 in 1992, effect of working in Year 12 in 1994	40% females, 30% males in part-time employment Average 9 hrs per week	✧ Did not report on characteristics, but found that workers generally happier with money they get each week, independence, but not what they can do in their spare time

Study	Data	Population	Proportion working part-time	Characteristics of those who combine school and work
Robinson (1996)	Youth in Transition (YIT) survey, precursor to current LSAY, year-based cohorts	Years 8–12 from 1989 to 1992	1989: 24.2% 1990: 27.8% 1991: 32.5% 1992: 35.4% Increases with school year level, but drops Y11 to Y12	✧ Females > males (except in 1989) ✧ White collar > semi-skilled and unskilled ✧ Wealthier families > poorer families ✧ Parents with secondary education > no secondary education > parents with degree ✧ Government schools > independent schools ✧ Higher self-perception of academic ability > lower perceived academic ability ✧ Intend to study only post-school > combine post-school study and work

Females, more so than males, tend to combine school and work, as do those in higher rather than lower socioeconomic status quartiles, and those from English speaking backgrounds. Students whose parents are working are more likely to combine work and school, but the types of jobs their parents do can also have an impact. Students with parents in white-collar jobs are more likely than those with semi-skilled or unskilled parents to combine work and school. This could relate to work ethic, the impact of government benefits, as well as the networks of prospective employers their parents can supply. Indeed, the most common way the Y03 LSAY cohort found a job in 2007 (when they were aged 19–20 years) was through a friend or relative.

Apart from gender and socioeconomic status, many of these reported characteristics are also associated with early school leaving (Curtis & McMillan 2008), which makes it difficult to separate out the effects of part-time work on school and post-school outcomes.

Characteristics of students who combine school and work and propensity score regression

Based on the findings of previous research (table 3), separate regression models for each gender and school year level were run on the binary response variable, working or not working, against the following background characteristics:[11]

✧ socioeconomic status

✧ locality

✧ school type

✧ post-school plans

✧ receipt of youth allowance

✧ intention to complete Year 12 asked at age 15

✧ Participation in VET in Schools in 2004

✧ academic ability (scores in maths, problem-solving, science, reading) at age 15.

The propensity scores were calculated from these regressions for each individual, indicating their probability of combining school and work. These were then used to control for background

[11] We would also have liked to include an outcome measure of personal attributes and qualities, such as individual motivation, health or behaviours that could affect outcomes, but were unable to do so because such information is not well measured in LSAY. This could be an area for future research with other longitudinal datasets such as the Australian Temperament Project (ATP) or the Youth in Focus dataset.

characteristics in subsequent statistical modelling in this paper. More details on these regressions are contained in appendix B.

Those who combine school and work tend to have post-school aspirations of apprentice and traineeships, are more likely to be in the second highest SES quartile, tend not to be in receipt of Youth Allowance, and are more likely to attend Catholic (or government for females who work in Year 12) schools. Students who live in remote or regional locations are more likely to work than those living in metropolitan locations.

These results are consistent with other research in this area (refer table 3), with the exception of locality. This difference may relate to our definition of work including 'work in a job, your own business or on a farm', which could, depending on the timing of the interview (most LSAY interviews are conducted between July and December each year), include seasonal work, which is more prevalent in regional localities.

Academic ability appears only to be an important predictor for males working in Year 11, and intention to complete Year 12 is not a predictor for males or females combining school and work. This is worth noting here because in many other LSAY research reports, academic ability and intention are strong predictors of school and post-school outcomes (Fullarton 2002; Lamb & McKenzie 2001; Marks, McMillan & Hillman 2001). The large variety of young people combining school and work may partially explain these findings. VET in Schools participation is not associated with an increased propensity to combine school and work.

Post-school intention is a good predictor of likelihood to combine school and work, especially in Year 12. For both males and females, those intending to undertake apprenticeships or traineeships, or those who intend to join the workforce soon after leaving school are more likely to combine school and work. Conversely, those who are intent on post-school study, either at TAFE, university or with some other training provider, are less likely to combine school and work.

Average hours worked by student characteristics

Since we see little variation in the characteristics of students by school year level, we provide the average hours worked by characteristics for only those significant characteristics, and only for working in Year 12.

Table 4 highlights that students who combine school and work are a reasonably homogeneous group, in terms of work intensity, with limited variation in hours of work by background characteristics, aside from locality. Year 12 male students living in remote areas work for relatively more hours when in Year 12 (14.0) than their metropolitan counterparts (11.8), but this trend is not evident for females.

However, where there is variation, those most likely to work do not always work the longest hours. For example, we know from figures 1 and 2 that females are more likely to work in Year 12 than males, but males work on average longer hours (12.1) than females (10.8). Similarly, those from a medium-high socioeconomic status are most likely to work, but work on average fewer hours than those from lower socioeconomic status quartiles. Receipt of Youth Allowance does not appear to be a good differentiator of average hours of work in Year 12.

Students with post-school plans that relate more to employment (job, apprenticeship, traineeship) work on average longer hours than Year 12 students with more academic post-school plans (university, TAFE or other training).

Those intent on university work the least number of hours in Year 12. Students with university intentions may be moderating their work to gain better Year 12 results, whereas students who have post-school employment plans may have already begun to be less interested in school, and be intentionally forming a stronger attachment to the labour market.

Table 4 Average hours worked in Year 12 by student characteristics, by gender

	Male	Female
Characteristic	Mean hrs of work per week	Mean hrs of work per week
Locality		
Metropolitan	11.8	10.7
Regional	13.0	11.0
Remote	14.0	10.4
School sector		
Government	12.8	11.3
Catholic	11.3	10.4
Independent	10.8	9.1
SES		
Low SES quartile	13.6	11.1
Low-medium SES quartile	12.4	11.3
Medium-high SES quartile	11.7	10.9
High SES quartile	11.0	10.0
Post-school intentions		
Go to university	9.9	9.5
Get an apprenticeship	13.5	12.8
Get a traineeship	12.7	10.7
Go to a TAFE college	11.6	11.4
Do some other course or training elsewhere	12.9	9.0
Look for work/get a job	12.4	11.5
Other	15.9	12.3
Don't know	10.2	11.9
Receive Youth Allowance or ABSTUDY		
No	12.1	10.6
Yes	12.2	11.6
Don't know	12.4	9.9

School outcomes

We explore the impact of different hours worked on school retention to Years 11 and 12, and on Year 12 performance, measured as TER score.

Impact on school retention

First, we investigate the effect of working on school year level retention between Years 10 and 12. In particular, we model retention to Year 11 against working hours in Year 10 and retention to Year 12 against working hours in Year 11. We have elected to look at retention to Year 12 rather than Year 12 completion, because the majority of students in the LSAY Y03 sample who commence Year 12 go on to complete it.

The Y03 LSAY cohort has a male Year 11 to Year 12 retention rate of 85% and a slightly higher female retention rate of 88%,[12] which provides some variation with which to model the effect of working hours on retention.

By modelling retention to these two separate school year levels rather than as a single measure from Year 10 to Year 12, we are able to assess the impact of combining school and work at two separate decision points in the school-to-work transition.

The results (predicted probability of continuing to Year 11 from Year 10) of the logistic regressions of hours worked in Year 10 on Year 11 retention are presented in table. The predicted probabilities for retention are calculated for each of the categorical classification of hours worked by applying the regression model values separately for males and females.[13] More details of the regression models are contained in appendix B, tables 21–24.

Table 5 Predicted probability of Year 10 to Year 11 retention by hours worked in Year 10

Working hours	Males	Diff. from 0	Females	Diff. from 0
Year 10				
Not working	0.83	-	0.85	-
0 < x < 5	0.84	+0.01	0.88	+0.03
5 <= x < 10	0.77*	-0.06	0.85	0.00
10 < = x < 15	0.77*	-0.06	0.83	-0.02
15 < = x < 20	0.69*	-0.14	0.78*	-0.07
X > = 20	0.59*	-0.24	0.70*	-0.15

Note: * significantly different from not working.

[12] The Y03 cohort has a Year 12 completion rate of 83%, which is significantly higher than the national average reported by the ABS of around 75% (ABS 2008).

[13] The predicted probabilities are calculated, based on the results of the regression at the average propensity score and for each level of working hours with the other hours set to zero.

For males, working more than five hours while in Year 10 leads to a lower Year 11 retention rate of between -6 and -24 percentage points, whereas females can work up to 15 hours before the negative effects are observed, and with lesser impact (between -7 and -15 percentage points).

Turning to retention to Year 12, we see a lesser effect for males than we did with Year 11 retention, with hours worked in Year 11 not affecting Year 12 retention (not statistically significant) until the hours exceed 20 hours a week, and here the penalty is of the order of -8 percentage points.

Table 6 Predicted probability of Year 11 to Year 12 retention by hours worked in Year 11

Working hours	Males	Diff. from 0	Females	Diff. from 0
Year 11				
Not working	0.86	-	0.88	-
0 < x < 5	0.85	-0.01	0.88	0.0
5 < = x < 10	0.85	-0.01	0.92	+0.04
10 < = x < 15	0.84	-0.02	0.88	0.0
15 < = x < 20	0.84	-0.02	0.86*	-0.02
X > = 20	*0.78**	-0.08	0.75*	-0.13

Note: * significantly different from not working.

For females, working more than 15 hours in Year 11 increases the probability of leaving school prior to undertaking Year 12 by a couple of percentage points for 15–20 hours, and by 13 percentage points for more than 20 hours of work. Again, as for males, the effect of combining work and study is not as strong for retention to Year 12 as it is for retention to Year 11.

Impact on school performance (TER score)

Ordinary least squares (OLS) regressions were used to investigate the effect of hours of work in Year 12 on Year 12 performance measured using TER scores. These regressions considered only those in Year 12 who actually obtained a TER score.[14] The interest in this section lies with students who are choosing an academic pathway.

The results of the regressions, presented as adjusted mean TER are contained in table 7 for males and table 8 for females. (Full results are presented in appendix B.)

Table 7 Mean TER scores by hours worked in Year 12, males

Hours worked	Mean TER	Difference from not working	95% confidence Interval
Not working	75.5	-	(74.5, 76.5)
0 < x < 5	75.4	-0.1	(72.5, 78.1)
5 < = x < 10	73.4*	-2.1	(71.4, 75.3)
10 < = x < 15	72.1*	-3.4	(70.0, 74.1)
15 < = x < 20	73.8^	-1.7	(70.1, 76.9)
X > = 20	70.0*	-5.5	(67.1, 73.0)

Notes: * significantly different from not working.
^ the lack of statistical significance is due to sample size and variation in TER scores.

Working a small number of hours (fewer than five) has no detrimental effect on Year 12 achievement for males, but working longer than five hours can reduce a respondent's TER score.

[14] It is possible for a student to complete Year 12 and not obtain a TER; however, we restrict the analysis to those with a TER score because the focus of our analysis is on the impact of combining school and work on TER score.

The difference between not working, and working for more than 20 hours a week for males is on average a reduction of -5.5 TER points.

Table 8 highlights that females can work up to ten hours a week in Year 12 before it affects Year 12 performance, but once this threshold is exceeded, the TER performance falls significantly. Females appear to be better able to manage the competing demands of Year 12 and working up to ten hours a week, with their TER scores affected at higher working hours than males. (The effect of working more than 20 hours a week has a similar effect to males, reducing female TER scores on average by 4.4 points.)

For both males and females, the detrimental effect of working on TER scores is not linear. Working between 15 and 20 hours appears to have a lower impact on TER scores than working between 10 and 15 hours for males, and for females, working more than 20 hours a week has a lower impact on TER scores than working between 15 and 20 hours a week. In both cases, these scores are not statistically significant and remain lower compared with TER scores for those not working at all. Therefore, we can conclude that there is a generally negative impact on TER scores associated with working for longer than five hours a week in Year 12.

Table 8 Mean TER scores by hours worked in Year 12, females

Hours worked	Mean TER	Difference from not working	95% confidence Interval
Not working	78.1	-	(77.1, 79.1)
0 < x < 5	78.5	+0.4	(76.3, 80.7)
5 < = x < 10	77.9	-0.2	(76.6, 79.3)
10 <= x < 15	73.8*	-4.3	(72.1, 75.4)
15 <= x < 20	72.8*	-5.3	(70.2, 75.3)
X >= 20	73.7	-4.4	(71.1, 76.5)

Notes: * significantly different from not working.
^ the lack of statistical significance is due to sample size and variation in TER scores.

Summary

Overall, combining school and work has a modest negative impact on school performance for those working more than five hours a week. Generally, this effect is more pronounced when hours are longer (in excess of 15 hours a week) for both males and females. However, the impact of the effect appears stronger for males than females.

The negative impact of work on school is consistent with previous research in this area, although we are not seeing the effects at moderate levels of work, as with Vickers, Lamb and Hinkley (2003) and Robinson (1999). Vickers et al. concluded that working more than five hours a week in Year 9 had a negative effect on Year 12 completion. Robinson concluded that working ten hours a week or more in Year 11 affected Year 12 completion, and more than ten hours a week in Year 11 or 12 negatively affected TER scores. As with these earlier studies, we are not taking into consideration total student load such as a student's other (sporting, social etc.) commitments.

Given the findings in the earlier section that those in pursuit of less academic post-school pathways are working longer hours, it may be that those working longer hours in the senior school years have already chosen to pursue a pathway into the workforce over a commitment to further study.

Post-school outcomes

In this section we look at the effect of working in Year 12 on post-school outcomes for students who have completed Year 12 but who have gone on to post-school full-time study or post-school full-time employment in 2007, that is, one to two years after Year 12 for the majority of students.[15]

We restrict our analysis to only Year 12 completers so as not to contaminate the analysis with early school leavers, as time in the labour market matters when assessing employment outcomes. A separate analysis of the effects of combining school and work on early school leavers' post-school outcomes is perhaps an area for future research.

Effect of working in Year 12 on post-school full-time study status

The outcome of interest is whether or not a respondent undertook any post-school full-time education in the two years after completing Year 12. Separate logistic regressions were undertaken for males and females, and the regressions consider the effect of TER score because we know this has an impact on post-school study. Full results appear in appendix B.

The probabilities of being in full-time study by hours of work in Year 12 are presented in tables 9 and 10. The probabilities are calculated at the averages of the TER and propensity scores.

Table 9 Predicted probability of undertaking full-time post-school study for hours worked in Year 12, males

Working hours	Pr (full-time study)	Difference from not working
Not working	0.68	-
0 < x < 5	0.66	-0.02
5 < = x < 10	0.67*	-0.01
10 < = x < 15	0.59	-0.09
15 < = x < 20	0.58	-0.10
X > = 20	0.52	-0.16

Notes: * significantly different from not working.
the statistical significance is influenced by sample size. There are a greater number of respondents in the 5–10 category and, therefore, the observable significant difference can be smaller. The overall trend is what is interesting in this table.

The effects of working in Year 12 for males (table 9) and females (table 10) on post-school full-time study are very different.

For males, the general trend was that the more hours worked in Year 12, the less likely they were to undertake post-school full-time study. Working for more than 20 hours in Year 12 reduced the probability that a male would pursue full-time post-school study by -16 percentage points.

[15] The effect of combining school and work in Year 12 is only considered as this is the year most immediate to the post-school outcome.

Table 10 Predicted probability of undertaking full-time post-school study for hours worked in Year 12, females

Working hours	Pr (full-time study)	Difference from not working
Not working	0.66	-
0 < x < 5	0.82*	+0.16
5 < = x < 10	0.77*	+0.11
10 < = x < 15	0.70*	+0.04
15 < = x < 20	0.53	-0.13
X > = 20	0.65*	-0.01

Note: * significantly different from not working.

For females, we find that, unlike for males, working for a moderate number of hours (less than 15 hours a week) in Year 12 can have a positive impact on the probability that they will go on to pursue post-school full-time study. However, once hours exceed 15–20 hours a week, then as for males, a negative effect is evident.

While we do not know the reason for this, females may be better able to manage the conflicting demands of school and work (as also evidenced in TER results, where females can work slightly longer hours) than their male counterparts.

Effect of working in Year 12 on post-school full-time employment status

Finally, we investigated the impact of hours worked during Year 12 on full-time employment status in 2007 for those who completed Year 12, but who did not undertake any full-time study in the two years after completing Year 12. As this is an age-based cohort, the majority of students had one to two years in the labour market by 2007.

Logistic regressions were undertaken for the dichotomous variable, in full-time employment or not in full-time employment in 2007 (results appear in appendix B, table 37–40).

Tables 11 and 12 present the predicted probabilities of being in full-time employment in 2007 for males and females separately by hours worked in Year 12.

Table 11 Predicted probability of full-time employment with no post-school study for hours worked in Year 12, males

Working hours	Pr (full-time employment)	Difference from not working
Not working	0.32	-
0 < x < 5	0.46	0.14
5 < = x < 10	0.52*	0.20
10 < = x < 15	0.59*	0.27
15 < = x < 20	0.56*	0.24
X > = 20	0.52*	0.20

Note: * significantly different from not working.

For males who complete school and pursue no post-school study, working for more than five hours in Year 12 is beneficial over not working at all. However, the rates of return do not increase in a linear manner, and working between 10 and 15 hours a week maximises the probability of better post-school employment outcomes.

Table 12 Predicted probability of full-time employment with no post-school study for hours worked in Year 12, females

Working hours	Pr (full-time employment)	Difference from not working
Not working	0.20	-
0 < x < 5	0.26	0.06
5 < = x < 10	0.32*	0.12
10 < = x < 15	0.39*	0.19
15 < = x < 20	0.49*	0.29
X > = 20	0.38*	0.18

Note: * significantly different from not working.

For females, we see a similar pattern with positive benefits of combining school and work in Year 12 on post-school employment outcomes. However, females have to work for slightly longer hours (15 to 20 hours a week in Year 12) to gain maximum benefit (of +29 percentage points), whereas maximum benefits are realised for males who work between 10 and 15 hours a week (of +27 percentage points).

Summary

These results point to a slightly negative effect of combining school and work on post-school full-time study, apart from a rather unexplained positive effect for moderate hours of work in Year 12 for females. However, once hours of work exceed 15 hours a week, we see a negative effect, as for all hours of work for males. The magnitude of the effects appears to be slightly greater for males than females.

Unlike the negative effects we see for school and post-school study outcomes, we see positive effects from working in Year 12 on post-school employment for both males and females who do not go on to post-school full-time study. The magnitude of these positive effects is consistent for males and females.

Discussion

The research in this paper confirms the findings of other research, that students who combine school and work are spread right across the school population, although some groups have a tendency to work longer hours than others. With such a large proportion of students combining school and work, it is not surprising that they do not have a set of strong defining characteristics. However, we do find that students who combine school and work are in general in the higher, but not highest socioeconomic status quartile, attend Catholic or government schools, are not in receipt of Youth Allowance, and have a preference for an apprenticeship, traineeship or a job when they leave school.

This paper finds that the effects of combining school and work of more than ten hours a week are moderately negative on school and post-school study outcomes, but positive on post-school full-time employment. These findings are similar to the earlier work of Robinson (1999), but what is interesting is that the two studies use different cohorts of young people in quite different economic conditions. The earlier research focused on young people in the Youth in Transition survey in a period of economic downturn (aged 17 years in 1992), whereas the analysis in this paper concerns a group of young people from the LSAY Y03 cohort who were aged 15–19 years between 2003 and 2007, in a much stronger economic climate. Despite the differences in economic conditions, the different cohorts and the growth in the numbers of young people combining school and work (increasing from around a quarter of 15 to 19-year-olds in 1992 to around a third in 2008), we find the same effects for combining school and work on school and post-school outcomes.

The novelty of the approach in this paper is the way in which school outcomes are measured. In addition to modelling Year 12 completion by gender and hours worked (as in Robinson 1999), we decompose it into retention from Year 10 to Year 11 and then retention from Year 11 to Year 12. This enables us to better understand the way combining school and work can affect the decision points between Years 10 and 12, while allowing us to more finely model the effect of work in previous school year levels. This approach uncovered the finding that the negative effects of combining school and work on school retention are stronger for those who work in Year 10 than those who work in Year 11. Perhaps this is because those who are working in Year 11 tend to moderate their hours. But, overall, the negative effects of combining school and work are modest, unless the person is working excessive hours (over 15–20 hours a week).

Is combining school and work detrimental to school and post-school outcomes? The results in this paper point towards moderate hours being preferable. Longer hours appear to be detrimental for educational outcomes but good for employment outcomes, which tends to suggest that those willing to work the longer hours are distancing themselves from the education environment.

References

ABS (Australian Bureau of Statistics) 2008, *Schools Australia 2007*, cat.no.4221.0, ABS, Canberra, December 2008, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4221.02007?OpenDocument>.

——2008, *Labour force Australia*, cat.no.6202.0, ABS, Canberra, viewed December 2008, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6202.0Feb%202009?OpenDocument>.

Biddle, N 2007, 'The labour market status of Australian students: who is unemployed, who is working and for how many hours?', *Journal of Education and Work*, vol.20, no.3, July 2007, pp.179–209.

Billett, S 2006, *Informing post-school pathways: investigating school students' authentic work experiences*, NCVER, Adelaide.

Curtis, D & McMillan, J 2008, *School non-completers: profiles and destinations*, LSAY research report 54, ACER, Melbourne.

Fullarton, S 2002, *Student engagement with school: individual and school-level influences*, LSAY research report 27, ACER, Melbourne.

Howieson, C, McKechnie, J & Semple, S 2006, *The nature and implications of the part-time employment of secondary school public*, Scottish Executive Social Research, Department of Enterprise, Transport and Lifelong Learning, Scotland.

Lamb, S & McKenzie, P 2001, *Patterns of success and failure in the transition from school to work in Australia*, LSAY research report 18, ACER, Melbourne.

Marks, GN, McMillan, J & Hillman, K 2001, *Tertiary entry performance: the role of student background and school factors*, LSAY research report 22, ACER, Melbourne.

Marsh, HW, & Kleitman, S 2005, 'Consequences of employment during high school: character building, subversion of academic goals, or a threshold', *American Educational Research Journal*, vol.42, issue 2, p.331.

Meyerhoff, MK 2006, 'Part-time work for teens', *Pediatrics for Parents*, vol.22, issue 10, pp.8–10.

Rosenbaum, P & Ruben, D 1983, 'The central role of the propensity score in observational studies for causal effects', *Biometrika*, issue 70, pp.41–55.

Robinson, L 1996, *School students and part-time work*, LSAY research report 2, ACER, Melbourne.

——1999, *The effects of part-time work on school students*, LSAY research report 9, ACER, Melbourne.

Shanahan, MJ & Flaherty, BR 2001, 'Dynamic patterns of time use in adolescence', *Child Development*, 72, pp.385–401.

Smith, E & Green, A 2005, *How workplace experiences while at school affect career pathways*, NCVER, Adelaide.

Staff, J & Mortimer, JT 2007, 'Educational and work strategies from adolescence to early adulthood: consequences for educational attainment', *Social Forces*, vol.85, issue 3, pp.1169–95, Chapel Hill.

——2008, 'Social class background and the school to work transition', *New Directions for Child and Adolescent Development*, no.119, pp.55–69.

Vickers, M, Lamb, S & Hinkley, J 2003, *Student workers in high school and beyond: the effects of part-time employment on participation in education, training and work*, LSAY research report 30, ACER, Melbourne.

Appendix A

Data

This research uses data from the LSAY Y03 cohort. The Y03 cohort follows 10 370 students from 2003, when they were 15 years of age. The pathways of these young people as they move through their senior secondary school years into post-school education and post-school employment are surveyed. Data from the period 2003 to 2007 are used in this paper.

Because the Y03 cohort is an aged-based, rather than a cohort based on school year level, we have a spread of students at different school year levels in any given calendar year. This is important, because in our analysis we are focusing on working in different school year levels, so we must sum this activity across the years of interview (waves). The table below summarises the LSAY Y03 cohort by calendar year and school year level up to the most recently available survey wave (2007 interviews).

Table 13 LSAY Y03 data by school year level and year of data collection (weighted)

School level	2003		2004		2005		2006		2007	
Avg. age	15.7	Yrs	16.7	Yrs	17.7	Yrs	18.7	Yrs	19.7	Yrs
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Year 9	901	8.7	11	0.1	0	0.0	0	0.0	0	0.0
Year 10	7 451	71.9	714	7.6	8	0.1	0	0.0	0	0.0
Year 11	1 979	19.1	5 769	61.5	611	7.0	9	0.1	0	0.0
Year 12	39	0.4	1 628	17.4	4 940	56.8	436	5.7	6	0.1
Left school	0	0.0	1 257	13.4	3 131	36.0	7 275	94.2	6 652	99.9
Total	**10 370**	**100.1**	**9 379**	**100.0**	**8 690**	**99.9**	**7 720**	**100.0**	**6 658**	**100.0**

Note: * totals do not always sum to 100 due to rounding.

Definition and scope

The definition of combining school and work is derived from the LSAY respondent's answer to the following question, which asks at the time of the survey:[16] *Do you currently work in a job, your own business or on a farm?* This is combined with the questions on whether or not they are at school, and in which school year they are in, to derive variables for combining school and work across the different school years. For young people with more than one job, the hours worked are the sum of all hours worked per week across all jobs (at the time of the survey).

The population of interest for the analysis is all students in the Y03 cohort for the current waves (2003 to 2007), where we can establish if they did or did not work in the school year level of interest. When looking at school outcomes, we consider all of these students. For the analysis on TER score, we include only those students who reported a TER score. For the analysis on post-

[16] LSAY interviewing is conducted from July/August – December/January each year, and so this will include school holiday jobs for some young people.

school outcomes, we consider all students who, two years after completing Year 12, go on to either full-time post-school study or full-time employment.

Distribution of hours of work by school year level

Figure 3 shows that there is very little change in the working hours of both girls and boys over the four school year levels. On average, both girls and boys have median working hours of around ten hours per week. However, it appears as though there are more males who are working longer hours. From table 14, we see that there are is a higher percentage of males working more than 15 hours per week, particularly for those who worked in Year 9 and Year 12, with 21% of males and 14% of females working more than 15 hours in Year 12. The mean number of hours worked by students working long hours is around 20 hours per week, with very little difference between males and females.

Figure 3 Box plot for working hours by school year level by gender, Y03 cohort

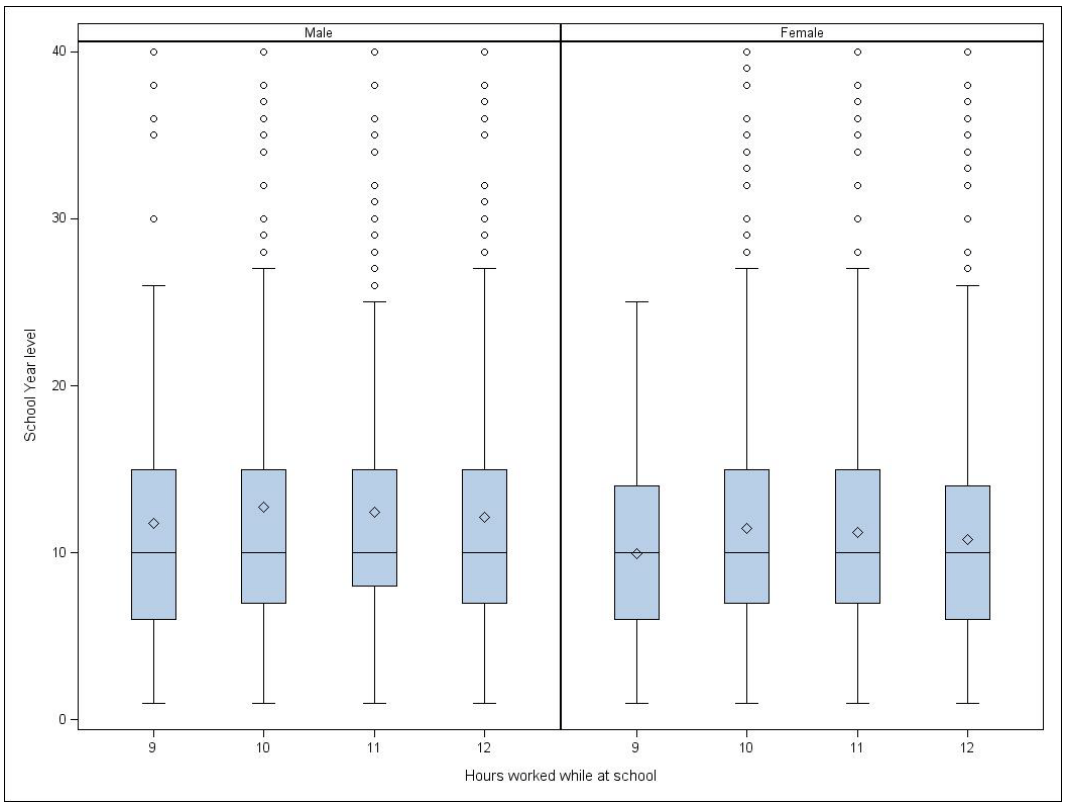


Table 14 Summary statistics of working hours and numbers by year level by gender

	Male				Female			
	Year 9	Year 10	Year 11	Year 12	Year 9	Year 10	Year 11	Year 12
No. in year level	519	4043	4055	3186	371	4034	4350	3576
No. working	204	1903	2069	1654	168	2193	2623	2230
% of all students working	39.3	47.1	51.0	51.9	45.3	54.4	60.3	62.4
Mean hours worked	11.8	12.8	12.4	12.1	9.9	11.4	11.2	10.8
No. working≥ 15 hours per week	37	417	449	351	20	400	425	313
% of all students	7.1	10.3	11.1	11.0	5.3	9.9	9.8	8.8
% of working students	18.1	21.9	21.7	21.2	11.9	18.2	16.2	14.0
Mean hours (≥ 15 hours)	22.0	21.5	21.2	21.4	17.5	19.3	19.0	20.1

Appendix B

This appendix contains the results of the regression models. All statistical analysis is carried out using the SAS statistical package.

The following summarises the definition of each output measure for logistic regression:

- b: These are the estimated beta coefficients for the logistic regression equation for predicting the dependent variable from the independent variables. The logistic prediction equation is

$$p = 1/(1+\exp^{-z})$$

Where $z = b_0 + b_1 \times x_1 + \ldots + b_n \times x_n$

- SE: The standard errors of the regression coefficients
- Wald and Sig.: Provide the Wald Chi-Square Statistic ((coefficient/S.E)^2) and the two-tailed p-value used in testing to determine whether the coefficient is significantly different from 0 (the reference category).
- df: This column lists the degrees of freedom for testing the coefficients.
- Odds ratio: These are the odds ratios for predictors. They are simply the exponentiation of the coefficients. Odds ratios of greater than one indicate a higher chance of the event occurring than the reference group; odds ratios of less than one indicate a lower chance than the reference group. The confidence interval for odds may also be presented; if this confidence interval contains one, then we can conclude that this effect has the same influence on the response as the reference category.

Tables 13 to 18 contain the results of the logistic regression, which model the probability of working in Years 10, 11 and 12 by gender. Separate models are run for each school year level. The propensity scores for these regressions are then used to summarise the background information of respondents into a single value. These provide a method for reducing selection bias in the modelling of our treatment effects of hours worked. The propensity scores are calculated as the probability that an individual will work, given the known background characteristics, that is, they 'average' out the effects of the background characteristics. These propensity scores are included as covariates in the subsequent regression models (tables 23 to 42) used in the school and post-school outcomes. Propensity score regression assesses the importance of intensity of work after removing the background effects.

Not all propensity scores are used in all regressions. For example, it is not appropriate to include the propensity to work in Year 12 when investigating retention to Year 12. In this case, you would only include propensity to work in Years 10, and 11. Note that propensity score regression coefficients are not examined for significance in the final regression analysis.

Table 15 Regression results for working in Year 10: males, Y03, 2003–07

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Maths achievement quartile*							
Lowest	-0.200	0.180	1.230	1	0.268	0.819	(0.576, 1.166)
Second	0.026	0.144	0.032	1	0.859	1.026	(0.774, 1.361)
Third	0.176	0.114	2.393	1	0.122	1.192	(0.954, 1.490)
Highest				Reference category			
Problem-solving achievement quartile							
Lowest	0.079	0.179	0.193	1	0.660	1.082	(0.762, 1.537)
Second	0.113	0.144	0.616	1	0.433	1.120	(0.844, 1.484)
Third	-0.010	0.114	0.007	1	0.932	0.990	(0.792, 1.239)
Highest				Reference category			
Science achievement quartile							
Lowest	-0.177	0.169	1.104	1	0.293	0.838	(0.602, 1.166)
Second	-0.125	0.140	0.793	1	0.373	0.882	(0.670, 1.162)
Third	-0.073	0.115	0.409	1	0.523	0.929	(0.742, 1.163)
Highest				Reference category			
Reading achievement quartile							
Lowest	0.215	0.166	1.661	1	0.198	1.239	(0.894, 1.717)
Second	0.076	0.139	0.296	1	0.586	1.078	(0.822, 1.416)
Third	0.107	0.116	0.847	1	0.357	1.113	(0.886, 1.397)
Highest				Reference category			
Location*							
Metropolitan	-0.744	0.232	10.239	1	0.001	0.475	(0.301, 0.750)
Regional	-0.456	0.237	3.691	1	0.055	0.634	(0.398, 1.009)
Remote				Reference category			
Sector*							
Government	0.172	0.099	3.064	1	0.001	1.188	(0.980, 1.441)
Catholic	0.446	0.419	1.136	1	0.287	1.452	(1.172, 1.799)
Independent				Reference category			
Socioeconomic status (ISCED, father's or mother's if missing)*							
Low SES quartile	-0.063	0.095	0.442	1	0.506	0.939	(0.780, 1.130)
Low-medium SES quartile	-0.249	0.096	6.817	1	0.009	0.779	(0.646, 0.940)
Medium-high SES quartile				Reference category			
High SES quartile	-0.331	0.094	12.385	1	0.000	0.718	(0.598, 0.864)
VET in Schools in 2004							
No	-0.093	0.074	1.562	1	0.211	0.912	(0.788, 1.054)
Yes				Reference category			
Unknown	0.017	0.170	0.010	1	0.921	1.017	(0.728, 1.421)

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Post-school intentions*							
Go to university	-0.135	0.305	0.195	1	0.659	0.874	(0.481, 1.589)
Get an apprenticeship	-0.051	0.316	0.026	1	0.871	0.950	(0.512, 1.764)
Get a traineeship	0.810	0.410	3.894	1	0.049	2.247	(1.005, 5.021)
Go to a TAFE college	-0.248	0.323	0.588	1	0.443	0.781	(0.415, 1.470)
Do some other course or training elsewhere	-0.121	0.396	0.093	1	0.760	0.886	(0.408, 1.926)
Look for work/ get a job	0.044	0.319	0.019	1	0.889	1.045	(0.560, 1.952)
Other	0.194	0.477	0.166	1	0.684	1.215	(0.477, 3.096)
Don't know				Reference category			
Intention to commence Year 12							
No	0.300	0.143	4.399	1	0.036	1.350	(1.020, 1.788)
Yes				Reference category			
Don't know	-0.055	0.175	0.010	1	0.752	0.946	(0.672, 1.333)
Receive Youth Allowance or ABSTUDY*							
No	0.144	0.142	1.023	1	0.312	1.154	(0.874,1.525)
Yes	-0.410	0.156	6.873	1	0.009	0.664	(0.489, 0.902)
Don't know				Reference category			

Note: *significant at the 5% level; ISCED = International Standard Classification of Education.

Table 16 Regression results for working in Year 10: females, Y03, 2003–07

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Maths achievement quartile							
Lowest	-0.021	0.176	0.014	1	0.905	0.979	(0.694, 1.381)
Second	0.155	0.144	1.158	1	0.282	1.168	(0.880, 1.549)
Third	0.132	0.118	1.266	1	0.261	1.142	(0.906, 1.438)
Highest				Reference category			
Problem-solving achievement quartile							
Lowest	-0.220	0.179	1.511	1	0.219	0.803	(0.566, 1.139)
Second	-0.164	0.145	1.273	1	0.259	0.849	(0.639, 1.128)
Third	-0.068	0.118	0.337	1	0.562	0.934	(0.741, 1.176)
Highest				Reference category			
Science achievement quartile							
Lowest	-0.217	0.171	1.606	1	0.205	0.805	(0.576, 1.126)
Second	-0.089	0.139	0.404	1	0.525	0.915	(0.697, 1.203)
Third	-0.099	0.111	0.791	1	0.374	0.906	(0.729, 1.126)
Highest				Reference category			
Reading achievement quartile							
Lowest	0.115	0.165	0.490	1	0.484	1.122	(0.813, 1.549)
Second	0.049	0.131	0.142	1	0.707	1.051	(0.812, 1.358)
Third	0.139	0.106	1.725	1	0.189	1.149	(0.934, 1.415)
Highest				Reference category			
Location*							
Metropolitan	-0.652	0.211	9.560	1	0.002	0.521	(0.345, 0.788)
Regional	-0.344	0.216	2.531	1	0.112	0.709	(0.464, 1.083)
Remote				Reference category			
Sector*							
Government	0.377	0.095	15.788	1	<0.0001	1.458	(1.211, 1.756)
Catholic	0.631	0.112	31.884	1	<0.0001	1.880	(1.510, 2.341)
Independent				Reference category			
Socioeconomic status (ISCED, father's or mother's if missing)*							
Low SES quartile	-0.281	0.094	8.943	1	0.003	0.755	(0.628, 0.908)
Low-medium SES quartile	-0.128	0.095	1.805	1	0.179	0.880	(0.731, 1.060)
Medium-high SES quartile				Reference category			
High SES quartile	-0.239	0.095	6.316	1	0.012	0.788	(0.654, 0.949)
VET in Schools in 2004							
No	0.079	0.075	1.113	1	0.291	1.082	(0.934, 1.254)
Yes				Reference category			
Unknown	-0.188	0.239	0.618	1	0.432	0.829	(0.519, 1.324)

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Post-school intentions							
Go to university	-0.163	0.303	0.289	1	0.591	0.850	(0.469, 1.539)
Get an apprenticeship	-0.292	0.387	0.571	1	0.450	0.747	(0.350, 1.594)
Get a traineeship	-0.038	0.381	0.010	1	0.921	0.963	(0.456, 2.032)
Go to a TAFE college	-0.236	0.314	0.563	1	0.453	0.790	(0.427, 1.462)
Do some other course or training elsewhere	0.285	0.451	0.399	1	0.528	1.330	(0.549, 3.218)
Look for work/ get a job	-0.171	0.317	0.290	1	0.590	0.843	(0.453, 1.570)
Other	0.283	0.478	0.352	1	0.553	1.327	(0.521, 3.385)
Don't know				Reference category			
Intention to commence Year 12							
No	0.146	0.209	0.491	1	0.484	1.157	(0.769, 1.742)
Yes				Reference category			
Don't know	0.202	0.236	0.731	1	0.393	1.223	(0.771, 1.942)
Receive Youth Allowance or ABSTUDY*							
No	0.233	0.148	2.487	1	0.115	1.262	(0.945, 1.685)
Yes	-0.123	0.159	0.603	1	0.438	0.884	(0.648, 1.207)
Don't know				Reference category			

Note: * Significant at the 5% level.

Table 17 Regression results for working in Year 11: males, Y03, 2003–07

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Maths achievement quartile*							
Lowest	-0.172	0.237	0.528	1	0.467	0.842	(0.529, 1.339)
Second	0.018	0.180	0.010	1	0.919	1.018	(0.716, 1.448)
Third	0.141	0.135	1.091	1	0.296	1.151	(0.884, 1.499)
Highest				Reference category			
Problem-solving achievement quartile							
Lowest	0.192	0.235	0.667	1	0.414	1.212	(0.764, 1.921)
Second	0.060	0.175	0.117	1	0.732	1.062	(0.753, 1.497)
Third	-0.016	0.134	0.014	1	0.905	0.984	(0.757, 1.280)
Highest				Reference category			
Science achievement quartile							
Lowest	-0.043	0.217	0.039	1	0.844	0.958	(0.627, 1.465)
Second	-0.134	0.172	0.605	1	0.437	0.875	(0.625, 1.225)
Third	-0.064	0.133	0.229	1	0.633	0.938	(0.722, 1.219)
Highest				Reference category			
Reading achievement quartile							
Lowest	-0.100	0.209	0.231	1	0.631	0.905	(0.601, 1.362)
Second	0.084	0.163	0.267	1	0.605	1.088	(0.790, 1.498)
Third	0.117	0.132	0.777	1	0.378	1.124	(0.867, 1.456)
Highest				Reference category			
Location*							
Metropolitan	-0.604	0.316	3.648	1	0.056	0.547	(0.294, 1.016)
Regional	-0.260	0.324	0.640	1	0.424	0.771	(0.409, 1.457)
Remote				Reference category			
Sector*							
Government	0.377	0.117	10.471	1	0.001	1.458	(1.160, 1.832)
Catholic	0.527	0.129	16.547	1	<0.0001	1.693	(1.314, 2.182)
Independent				Reference category			
Socioeconomic status (ISCED, Father's or mother's if missing)*							
Low SES quartile	0.029	0.124	0.057	1	0.812	1.030	(0.808, 1.312)
Low-medium SES quartile	-0.062	0.124	0.247	1	0.619	0.940	(0.738, 1.199)
Medium-high SES quartile				Reference category			
High SES quartile	-0.313	0.112	7.824	1	0.005	0.732	(0.588, 0.911)
VET in Schools in 2004							
No	-0.159	0.090	3.098	1	0.078	0.853	(0.714, 1.018)
Yes				Reference category			
Unknown	0.196	0.183	1.147	1	0.284	1.216	(0.850, 1.739)

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Post-school intentions*							
Go to university	-0.472	0.323	2.136	1	0.144	0.624	(0.331, 1.175)
Get an apprenticeship	-0.180	0.335	0.289	1	0.591	0.835	(0.433, 1.610)
Get a traineeship	0.165	0.429	0.148	1	0.701	1.179	(0.508, 2.735)
Go to a TAFE college	-0.450	0.340	1.748	1	0.186	0.638	(0.328, 1.242)
Do some other course or training elsewhere	-0.416	0.415	1.007	1	0.316	0.660	(0.292, 1.487)
Look for work/ get a job	-0.169	0.337	0.252	1	0.615	0.844	(0.436, 1.634)
Other	0.095	0.501	0.036	1	0.849	1.100	(0.412, 2.933)
Don't know				Reference category			
Intention to commence Year 12							
No	-0.161	0.421	0.146	1	0.703	0.852	(0.373, 1.943)
Yes				Reference category			
Don't know	0.092	0.407	0.051	1	0.821	1.096	(0.494, 2.432)
Receive Youth Allowance or ABSTUDY*							
No	0.195	0.167	1.370	1	0.242	1.216	(0.876, 1.689)
Yes	-0.460	0.187	6.063	1	0.014	0.631	(0.438, 0.910)
Don't know				Reference category			

Note: * Significant at the 5% level.

Table 18 Regression results for working in Year 11: females, Y03, 2003–07

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Maths achievement quartile							
Lowest	-0.046	0.214	0.045	1	0.831	0.955	(0.628, 1.453)
Second	0.174	0.166	1.107	1	0.293	1.190	(0.860, 1.647)
Third	0.204	0.131	2.439	1	0.118	1.227	(0.949, 1.586)
Highest				Reference category			
Problem-solving achievement quartile							
Lowest	-0.023	0.222	0.011	1	0.918	0.977	(0.633, 1.510)
Second	0.030	0.169	0.032	1	0.858	1.031	(0.740, 1.437)
Third	-0.074	0.133	0.310	1	0.578	0.929	(0.717, 1.204)
Highest				Reference category			
Science achievement quartile							
Lowest	0.076	0.213	0.128	1	0.721	1.079	(0.711, 1.636)
Second	0.022	0.162	0.019	1	0.890	1.023	(0.744, 1.405)
Third	0.109	0.124	0.763	1	0.383	1.115	(0.874, 1.422)
Highest				Reference category			
Reading achievement quartile							
Lowest	-0.277	0.214	1.676	1	0.196	0.758	(0.498, 1.153)
Second	0.050	0.160	0.099	1	0.753	1.051	(0.769, 1.438)
Third	0.004	0.123	0.001	1	0.974	1.004	(0.790, 1.276)
Highest				Reference category			
Location*							
Metropolitan	-0.625	0.288	4.727	1	0.030	0.535	(0.305, 0.940)
Regional	-0.344	0.294	1.366	1	0.243	0.709	(0.398, 1.262)
Remote				Reference category			
Sector*							
Government	0.387	0.110	12.281	1	0.0005	1.472	(1.186, 1.827)
Catholic	0.628	0.131	22.929	1	<0.0001	1.873	(1.449, 2.421)
Independent				Reference category			
Socioeconomic status (ISCED, father's or mother's if missing)*							
Low SES quartile	-0.280	0.119	5.497	1	0.019	0.756	(0.598, 0.955)
Low-medium SES quartile	-0.151	0.112	1.618	1	0.203	0.860	(0.681, 1.085)
Medium-high SES quartile				Reference category			
High SES quartile	-0.294	0.112	6.985	1	0.008	0.745	(0.599, 0.927)
VET in Schools in 2004							
No	0.014	0.089	0.026	1	0.872	1.014	(0.852, 1.208)
Yes				Reference category			
Unknown	-0.325	0.228	2.033	1	0.154	0.723	(0.462, 1.129)

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Post-school intentions							
Go to university	0.324	0.303	1.151	1	0.283	1.383	(0.765, 2.503)
Get an apprenticeship	0.795	0.405	3.848	1	0.050	2.213	(1.001, 4.895)
Get a traineeship	0.719	0.401	3.218	1	0.072	2.053	(0.936, 4.504)
Go to a TAFE college	0.428	0.315	1.852	1	0.174	1.535	(0.828, 2.845)
Do some other course or training elsewhere	0.145	0.439	0.109	1	0.741	1.156	(0.489, 2.730)
Look for work/ get a job	0.612	0.318	3.694	1	0.055	1.844	(0.988, 3.441)
Other	0.810	0.506	2.558	1	0.110	2.247	(0.833, 6.060)
Don't know				Reference category			
Intention to commence Year 12							
No	0.143	0.535	0.072	1	0.789	1.154	(0.405, 3.292)
Yes				Reference category			
Don't know	-0.143	0.482	0.088	1	0.766	0.867	(0.337, 2.227)
Receive Youth Allowance or ABSTUDY*							
No	0.348	0.166	4.369	1	0.037	1.416	(1.022, 1.961)
Yes	-0.244	0.181	1.813	1	0.178	0.784	(0.549, 1.118)
Don't know				Reference category			

Note: * Significant at the 5% level

Table 19 Regression results for working in Year 12: males, Y03, 2003–07

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Maths achievement quartile							
Lowest	-0.063	0.240	0.070	1	0.792	0.939	(0.587, 1.501)
Second	0.330	0.180	3.360	1	0.067	1.391	(0.977, 1.980)
Third	0.107	0.134	0.636	1	0.425	1.113	(0.856, 1.447)
Highest				Reference category			
Problem-solving achievement quartile							
Lowest	-0.025	0.239	0.011	1	0.918	0.976	(0.611, 1.559)
Second	-0.140	0.176	0.631	1	0.427	0.870	(0.616, 1.227)
Third	-0.144	0.134	1.157	1	0.2822	0.866	(0.667, 1.125)
Highest				Reference category			
Science achievement quartile							
Lowest	-0.191	0.221	0.747	1	0.387	0.826	(0.536, 1.274)
Second	-0.100	0.172	0.332	1	0.564	0.905	(0.645, 1.270)
Third	0.038	0.133	0.079	1	0.779	1.038	(0.799, 1.348)
Highest				Reference category			
Reading achievement quartile							
Lowest	0.106	0.214	0.245	1	0.621	1.112	(0.731, 1.691)
Second	0.112	0.164	0.465	1	0.500	1.118	(0.811, 1.543)
Third	0.109	0.133	0.680	1	0.410	1.116	(0.860, 1.447)
Highest				Reference category			
Location*							
Metropolitan	-0.110	0.305	0.130	1	0.718	0.896	(0.493, 1.628)
Regional	0.294	0.314	0.877	1	0.349	1.342	(0.725, 2.483)
Remote				Reference category			
Sector*							
Government	0.4862	0.119	16.687	1	<0.0001	1.626	(1.287, 2.055)
Catholic	0.5391	0.132	16.574	1	<0.0001	1.714	(1.324, 2.220)
Independent				Reference category			
Socioeconomic status (ISCED, father's or mother's if missing)*							
Low SES quartile	-0.009	0.127	0.005	1	0.946	0.991	(0.776, 1.272)
Low-medium SES quartile	-0.087	0.126	0.471	1	0.492	0.917	(0.716, 1.174)
Medium-high SES quartile				Reference category			
High SES quartile	-0.356	0.114	9.729	1	0.002	0.701	(0.560, 0.876)
VET in Schools in 2004							
No	-0.2149	0.091	5.627	1	0.018	0.807	(0.675, 0.963)
Yes				Reference category			
Unknown	-0.0466	0.221	0.045	1	0.833	0.954	(0.619, 1.471)

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Post-school intentions*							
Go to university	-0.3551	0.334	1.132	1	0.287	0.701	(0.364, 1.349)
Get an apprenticeship	0.2860	0.348	0.677	1	0.411	1.331	(0.673, 2.631)
Get a traineeship	0.7213	0.452	2.55	1	0.110	2.057	(0.849, 4.986)
Go to a TAFE college	-0.0201	0.351	0.033	1	0.954	0.980	(0.493, 1.948)
Do some other course or training elsewhere	-0.0922	0.426	0.047	1	0.829	0.912	(0.396, 2.102)
Look for work/ get a job	-0.0314	0.348	0.008	1	0.928	0.969	(0.490, 1.916)
Other	0.0487	0.525	0.009	1	0.926	1.050	(0.375, 2.938)
Don't know			Reference category				
Intention to commence Year 12							
No	0.0885	0.450	0.039	1	0.844	1.093	(0.453,2.637)
Yes			Reference category				
Don't know	-0.2384	0.460	0.269	1	0.604	0.788	(0.320, 1.939)
Receive Youth Allowance or ABSTUDY*							
No	0.1823	0.174	1.100	1	0.295	1.200	(0.853, 1.688)
Yes	-0.3674	0.193	3.622	1	0.057	0.693	(0.474, 1.011)
Don't know			Reference category				

Note: * Significant at the 5% level

Table 20 Regression results for working in Year 12: females, Y03, 2003–07

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Maths achievement quartile							
Lowest	0.001	0.219	0.000	1	0.998	1.001	(0.652, 1.536)
Second	0.200	0.169	1.403	1	0.236	1.221	(0.878, 1.699)
Third	0.086	0.131	0.434	1	0.510	1.090	(0.843, 1.409)
Highest				Reference category			
Problem-solving achievement quartile							
Lowest	-0.261	0.226	1.328	1	0.249	0.771	(0.495, 1.200)
Second	-0.030	0.172	0.030	1	0.863	0.971	(0.693, 1.359)
Third	-0.152	0.133	1.311	1	0.252	0.859	(0.661, 1.115)
Highest				Reference category			
Science achievement quartile							
Lowest	-0.127	0.216	0.343	1	0.558	0.881	(0.577, 1.346)
Second	-0.050	0.164	0.091	1	0.763	0.952	(0.690, 1.313)
Third	0.033	0.125	0.069	1	0.793	1.033	(0.809, 1.319)
Highest				Reference category			
Reading achievement quartile							
Lowest	0.089	0.219	0.167	1	0.683	1.093	(0.712, 1.680)
Second	0.203	0.162	1.576	1	0.209	1.225	(0.892, 1.683)
Third	0.166	0.123	1.819	1	0.178	1.181	(0.927, 1.503)
Highest				Reference category			
Location							
Metropolitan	-0.189	0.270	0.491	1	0.484	0.828	(0.488, 1.404)
Regional	0.048	0.277	0.030	1	0.863	1.049	(0.610, 1.804)
Remote				Reference category			
Sector*							
Government	0.6866	0.111	38.373	1	<0.0001	1.987	(1.599, 2.469)
Catholic	0.6870	0.131	27.578	1	<0.0001	1.988	(1.538, 2.569)
Independent				Reference category			
Socioeconomic status (ISCED, father's or mother's if missing)							
Low SES quartile	-0.075	0.121	0.383	1	0.536	0.928	(0.731, 1.177)
Low-medium SES quartile	0.029	0.121	0.058	1	0.810	1.029	(0.813, 1.304)
Medium-high SES quartile				Reference category			
High SES quartile	-0.139	0.112	1.555	1	0.212	0.870	(0.699, 1.083)
VET in Schools in 2004							
No	-0.025	0.089	0.076	1	0.783	0.976	(0.819, 1.163)
Yes				Reference category			
Unknown	0.002	0.279	0.0001	1	0.994	1.002	(0.580, 1.733)

Characteristic	Coefficients (response reference category is working)	S.E	Wald	df	p-value	Odds ratio	95% CI for odds ratio
Post-school intentions*							
Go to university	-0.277	0.328	0.715	1	0.398	0.758	(0.399, 1.441)
Get an apprenticeship	0.213	0.439	0.235	1	0.628	1.237	(0.523, 2.927)
Get a traineeship	0.161	0.425	0.144	1	0.705	1.175	(0.511, 2.702)
Go to a TAFE college	0.069	0.341	0.041	1	0.840	1.071	(0.549, 2.091)
Do some other course or training elsewhere	-0.227	0.473	0.230	1	0.632	0.797	(0.315, 2.016)
Look for work/ get a job	0.004	0.343	0.0001	1	0.992	1.004	(0.512, 1.967)
Other	0.663	0.573	1.341	1	0.247	1.941	(0.632, 5.962)
Don't know			Reference category				
Intention to commence Year 12							
No	-0.280	0.596	0.220	1	0.639	0.756	(0.235, 2.433)
Yes			Reference category				
Don't know	-0.067	0.485	0.019	1	0.890	0.935	(0.362, 2.418)
Receive Youth Allowance or ABSTUDY*							
No	0.020	0.172	0.013	1	0.910	1.020	(0.728, 1.430)
Yes	-0.591	0.188	9.916	1	0.002	0.554	(0.383, 0.800)
Don't know			Reference category				

Note: * Significant at the 5% level

Regression results for school retention

Year 11 retention

Table 21 Type 3 analysis of effects for Year 11 retention, males

Effect	df	Wald	P-value
Year 10 hours	5	90.330	<0.0001
Year 10 propensity	1	147.065	0.0001
R^2	8.5%		

Table 22 Regression results Year 11 retention, males

Parameter	Estimate	Standard error	df	Wald	P-value	Odds-ratio	95% confidence interval
Intercept	1.422	0.047	1	908.601	<0.0001		
Year 10 hours							
Not working				Reference category			
0 < x < 5	0.133	0.211	1	0.396	0.529	1.142	(0.755, 1.727)
5 < = x < 10	-0.289	0.120	1	5.763	0.016	0.749	(0.592, 0.948)
10 < = x < 15	-0.278	0.117	1	5.700	0.017	0.757	(0.602, 0.951)
15 < = x < 20	-0.557	0.136	1	16.492	<0.0001	0.577	(0.442, 0.752)
X > = 20	-1.010	0.113	1	79.322	<0.0001	0.364	(0.292, 0.455)
Year 10 prop.	-5.007	0.413	1	147.065	<0.0001		

Table 23 Type 3 analysis of effects for Year 11 retention, females

Effect	df	Wald	P-value
Year 10 Hours	5	60.221	<0.0001
Year 10 propensity	1	5.339	0.021
R^2	1.9%		

Table 24 Regression results Year 11 retention, females

Parameter	Estimate	Standard error	df	Wald	P-value	Odds-ratio	95% confidence interval
Intercept	1.721	0.051	1	1141.060	<0.0001		
Year 10 hours							
Not working				Reference category			
0 < x < 5	0.175	0.217	1	0.649	0.420	1.142	(0.755, 1.727)
5 < = x < 10	-0.061	0.121	1	0.255	0.613	0.749	(0.592, 0.948)
10 < = x < 15	-0.210	0.118	1	3.161	0.754	0.757	(0.602, 0.951)
15 < = x < 20	-0.497	0.140	1	12.590	0.0004	0.577	(0.442, 0.752)
X > = 20	-0.918	0.130	1	49.909	<0.0001	0.364	(0.292, 0.455)
Year 10 prop.	1.066	0.461	1	5.339	0.0202		

Year 12 retention

Table 25 Type 3 analysis of effects for Year 12 retention, males

Effect	df	Wald	P-value
Year 11 hours	5	6.764	0.239
Year 10 propensity	1	5.769	0.016
Year 11 propensity	1	15.906	<0.0001
R^2	6.6%		

Table 26 Regression results Year 12 retention, males

Parameter	Estimate	Standard error	df	Wald	P-value	Odds-ratio	95% confidence interval
Intercept	1.581	0.0800	1	394.418	<0.0001		
Year 11 hours							
Not working				Reference category			
0 < x < 5	-0.037	0.259	1	0.020	0.887	0.964	(0.580, 1.601
5 < = x < 10	0.031	0.154	1	0.041	0.839	0.749	(0.763, 1.394)
10 < = x < 15	0.085	0.162	1	0.278	0.598	0.757	(0.793, 1.496)
15 < = x < 20	0.099	0.207	1	0.227	0.634	0.577	(0.735, 1.658)
X > = 20	-0.367	0.167	1	4.846	0.028	0.364	(0.500, 0.961)

Table 27 Type 3 analysis of effects for Year 12 retention, females

Effect	df	Wald	P-value
Year 11 hours	5	41.883	<0.001
Year 10 propensity	1	1.535	0.215
Year 11 propensity	1	33.952	<0.0001
R^2	5.4%		

Table 28 Regression results Year 12 retention, females

Parameter	Estimate	Standard error	df	Wald	P-value	Odds-ratio	95% confidence interval
Intercept	2.023	0.089	1	511.503	<0.0001		
Year 11 hours							
Not working				Reference category			
0 < x < 5	-0.190	0.247	1	0.592	0.442	0.827	(0.510, 1.342)
5 < = x < 10	0.237	0.173	1	1.879	0.171	1.267	(0.903, 1.778)
10 < = x < 15	-0.201	0.159	1	1.609	0.205	0.818	(0.599, 1.116)
15 < = x < 20	-0.340	0.203	1	2.808	0.094	0.712	(0.478, 1.059)
X > = 20	-1.078	0.190	1	32.330	<0.0001	0.340	(0.235, 0.496)

Regression results for school performance (TER)

Ordinary least squares (OLS) regression was undertaken to measure TER score against the categorical variable, hours worked in Year 12. Tables of the analysis of variance and the relevant regression estimates are presented.

Table 29 ANOVA for TER scores against Year 12 working hours, males

Source	df	Type III SS	MSQ	F-value	P-value
Working hours Yr 12	6	801 269	1 335 345	4 580	<0.0001
Yr 12 propensity scores	1	49 097	49 097	168	<0.0001
Residual (error)	2046	596 528	292		
R^2	9.5%				

Table 30 Regression means for TER against Year 12 working hours, males

Hours	Means	S.E.	t-value	p-value	Adj. mean	95% CI of the adj. mean
Not working	72.72	0.583	124.7	<0.0001	75.47	(74.46, 76.49)
0 < x < 5	72.55	1.465	49.5	<0.0001	75.30	(72.46, 78.14)
5 < = x < 10	70.61	0.996	70.9	<0.0001	73.36	(71.44, 75.29)
10 < = x < 15	69.30	1.061	65.3	<0.0001	72.05	(69.98, 74.13)
15 < = x < 20	71.03	1.561	45.5	<0.0001	73.78	(70.71, 76.85)
X > = 20	67.24	1.501	44.8	<0.0001	69.99	(67.05, 72.94)

Note: CI = confidence interval.

Table 31 ANOVA for TER scores against Year 12 working hours, females

Source	df	Type III SS	MSQ	F-value	P-value
Working hours Yr 12	6	13 434 256	2 239 043	9 004	<0.0001
Yr 12 propensity scores	1	18 476	18 476	74	<0.0001
Residual (error)	2419	601 545	249		
R^2	5.3%				

Table 32 Regression means for TER against Year 12 working hours, females

Hours	Means	S.E.	t-value	p-value	Adj. mean	95% CI of the adj. mean
Not working	78.97	0.487	162.2	<0.0001	78.09	(77.12, 79.06)
0 < x < 5	79.39	1.118	71.0	<0.0001	78.52	(76.34, 80.70)
5 < = x < 10	78.79	0.705	111.8	<0.0001	77.92	(76.56, 79.27)
10 < = x < 15	74.63	0.843	88.5	<0.0001	73.75	(72.13, 75.37)
15 < = x < 20	73.65	1.308	56.3	<0.0001	72.78	(70.24, 75.31)
X > = 20	74.63	1.388	53.8	<0.0001	73.76	(71.05, 76.47)

Regression results for post-school full-time study

Table 33 Type 3 analysis of effects for post-school study, males

Effect	df	Wald	P-value
Year 12 hours	5	5.2024	0.392
TER score	1	233.55	<0.0001
Year 10 propensity	1	0.084	0.771
Year 11 propensity	1	1.302	0.254
Year 12 propensity	1	29.315	<0.0001
R^2	29.98%		

Table 34 Regression results full-time study post-Year 12, males

Parameter	Estimate	Standard error	df	Wald	P-value	Odds-ratio	95% confidence interval
Intercept	-3.416	0.259	1	173.832	<0.0001		
Year 12 hours							
Not working				Reference category			
0 < x < 5	0.031	0.221	1	0.019	0.0.891	1.031	(0.668, 1.591)
5 < = x < 10	0.295	0.159	1	3.430	0.064	1.343	(0.983, 1.835)
10 < = x < 15	0.013	0.162	1	0.006	0.938	1.013	(0.738, 1.391)
15 < = x < 20	-0.026	0.223	1	0.013	0.909	0.975	(0.629, 1.510)
X > = 20	-0.199	0.208	1	0.916	0.339	0.819	(0.545, 1.232)
TER score	0.052	0.003	1	233.554	<0.0001		
Year 10 prop.	0.351	1.210	1	0.084	0.771		
Year 11 prop.	1.784	1.564	1	1.302	0.254		
Year 12 prop.	-6.272	1.159	1	29.315	<0.0001		

Table 35 Type 3 Analysis of effects for post-school study, females

Effect	df	Wald	P-value
Year 12 hours	5	54.996	<0.0001
TER score	1	177.454	<0.0001
Year 10 propensity	1	5.357	0.0206
Year 11 propensity	1	1.250	0.264
Year 12 propensity	1	5.628	0.017
R^2	16.99%		

Table 36 Regression results full-time study post-Year 12, females

Parameter	Estimate	Standard error	df	Wald	P-value	Odds-ratio	95% confidence interval
Intercept	-2.553	0.247	1	106.570	<0.0001		
Year 12 hours:							
Not working				Reference category			
0 < x < 5	0.980	0.205	1	22.919	<0.0001	2.664	(1.784, 3.979)
5 < = x < 10	0.726	0.132	1	30.368	<0.0001	2.067	(1.596, 2.676)
10 < = x < 15	0.508	0.142	1	12.747	0.0004	1.663	(1.258, 2.198)
15 < = x < 20	-0.169	0.190	1	0.796	0.372	0.844	(0.582, 1.225)
X > = 20	0.218	0.208	1	1.097	0.295	1.243	(0.827, 1.869)
TER score	0.042	0.003	1	177.454	<0.0001		
Year 10 prop.	2.254	0.974	1	5.357	0.021		
Year 11 prop.	-1.290	1.154	1	1.250	0.264		
Year 12 prop.	-2.450	1.033	1	5.628	0.017		

Regression results for post-school full-time employment

Table 37 Type 3 analysis of effects for labour market outcomes: no full-time study post-Year 12 for Year 12 working hours, males

Effect	df	Wald	P-value
Year 12 hours	5	141.581	<0.0001
Year 10 propensity	1	13.686	0.0002
Year 11 propensity	1	6.963	0.008
Year 12 propensity	1	8.130	0.004
R^2	6.5%		

Table 38 Regression results full-time employment post-Year 12, males

Parameter	Estimate	Standard error	df	Wald	P-value	Odds-ratio	95% confidence interval
Intercept	-0.750	0.048	1	317.962	<0.0001		
Year 12 hours							
Not working				Reference category			
0 < x < 5	0.621	0.231	1	7.658	0.0057	1.861	(1.199, 2.889)
5 < = x < 10	0.824	0.145	1	35.536	<0.0001	2.280	(1.739, 2.990)
10 < = x < 15	1.125	0.143	1	67.798	<0.0001	3.079	(2.356, 4.023)
15 < = x < 20	0.997	0.177	1	34.509	<0.0001	2.711	(1.943, 3.780)
X > = 20	0.849	0.142	1	39.072	<0.0001	2.338	(1.791, 3.051)
Year 10 prop.	1.823	0.493	1	13.686	0.0002		
Year 11 prop.	-2.530	0.959	1	6.963	0.0083		
Year 12 prop.	2.365	0.830	1	8.130	0.0044		

Table 39 Type 3 analysis of effects for labour market outcomes: no full-time study post-Year 12 for Year 12 working hours, females

Effect	df	Wald	P-value
Year 12 hours	5	80.106	<0.0001
Year 10 propensity	1	0.954	0.329
Year 11 propensity	1	0.876	0.349
Year 12 propensity	1	5.902	0.015
R^2	5.0%		

Table 40 Regression results full-time employment post-Year 12, females

Parameter	Estimate	Standard error	df	Wald	P-value	Odds-ratio	95% confidence interval
Intercept	-1.411	0.055		666.768	<0.0001		
Year 12 hours:							
Not working				Reference category			
0 < x < 5	0.170	0.270	1	0.394	0.530	1.185	(0.698, 2.013)
5 < = x < 10	0.463	0.140	1	10.905	0.001	1.588	(1.207, 2.090)
10 < = x < 15	0.766	0.133	1	33.106	<0.0001	2.152	(1.657, 2.794)
15 < = x < 20	1.156	0.162	1	51.155	<0.001	3.176	(2.314, 4.360)
X > = 20	0.747	0.166	1	20.195	0.0001	2.111	(1.524, 2.924)
Year 10 prop.	-0.600	0.611	1	0.954	0.329		
Year 11 prop.	0.952	1.017	1	0.876	0.349		
Year 12 prop.	2.419	0.996	1	5.902	0.015		

Appendix C

Hours of work in Year 10 and Year 12 completion

Tables 41 and 42 summarise Year 12 completion status in 2007 for students by hours of work in Year 10 by gender. The number of students currently undertaking Year 12 is included in the tables for completeness, but it is acknowledged that their numbers are small. Note that these simple tables do not account for background characteristics.

Table 41 Year 12 completion status by intensity (hours) worked per week in Year 10, Y03 cohort in 2007, males

	Currently undertaking Year 12		Completed Year 12		Commenced but never completed Year 12		Never commenced	
Hours worked per week	No. students	%	No. students	%	No. students	%	No. students	%
Zero	11	0.8	1154	82.4	57	4.1	178	12.7
1–5 hrs	6	3.0	162	80.6	4	2.0	29	14.4
6–10 hrs	1	0.3	336	84.2	10	2.5	52	13.0
11–15 hrs	2	0.7	226	75.3	20	6.7	52	17.3
16– 20 hrs	0	0	94	70.2	6	4.5	34	25.4
21–30 hrs	1	1.5	43	66.2	6	9.2	15	23.1
31–40 hrs	1	2.6	17	43.6	2	5.1	19	48.7
Hours unknown	0	0	48	69.6	3	4.4	18	26.1
Male students	**22**	**0.8**	**2080**	**79.8**	**108**	**4.1**	**397**	**15.2**

Note: * percentages sum across the rows.

For males, table 41 indicates that those who do not work, or work fewer than ten hours in Year 10 have higher completions rates. Those who work longer hours (> 20 hours) in Year 10 are more likely to have never commenced Year 12 than those who do not work, or who work fewer hours.

Table 42 Year 12 completion status by intensity (hours) worked per week in Year 10, Y03 cohort in 2007, females

	Currently undertaking Year 12		Completed Year 12		Commenced but never completed Year 12		Never commenced	
Hours worked per week	No. students	%	No. students	%	No. students	%	No. students	%
Zero	21	1.7	1053	86.2	29	2.4	119	9.7
1–5 hrs	1	0.4	206	91.2	3	1.3	16	7.1
6–10 hrs	11	1.9	511	90.3	10	1.8	34	6.0
11–15 hrs	4	1.2	290	86.6	9	2.7	32	9.6
16– 20 hrs	0	0	121	77.6	11	7.1	24	15.4
21–30 hrs	0	0	41	77.4	3	5.7	9	17.0
31–40 hrs	0	0	8	53.3	0	0	7	46.7
Hours unknown	1	1.8	47	82.5	2	3.5	7	12.3
Female students	**38**	**1.4**	**2277**	**86.6**	**67**	**2.6**	**248**	**9.4**

Note: * percentages sum across the rows.

For females we see a similar trend. Females who work more than ten hours a week in Year 10 have lower Year 12 completion rates than those who work. As for males, females who work fewer than ten hours per week in Year 10 have higher completion rates than those who do not work, but there is little impact unless the hours are very long (more than 15 hours a week).

Tables 43 and 44 summarise labour market status in 2007 for students who completed Year 12 (between 2003 and 2007) but who did not go on to any post-school study by 2007, by hours of work in Year 12 by gender.

Table 43 Hours of work in Year 12 and later labour market outcomes for Y03 in 2007: no post-school study, males

Characteristic	Not working	Working	1–5 hrs	6–10 hrs	11–15 hrs	16–20 hrs	21–40 hrs	Unknown hours (but working)	Mean hours of work for those working in Year 12
Total (n)	**454**	**569**	**84**	**165**	**132**	**71**	**85**	**32**	**13.8**
%	**44.4**	**55.6**	**8.2**	**16.1**	**12.9**	**6.9**	**8.3**	**3.1**	
Labour force status									
Employed full-time	58.0	65.4	42.9	72.0	69.6	61.9	66.0	85.7	14.0
Employed part-time	30.6	25.7	38.8	23.0	23.2	23.8	26.4	14.3	13.0
Unemployed	5.7	5.2	6.1	4.0	5.8	11.9	1.9	0.0	13.1
Not in the labour force	5.7	3.7	12.2	1.0	1.5	2.4	5.7	0.0	13.5

For males, students who went on to no further study after completing Year 12 appear to have benefited from working more than five hours a week in Year 12, with better post-school employment outcomes than those who worked fewer hours.

Table 44 Hours of work in Year 12 and later labour market outcomes for Y03 in 2007: no post-school study, females

Characteristic	Not working	Working	1–5 hrs	6–10 hrs	11–15 hrs	16–20 hrs	21–40 hrs	Unknown hours (but working)	Mean hours of work for those working in Year 10
Total (n)	**620**	**1064**	**122**	**396**	**300**	**143**	**71**	**32**	**12.1**
%	**36.8**	**63.2**	**7.2**	**23.5**	**17.8**	**8.5**	**4.2**	**1.9**	
Labour force status									
Employed full-time	45.7	57.3	55.6	50.3	62.4	64.5	63.6	54.6	12.9
Employed part-time	33.5	32.6	31.5	37.3	32.0	25.8	27.3	27.3	11.5
Unemployed	10.8	6.2	9.3	9.5	1.6	3.2	6.1	9.1	10.5
Not in the labour force	10.0	4.0	3.7	3.0	4.0	6.5	3.0	9.1	12.2

For females we see a similar picture, with benefits for females who went on to no further study after completing Year 12. However females appear to have to work longer hours (> 10 hours a week) than males (> 5 hours a week) to realise this benefit.

Australian Government

Department of Education, Employment and Workplace Relations

National Centre for Vocational Education Research Ltd
Level 11, 33 King William Street, Adelaide, South Australia
PO Box 8288, Station Arcade, SA 5000 Australia
Telephone +61 8 8230 8400 Facsimile +61 8 8212 3436
Website www.ncver.edu.au Email ncver@ncver.edu.au