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Gender differences in educational and labour market outcomes.

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Gender differences in educational and labour market outcomes

Introduction

Despite numerous changes in policy and legislation, issues of gender equity in the Australian education system and labour market remain a concern of the Australian public. Males and females differ in academic performance at various points in their education; there are differences in the numbers of young men and women participating in education and training; men and women experience differential success in the labour market. This *Briefing* focuses on differences between young males and females on a range of educational and labour market outcomes. The educational outcomes include achievement on tests of reading and mathematics, retention in secondary school, performance for tertiary entrance, tertiary qualifications and fields of study. Labour market outcomes discussed here include the pathways followed by young men and women after

compulsory schooling, weekly income reported by those in full-time work, and the types of occupation held by young people seven years after school.

Gender differences in achievement in reading and mathematics

Rothman (2002) examined the performance of five cohorts of Australian students on reading comprehension and mathematics tests. These tests were conducted as part of a number of studies, including the Australian Studies of School Performance (ASSP) and the Youth in Transition (YIT) survey. The results for 14-year-old students are summarised in Table 1.

Reading comprehension

Mean scaled scores on the reading comprehension tests differed by gender for each cohort between 1975 and 1998. During this period, the mean scaled score for male 14-year-old students scores decreased from

LSAY Briefings is a series produced by the Australian Council for Educational Research (ACER), bringing summaries of research findings to a wide audience and highlighting implications for policy and further research.

In particular, *LSAY Briefings* draws on data from ACER's Longitudinal Surveys of Australian Youth (LSAY) project. Key LSAY reports published by ACER upon which this paper is based are listed at the end of the paper.



Longitudinal Surveys of Australian Youth BRIEFING

HIGHLIGHTS

- Males continue to score higher in mathematics, while females score higher in reading.
- Males are more likely to leave school before completing Year 12.
- The distribution of scores for tertiary entrance differs by gender; females score higher on average and the range of scores is wider for males.
- Females are more likely to hold a qualification in areas such as education, social sciences or hospitality; males in engineering, computing or maths and sciences.
- Male graduates tend to be employed in higher status occupations, and earn more, than female graduates.

Table 1. Means and standard errors of scaled scores on reading comprehension and mathematics tests, by gender, 1975–1998

		1975 ASSP		1980 ASSP		1989 YIT		1995 LSAY		1998 LSAY	
		Mean	(s.e.)	Mean	(s.e.)	Mean	(s.e.)	Mean	(s.e.)	Mean	(s.e.)
Reading Comprehension	Males	50.2	(0.48)	50.0	(0.46)	50.1	(0.44)	49.3	(0.33)	49.6	(0.32)
	Females	51.1	(0.39)	51.1	(0.39)	50.9	(0.39)	51.1	(0.26)	51.6	(0.31)
Mathematics	Males	50.7	(0.49)	51.8	(0.48)	49.6	(0.46)	51.4	(0.35)	51.3	(0.32)
	Females	49.6	(0.35)	50.5	(0.46)	48.8	(0.45)	49.9	(0.28)	49.8	(0.34)

Note: Test scores are scaled to have a mean of 50 and a standard error of 10.

50.2 to 49.6, a statistically significant decline, whilst female students' mean scaled scores remained relatively stable during the same period.

Multivariate tests on the performance of the 1975, 1995 and 1998 cohorts on the reading tests indicated that although gender differences in average performance were noted, there was no significant difference between males and females on tests of reading comprehension in the 1975 cohort when other factors, such as family background, are considered. In the 1995 and 1998 cohorts, however, there were significant differences between males and females on the reading comprehension tests, even when other factors are considered.

Mathematics

Mean scores on the mathematics tests fluctuated over the period covered by the cohorts, with the 1989 Youth in Transition cohort having noticeably lower mean scores than the other cohorts. Over the period, the mean for males increased by 0.6 points and the mean for females increased by 0.2 points. In all five cohorts, the difference between males and females was significant.

Multivariate tests of the performance of the 1975, 1995 and 1998 cohorts on the mathematics tests indicated that

significant gender differences in mathematics performance existed even when other factors, such as location and language background, were held constant. The results contrast sharply with results from international studies (TIMSS and PISA), which indicate no significant difference between males' and females' mathematics test scores. This difference may be the result of differences in the assessments used.

Gender differences in early school leaving

McMillan and Marks (2003) examined the process of school leaving and the transition from school to post-school education, training and labour market activities. They focused upon the experiences of the cohort of young people who were in Year 9 in 1995, supplemented by data on previous cohorts of teenagers that make up the LSAY program.

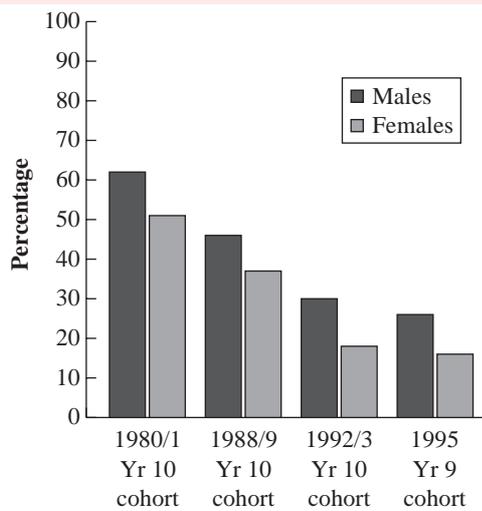
The experiences of the 1995 Year 9 cohort were followed until late 2000, when the majority of cohort members were 19 years of age. The analysis was based upon a comparison of two broad groups: *non-completers* and *completers*. Results from four cohorts of young people who left school between the early 1980s and the late 1990s are presented in Figure 1.

Up to the mid-1970s, boys were more likely than girls to complete senior secondary school.

In the 1970s, this pattern reversed, and boys became more likely than girls to leave before the completion of Year 12. The difference in school leaving between male and female students was around 10 percentage points throughout the 1980s and 1990s. For example, among students who were in Year 10 in the early 1980s, 51 per cent of females left school without completing Year 12, compared to 62 per cent of males, a gap of just over 10 percentage points. By the mid to late 1990s, school non-completion rates for both males (26%) females (16%) had decreased markedly, but the absolute gender gap remained similar (10 percentage points). Multivariate analyses of school leaving in the mid to late 1990s indicated that males were significantly more likely than females to leave school during Year 10, Year 11 and Year 12.

Those who left school in 1997 and 1998 were asked to indicate reasons for leaving school that had played a part in their decision to leave. There were substantial gender differences in the reasons given for leaving school. Males placed more importance on work-related reasons (getting a job/ apprenticeship and earning money). Females were more likely to nominate school-related factors (not liking school) as the main reason.

Figure 1 Rates of non-completion of school in the 1980s and 1990s, by gender



The greater importance placed upon seeking work by males as a reason for leaving school has been noted in other research (Kirby, 2000). McMillan and Marks (2003) concluded that this may reflect the awareness of young people of the different labour market options for male and female non-completers.

Gender differences in subject enrolments and performance for tertiary entrance

Fullarton, Walker, Ainley and Hillman (2003) examined student enrolment in various Key Learning Areas using data from Year 12 students in the LSAY 1995 and 1998 Cohorts. They found that gender differences in subject enrolments remained relatively unchanged between the cohorts. Male students continued to participate at higher rates than females in Advanced Mathematics, Physical Sciences and Technology, while female students were more likely to study Basic Mathematics, Biological Sciences, Languages Other than English, Humanities

and Arts. They also found that overall enrolments in the Science KLA dropped between 1998 and 2001, with this decline larger among female students. Enrolments in Mathematics, in comparison, increased among male students but remained stable among females.

Marks, McMillan and Hillman (2001) examined the tertiary entrance performance of students in Year 12 in 1998, as measured by their Equivalent National Tertiary Entrance Rank (or ENTER) scores. On average, females attained slightly higher tertiary entrance scores than males (+ 2–3 points). Although these gender differences in tertiary performance were significant, they were also small compared to differences by socioeconomic background, school sector and achievement in literacy and numeracy. The distributions of ENTER scores also differed by gender: males were more likely to be found at both the top and the bottom of the distribution (see Figure 2). The 90th percentile for males was at a slightly higher score than that for females; the 75th percentile was much the

same value; and scores at 25th and 10th percentiles were substantially lower for males than females.

Gender differences in qualifications and fields of study

Lamb (2001) examined the pathways from school to further education and work for graduates of diploma and degree courses, using data from the Australian Youth Survey and a sample of Year 10 students selected in the late 1980s.

Overall, the level of qualifications attained by this sample of young graduates was remarkably similar across gender, with 87% of young men and 88% of young women holding a degree, and 13% and 12% of young men and women, respectively, holding an associate diploma.

The field of study in which these qualifications were held,

Figure 2 Box and whisker plot of the distribution of ENTER scores by gender, 1998

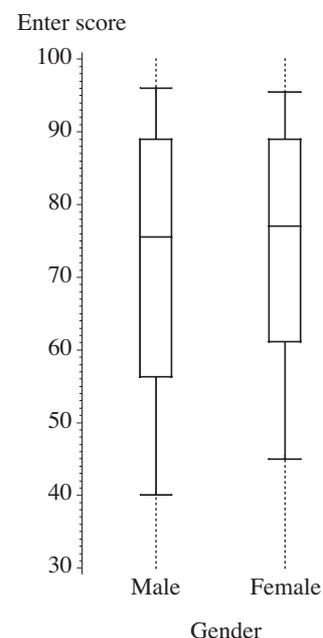
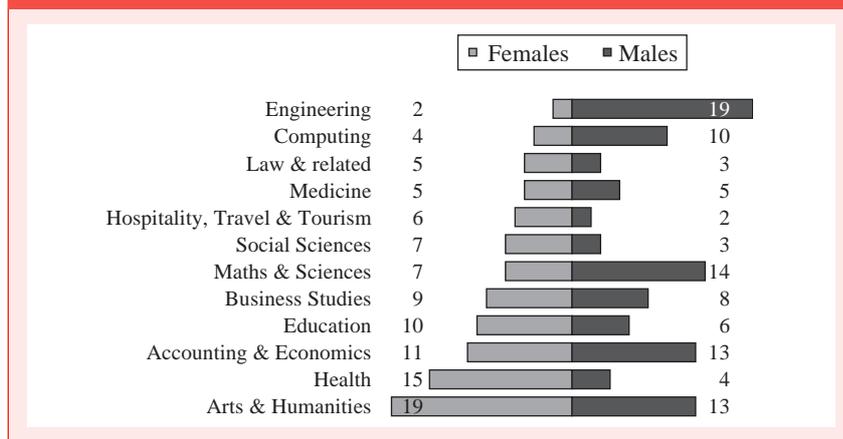


Figure 3 Field of study by gender, mid 1990s



however, varied greatly between male and female graduates. As noted in Figure 3, females were much more likely to hold a qualification in the areas of education, the social sciences or hospitality and males were more commonly qualified in the areas of engineering, computing, and mathematics and sciences.

Gender differences in post-school pathways

Lamb and McKenzie (2001) mapped successful and unsuccessful school-to-work pathways of a sample of young Australians. The data used to examine transition experiences were from the Australian Youth Survey, and the analyses were based on a sample of Year 10 students selected in the late 1980s, who had not gone on to graduate from further diploma or degree courses. The experiences of this sample of young people were measured over their first seven post-school years.

Forty-one per cent of males were in full-time employment in the first year, 20 per cent were in apprenticeships or traineeships, and 18 per cent were in full-time study. The rest were in part-time work (7%), unemployed (11%) or not in the labour force (2%). In

each successive year, as young men finished their study or training, the numbers in full-time study and in apprenticeships and traineeships fell and the proportion in full-time work grew. Thus, for each year, roughly 80 per cent were engaged in full-time study, in apprenticeships or traineeships, or in full-time work. By the seventh post-school year, the majority – 78 per cent – were in full-time work.

The pattern for females was similar, except that the total in full-time work, training or study was about 70 rather than 80 per cent. Furthermore, the proportion in apprenticeships or traineeships was much smaller than for males – about 4 per cent in the first year compared to about 20 per cent for males. Female rates of part-time work were about double the rates for males in each year, and apart from the first year, their rate of unemployment was lower.

A major difference between males and females who had not completed their secondary schooling was the proportion not in the labour force. In the first post-school year, 8 per cent of young women were not in the labour force compared to only 2 per cent of young men. The rate for women increased each year to

17 per cent by the seventh year, with most remaining out of the labour force in order to care for children. The proportion of females not in the labour force in the seventh year was almost six times that for males.

More recent studies of post-school pathways using data from the 1995 Year 9 LSAY cohort have indicated that these gender differences in labour force outcomes are still evident – 3 per cent of males who did not complete secondary school while only 1 per cent of secondary school completers were not in the labour force. For females, the corresponding figures were 14 per cent and 2 per cent for non-completers and completers, respectively (McMillan & Marks, 2003).

Gender differences in income and occupations

Lamb (2001) investigated the pathways from school to further education and work for graduates of diploma and degree courses.

Table 2, based on Lamb's report, presents the average weekly earnings of graduates in full-time work and it shows that earnings varied by pathway. The highest weekly earnings were achieved by male graduates who studied part-time while working. The next highest average weekly pay was obtained by male graduates who went directly from school to study and then into full-time work.

The relationship between pathway and income was different for females – female graduates who studied and then entered the workforce earned \$565 per week on average, while those who had combined work with part-time study earned \$484 per week. Females, it appears, were better off studying

and then working, even if they spent some time finding a job, than combining work with part-time study, while the opposite held true for males. In all pathways, however, females were earning less per week on average than their male counterparts.

The differences in earnings between males and females may be explained in part by differences in the sorts of jobs they obtained. For example, 75 per cent of male graduates (degree and diploma courses)

worked in professional and managerial occupations, compared to 61 per cent of female graduates (Lamb, 2001).

For those who entered study immediately after leaving school and then moved smoothly to full-time work, the majority obtained professional and managerial positions. The rate was higher for males (70 per cent) than for females (55 per cent).

Among females, technical (18 per cent) and clerical (12 per cent) jobs were also important for those who followed

this pathway, while close to 10 per cent of male graduates were employed in these areas.

Nearly one-quarter of males who studied part-time while working were in technical occupations in telecommunications, electronics, engineering and similar fields. A further 12 per cent were in skilled trades and 27 per cent in lower professional and managerial positions. Females who took the same path on leaving school were concentrated in clerical (26 per cent) and sales, service and related (26 per cent) occupations.

Irrespective of the pathway, females were more likely to work in clerical and sales and service occupations than males were. For instance, 22 per cent of females who worked for a period before completing their study and then re-entered the workforce were in sales and service jobs compared to 1 per cent of males (see Table 3).

Table 2. Mean weekly earnings of graduates in full-time work seven years after leaving school, by pathway and gender, mid 1990s

Pathway	Mean weekly earnings		
	Males	Females	Persons
	\$	\$	\$
Study, full-time work	606	565	580
Work, study, work	583	525	543
Work, part-time study	639	484	556
Study, brief interruption then work	558	528	542

Table 3. Types of occupation of graduates and non-graduates seven years after leaving school, by pathway and gender, mid 1990s

Occupation	Graduate pathways			
	School, study and work	Work, study and work	Work, part-time study	Study, short transition to work
	Males			
Upper professional/managerial	5	4	8	7
Lower professional/managerial	70	43	27	44
Technical	9	17	23	11
Skilled trades	1	9	12	5
Clerical	2	13	4	11
Sales and service	7	1	8	16
Plant/machine operators	3	4	8	0
Labourers	4	9	12	4
Females				
Upper professional/managerial	6	4	13	4
Lower professional/managerial	55	30	9	45
Technical	18	26	9	20
Skilled trades	0	2	9	5
Clerical	12	13	26	11
Sales and service	8	22	26	16
Plant/machine operators	0	0	0	0
Labourers	1	2	4	0

Summary

Concern remains in Australian society about differential outcomes of males and females, particularly the poorer performance of males on tests of literacy and their lower rates of completion of Year 12. The results summarised here suggest that although there is a small but statistically significant difference between the average levels of reading comprehension of male and female students, this difference may not extend beyond the school – males on average continue to progress, either through the education system or through the labour force, to better-paid occupations than their female counterparts.

Continued surveys of the LSAY cohorts, in which the early performance differences were most apparent, will reveal whether these early differences have long-reaching effects on the transitions of these young people to further education and the labour force, and whether the gender differences in labour market outcomes such as occupations and incomes that are evidenced in older cohorts continue to be an issue that policy makers in the education and employment fields will need to address. They will also be used to learn more about the groups of young men and women who are most affected by the earlier performance gaps – young men with lower levels of achievement in reading comprehension, and young women in lower-paid occupations.

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The Longitudinal Surveys of Australian Youth

The *Longitudinal Surveys of Australian Youth* (LSAY) is a research program jointly managed by ACER and the Commonwealth Department of Education, Science and Training (DEST).

The program includes more than 20 years of data on young Australians as they move through school and into tertiary education, the labour market and adult life.

LSAY commenced in its present form in 1995 with a national sample of 13 000 Year 9 students. Another sample of Year 9 students was drawn in 1998. Data are collected via mail and telephone interviews.

Advice and guidance is provided by a Steering Committee, with representatives from DEST, other Commonwealth departments, the Australian Education Systems Officials

Committee (AESOC), the Conference of ANTA Chief Executive Officers, non-government schools, academics and ACER.

The data collected through LSAY are deposited with the Social Science Data Archives for access by other analysts.

Further information on the LSAY program is available from ACER's Website: www.acer.edu.au



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