Influences on, and the Consequences of, Low Achievement

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Abstract

The paper examines the influences on, and consequences of, low achievement defined as scores within the lowest achievement quartile. Low achievement is moderately associated with socioeconomic background and Indigenous status and the relationships with gender, ethnicity, region, family type, state and region differ for reading and mathematics. Low achievement substantially reduces the chances of school completion and university entrance. It has much less impact on other forms of post-secondary education and training. There are stronger differences in labour market outcomes between low and higher achievers for young women than for young men. This study suggests the policies promoting the securing of full-time work soon after completing full-time education should reduce the detrimental effects of low achievement on labour market outcomes.

Introduction

The social and socioeconomic correlates of student achievement are well established. Socioeconomic background, gender, ethnicity, Indigenous status and to some extent, region influence students' achievement scores in reading and mathematics (Lokan, Ford & Greenwood 1996, Lokan, Greenwood & Cresswell 2001, Marks & Ainley 1996, Masters & Forster 1997, Rothman 2002, 2003). There are also differences in student achievement by state or territory and school sector (Afrassa & Keeves 1999, Marks & Cresswell 2005, Williams & Carpenter 1990, Williams & Carpenter 1991). Similarly, it is well-established that student achievement influences subsequent educational outcomes in Australia, such as, early school leaving, school completion, performance in Year 12, and university participation (Fullarton, Walker, Ainley & Hillman 2003, Marks & Fleming 1999, Marks, Fleming, Long & McMillan 2000, Marks, McMillan & Hillman 2001). The effects of achievement on educational outcomes are generally larger than that of socioeconomic background. Also, achievement has, albeit more

moderate, direct effects on labour market outcomes, such as full-time work, earnings and unemployment (Lamb 1997, Marks & Fleming 1998, McMillan & Marks 2003, Miller & Chiswick 1996). This is in addition to its indirect effects via educational attainment.

Although there has been a considerable amount of research on both the influences on, and consequences of, student achievement much less is known specifically about low achievement. From achievement studies it can be inferred that low achievers tend to come from lower socioeconomic backgrounds and have less successful educational and labour market outcomes. However, it is not established how strongly low achievement is associated with socioeconomic background and other social factors, and to what extent do low achievers have 'unsuccessful' labour market outcomes. A large proportion is likely to be in full-time work. Importantly, little is understood of the process by which low achievement is associated with less successful labour market outcomes. If the process is better understood then policies can be implemented to reduce the detrimental effects of low achievement. Therefore, the purpose of this paper is to focus on low achievement: the influences on, and the consequences of low achievement. However, before discussing the results of analyses of low achievement, it is worth reviewing previous Australian studies on low achievement.

Previous Studies on Low Achievement

The 1975 and 1980 Australian Studies of School (later Student) Performance (ASSP) were designed to identify those students who failed to 'master' basic verbal and mathematical skills necessary for full participation in adult society. From these and a more recent national study approximately one-third of students had not gained mastery (Bourke & Keeves 1977, Bourke, Mills, Stanyon & Holzer 1981, Marks & Ainley 1996). According to bivariate analyses of the 1975 ASSP, mastery of literacy is higher among girls than boys, relates to language spoken at home, year level, school attendance, and school sector. Differences in mastery among students attending government, Catholic and independent schools were particularly large. Surprisingly, regional differences were small. For numeracy, boys were more likely to achieve mastery, and the relationship with language at home was weaker than that for literacy (Bourke & Keeves 1977, pp. 87-90, 94, 95).

Aiming to distinguish the major influences on mastery using multivariate analyses, Bourke and Keeves (1977, pp. 87-90) concluded that state and year level were important discriminators of mastery in both literacy and numeracy. Williams et al., (1980, pp. 67-68) identified small to moderate effects of father's occupational status. Students born in non-English speaking countries were 11 and 6 per cent less likely to

achieve mastery in literacy and numeracy respectively, than students born in English speaking countries (including Australia). State differences in mastery of literacy were minimal, when controlling for socioeconomic background and grade (students' year level). In contrast, there were substantial state differences in mastery of numeracy with Queensland students ten per cent more likely to achieve mastery. Controlling for social background variables, students attending Catholic or independent schools were about ten per cent more likely to achieve mastery in literacy than government school students. Catholic school students were no different from Government school students in mastery of numeracy, while students from independent schools were about 10 per cent more likely to achieve mastery than government school students. In the 1980 ASSP study, the level of mastery in reading among 14 year-old metropolitan students was not significantly different to that of non-metropolitan students. A higher proportion of male than female students attained mastery in mathematics and the opposite was found for literacy (Bourke et al. 1981, pp. 84-85, 138-139).

In recent national studies proficiency levels have replaced the concept of mastery. Proficiency levels group students by their ability to perform satisfactorily tasks at increasing levels of complexity (Lokan et al. 2001, pp. 65-72, OECD 2001, pp. 34-49, 71-78, 83-87). In the 2000 Program for International Student Assessment (PISA), 12 per cent of Australian students were at or below the lowest proficiency level in reading, which compared favourably with the OECD average of 18 per cent (Lokan et al. 2001, p. 66). Approximately 18 per cent of students from non-English speaking backgrounds were in this group, compared to 11 per cent of students from English-speaking backgrounds. Of concern is the finding that 35 per cent of Indigenous students had not reached this level of proficiency. There were also substantial differences across the states in the proportion of students at this level, from 8 per cent in the ACT, 11 per cent in New South Wales, 15 per cent in Victoria, 19 per cent in Tasmania and 23 per cent in the Northern Territory (Lokan et al. 2001, pp. 125, 127, 128).

Consequences of Low Achievement

Low achievement is associated with weaker or less successful educational and labour market outcomes. In an analysis of very early school leaving, Marks and Fleming (1999) reported that 20 per cent of students in the lowest achievement group – defined as students with scores one standard deviation or more below the mean score (about 16 per cent of all students) – had left school at the beginning of Year 11 compared with only 2 per cent of students in the highest achievement group. Almost one-half (48 per cent) of early school leavers were low achievers. Similarly, Lamb and Rumberger (1999, p. 5) analysing data from the Australian Youth Survey reported that 59 per cent of males in the lowest achievement quintile had left school early

compared to 33 per cent of average achievers and only 10 per cent of students in the highest quintile. The high propensity for low achievers to leave school early was also found in the cohort of students who were in Year 9 in 1995. Of low achievers – again defined as students with scores one standard deviation or less below the mean – 18 per cent had left school by the end of Year 10 and a further 20 per cent did not complete Year 12 (McMillan & Marks 2003).

Correspondingly, low achievers are less likely to complete school. Of students born in 1961, the proportion of students with achievement scores in the lowest quartile who completed school was 10 per cent compared to 67 per cent for the highest quartile. In the cohort born 14 years later, school completion of both groups had increased markedly but a large gap remained: 62 per cent of the lowest quartile completed school compared to 93 per cent of the highest quartile (Marks et al. 2000).

Similarly, lower achievers are unlikely to participate in higher education. In 1980, only 5 per cent of students in the lowest achievement quartile entered university compared to 43 per cent of students in the highest quartile. In 1999 the corresponding figures were 9 and 55 per cent (Marks et al. 2000).

In contrast to school and university participation, low achievers do not have particularly low levels of participation in other forms of post-secondary education: apprenticeships and Technical and Further Education (TAFE). In 1980, the three lower achievement quartiles show similar levels of participation in apprenticeships (of around 20 per cent) and the highest quartile show the lowest participation levels. Over time the proportion of the three lower achievement groups participating in apprenticeships declined slightly to between 15 and 18 per cent but only 9 per cent of the highest achieving quartile took apprenticeships (Long, Carpenter & Hayden 1999, p. 113). These data also suggest a decline in the average achievement scores of apprentices (Lamb, Long & Malley 1998, pp. 44-45). For participation in non-apprenticeship TAFE certificate courses, achievement differences have widened. In 1980 participation levels were similar across the four achievement quartiles at between 11 to 14 per cent. By 1999, approximately 27 per cent of the lowest achievement quartile participated in non-apprenticeship TAFE compared to only 9 per cent of students in the top achievement quartile.

Low achievement also has consequences for the labour market. Miller and Chiswick (1996) analysing the adult literacy survey reported that labour market participation rates decline substantially from the highest achievement group (around 90 per cent) to the lowest achievement group (around 61 per cent). For the highest literacy skill group, unemployment rates were around 3 per cent, rising to 5 per cent for the next highest skill group, 9 per cent for the next group and 20 per cent for the lowest skill (achievement) group.

Students with lower achievement scores at school also show higher unemployment levels a decade later. Using data from four youth cohorts, Marks and Fleming (1998) found unemployment rates were 2 to 3 times higher in the group with the lowest test scores compared to the group with the highest test scores. In a more recent study on school leavers who did not proceed to university, McMillan and Marks (2003, p. 64) found that 13 per cent of students in the lowest achievement group (who scored one standard deviation or more below the mean) were looking for work, compared to 7 per cent of students of the highest achievement group.

Overview

The main points emerging from review of the Australian literature on low achievement are:

- There is no consistent definition of low achievement. These include conceptual definitions such as, mastery and basic proficiency and definitions based on distributional statistics: the lowest achievement quintile or quartile, and students with scores one standard deviation or more below the mean. The first group of definitions tend to be used for studies focusing on the influences on or correlates of, achievement whereas the second group are used in studies examining the effects of achievement.
- The strength of these relationships with low achievement is not clear. Is the relationship between low achievement and socioeconomic background and other social factors strong, moderate or weak? Does low achievement almost inevitably lead to poor labour market outcomes?
- The relationship between family type and low achievement has not been examined.
- None of the studies reviewed have examined the role of individual schools on low achievement. Since student learning occurs in schools, schools are likely to influence the prevalence of low achievement. However, it is important to take into account the characteristics of the students in the schools, for example, a school with a high proportion of students from low socioeconomic backgrounds is likely to show a higher proportion of low achievers. What is important is to identify those schools with much higher or lower proportions of low achievers after taking into account socioeconomic background, language background and other characteristics of the students attending each school.
- Many recent studies are limited to bivariate analyses which do not attempt to examine independent influences. Bivariate analyses can lead to spurious interpretations.[1]

The analyses reported in this paper contribute to our understanding of low achievement by using a consistent measure of low achievement (the lowest quartile), quantifying the strength of its association with background factors, analysing the independent effects of influences (including family type) and examining the role of individual schools. Furthermore, this paper investigates the consequences of low achievement using more recent data than that used in earlier publications and examines the process by which low achievement is associated with labour market outcomes.

Influences on Low Achievement

The purpose of this section is to examine the influences on low achievement. The first part of this section presents and discusses the distribution of low achievers across demographic and socioeconomic groups. This is followed by an analysis of the independent effects of these factors (or influences) on low achievement. The final part of this section examines the contribution of individual schools.[2]

The data used is from the PISA 2000 study, which investigated achievement of 15 year-old students in reading, mathematics and science in 32 countries. The Australian data comprises 5,477 students from all states and territories. The smaller states were oversampled so that conclusions on state differences would not be undermined by small sample sizes. Schools were sampled with probability according to size and then samples of 15 year-old students were drawn within selected schools. The data, tests, and sampling procedures are detailed in the international PISA and Australian reports (Lokan et al. 2001, OECD 2001). Item Response Theory (IRT) modelling was used to create scores which were standardised for each of the three domains – reading, mathematical and scientific literacy – at an international mean of 500 and standard deviation of 100. Details on this procedure are available from the PISA technical report (OECD 2002). Low achievement was defined as a score in the lowest achievement quartile.

The demographic and socioeconomic factors examined include socioeconomic background, Indigenous status, family type, state and region. Socioeconomic background is a composite comprising father's and mother's occupation and education. It was constructed by the sheaf variable method (see Whitt 1986) which maximises the effects of these four variables on combined achievement score. It is a continuous variable standardised with a mean of zero and a standard deviation of one. This is a stronger measure – that is, it has a higher correlation with student achievement – than measures based on a single indicator or the socioeconomic characteristics of one parent. In order to inform on the bivariate patterning of low achievement by parental occupation and education (Table 2) separate categorical

measures of father's occupational group and mother's highest level of education were also constructed.

Indigenous status was measured by asking students if they considered themselves as Aboriginal or a Torres Strait Islander. The measure of family type distinguished between students living in a traditional family (with two biological parents), a single-parent family and a mixed family (with one biological parent and one step-parent). State was ascertained by the sampling frame. Region is measured by the Jones typology distinguishing between students living in a mainland state capital, other major urban centre, a provincial city, other regional area, or a remote area (Jones 2000, Jones 2002).

Demographic and Socioeconomic Characteristics of Low Achievers

Tables 1 and 2 present the percentage of students in the bottom quartile in both reading and mathematics achievement by demographic and socioeconomic characteristics. There is a large gender difference for low achievement in reading, 30 per cent of 15 year-old boys are in the lowest quartile compared to 19 per cent of girls. In contrast, there is only a small gender difference for numeracy. There are considerable differences according to language spoken at home for reading with over one-third of students from non-English speaking backgrounds in the lowest quartile compared to 23 per cent of students from English-speaking backgrounds. For mathematics, the gap is much smaller at around 6 percentage points. There are large differences for Indigenous status; 56 per cent of Indigenous students are low achievers in reading and 55 per cent low achievers in mathematics. Sizable differences are found for family type: 22 per cent of students living in traditional families were low reading achievers compared to 29 and 31 per cent of students from single parent or 'mixed' families. For numeracy, differences according to family type are similar with 23 per cent of students from traditional families in the lowest quartile, compared to around 30 per cent of students from single parent and mixed family types.

There are state differences in the proportions of low achievers. Over one-third of students from the Northern Territory are low achievers compared to around 20 per cent of students from the Australian Capital Territory and New South Wales. For both reading and mathematics, about 30 per cent of Victorian and Tasmanian students are low achievers. Queensland shows slightly higher proportions of students in the lowest quartile than South Australia or Western Australia. The proportion of low achievers among students living in major urban areas (21 per cent) is slightly lower than the proportion of those living in the mainland state capitals (23 per cent). About 28 per cent of students living in provincial cities are low achievers in reading and 30 and 38 per cent of students living in regional and remote areas. Regional differences in the proportion of low achievers are wider for reading than for mathematics.

Year	Reading N=5176	Mathematics N=2859
Gender		
Male	30	24
Female	19	26
Language at Home		
English	23	24
Other than English	34	30
Indigenous Status		
Indigenous	56	55
Non-Indigenous	24	25
Family Type		
Traditional	22	23
Single Parent	29	30
Mixed	31	28
State		
Australian Capital Territory	18	22
New South Wales	21	19
Victoria	31	28
Queensland	26	25
South Australia	21	25
Western Australia	24	22
Tasmania	29	30
Northern Territory	36	35
Region (Jones)		
Major City	23	24
Other Major Urban	21	23
Provincial City	28	25
Other Regional	30	31
Remote	38	31

Note: Row Percentages

Table 1
Lowest Quartile of Achievement by Demographic Characteristics PISA 2000

Generally, there is a socioeconomic hierarchy with students from lower socioeconomic groups showing higher proportions of low achievers (Table 2). Of students whose fathers worked in unskilled manual occupations, 40 per cent were low achievers in literacy compared to 11 per cent of students whose fathers worked in professional occupations. Of students whose father's occupation was classified in the 'operatives' group, 37 per cent were low achievers in literacy. Twenty-eight per cent of students whose fathers worked in skilled manual or trade occupations were low achievers in literacy, the same percentage as that for students whose fathers worked in sales and service occupations.[3] Generally occupational background differences are larger for mathematics than for reading. The group that showed the highest proportions of low achievers (almost half) were students who provided no useable data on their father's occupation. Students whose fathers were teachers show a very low incidence of low achievement.

The relationship between mothers' education and low achievement are similar to that for fathers' occupation. Only 15 per of students whose mothers had been to university are low achievers in literacy compared to 32 per cent of students whose mothers had only a primary school education. Of the small proportion of students whose mothers did not receive any formal schooling, 43 per cent were low achievers. As was the case for occupational background, differences in the proportion of low achievers across educational backgrounds were greater for mathematics than for reading. The group that showed the highest proportions of lower achievers were students who did not provide usable information on their mother's education.

Influences on Being in the Lowest Achievement Quartiles

Table 3 shows the results from logistic regression analyses of low achievement. The coefficients presented are log-odds, which are interpreted as odds ratios in the text.[4] The levels of statistical significance for the coefficients are indicated in the tables in the traditional manner. These multivariate analyses were weighted to reflect the population of 15 year-old students across states and sectors.

The odds of male 15 year-olds being a low achiever in reading as opposed to not being a low achiever were twice as large as the comparable odds for female students. Socioeconomic background had a moderate impact. A one standard deviation increase in score on the composite measure of socioeconomic background decreased the odds of being in the lowest quartile by a factor of 1.8. The odds of students from a mixed or single-parent family on being a low achiever were 1.2 and 1.5 times, respectively, the odds for students from a traditional family. One of the largest effects was for Indigenous status; the odds for an Indigenous student being a low achiever in reading were 3.5 times the odds for non-Indigenous students. This large effect was

net of measured differences in socioeconomic background, family type, state of residence and region. The odds of being a low achiever for Victorian and Queensland students were 1.7 and 1.2 times the comparable odds for students from New South Wales. There were no significant regional differences on being a low achiever in reading when taking into account socioeconomic background and Indigenous status.

	Reading N=5176	Mathematics N=2859
Father's Occupation		
Manager	13	10
Professional	11	8
Paraprofessional	18	16
Clerical	8	18
Sales and Service	28	31
Skilled Agriculture	24	24
Craft and Trades	28	30
Operatives	37	36
Unskilled manual	40	42
Teachers	11	9
Small Managers	23	21
Missing	47	49
Mother's Education		
Didn't Go to School	43	48
Primary School	32	36
Lower Secondary School	31	34
Secondary (Vocational)	24	27
Upper Secondary School	24	23
Post Secondary Trade	21	20
University	15	13
Missing	54	46

Note: Row Percentages

Table 2
Lowest Quartile of Achievement by Socioeconomic Characteristics PISA 2000

	Reading N=5130	Mathematics N=2859
Intercept	-2.11***	-1.62***
Male	0.69***	-0.18
SES	-0.61***	-0.79***
Other than English	0.50***	0.17
Indigenous	1.25***	0.98*
Single Parent Family	0.21**	0.09
Mixed Family	0.41**	0.27
Australian Capital Territory	-0.28	0.42
Victoria	0.51***	0.55***
Queensland	0.22*	0.29*
South Australia	0.00	0.24
Western Australia	0.14	0.09
Tasmania	0.35	0.60*
Northern Territory	0.57	1.09*
Major Urban (Not Mainland Capitals)	0.07	-0.14
Provincial City	-0.16	-0.35*
Other Regional	0.15	0.02
Remote	0.47	-1.27*
Adjusted R Square	0.15	0.16

Note: Logistic regression coefficients. *0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001 Reference Group, Female, average family socioeconomic background, non-Indigenous, traditional family, New South Wales, Mainland Capital. Dummy variable included for socioeconomic background missing.

Table 3
Influences on Being in the Lowest Quartile of Achievement

For mathematics there were no significant effects for gender, language background or family type. The effect of socioeconomic background on low achievement in mathematics was larger than its effects on low reading achievement. The odds ratio for a one standard deviation difference in socioeconomic background in being a low achiever in mathematics was 2.2 compared to 1.8 for reading. The odds of Victorian and Queensland students being low achievers in numeracy were 1.7, and 1.3 the odds for students from New South Wales. Students from Tasmania and the Northern Territory were more likely to be low achievers in mathematics than students from New South Wales, whereas there was no difference for reading. Students living in a provincial city were significantly less likely to be low achievers in mathematics than

students living in the mainland state capitals. Students living in remote areas, net of other factors, are significantly less likely to be low achievers than students living in major urban areas, net of other factors in the model.

Although many significant effects were found in these analyses of low achievement, it should be noted that these influences account for only about 15 per cent of the variation in low achievement. Therefore, low achievement is only moderately related to socioeconomic background and the other factors in the model. It is important to reiterate that a 'strong' measure of socioeconomic background was used which comprised both father's and mother's occupation and education.

The Contribution of Schools

The next step is to examine the role of schools in low achievement. This involves several steps. The first step involves estimating the percentage of schools with significantly higher or lower proportions of low achievers. This percentage indicates the extent to which low achievement is spread more or less evenly across schools or clustered within particular schools. Subsequent analytical steps take into account students' socioeconomic background, state of residence and the factors in the full model presented in the previous section.[5]

Model	Lowest Quartile in Reading Achievement
Null	19.8
Socioeconomic Background	14.2
Socioeconomic Background and State	13.0
Full Model (Variables in Table 3)	10.0

Note: Proportion of Schools showing Statistically Significant effects on being in the lowest Quartile.

Table 4
Percentage of Schools with Statistically Significant Contributions to Low Achievement (Lowest Quartile) and Reading Score with and without controls for other factors

Analysis of the Australian 2000 PISA data indicates that only 20 per cent of schools have significantly higher or lower proportions of low achievers in reading. Thus for the great majority of schools (80 per cent) the proportion of low achievers is not significantly different from 25 per cent. When taking into account, students' socioeconomic backgrounds, the percentage of schools with significantly higher or lower proportions of low achievers declines to 14 per cent. The addition of state of

residence reduces the percentage only marginally to 13 percent. When taking into account all factors in the full model – socioeconomic background, family structure, language background, Indigenous status, state and region – the proportion of schools making a significant contribution to the proportion of low achievers declines to 10 per cent. Of these 23 schools, 17 show a significantly higher proportion of low achievers. So, only in a small minority of schools is the proportion of low achievers higher than expected given the students' socioeconomic backgrounds and other characteristics.

Consequences of Low Achievement

Data from the Longitudinal Study of Australian Youth (LSAY), 1995 Year 9 cohort is used to examine the consequences of low achievement. This is a longitudinal study of a representative sample of young Australians who were in Year 9 in 1995. The original sample comprised about 13,500 students (see Marks & Rothman 2003).[6]

For the analysis of consequences, low achievers are defined as those in the lowest quartile in combined score on literacy and numeracy. Achievement in literacy and numeracy are too highly correlated ($r>0.6$) to isolate differential effects for low achievement in the two areas. The education and training outcomes include participation in: Year 12, university, apprenticeships and traineeships, diploma courses at either the undergraduate level at university or at a TAFE institution, and non-apprenticeship TAFE certificate courses (Table 5). The labour market outcomes examined are main activity in the years 2000 to 2002 (Table 6), and full-time work and unemployment in 2002 (Tables 7 and 8).

Table 5 shows the effects of being in the lowest quartile on participation in Year 12, university, apprenticeships and traineeships, diploma and TAFE certificate courses, net of students' socioeconomic background. The analyses are performed on the entire cohort for school and university participation, but exclude those enrolled in Bachelor degrees in 2000 or 2001 for analyses of participation in other forms of education and training. This is because very few students in Bachelor degrees also participate in these other forms of education and training.

The odds of low achievers participating in Year 12 were 2.9 times less than the odds for students in higher quartiles. The effects of low achievement on university participation were even stronger; low achievers were about 4.2 times less likely to go to university (rather than not go to university) than higher achievers. These findings indicate that low achievers are substantially less likely to complete school and participate in university education than higher achievers and this strong tendency cannot be attributed to socioeconomic background.

	Year 12	University by 2001	Ever Apprentice by 2001	Ever Trainee by 2001	Ever Diploma Course by 2001	Ever TAFE Certificate Course by 2001
Intercept	1.80***	-0.14***	-1.41***	-1.11**	-1.64***	-0.86***
Lowest Quartile	-1.08***	-1.43***	0.12	-0.18*	-0.31***	0.07
Socioeconomic Background	0.26***	0.37***	0.00	-0.03	0.11*	0.01
Max-rescaled R Square	0.08	0.14	0.00	0.00	0.01	0.00

Note: Logistic regression coefficients. *0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001 Reference Group, average family socioeconomic background. 1. Analyses of ever apprentice, trainee, or in certificate or Diploma courses excludes those participating in Bachelor degrees in 2000 or 2001

Table 5
Effects of Being in the Lowest Quartile and Socioeconomic Background on Educational Participation

Low achievers are not significantly more or less likely to participate in apprenticeships than other students who did not pursue higher education. Similarly, there was no significant difference in their propensity to undertake TAFE certificate courses. However, low achievers are significantly less likely to be in traineeships; the odds of participation in a traineeship for low achievers are about 1.2 times less than that for higher achievers (excluding those in Bachelor degree courses). Similarly, they are about 1.4 times less likely to enrol in a TAFE diploma course.

	2000 Q1	Q2-4	2001 Q1	Q2-4	2002 Q1	Q2-4
Males						
Full Time Study	11.1	12.2	4.6.	5.1	2.8	3.9
Full-Time Work	67.3	70.5	71.9	78.1	77.4	80.1
Part-Time Work/Part-time Study	8.3	7.8	8.4	8.6	7.9	7.2
Looking For Work	10.6	7.6	11.5	6.2	6.9	5.7
Not in the Labour Force or Education	2.7	2.0	3.6	2.0	5.1	3.1
Females						
Full Time Study	13.5	15.8	5.0	5.8	6.9	4.5
Full-Time Work	51.0	60.0	57.1	68.0	57.2	69.4
Part-Time Work/Part-time Study	15.2	14.6	18.1	12.9	17.3	13.0
Looking For Work	11.4	4.5	8.4	5.9	7.4	4.5
Not in the Labour Force or Education	8.9	5.1	11.5	7.6	11.3	8.6

Note: Column Percentages. Excludes those participating in Bachelor degrees in 2000, 2001 or 2002.

Table 6
Main Activity of Lowest Quartile (Q1) compared to Other Quartiles (Q2-4) for Years 2000-2002 (Males)

Table 6 presents the main activity in the years 2000 to 2002 of low and higher achievers. Main activity is defined hierarchically: full-time study, full-time work, part-time work (with or without part-time study), looking for work (unemployed), and not in the labour force or in education (most often home duties and holidays). These analyses separate males and females and exclude those participating in Bachelor degree courses.

For both males and females, low achievers are slightly less likely to be engaged in (non-university) full-time study. Among females, participation in full-time work among low achievers was around 10 percentage points less than higher achievers. Among males, differences in full-time work participation levels between low and higher achievers were much smaller. Among males around 80 per cent of low achievers are fully engaged in either full-time work or study, only slightly lower than the comparable percentage for higher achievers. For young women the differences are greater: about 60 to 65 per cent of low achievers are fully engaged compared to 70 to 75 per cent of higher achievers. Similarly, young women with achievement scores in the lowest quartile show a higher incidence of part-time work than other young women. Among young men there are generally smaller differences in the incidence of part-time work between low and higher achievers. Low achievers are more likely to be looking for work or not in the labour force although differences between low and higher achievers are generally smaller among males.

The next step in these analyses is to model the two most important labour market outcomes, full-time work and unemployment, to examine the process by which low achievement relates to poorer labour market outcomes. Their poorer labour market outcomes may be because low achievers tend to have: lower socioeconomic backgrounds, left school earlier, lower levels of participation in post-secondary education or poorer initial labour market outcomes.

Table 7 presents the results of sequential analyses of the relationship between low achievement and being in full-time work at the time of interview in 2003. One striking finding is that low achievement has much more detrimental effects on full-time work for young women than young men. Among young men the odds of low achievers being in full-time work in 2003 is 0.84 times that for higher achievers. This effect was barely significant. However, among young women odds of low achievers being in full-time work were 0.62 times the odds for higher achievers. The association between low achievement and full-time work amongst both groups is not accounted for by socioeconomic background, Year 12 completion, and participation in post-secondary education and training. (That is because the magnitude of the coefficient for low achievement does not change substantially). Employment experience has a very strong impact on obtaining full-time work indicated by the steep increase in R square

value. Among young women, the effect of low achievement is no longer significant indicating that the detrimental effect of low achievement on full-time work is largely accounted for by employment experience. Among young men the effect of low achievement is much weaker and moves in and out of statistical significance.

Model	1	2	3	4	5
Males					
Intercept	0.98***	0.99***	1.27***	1.31***	1.26**
Lowest Quartile	-0.17†	-0.16	-0.23*	-0.22*	-0.14
Socioeconomic Background		0.02	0.04	0.05	-0.02
Year 12 Completed			-0.40***	-0.19	-0.25*
Ever in Apprenticeship				0.25***	-0.22†
Ever in Traineeship				0.15	0.04
Ever in Diploma Course (TAFE/Uni)				-0.56***	-0.31*
Ever in TAFE Certificate Course				-0.61***	-0.37**
Percent time Employed from Leaving School until August 2001					0.31***
Max-rescaled R Square	0.01	0.01	0.02	0.03	0.20
Females					
Intercept	0.66***	0.68***	0.21***	0.18***	0.22**
Lowest Quartile	-0.48***	-0.47***	-0.40***	-0.40***	-0.21
Socioeconomic Background		0.09	0.08	0.08	0.04
Year 12 Completed			0.62***	0.62***	0.48**
Ever in Apprenticeship				-0.08	-0.40†
Ever in Traineeship				0.20†	-0.09
Ever in Diploma Course (TAFE/Uni)				-0.01	0.06
Ever in TAFE Certificate Course				-0.04	0.15
Percent time Employed from Leaving School until August 2001					0.31***
Max-rescaled R Square	0.02	0.02	0.04	0.05	0.23

Note: Logistic regression coefficients. † 0.10>P>0.05 *0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001 Reference Group, not in lowest quartile, average family socioeconomic background, absence of respective qualification, average percentage time in work (70 per cent) and no time spent unemployed. Excludes those participating in Bachelor degree courses in 2000 to 2002.

Table 7
Relationship between Being in Lowest Quartile and in Full-time Work in 2002

Table 8 presents the results of corresponding analyses of unemployment, defined as looking for work but not in full-time work or full-time study. As was the case for full-time work there are strong gender differences. Among males being a low achiever has no significant effect on looking for work in 2003. In contrast among females, being in the lowest quartile increases the odds of looking for work by 1.8 times. The impact of being a low achiever on unemployment among girls could not be explained by socioeconomic background, Year 12 completion or participation in post-secondary

education and training. Adding Year 12 completion only marginally reduced the coefficient for low achievement from 0.57 to 0.48. A smaller decrease was produced by the addition of participation in post-school (non-university) education and training. As was the case for full-time work, the lower level of employment experience has a very strong negative impact on unemployment and accounted for much of the relationship between low achievement and unemployment among young women. The coefficient was no longer significant when controlling for employment experience.

Model	1	2	3	4	5
Males					
Intercept	-2.73***	-2.77***	-2.63***	-2.04***	-2.10**
Lowest Quartile	0.22	0.17	0.13	0.08	-0.08
Socioeconomic Background		-0.27*	-0.27*	-0.27*	-0.16
Year 12 Completed			-0.20	-0.50*	-0.45*
Ever in Apprenticeship				-1.03***	-0.35
Ever in Traineeship				-1.37***	-1.28***
Ever in Diploma Course (TAFE/Uni)				0.15	-0.31
Ever in TAFE Certificate Course				0.12	-0.43*
Percent time Employed from Leaving School until August 2001					-0.38***
Max-rescaled R Square	0.01	0.01	0.02	0.07	0.23
Females					
Intercept	-2.90***	-2.92***	-2.31***	-2.16***	-2.13**
Lowest Quartile	0.59**	0.57**	0.48*	0.44*	-0.24
Socioeconomic Background		-0.11	-0.09	-0.08	-0.07
Year 12 Completed			-0.86***	-0.69**	-0.65**
Ever in Apprenticeship				-0.02	0.11
Ever in Traineeship				-0.30	-0.06***
Ever in Diploma Course (TAFE/Uni)				-0.97**	-1.15***
Ever in TAFE Certificate Course				0.02	-0.24*
Percent time Employed from Leaving School until August 2001					-0.38***
Max-rescaled R Square	0.01	0.02	0.04	0.06	0.23

Note: Logistic regression coefficients. † 0.10>P>0.05 *0.05>P>0.01; ** 0.01>P>0.001; *** P<0.001 Reference Group, not in lowest quartile, average family socioeconomic background, absence of respective qualification, average percentage time in work (70 per cent) and no time spent unemployed. Excludes those participating in Bachelor degree courses in 2000 to 2002.

Table 8
Relationship between Being in Lowest Quartile and Looking For Work in 2002

Summary and Conclusions

The findings for the influences on low achievement are not inconsistent with the literature. Males are more likely to be low achievers in reading but for mathematics there is no significant difference. Socioeconomic background has a moderate effect on being a low achiever; its effect is stronger for mathematics than for reading. Students with language backgrounds other than English are more likely to be low achievers in reading but not for mathematics. Indigenous students are substantially more likely to be low achievers than non-Indigenous students especially in reading. The impact of Indigenous status remains strong even when taking into account socioeconomic background and region. Students from traditional families are less likely to be low achievers. For reading, significant differences for family type remained after controlling for socioeconomic background and other factors but for low achievement in mathematics there were no significant differences for family type.

There are some substantial state and territory differences in low achievement. Victorian students show a greater propensity to be low achievers in reading and mathematics, as do students from the Northern Territory and Tasmania with numeracy. There are regional differences in low achievement with higher levels of low achievement among students from regional and remote regions. However, there were no significant regional differences in low reading achievement when controlling for socioeconomic background and other factors. For numeracy, students living in provincial cities and remote areas were less likely (not more likely) to be low achievers than students living in the mainland capitals once socioeconomic background and Indigenous status were taken into account.

The state differences cannot be attributed to differences between states in student characteristics, so tentatively can be attributed to differences between states in the organisation and provision of education. If the difference can be attributed to administrative factors then a policy response is necessary. Similarly, the small proportion of schools that contribute to a higher proportion of low achievers than expected suggests that in a small minority of schools there is a school culture where low achievement is acceptable.

It is important to note that all these factors could account for only about 15 per cent of the variation in achievement score. This indicates that there is considerably more variation within social groups than between social groups and that there is not a strong relationship between social group and student performance. Importantly, there is no deterministic relationship between socioeconomic background and low achievement.

Low achievement has important consequences for school completion and university entrance. It has much less impact on other forms of post-secondary education and training. Generally, the labour market outcomes of low achievers are poorer than for higher achievers. Among young women, low achievers tend to show lower levels of participation in full-time work and higher proportions looking for work or not in other activities. However, there are much smaller differences among males. The finding that low achievement among males is not as strongly associated with poorer labour market outcomes can be attributed to the labour market that these boys typically enter where practical knowledge and in some cases muscle power are more highly valued than skills in literacy and numeracy. In contrast, the types of jobs that low achieving girls typically enter – sales, personal service and clerical work – require reasonable skills in literacy and numeracy.

For low achievers the important policy focus should be on employment opportunities as soon as they leave full-time education. Once they have gained experience in employment, subsequent labour market outcomes are far healthier. In contrast, the analyses presented here suggest that encouraging low achievers to complete Year 12 or participate in non-university forms of post-secondary education and training will do little to alleviate the poorer labour market outcomes of low achievers.

Endnotes

[1] 'Spurious' refers to a factor having an apparent relationship with low achievement but in reality the relationship is due to another factor. For example, low achievement may be related to immigrant status but the relationship could largely disappear once the researcher takes into account the occupational status, education and income levels of the parents of immigrant students.

[2] Unfortunately, agreements between the Australian Council of Educational Research and Educational Authorities in the states and territories preclude publication of school sector differences in achievement using the PISA 2000 or LSAY data.

[3] The estimate of 8 per cent for low achievers among students with clerical backgrounds is likely to be an underestimate since the proportion of students with fathers in clerical occupations is very small.

[4] The odds ratios are the exponents of the coefficients (log odds).

[5] This procedure belies the complex statistics involved. It is not simply the difference between the school's proportion of low achievers and the overall proportion. The procedure uses both the mean and variation of the students' raw scores within each school.

[6] Further details on the LSAY data can be obtained from the web site http://www.acer.edu.au/research/LSAY/overview.html

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