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ABSTRACT

Data from the Longitudinal Surveys of Australian Youth (LSAY) were analyzed to assess the viability of using the LSAY study data for national reporting of outcomes by geographic location and to identify variations in young Australians' education participation and outcomes by geographic region. The analysis revealed several sample distribution problems inherent in the LSAY data. As a result, the use of LSAY data for national reporting of outcomes by geographic location was not recommended. However, when the LSAY data were analyzed with multivariate analysis techniques, they did prove important for determining whether outcomes are affected by geographic location and other characteristics and the characteristics' relative influence. For nonindigenous students, home location had statistically significant effects on the reading comprehension and numeracy scores of year 9 students. However, the effect of home location was much weaker than those associated with other background characteristics. For indigenous students, the influence of home location on attainment was comparable to that of other background characteristics, with the average level of attainment of indigenous students living in remote areas being substantially below that of other indigenous students. The multiple classification analysis results and 12 additional tables are appended. (Contains 15 tables and 16 references.) (MN)

LSAY Longitudinal Surveys of Australian Youth

Research Report Number 26

Education Participation and Outcomes
by Geographic Location

Roger G Jones

June 2002

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Longitudinal Surveys of Australian Youth

Research Report Number 26

EDUCATION PARTICIPATION AND OUTCOMES BY GEOGRAPHIC LOCATION

Roger G Jones
Quantitative Evaluation and Design (QED) Pty Ltd

This report forms part of the Longitudinal Surveys of Australian Youth: a research program that is jointly managed by ACER and the Commonwealth Department of Education, Science and Training (DEST).

The project has been funded by the DEST LSAY Analytic Grants Scheme. The Scheme aims to widen the use of LSAY data amongst researchers and encourage new approaches to using the data to address policy issues.

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Acronyms and Abbreviations

ABS	Australian Bureau of Statistics
ACER	Australian Council for Educational Research
ANOVA	Analysis of variance
ARIA	Accessibility/Remoteness Index of Australia
ASGC	Australian Standard Geographical Classification
CD	Census Collection District
DH&AC	Department of Health and Aged Care
ENTER	Equivalent National Tertiary Entrance Rank
GISCA	National Key Centre for Social Applications of Geographical Information Systems, University of Adelaide
LSAY	Longitudinal Surveys of Australian Youth
MCA	Multiple Classification Analysis
NLI	National Localities Index
NEPMT	National Education Performance Monitoring Taskforce
RRMAC	Rural, Remote and Metropolitan Areas Classification
SD	Statistical Division
SDist	Statistical District
SLA	Statistical Local Area
SSD	Statistical Sub-Division
VET	Vocational Education and Training

Executive Summary

This project has two related aims:

1. to assess the viability of using the Longitudinal Surveys of Australian Youth (LSAY) study data for national reporting of outcomes by geographic location; and
2. to investigate, using LSAY data, the variations in education participation and outcomes by geographical location.

The distributions of the 1995 and 1998 LSAY Year 9 cohort samples by geographic location category are identified and examined (Chapter 2), with particular consideration being given to the sampling of *Remote* areas. The conclusions are:

- Given the size of the LSAY cohort samples, the number of students from *Remote* areas selected in the first wave of each cohort is expected to be around 625. This sample was achieved in the Y95 cohort but not in the Y98 cohort, where the first wave sample includes only 356 students from *Remote* areas.
- Achievement of the expected sample size requires appropriate representation of schools located in *Remote* areas. In order to ensure that this occurs, separation of Government schools in Queensland, South Australia, Western Australia and the Northern Territory into *Remote* and non-remote strata should be implemented in the sample design.
- Sample attrition among students from *Remote* areas is only marginally higher than for students from other areas.
- There are substantial differences between the two cohorts in the regional distributions *within* States and Territories, differences that reflect the effects of sampling variability on the regional distribution of the school samples. Only explicit regional stratification of the schools population, in addition to the State/Territory and school sector strata, would ensure appropriate representation of all geographic location populations.
- In light of these sample distribution problems, the use of LSAY data for national reporting of outcomes by geographical location is not recommended.

LSAY data are, however, important for identifying, using multivariate analysis techniques, whether outcomes are affected by geographic location and other characteristics and the relative strengths of their influence. Chapter 3 examines the association between geographic location and the scores obtained on the reading comprehension and numeracy tests administered to the samples in Year 9. In view of the marked difference in average reading comprehension and numeracy scores between Indigenous and non-Indigenous Year 9 students and the over-representation of Indigenous students in *Remote* areas and in *Remote* area schools, Indigenous and non-Indigenous students are considered separately. These analyses then indicate that:

- for non-Indigenous students, while home location does have statistically significant effects on the reading comprehension and numeracy scores of Year 9 students, its effects (and those for State/Territory of school) are very much weaker than those associated with other background characteristics, and it is difficult to conclude that there is any substantive regional variation in scores or, more particularly, that students from *Remote* areas are disadvantaged; and

- for Indigenous students, the influence of home location on attainment is comparable to that of other background characteristics and, despite the small sample sizes at regional level, the results indicate that, consistent with expectations, the average level of attainment of Indigenous students living in *Remote* areas is substantially below that of other Indigenous students.

Chapter 4 examines regional differences in the proportions of early school leavers, identified here as those students from the 1995 and 1998 Year 9 cohort samples who were contacted two years later in 1997 and 2000 respectively and reported that they had left school. While regional variation appears substantial when examined independently, the regional differences are largely the result of the associations between early school leaving and other characteristics, particularly lower attainments in Year 9 reading comprehension and numeracy (more likely to leave), non-English speaking background at home (less likely to leave), gender (boys more likely to leave than girls) and, for girls only, Indigenous identification (more likely to leave).

After adjusting for these factors, these results show only relatively weak effects of home location on early school leaving, the main difference being that students from the large *Metropolitan* areas appear a little less likely to leave school early than students from *Provincial* and, perhaps, *Remote* areas. Given the variation between the two cohorts in the results for *Remote* areas, the small sample sizes and the small number of schools from which these students are selected, the findings there are somewhat inconclusive.

Chapter 5 examines regional variation in Year 12 completion and entry to university rates, based on information collected from the 1995 cohort surveyed in 1999. As reported previously by Marks *et al* (2000), there is a difference of about 10 percentage points between metropolitan and non-metropolitan students in the proportions participating in Year 12 and entering university, with no significant regional variation over non-metropolitan areas. These findings, however, take no account of the possible influence of other background characteristics.

With the more refined non-metropolitan categories used for this analysis we find, after controlling for other background characteristics of the students, that students from *Remote* and *Outer Provincial* areas appear slightly more likely to complete Year 12 than students from *Provincial City* and *Inner Provincial* regions and no less likely to complete Year 12 than students from *Metropolitan* regions. It should be noted however, that regional effects on Year 12 completion, while statistically significant, are again relatively weak in comparison to the effects of State/Territory of school in Year 9, Year 9 reading comprehension and numeracy scores, school type, and non-English speaking background at home.

The regional variation in university entry rates is again substantial when viewed independently, but after controlling for other characteristics we find that home location has no significant effect on whether students, male or female, enter university. The background factors having the strongest influence are Year 9 reading comprehension and numeracy scores, particularly the latter, non-English speaking background at home and, for females, parental education status, with school type, parental occupation status, State/Territory of school in Year 9 and, for males, parental education status having significant but less important influences. For males, the results do show a somewhat lower rate of university entry for those from *Remote* areas, but the results are not

statistically significant. It is then impossible to conclude from these data, either from the total sample or when limited to students who completed Year 12, that students from *Remote* areas experience any disadvantage in university entry.

The level of participation in other forms of post-secondary education by students who had left school and had not entered higher education has also been examined, and there is again no evidence that home location has an effect on levels of participation.

The general finding of these analyses of LSAY data is that regional effects on the outcomes considered are generally weak in comparison to those of other background characteristics considered, and that regional differences can often be explained by the different characteristics of regional populations. The one possible exception to this is for analyses of the outcomes of Indigenous students, but the samples of Indigenous students in the LSAY cohorts are generally too small to pursue this question.

While the analyses generally show no statistically significant disadvantage associated with living in a *Remote* area, the small sample size and the small number of schools from which *Remote* area students are selected in the LSAY caution against concluding that there is no disadvantage.

EDUCATION PARTICIPATION AND OUTCOMES BY GEOGRAPHIC LOCATION

1. Introduction

The LSAY data used in this project comprise two nationally representative sample cohorts each of over 13,000 Year 9 students selected in 1995 and 1998. The sample cohorts have each been surveyed annually, and the 1995 cohort in particular provides detailed data on a national cohort of students progressing from Year 9 through to the completion of their secondary schooling and entry into the labour force and/or into post-secondary education and training.

In addition to data collection, the LSAY program incorporates a program of analysis and reporting by the Australian Council for Educational Research (ACER), with ACER findings published in the LSAY Research Report series. Many of these reports include investigations of the variations in educational participation and outcomes by region/location, defined on the basis of the student's home postcode in Year 9 grouped into metropolitan (major urban centres with population 100,000 or more), regional (urban centres with population 10,000 to 99,999), and rural or remote (the remainder) categories. The distribution of the sample between these three categories is 55 per cent, 25 per cent and 20 per cent respectively (Marks and Long, 2000).

A summary of the findings from this research dealing with geographic location effects is as follows:

- Year 11 students from rural or remote areas are significantly more likely to participate in workplace learning programs (LSAY Research Report No 10, Fullarton, 1999);
- students living in non-metropolitan areas are more likely to leave school before completing Year 12 (LSAY Research Report No 11, Marks and Fleming, 1999);
- students living in non-metropolitan areas are less likely to participate in Year 12 and are less likely to participate in higher education, although these latter differences are comparatively small (LSAY Research Report No 17, Marks *et al*, 2000);
- among students who leave school before completing Year 12, those living in rural or remote areas are more likely to enrol in post-school Vocational Education and Training (VET) courses, but students from metropolitan areas were more likely to enrol in "complete trade courses" while those from rural or remote areas were more likely to enrol in "initial vocational courses" or "other complete skills courses" and they have a higher rate of non-successful outcomes (LSAY Research Report No 20, Ball and Lamb, 2001); and
- Year 12 students from metropolitan areas had marginally higher Equivalent National Tertiary Entrance Rank (ENTER) scores than students from non-metropolitan areas (LSAY Research Report No 22, Marks *et al*, 2001).

The NEPMT classification of geographic location

In a discussion paper commissioned by the National Education Performance Monitoring Taskforce (NEPMT) to examine the definition of geographic location to be used for the purposes of nationally comparable reporting of outcomes of schooling, Jones (2000) recommended a classification which divides Australia into three zones: the *Metropolitan*, *Provincial* and *Remote* zones, the definition of the *Remote* zone being based on the recently developed Accessibility/Remoteness Index of Australia (ARIA) (DH&AC, 1999). For the main classification, five categories were proposed, with the *Metropolitan* and *Provincial* zones each subdivided into two categories. Further subdivisions of the *Provincial* and *Remote* zone categories provide more detailed classification options.

In the interim, the Australian Bureau of Statistics (ABS) undertook an investigation of the methodology used in developing ARIA with a view to incorporating a classification of remoteness in the Australian Standard Geographical Classification (ASGC). As a result of their investigations, a new version of ARIA was derived and a remoteness classification with 5 classes of remoteness was proposed (ABS, 2001a). In light of the feedback to their information paper, some slight modifications were made to the classification, the remoteness classes for the 2001 ASGC Remoteness Structure being defined on the basis of Census Collection Districts (CD) as (ABS, 2001b):

Major cities of Australia: CDs with an average ARIA index value of 0 to 0.2

Inner Regional Australia: CDs with an average ARIA index value greater than 0.2 and less than or equal to 2.4

Outer Regional Australia: CDs with an average ARIA index value greater than 2.4 and less than or equal to 5.92

Remote Australia: CDs with an average ARIA index value greater than 5.92 and less than or equal to 10.53

Very Remote Australia: CDs with an average ARIA index value greater than 10.53

Migratory: areas composed of off-shore, shipping and migratory CDs

Incorporating these revisions to ARIA and the boundary scores used to define remoteness categories, and recent up-dates to the definition of Statistical Districts (SDist) in the ASGC, the revised definition of geographic location adopted in principle by the NEPMT is shown in Figure 1.

While the definition of *Remote* and *Very Remote* areas is identical to that of the ABS Remoteness Structure, the classification uses the standard regions of the Main Structure of the ASGC (Statistical Divisions (SD) and Statistical Districts which equate to Statistical Sub-Divisions (SSD) associated with large urban centres outside the major cities) to identify areas associated with urban centres of population 25,000 or more. The use of ARIA scores is then limited to areas away from these major and provincial urban centres, categorising the remaining areas as *Other Provincial*, *Remote* or *Very Remote*.

1. Metropolitan Zone

1. Mainland State Capital City regions (Statistical Divisions (SD))
Sydney, Melbourne, Brisbane, Adelaide and Perth SDs

2. Major urban Statistical Districts (100,000 or more pop'n)
ACT-Queanbeyan, Cairns, Gold Coast-Tweed, Geelong, Hobart, Newcastle, Sunshine Coast, Townsville, Wollongong

2. Provincial Zone (non-remote)

3. Provincial City Statistical Districts plus Darwin SD

Provincial City Statistical Districts and Darwin SD (50,000-99,999 pop'n)
Albury-Wodonga, Ballarat, Bathurst-Orange, Burnie-Devonport, Bundaberg, Bendigo, Darwin, Launceston, La Trobe Valley, Mackay, Rockhampton, Toowoomba, Wagga Wagga

Provincial City Statistical Districts (25,000 - 49,999 pop'n)
Bunbury, Coffs Harbour, Dubbo, Geraldton, Gladstone, Shepparton, Hervey Bay, Kalgoorlie-Boulder, Lismore, Mandurah, Mildura, Nowra-Bomaderry, Port Macquarie, Tamworth, Warrnambool

4. Other provincial areas (CD ARIA Plus score $\leq$ 5.92)

Inner provincial areas (CD ARIA Plus score $\leq$ 2.4)

Outer provincial areas (CD ARIA Plus score > 2.4 and $\leq$ 5.92)

3. Remote Zone

5. Remote Zone (CD ARIA Plus score > 5.92)

Remote areas (CD ARIA Plus score > 5.92 and $\leq$ 10.53)

Very Remote areas (CD ARIA Plus score > 10.53)

Figure 1 Recommended Structure of the Classification of Geographic Location, July 2001

In regard to the coding of addresses, this classification has a number of advantages over the ABS Remoteness Structure. In the *Metropolitan* and *Provincial City* regions, addresses need only be matched to their Statistical Division (SD) or Statistical District (SDist or equivalent SSD) rather than to a CD. In many cases, the postcode of an address is sufficient to identify its category.

To identify addresses in the *Other Provincial* areas and *Remote* zone categories, the approach adopted here uses the locality and postcode of the address. The National Key Centre for Social Applications of GIS (GISCA) has provided ARIA scores for some 12,000 localities throughout Australia, and the ABS National Localities Index (NLI) provides a match between locality names and postcodes and Statistical Local Areas (SLA). An investigation of CD ARIA scores by SLA has identified SLAs which are wholly within the *Other Provincial* areas category (all CDs have an ARIA score ≤ 5.92) or wholly within the *Remote* zone (all CDs have an ARIA score > 5.92). Using the NLI, postcodes and localities located wholly within these SLAs can then be assigned to an appropriate category. In the remaining cases, where a locality is within an SLA that overlaps a boundary between *Inner Provincial* areas, *Outer Provincial* areas or the *Remote* zone, GISCA locality scores are used to determine its classification.

The rationale for this project is then to investigate the extent to which implementing this classification of geographic location provides better discrimination and understanding of variations in outcomes such as early school leaving, Year 12 completion, entry to higher education, other post-school education and training, and employment. In particular, the geographic classification used here includes a clear definition of remote areas and thus remote students, a group which has long been considered most disadvantaged but which has rarely been examined separately from the less remote rural population. The findings in relation to this group of students may have implications for the various approaches used by the Commonwealth and States/Territories for targeted funding to rural and remote schools and students, for the equity program in higher education, and for targeting VET and employment initiatives for rural and remote areas. It may also have implications for the sample design of future LSAY cohorts to ensure appropriate representation of the rural and remote populations.

Outline of the Report

In Chapter 2, the distributions of the 1995 and 1998 LSAY Year 9 cohort samples by geographic location category are identified and examined, to assess the viability of using LSAY data for national reporting of outcomes by geographical location, particularly in regard to its ability to provide useful estimates for the relatively small population of students living in *Remote* areas.

The remaining chapters of the report examine the association between geographic location and various educational outcomes. Chapter 3 considers the results of the literacy and numeracy tests administered to the sample in Year 9, Chapter 4 examines the relationship between geographic location and early school leaving previously considered in Research Report No 11, (Marks and Fleming, 1999) and Chapter 5 considers Year 12 completion and participation in higher education (see Research Report No 17, Marks *et al*, 2000).

Throughout these chapters, the associations between educational outcomes and geographic location are presented by comparing means or percentages by geographic location category. Two types of estimates are given, the observed means or percentages, and *adjusted* values which take account of the associations between outcomes and other background characteristics of the students.

The background characteristics used throughout this report are those reported by the students when they were first surveyed in Year 9. They include measures of parental occupation and parental education status, Indigenous identification, whether English is the main language spoken at home, age in Year 9, gender and the school system attended in Year 9. In addition, the students' literacy and numeracy scores from the Year 9 tests are included in the assessment of later outcomes. In the body of the report, we focus on reporting only the effects of geographic location on outcomes.

Adjusted values are calculated using the multiple classification analysis (MCA) option available through the analysis of variance (ANOVA) procedure of the Statistical Package for the Social Sciences (SPSS). This procedure assigns a dichotomous (1,0) dummy variable to each predictor (each category of a background characteristic) and calculates, using ordinary least squares regression, the effect of each predictor on the dependent variable (e.g. literacy or numeracy score), net of other characteristics considered. The effect of each predictor is presented as the adjusted mean value or percentage associated with cases having that characteristic. MCA results for the complete models are presented in the Appendix. A discussion of the use of MCA in this context is given in Long, Carpenter and Hayden (1999).

ANOVA results are not presented but are referred to when assessing the significance of effects due to student characteristics. ANOVA provides a test, the F test statistic, of the statistical significance of the effect of each background characteristic on the outcome of interest, after controlling for the effects of other background characteristics included in the analysis. The value of the F statistic also provides a measure of the strength of an effect relative to that of other characteristics considered, and this is referred to throughout the report. The variance explained by the MCA regression model, (included in the Appendix tables), is an indication of the adequacy of all of the characteristics included in the model in explaining the total variation in the dependent variable.

2. LSAY Samples by Geographic Location

LSAY 1995 and 1998 school samples

The Year 9 cohorts for LSAY are drawn from a sample of schools within each State and Territory, with schools stratified into Government, Catholic and Other Non-government (referred to as Independent) schools and ordered by postcode to ensure appropriate representation of students from each sector and, implicitly, by geographic area. Schools are selected with probability proportional to the number of Year 9 students enrolled, with two Year 9 classes for a subject studied by all Year 9 students (usually English) selected within each selected school. Schools with less than 30 Year 9 students are combined with other small schools to form a pseudo-school with more than 35 Year 9 students. Weights are applied to the sample to adjust for variations within each State and Territory in the probability of selection of students due to variations in class sizes and variations between States and Territories in the probability of selection of schools (Long, 1996; Marks and Long, 2000).

The distribution of schools selected by State and Territory and sector for the 1995 and 1998 Year 9 cohorts is shown in Table 1. Overall the sample design for both cohorts appears to have been similar with the possible exception of South Australia, where the probability of selection for Government schools appears to be somewhat lower in 1998 than in 1995, resulting in a sample of 19 schools from this sector in 1998 compared with 31 schools in 1995 (or 18 pseudo-schools in 1998 compared with 26 in 1995).

Table 1 Number of schools selected by State/Territory and sector, 1995 and 1998 cohorts

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
					1995 cohort				
Government	45	41	38	31	30	11	8	7	211
Catholic	13	11	9	5	4	3	1	4	50
Independent	7	8	9	5	6	2	1	1	39
Total	*65*	*60*	*56*	*41*	*40*	*16*	*10*	*12*	*300*
					1998 cohort				
Government	42	43	39	19	24	10	5	8	190
Catholic	13	15	13	6	7	3	1	3	61
Independent	9	10	10	5	5	2	2	2	45
Total	*64*	*68*	*62*	*30*	*36*	*15*	*8*	*13*	*296*

The distribution of schools by geographic location category and State/Territory for each cohort is given in Table 2. Here again, the sample design for both cohorts gives a similar distribution of schools by geographic location but with some notable exceptions. In particular, the number of schools in *Other Provincial* areas is down from 59 in 1995 to 48 in 1998, and the number of schools in *Remote* areas is almost halved, from 20 in 1995 to only 11 in 1998, with the sample of *Remote* schools reduced from 7 (combined into 2 pseudo schools) to 1 in SA, from 6 to 4 in WA and from 6 to 3 in the NT. The effect of these variations on the distribution of students by geographic location category is considered in the following section.

Table 2 Number of schools selected by State/Territory and school location, 1995 and 1998 cohorts

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
School location					1995 cohort				
Mainland State Capital	37	41	24	23	24	---	---	---	149
Major Urban region	6	2	6	---	---	7	---	12	33
Large Provincial City	4	6	8	---	---	4	4	---	26
Small Provincial City	4	4	2	---	3	---	---	---	13
Other Provincial area	14	7	15	11	7	5	---	---	59
Remote area	0	0	1	7	6	0	6	---	20
Total	*65*	*60*	*56*	*41*	*40*	*16*	*10*	*12*	*300*
					1998 cohort				
Mainland State Capital	32	48	29	20	24	---	---	---	153
Major Urban region	11	2	10	---	---	5	---	13	41
Large Provincial City	2	7	10	---	---	8	5	---	32
Small Provincial City	5	2	1	---	3	---	---	---	11
Other Provincial area	13	9	11	9	5	1	---	---	48
Remote area	1	0	1	1	4	1	3	---	11
Total	*64*	*68*	*62*	*30*	*36*	*15*	*8*	*13*	*296*

Note: Cells shown as "---" do not apply in that State/Territory - eg SA has no major urban or provincial city regions, all of the NT other than the Darwin SD is remote, and the whole of the ACT is part of the major urban region of ACT-Queanbeyan.

LSAY 1995 and 1998 student samples

Table 3 Number of Year 9 students selected by State/Territory and home location, 1995 and 1998 cohorts

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Home location					1995 cohort				
Mainland State Capital	1840	1971	1233	1120	1186	---	---	---	7350
Major Urban region	314	80	325	---	---	287	---	558	1564
Large Provincial City	183	206	277	---	---	172	202	---	1040
Small Provincial City	146	173	93	---	113	---	---	---	525
Other Provincial area	621	440	529	486	308	116	---	---	2500
Remote area	6	9	64	109	225	7	201	---	621
Total	*3110*	*2879*	*2521*	*1715*	*1832*	*582*	*403*	*558*	*13600*
					1998 cohort				
Mainland State Capital	1840	2165	1610	916	1227	---	---	---	7758
Major Urban region	601	63	481	---	---	256	---	519	1920
Large Provincial City	75	220	393	---	---	326	313	---	1327
Small Provincial City	237	71	32	---	182	---	---	---	522
Other Provincial area	661	427	517	306	200	108	---	---	2219
Remote area	23	0	56	27	78	24	148	---	356
Total	*3437*	*2946*	*3089*	*1249*	*1687*	*714*	*461*	*519*	*14102*

Note: Cells shown as "---" do not apply in that State/Territory. Excludes 13 overseas students in 1995 and 16 overseas students in 1998.

The distribution of Year 9 students in the two sample cohorts is given in Table 3. The lower number of *Remote* schools in the 1998 sample results in a corresponding reduction in the number of students from *Remote* areas. The number selected is down from 109 to 27 in SA, from 225 to 78 in WA and from 201 to 148 in the NT, resulting in a reduction from 621 to 356 nationally in the total sample of students from *Remote* areas.

These findings indicate a relatively strong association between schools and students in *Remote* areas. Indeed, as Table 4 shows, four-in-five (81 per cent) of the students living in *Remote* areas attend a school located in a *Remote* area. However, Queensland is an exception to this, with just 41 (34 per cent) of the 120 students from *Remote* areas selected in the two cohorts attending a *Remote* school, the remainder attending schools in *Other Provincial* areas (41 students), large *Provincial City* regions (20 students) and *Metropolitan* areas (18 students). In SA, WA and the NT, almost all of the students from homes in a *Remote* area attend school in a *Remote* area.

Table 4 School location of Year 9 students by home location (per cent), 1995 and 1998 cohorts

	Home location						
School location	Mainland State Capital	Major Urban region	Large Provincial City	Small Provincial City	Other Provincial area	Remote area	Total
	1995 cohort						
Mainland State Capital	99.5	0.7	0.3	1.3	5.5	4.3	55.1
Major Urban region	0.0	96.7	0.0	0.0	2.2	0.5	11.6
Large Provincial City	0.0	0.0	98.5	8.6	4.2	2.4	8.7
Small Provincial City	0.0	0.0	0.0	89.9	4.0	0.0	4.2
Other Provincial area	0.5	2.6	1.3	0.2	84.1	11.8	16.7
Remote area	0.0	0.1	0.0	0.0	0.0	81.0	3.7
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
	1998 cohort						
Mainland State Capital	99.4	0.7	0.1	1.3	4.2	8.1	55.7
Major Urban region	0.0	98.8	0.1	0.0	2.3	2.0	13.9
Large Provincial City	0.0	0.1	99.5	0.2	6.8	3.4	10.5
Small Provincial City	0.0	0.1	0.0	96.2	3.7	0.3	4.2
Other Regional area	0.5	0.4	0.3	1.7	82.9	5.1	13.6
Remote area	0.0	0.0	0.0	0.6	0.1	81.2	2.1
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

The number of students from *Remote* areas selected in the LSAY samples will then be determined primarily by the number of schools located in *Remote* areas selected in the sample. If LSAY data are to be used to investigate the outcomes of students from *Remote* areas and, in particular, to meet national reporting requirements, greater control over the sampling of *Remote* schools, in the form of stratification, is required to ensure appropriate representation and distribution of students from *Remote* areas.

Table 5 Suggested distribution of schools in *Remote* areas for LSAY samples

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
	Percent of sample/population living in *Remote* areas								
1995	0.19	0.31	2.54	6.36	12.28	1.20	49.88	0.00	4.57
1998	0.67	0.00	1.81	2.16	4.62	3.36	32.10	0.00	2.52
1996 Census	0.81	0.14	4.69	4.18	9.16	2.5	48.69	0.00	3.02
	Selected and expected sample living in *Remote* areas								
1995	6	9	64	109	225	7	201	---	621
1998	23	0	56	27	78	24	148	---	356
Expected (1998)	28	4	145	52	155	18	224	---	626
	Selected and expected sample of schools in *Remote* areas								
1995	0	0	1	7	6	0	6	---	20
1998	1	0	1	1	4	1	3	---	11
Expected (1998)	1	0	3	3	6	1	6	---	20

Note: The Expected (1998) sample of students is derived by multiplying the 1996 Census percentage of the population living in *Remote* areas by the number of students selected in the 1998 sample. The Expected (1998) sample of schools in *Remote* areas is then derived on the basis of average numbers of Year 9 students obtained from *Remote* schools in each State/NT, after accounting for *Remote* students attending schools in non-remote areas.

Based on the percentage of the total State/Territory population identified as living in *Remote* areas in the 1996 Census (ABS, 2001b, Table 5) and the association between schools in *Remote* areas and students from *Remote* locations, Table 5 provides an estimate of the number of *Remote* area schools that should be targeted for selection in the LSAY sample. In NSW, Victoria and Tasmania, no change to the current sampling approach is required. In Queensland, SA, WA and the NT however, it would seem appropriate to impose additional stratification into *Remote* and non-remote strata on Government schools only to ensure adequate representation of the *Remote* population. Notably, the 1995 sample appears relatively similar to the expected sample requirement, although *Remote* schools in Queensland appear under-represented, but the 1998 sample is somewhat less satisfactory in its representation of students and schools from *Remote* areas.

LSAY 1995 sample attrition

One further concern is the extent to which sample attrition affects the *Remote* sample and, in particular, whether it is significantly higher for students from *Remote* areas than from other areas. As the results in Table 6 show, this is not the case. While attrition among the students from *Remote* areas is higher than that in other home location categories, it is only very marginally so.

Table 6 Sample attrition by home location, 1995 cohort

	1995	1997	1998	1999	1997	1998	1999
Home location	Number of respondents				Percent of 1995 sample		
Mainland State Capital	7350	5472	5176	4699	74.4	70.4	63.9
Major Urban region	1564	1161	1103	986	74.2	70.5	63.0
Large Provincial City	1040	779	734	657	74.9	70.6	63.2
Small Provincial City	525	397	370	323	75.6	70.5	61.5
Other Provincial area	2500	2049	1930	1741	82.0	77.2	69.6
Remote area	621	449	425	377	72.3	68.4	60.7
Total	*13600*	*10307*	*9738*	*8783*	*75.8*	*71.6*	*64.6*

The smaller initial sample of 356 students from *Remote* areas obtained in the 1998 cohort does however impose limitations on the use of that data for national reporting of outcomes by geographic location. On the assumption that the attrition rate is similar to that of the 1995 cohort, the sample of students from *Remote* areas will be reduced to less than 200 students in 2002 when the majority will have completed Year 12 and be seeking entry into the workforce or tertiary education. This will then be a relatively small sample on which to base detailed investigations of their outcomes.

Weighted samples and geographic location

The weighting procedures for the LSAY Year 9 cohort samples are described in Marks and Long (2000) as follows:

> "In order for the sample to more accurately represent the population of Australian Year 9 students, the sample needs to be weighted so that sample sizes within strata are proportionate to the population sizes of the strata. In the first year of the survey the weighting compensates for the joint effects of differences in sampling fractions among the strata and differences in response rates among the strata. In subsequent years it also compensates for differences in attrition among the strata."

The distributions of the weighted 1995 and 1998 samples by home location category and State/Territory are shown in Table 7. The distribution of total numbers by State and Territory of school location reflect the distribution of Year 9 students identified in *Schools, Australia* (ABS) for the corresponding years, proportionately adjusted to the LSAY sample size, and the distribution by State and Territory of home location parallels this. As indicated by the average weights, the weighting adjusts for the relatively lower rates of sampling of schools in NSW and Victoria and the relatively higher rates applied in the remaining states, particularly Tasmania and the two territories.

Table 7 Weighted sample of Year 9 students selected by State/Territory and home location, 1995 and 1998 cohorts

Home location	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
					1995 cohort				
Mainland State Capital	2652	2289	1174	658	902	---	---	---	7676
Major Urban region	461	93	302	---	---	165	---	251	1273
Large Provincial City	267	246	286	---	---	98	39	---	935
Small Provincial City	220	192	88	---	82	---	---	---	582
Other Provincial area	934	496	529	317	243	125	---	---	2645
Remote area	9	9	113	56	208	11	79	---	485
Total	*4543*	*3325*	*2493*	*1032*	*1435*	*399*	*118*	*251*	*13596*
Average weight	*1.46*	*1.15*	*0.99*	*0.60*	*0.78*	*0.69*	*0.29*	*0.45*	*1.00*
					1998 cohort				
Mainland State Capital	2327	2329	1302	736	1057	---	---	---	7750
Major Urban region	888	80	475	---	---	131	---	252	1826
Large Provincial City	96	271	368	---	---	180	76	---	991
Small Provincial City	329	97	49	---	123	---	---	---	598
Other Provincial area	979	528	568	296	214	58	---	---	2643
Remote area	43	0	51	43	93	17	45	---	293
Total	*4662*	*3305*	*2814*	*1075*	*1487*	*387*	*121*	*252*	*14103*
Average weight	*1.36*	*1.12*	*0.91*	*0.86*	*0.88*	*0.54*	*0.26*	*0.49*	*1.00*

Note: Cells shown as "---" do not apply in that State/Territory. Excludes 13 overseas students in 1995 and 16 overseas students in 1998.

The weighting does not however take explicit account of the regional distribution of the population, although some control over this distribution is imposed by the postcode ordering of schools within the State/Territory and school sector strata. At the national level, the distributions of the two cohorts across regions are quite similar, although the proportion of the population in the *Major Urban* regions increases from 9.4 to 12.9 per cent and that of the *Remote* areas declines from 3.6 to 2.1 in the 1995 and 1998 samples respectively. There are however more substantial differences between the two cohorts in the regional distributions *within* States and Territories, differences which reflect the effects of sampling variability on the regional distribution of the samples and not changes between the cohorts in the regional distribution of the population.

What implications does this variability then have on the use of the LSAY data for national reporting of outcomes by geographic location? Firstly, it implies that the data cannot usefully be used to estimate regional population numbers or regional population distributions. To illustrate this with a relatively extreme example, the 1995 cohort shows 33 per cent of the NT Year 9 population living in Darwin, while the 1998 cohort has 63 per cent. Similarly, though less extreme, *Remote* area students represent 14.5 per cent of the Year 9 cohort of WA students in 1995 but only 6.3 per cent of the 1998 cohort. Even in the larger NSW samples, there is considerable variation in the regional distribution between the two Year 9 cohorts. Secondly, and flowing on from this, there is potential

for bias in the estimation of characteristics that are influenced by regional effects. For example, simple comparisons between States or between different cohorts of characteristics such as Year 12 participation that are derived as proportions from the weighted samples may show apparent, but spurious, differences, due to differences in the regional distributions of the samples, given that there are significant regional differences in participation.

These variations between the 1995 and 1998 cohorts are primarily the result of the differences in the regional distributions of the schools selected (Table 2). Less variation could be achieved by ordering schools on the ACER sampling frame into regional categories within strata rather than postcode order, although even then there would undoubtedly be regional categories where no schools were selected or all school sectors were not represented. Only explicit regional stratification of the schools population, in addition to the State/Territory and school sector strata, would ensure appropriate representation of all State/Territory geographic location populations. It would be a relatively simple task to code school locations to their appropriate geographic category and derive the appropriate population distributions from the National Schools Statistics Collection, a necessary first step in any program of national reporting on schools by geographic location.

There are thus some difficulties in using the LSAY cohort samples to derive population estimates of outcomes by geographic location, at least generally. In regions where the number of schools selected is relatively large, such as the State capital cities and the ACT, the sample is very likely to be representative of the population and give population estimates with adequate precision and consistency. In other geographic location categories however, there is substantial sampling variability in the number of schools selected and their distribution over school sectors, with consequent effects on the sample characteristics of the sample and the outcomes of interest. The effect of this sampling variation on comparisons between cohorts is difficult to assess.

3. Year 9 Reading Comprehension and Numeracy by Geographic Location

Similar, though not identical, reading comprehension and numeracy tests were administered to all Year 9 students selected in the 1995 and 1998 LSAY samples. Copies of the tests are included in the *1995 LSAY Wave 1 codebook* (ACER, 1997) and the *1998 LSAY Wave 1 codebook* (Fleming, 2000). Each test comprises 20 multiple choice items, the number of items answered correctly being the student's literacy or numeracy score on a scale from 0 to 20. For most of the analyses of LSAY data undertaken by ACER, the two scores have been combined to form a single measure of early school achievement.

Here, the two scales are considered separately to assess the relationships between students' literacy and numeracy scores and their background, particular geographical background and more specifically, remoteness. In addition, the 1995 Year 9 cohort sample from the *Other Provincial* areas category of geographic location is divided into *Inner* and *Outer Provincial* areas, based on ARIA scores of 2.4 or less and between 2.4 and 5.92 respectively (see Figure 1), in order to assess if any effects associated with *Remote* areas are also evident in the contiguous *Outer Provincial* areas in particular. The analyses are based on weighted sample data.

Reading comprehension and numeracy scores by home location category, 1995 and 1998 Year 9 cohorts

Table 8 shows the difference of the average test scores of students living in each geographic location category from the overall average test score for both the 1995 and the 1998 cohort samples. Unadjusted differences are simply differences in the observed means, while adjusted differences take account of other background characteristics which could explain regional variations in scores (see Appendix Tables A1 and A2). For example, Marks and Ainley (1997) identify differences associated with higher socio-economic status and indigenous students in the 1995 Year 9 cohort, factors which, among others, clearly vary by region.

The one consistent feature of these results is of lower average test scores in both reading comprehension and numeracy for students from *Remote* areas, *before* other differences in the characteristics of students between regional categories are taken into account. However, the differences are not substantial. The average reading comprehension scores of students from *Remote* areas are only about half a point below average in both samples, while numeracy scores are almost one point lower in the 1995 cohort and 0.7 points lower in the 1998 cohort.

For reading comprehension, the regional differences are barely significant when other characteristics are taken into account. Although average scores for students from *Remote* areas remain lower than elsewhere, they are similar to the scores for *Mainland Capital City* students and only slightly below, at most about 0.4 of a point, the scores of students elsewhere. There is also some inconsistency between the regional results for the two cohorts. In the 1995 cohort, higher average scores are obtained by students from *Small Provincial City* and *Other Provincial* regions, whereas students from *Major Urban* and *Large Provincial City* regions score higher in the 1998 cohort.

Table 8 Differences in reading comprehension and numeracy scores by home location, 1995 and 1998 Year 9 cohorts

	Reading comprehension test			Numeracy test		
	1995 Year 9 cohort					
		Difference from Total score			Difference from Total score	
Home location	Cases	Unadjusted	Adjusted	Cases	Unadjusted	Adjusted
Mainland State Capital	7575	0.00	-0.09	7539	+0.09	-0.09
Major Urban region	1262	-0.10	+0.07	1266	+0.03	+0.40
Large Provincial City	933	-0.10	-0.03	927	-0.46	-0.13
Small Provincial City	568	+0.30	+0.15	560	+0.20	+0.16
Other Provincial-inner	1216	+0.24	+0.19	1214	+0.05	+0.06
Other Provincial-outer	1397	+0.01	+0.21	1401	-0.02	+0.30
Remote area	474	-0.54	-0.17	481	-0.95	-0.66
Total score	*13426*	*13.15*	*13.15*	*13387*	*12.28*	*12.28*
	1998 Year 9 cohort					
		Difference from Total score			Difference from Total score	
Home location	Cases	Unadjusted	Adjusted	Cases	Unadjusted	Adjusted
Mainland State Capital	7506	-0.08	-0.15	7526	-0.12	-0.23
Major Urban region	1785	+0.47	+0.29	1787	+0.74	+0.63
Large Provincial City	968	+0.33	+0.28	968	+0.23	+0.23
Small Provincial City	552	-0.34	-0.04	590	+0.03	+0.41
Other Provincial area	2565	-0.09	+0.15	2592	-0.19	+0.08
Remote area	289	-0.53	-0.17	286	-0.69	-0.30
Total score	*13665*	*12.49*	*12.49*	*13749*	*11.97*	*11.97*

Note: See Appendix Tables A1 and A2 for details of the effects of other background characteristics of students.

The differences on numeracy test scores are more substantial and more consistent. Students from *Major Urban* and *Small Provincial City* regions perform relatively well and students from *Remote* areas relatively poorly in both cohorts. These differences, of about one point and 0.7 points respectively net of the effects of other background characteristics, are not as large as the 2 point difference found between students in the highest and lowest socio-economic status (SES) levels but are nevertheless comparable with the differences in average numeracy scores between males and females, 0.7 in 1995 and 0.45 in 1998 (see Appendix Tables A1 and A2).

In summary, the results from the LSAY reading comprehension and numeracy tests indicate some regional variation, with slightly lower average scores for students from *Remote* areas on the reading comprehension test but more substantial differences on the numeracy test. On average, students from *Major Urban*, *Provincial City* and *Other Provincial* regions achieve better scores than students living in the five *Mainland Capital City* regions or in *Remote* areas.

There are however very marked differences in reading comprehension and numeracy scores between Indigenous and non-Indigenous Year 9 students. In particular, the average scores for Indigenous students are respectively 2.5 and 2.3 points lower in the 1995 cohort and 3.1 and 2.4 points lower in the 1998 cohort. Indigenous students are also over-represented in *Remote* areas and in *Remote* area schools, comprising 12.8 per cent and 13.8 per cent respectively of the 1995 cohort sample in these categories. The results of separate analyses of non-Indigenous and Indigenous students are therefore examined in Table 9 and Table 10 respectively (see also Appendix Tables A3 to A6).

Table 9 Differences in reading comprehension and numeracy scores by home location, non-Indigenous students, 1995 and 1998 Year 9 cohorts

	Reading comprehension test			Numeracy test		
	1995 Year 9 cohort					
		Difference from Total score			Difference from Total score	
Home location	Sample	Unadjusted	Adjusted	Sample	Unadjusted	Adjusted
Mainland State Capital	7459	-0.03	-0.09	7423	+0.06	-0.09
Major Urban region	1216	-0.08	+0.06	1219	+0.03	+0.38
Large Provincial City	901	-0.05	+0.06	894	-0.45	-0.14
Small Provincial City	547	+0.27	+0.10	538	+0.24	+0.18
Other Provincial-inner	1187	+0.22	+0.19	1183	+0.06	+0.09
Other Provincial-outer	1333	+0.05	+0.21	1336	+0.02	+0.30
Remote area	416	-0.18	-0.02	424	-0.69	-0.57
Total score	*13060*	*13.21*	*13.21*	*13017*	*12.35*	*12.35*
	1998 Year 9 cohort					
		Difference from Total score			Difference from Total score	
Home location	Sample	Unadjusted	Adjusted	Sample	Unadjusted	Adjusted
Mainland State Capital	7340	-0.12	-0.16	7356	-0.15	-0.24
Major Urban region	1739	+0.46	+0.31	1742	+0.75	+0.66
Large Provincial City	930	+0.32	+0.27	930	+0.21	+0.22
Small Provincial City	512	-0.25	-0.06	545	+0.10	+0.10
Other Provincial area	2462	-0.05	+0.18	2488	-0.16	+0.10
Remote area	254	-0.03	+0.08	251	-0.29	-0.10
Total score	*13239*	*12.59*	*12.59*	*13313*	*12.05*	*12.05*

Note: See Appendix Tables A3 and A4 for details of the effects of other background characteristics of students.

The exclusion of Indigenous students from the sample increases significantly the mean reading comprehension and numeracy scores of students from *Remote* areas, with very small effects on other location categories. There is then rather less regional variation for non-Indigenous students, the only notable effect being the relatively low average numeracy score for students from *Remote* areas in the 1995 cohort sample. While statistically significant, the contributions of home location and State/Territory of school to the variation in reading comprehension and numeracy scores are very weak[1] in comparison to the other background characteristics considered. Given these patterns, it is difficult to conclude that there is any substantive regional variation in average literacy and numeracy scores for non-Indigenous students or, more particularly, that students from *Remote* areas are disadvantaged.

For Indigenous students, those living in *Remote* areas have the lowest reading comprehension and numeracy scores in both cohorts, about 1.2 points below the national average in the 1995 cohort and almost 2 points below average in the 1998 cohort, although adjustment for other characteristics generally reduces slightly the effects of *Remote* location. Despite the small sample sizes at regional level, the results indicate that, consistent with expectations, the average level of attainment of Indigenous students living in *Remote* areas is substantially below that of other Indigenous students.

[1] The strength of the effect is assessed from the ANOVA table by the size of the F test statistic, which indicates the average contribution of each category of the variable to the explained variance.

Table 10 Differences in reading comprehension and numeracy scores by home location, Indigenous students, 1995 and 1998 Year 9 cohorts

	Reading comprehension test			Numeracy test		
	1995 Year 9 cohort					
		Difference from Total score			Difference from Total score	
Home location	Sample	Unadjusted	Adjusted	Sample	Unadjusted	Adjusted
Mainland State Capital	115	+0.12	+0.37	116	+0.44	+0.32
Major Urban region	46	+0.12	+0.18	46	+0.69	+0.92
Large Provincial City	33	-0.87	-0.63	33	-0.21	+0.13
Small Provincial City	21	+1.74	+1.63	22	-0.11	-0.03
Other Provincial-inner	29	+0.83	+0.46	30	-0.46	-0.75
Other Provincial-outer	64	+0.27	+0.20	65	+0.11	+0.19
Remote area	58	-1.19	-1.57	57	-1.19	-1.30
Total score	*366*	*10.74*	*10.74*	*369*	*10.07*	*10.07*
	1998 Year 9 cohort					
		Difference from Total score			Difference from Total score	
Home location	Sample	Unadjusted	Adjusted	Sample	Unadjusted	Adjusted
Mainland State Capital	166	+0.34	+0.46	171	+0.24	+0.19
Major Urban region	46	+0.11	-0.38	45	+0.01	-0.14
Large Provincial City	38	+1.28	+0.63	38	+1.24	+0.59
Small Provincial City	40	+0.22	+0.42	45	+0.58	+0.88
Other Provincial area	102	-0.50	-0.38	103	-0.49	-0.38
Remote area	35	-1.94	-1.73	35	-1.82	-1.41
Total score	*426*	*9.53*	*9.53*	*436*	*9.68*	*9.68*

Note: See Appendix Tables A5 and A6 for details of the effects of other background characteristics of students.

4. Early School Leavers by Geographic Location

Early school leavers are identified here as those students from the 1995 and 1998 Year 9 cohort samples who were contacted two years later in 1997 and 2000 respectively and reported that they had left school. Sample losses over the two year period reduced the number of cases contacted from 13,613 to 10,307 (76 per cent) of the 1995 cohort and from 14,118 to 9,547 (67.6 per cent) of the 1998 cohort. Of those contacted, 1,431 (13.9 per cent) and 1,184 (12.4 per cent) reported having left school in 1997 and 2000 respectively.

It should be noted that this definition of early school leavers differs from that used by Marks and Fleming (1999) in their analysis of early school leavers from the 1995 cohort. They limited early school leavers to a somewhat smaller sample of students who had left school before the beginning of Year 11 – 855 of the 1,431 cases considered here.

Early school leavers by home location category, 1995 and 1998 Year 9 cohorts

Table 11 reports the regional differences in the percentage of early school leavers from the 1995 and 1998 cohort samples, both for the total sample and for males and females separately. The results show unadjusted differences in the proportions of early school leavers, and adjusted differences after controlling for the effects of Year 9 attainment in reading comprehension and numeracy and other background characteristics (see Appendix Tables A7 and A8).

While regional variation has some influence on the percentage of early school leavers, its effects, along with those of some other background characteristics, are relatively weak. In both cohorts, the background factors having a strong influence on early school leaving are lower attainments in Year 9 reading comprehension and numeracy (more likely to leave), non-English speaking background at home (less likely to leave), gender (males more likely to leave than females) and, for females only, indigenous identification (more likely to leave). Other characteristics, including school type, parental occupation status and parental education status have relatively weak effects or, in some cases, no significant effect on the likelihood of students leaving school early.

For the 1995 Year 9 cohort, regional variation appears substantial when examined independently, with early school leavers accounting for around 24 per cent of the males and 16 per cent of the females from *Provincial* and *Remote* areas compared with 14 per cent and 9 per cent respectively of those from the *Mainland State Capital City* regions. These differences are however largely the result of the associations between early school leaving and other characteristics, particularly those with a strong influence identified above. After adjusting for these factors, the difference between the proportion of early school leavers in the *Mainland State Capital Cities* and the non-metropolitan areas is reduced to just 4 percentage points for males and just 3 percentage points for females. Regional variation is then no longer statistically significant for females, and only weakly significant for males.

Table 11 Early school leavers (per cent) by home location and gender, 1995 and 1998 Year 9 cohorts

	1995 cohort in 1997			1998 cohort in 2000		
		Difference from Total (%)			Difference from Total (%)	
Home location	Cases	Unadjusted	Adjusted	Cases	Unadjusted	Adjusted
			Total			
Mainland State Capital	5565	-3	-1	5061	-2	-1
Major Urban region	934	0	-2	1203	-1	0
Large Provincial City	696	+5	+3	652	+1	+3
Small Provincial City	411	+4	+4	379	+7	+3
Other Provincial area				1731	+3	+1
-- inner provincial	971	+5	+3			
-- outer provincial	1120	+6	+2			
Remote area	353	+4	0	192	+11	+8
Total (%)	*10049*	*15*	*15*	*9217*	*14*	*14*
			Males			
Mainland State Capital	2769	-4	-1	2516	-2	-1
Major Urban region	401	0	-3	578	-4	-3
Large Provincial City	333	+7	+4	306	-1	+1
Small Provincial City	203	+3	+3	172	+5	+2
Other Provincial area				851	+5	+2
-- inner provincial	478	+7	+5			
-- outer provincial	527	+7	+2			
Remote area	190	+4	0	90	+19	+14
Total (%)	*4901*	*18*	*18*	*4513*	*17*	*17*
			Females			
Mainland State Capital	2796	-3	-1	2544	-3	-2
Major Urban region	533	0	-2	624	+2	+3
Large Provincial City	363	+4	+2	345	+3	+4
Small Provincial City	208	+5	+5	207	+9	+5
Other Provincial area				881	+2	0
-- inner provincial	493	+2	+2			
-- outer provincial	593	+4	+1			
Remote area	163	+4	-1	103	+5	+3
Total (%)	*5148*	*12*	*12*	*4704*	*11*	*11*

Note: Home location has no significant effect, net of other characteristics, for females in the 1995 cohort.

These 1995 cohort results are in general agreement with the main findings of Marks and Fleming (1999) that after controlling for other factors, regional effects remain but only for males. However, their finding that early school leaving for males increased from regional to rural and remote areas is not replicated here, the comparison between *Provincial City* regions and the combination of *Other Provincial* and *Remote* areas showing similar rates while students from *Remote* areas appear a little less likely to leave school early than students from other non-metropolitan areas.

Similar patterns of regional variation are evident in the 1998 Year 9 cohort, except that the unadjusted rate of early school leaving among males from *Remote* areas is much higher at 36 per cent, based on a smaller (weighted) sample of just 90 students. Regional effects remain statistically significant, though relatively weak, for both males and females, net of the effects of other characteristics. For males, the difference between students from *Metropolitan* and *Provincial* areas is slightly below that of the 1995 cohort, the rates of early school leaving among students from *Provincial* areas falling by about 3 percentage points, from 22 per cent to 19 per cent. For females, the difference between the *Mainland State Capital City* students and those from elsewhere is greater than in 1995.

In summary, these results show only relatively weak effects of home location on early school leaving, the main difference being that students from the large *Metropolitan* areas appear less likely to leave school early than students from *Provincial* and, perhaps, *Remote* areas. Given the variation between the two cohorts for *Remote* areas, the small sample sizes and the small number of schools from which these students are selected, the findings there are somewhat inconclusive.

5. Year 12 Completion and Entry to Higher Education by Geographic Location

Year 12 completers are identified here as those students from the 1995 Year 9 cohort sample who were contacted four years later in 1999 and reported that they had left school from Year 12 or Year 13 in 1998/1999. Sample losses over the four year period reduced the number of cases contacted from 13,613 to 8,783 (65 per cent) of the 1995 Year 9 sample. Of those contacted, 6,746 (77 per cent) are defined here as Year 12 completers, although 171 (2.5 per cent) indicated that they had not been awarded a Year 12 certificate and a further 27 did not know. With the public use data files available for this project, it was not possible to exclude these non-completers from the definition of completers. Students entering university are identified as those who reported in 1999 that they were enrolled in a university degree course. Of those contacted, 2974 (34 per cent) identified as university entrants. Comparable data from the 1998 cohort will not be available until 2003. The analyses are again based on weighted sample data.

Marks *et al* (2000) report analyses of the patterns of participation in Year 12 (based on 1998 data) and in higher education (based on 1999 data) of the 1995 Year 9 cohort and, in particular, examine the relationship between various alternative measures of rurality and participation in education. They conclude from their analysis that (Chapter 5, p23):

- no matter what urban/rural measure is used, there is about a 10 percentage point difference in participation (in either Year 12 or higher education) between the most urban and most rural groups;
- there is no evidence that young people attending school in the most remote areas are substantially less likely to participate in Year 12 and higher education compared to young people in slightly less remote areas; and
- the major difference is between the 55 per cent of students living in metropolitan areas and the rest who live in non-metropolitan areas.

These findings did not however take account of the effects of other background characteristics on regional differences.

Year 12 completion by home location, 1995 Year 9 cohort

Table 12 reports the regional differences in the percentage of Year 12 completers from the 1995 cohort samples, both for the total sample and for males and females separately. The results show unadjusted differences in the proportions of early school leavers, and adjusted differences after controlling for the effects of Year 9 attainment in reading comprehension and numeracy and other background characteristics (see Appendix Table A9).

Looking first at the unadjusted regional differences, the higher completion rate of students from the *Mainland State Capital City* regions compared with other regions is clearly evident. For the total sample, the gap in completion rates ranges from 6 per cent for students from *Major Urban* and *Small Provincial City* regions to 10 per cent for those from *Other Provincial* areas, 12 per cent for *Large Provincial City* regions and 16 per cent for *Remote* area students. These regional differences are generally larger for males than for females, increasing to 8, 14 and 16 per cent respectively for male students from *Major Urban*, *Other Provincial* and *Large Provincial City* regions.

Table 12 Year 12 completers (per cent) by home location and gender, 1995 Year 9 cohort

	1995 cohort in 1999		
		Difference from Total (%)	
Home location	Cases	Unadjusted	Adjusted
		Total	
Mainland State Capital	4850	+4	+2
Major Urban region	832	-2	0
Large Provincial City	615	-8	-5
Small Provincial City	344	-2	-4
Other Provincial-inner	813	-6	-4
Other Provincial-outer	873	-5	-1
Remote area	279	-12	0
Total (%)	*8606*	*76*	*76*
		Males	
Mainland State Capital	2429	+5	+2
Major Urban region	371	-3	0
Large Provincial City	286	-11	-6
Small Provincial City	167	+2	0
Other Provincial-inner	395	-8	-5
Other Provincial-outer	401	-10	-2
Remote area	151	-10	+2
Total (%)	*4201*	*71*	*71*
		Females	
Mainland State Capital	2421	+3	+1
Major Urban region	461	-1	+1
Large Provincial City	329	-7	-4
Small Provincial City	177	-6	-7
Other Provincial-inner	419	-4	-3
Other Provincial-outer	472	-2	+1
Remote area	128	-13	-2
Total (%)	*4405*	*81*	*81*

Taking into account the influence of other background characteristics on Year 12 completion rates reduces the regional variation considerably. The background factors having the strongest influence on Year 12 completion rates are State/Territory of school in Year 9, Year 9 reading comprehension and numeracy scores, school type, and non-English speaking background at home, their effects being stronger for males than for females. Home location has a somewhat weaker, though still significant, effect, similar to that of parental occupation and education status (see Appendix Table A9).

For the total sample, the gap between the *Metropolitan* regions and *Provincial City*, *Other Provincial* and *Remote* areas narrows from around 11, 10 and 15 percentage points to 7, 5 and 2 percentage points respectively. For males, the adjusted completion rates for students from *Major Urban*, *Small Provincial City*, *Outer Provincial* and *Remote* areas are similar to those of the *Mainland State Capital City* students, with rates some 5 to 6

per cent lower in *Large Provincial City* and *Inner Provincial* areas. Similarly, females from *Large Provincial City* and *Inner Provincial* regions have completion rates some 3 to 4 per cent below average, with lower rates for those from *Small Provincial City* areas.

Comment

In comparing this analysis to the findings of Marks *et al* (2000), it is important to note the different definitions of remoteness used and that their conclusions take no account of the influence of other background factors. Their lowest estimate of Year 12 participation by different rural-urban measures is obtained for the size of place categories (Table 8, p23), where rural/remote areas are 'defined as centres with less than 1000 persons or farms' (p49), although this description is both wrong (the reference to 'less than 1000 persons' should be 'less than 10,000 persons') and misleading. The category is, we believe, defined on the basis of the *Rural, Remote and Metropolitan Areas Classification* (RRMAC) and combines postcodes matched to SLAs in the Other Rural areas category, comprising Rural Zone SLAs whose largest urban centre has less than 10,000 population, and SLAs in the Remote Zone of that classification. This rural/remote category then comprises 21 per cent of the weighted sample and corresponds, roughly, to a combination of the *Other Provincial* and *Remote* areas in the classification used here. Their metropolitan category also corresponds closely with the *Mainland State Capital City* category, and their regional category, roughly, to the combined *Major Urban* and *Provincial City* regions.

The results here, before adjusting for other background characteristics, then support the first and third of their findings, that the major difference is between students from metropolitan and non-metropolitan areas, with a gap of about 10 percentage points between their completion rates. We would add that the gap is somewhat higher for males than for females, around 13 compared to 7 percentage points. Net of the effects of other characteristics, these differences are reduced to around 6 per cent for males and 4 per cent for females.

The second finding of Marks *et al* (2000) is more contentious, primarily due to their use of the term "remote areas" – were this replaced by "rural groups", the phrase used in the first finding, it would not be of concern. On the basis of the LSAY sample and the variables used to define rurality, it is simply not appropriate to draw strong conclusions about the outcomes of students from "the most remote areas". Despite these semantic reservations, the results presented here give rise to a similar conclusion: it is impossible to conclude from the LSAY data that students from *Remote* areas experience lower rates of Year 12 completion than students from other non-metropolitan regions. Indeed, it would seem that, when the effects of other background characteristics are taken into account, students from *Remote* and *Outer Provincial* areas are more likely to complete Year 12 than students from *Provincial City* and *Inner Provincial* regions and no less likely to complete Year 12 than students from *Metropolitan* regions.

Entry to university by home location, 1995 Year 9 cohort

Regional differences in the proportion of students entering university, again for the total sample and for males and females separately, are examined in Table 13, with details of the adjustments made for the effects of other background characteristics in Appendix Table A10.

The unadjusted differences in Table 13 are very similar to those in Table 12, the major regional differences again being between the students from *Mainland State Capital City* regions and other areas with a gap of about 9 percentage points and again somewhat higher for males than for females, 11 per cent and 7 per cent respectively. It should be noted however that these percentage differences should be viewed somewhat differently from those for Year 12 completion due to the difference in the overall percentages, 31 per cent are university entrants compared with 76 per cent who completed Year 12. For example, *Mainland State Capital City* students have 4 per cent higher than average rates of completing Year 12 and entering university, and students from *Remote* areas have 12 per cent lower than average rates for both outcomes. The *Mainland State Capital City* students are then 80/64 = 1.25 times more likely than *Remote* area students to complete Year 12 but 35/19 = 1.84 times more likely than *Remote* area students to enter university.

Table 13 Entrants to university (per cent) by home location and gender, 1995 Year 9 cohort

	1995 cohort in 1999		
		Difference from Total (%)	
Home location	Cases	Unadjusted	Adjusted
		Total	
Mainland State Capital	4850	+4	+1
Major Urban region	832	-3	-1
Large Provincial City	615	-7	-2
Small Provincial City	344	0	-2
Other Provincial-inner	813	-5	-2
Other Provincial-outer	873	-4	+2
Remote area	279	-12	-2
Total (%)	*8606*	*31*	*31*
		Males	
Mainland State Capital	2429	+5	0
Major Urban region	371	-6	+1
Large Provincial City	286	-6	-1
Small Provincial City	167	+3	+1
Other Provincial-inner	395	-6	-2
Other Provincial-outer	401	-8	+1
Remote area	151	-14	-5
Total (%)	*4201*	*26*	*26*
		Females	
Mainland State Capital	2421	+3	+1
Major Urban region	461	-1	-2
Large Provincial City	329	-8	-3
Small Provincial City	177	-4	-4
Other Provincial-inner	419	-5	-1
Other Provincial-outer	472	-1	+3
Remote area	128	-8	+2
Total (%)	*4405*	*35*	*35*

Taking into account the influence of other background characteristics on entry to university again reduces the regional variation considerably. The background factors having the strongest influence are Year 9 reading comprehension and numeracy scores, particularly the latter, non-English speaking background at home and, for females, parental education status, with school type, parental occupation status, State/Territory of school in Year 9 and, for males, parental education status having significant but less important influences. Net of these other characteristics, home location has no significant effect on whether students, male or female, enter university.

Table 14 Entrants to university (per cent) by home location and gender, 1995 Year 9 cohort who had completed Year 12 in 1999

	Year 12 completers in 1999		
		Difference from Total (%)	
Home location	Cases	Unadjusted	Adjusted
		Total	
Mainland State Capital	3871	+3	0
Major Urban region	617	-3	-1
Large Provincial City	415	-5	-1
Small Provincial City	254	+1	0
Other Provincial-inner	570	-4	-2
Other Provincial-outer	617	-3	+2
Remote area	178	-11	-4
Total (%)	*6523*	*41*	*41*
		Males	
Mainland State Capital	1844	+3	0
Major Urban region	250	-8	+2
Large Provincial City	172	-3	+1
Small Provincial City	122	+3	+3
Other Provincial-inner	250	-4	-2
Other Provincial-outer	244	-8	+1
Remote area	92	-16	-11
Total (%)	*2973*	*37*	*37*
		Females	
Mainland State Capital	2026	+2	0
Major Urban region	368	-1	-2
Large Provincial City	244	-7	-3
Small Provincial City	132	-2	-2
Other Provincial-inner	320	-4	-1
Other Provincial-outer	373	-1	+3
Remote area	87	-4	+3
Total (%)	*3550*	*44*	*44*

Given this relatively surprising finding, a second analysis of university entry was conducted based only on those students who had completed Year 12, giving the results in Table 14 (see also Appendix Table A11). The results of this analysis are, in effect, simply a replication of the results obtained for the complete cohort, the regional variation again being explained by the effects of other characteristics on entry to university. For males, the results do show a somewhat lower rate of university entry for those from *Remote* areas, but the differences are not statistically significant and, here again, it is impossible to conclude from these data that students from *Remote* areas experience disadvantage in university entry.

Participation in other post-secondary education by home location, 1995 Year 9 cohort

The level of participation in other forms of post-secondary education by students who had left school and had not entered higher education has also been examined. Participants are defined as those people who reported in 1999 that they had completed or were now doing a diploma, trade certificate, other certificate, apprenticeship or traineeship course. The results of this analysis, reported in the Appendix Table A12, show very weak, and in most cases non-significant, associations with all of the background characteristics considered, these characteristics explaining only 2 per cent of the variation, and there is again no evidence that home location has an effect on levels of participation.

6. Conclusion

Chapter 2 provides an assessment of the viability of using LSAY data for national reporting of outcomes by geographical location, particularly in regard to its ability to provide useful estimates for the relatively small population of students living in *Remote* areas. The main findings of this assessment are as follows.

- Given the size of the LSAY cohort samples, the number of students from *Remote* areas selected in the first wave of each cohort is expected to be around 625. This sample was achieved in the 1995 cohort but not in the 1998 cohort, where the first wave sample includes only 356 students from *Remote* areas.
- Achievement of the expected sample size requires appropriate representation of schools located in *Remote* areas. In order to ensure that this occurs, separation of Government schools in Queensland, South Australia, Western Australia and the Northern Territory into *Remote* and non-remote strata should be implemented in the sample design.
- Sample attrition among students from *Remote* areas is only marginally higher than for students from other areas.
- There are substantial differences between the two cohorts in the regional distributions *within* States and Territories, differences that reflect the effects of sampling variability on the regional distribution of the school samples. Only explicit regional stratification of the schools population, in addition to the State/Territory and school sector strata, would ensure appropriate representation of all geographic location populations.
- In light of these sample distribution problems, the use of LSAY data for national reporting of outcomes by geographical location is not recommended.

The remainder of the report examines the association between geographic location and various educational outcomes - the literacy and numeracy tests administered to the sample in Year 9, early school leaving, Year 12 completion and participation in post-secondary education.

The general finding of these analyses is that regional effects on the outcomes considered are generally weak in comparison to those of other background characteristics considered, and that regional differences can often be explained by the different characteristics of regional populations. The one possible exception to this is for analyses of the outcomes of Indigenous students, but the samples of Indigenous students in the LSAY cohorts are generally too small to pursue this question.

While home location does have statistically significant effects on the reading comprehension and numeracy scores of Year 9 students, its effects (and those for State/Territory of school) are very much weaker than those associated with other background characteristics. The results from the LSAY indicate slightly lower average scores for students from *Remote* areas on the reading comprehension test but more substantial differences on the numeracy test. On average, students from *Major Urban*, *Provincial City* and *Other Provincial* regions achieve better scores than students living in the five *Mainland State Capital City* regions or in *Remote* areas.

There are however very substantial differences in attainment between Indigenous and non-Indigenous students and Indigenous students are over-represented in *Remote* areas, while remaining a relatively small minority of the *Remote* area population. Excluding Indigenous students from the sample, it is difficult to conclude that there is any substantive regional variation in average literacy and numeracy scores or, more particularly, that non-Indigenous students from *Remote* areas are disadvantaged.

For Indigenous students, the influence of home location on attainment is comparable to that of other background characteristics. Despite the small sample sizes at regional level, the results indicate that, consistent with expectations, the average level of attainment of Indigenous students living in *Remote* areas is substantially below that of other Indigenous students.

In regard to early school leaving, the results for the 1995 cohort are in general agreement with the main findings of Marks and Fleming (1999) that, after controlling for other factors, regional effects remain only for males. However, their finding that early school leaving for males increased from regional to rural and remote areas is not replicated here, the students from *Remote* areas appearing a little less likely to leave school early than students from other non-metropolitan areas.

In the 1998 Year 9 cohort, the rate of early school leaving among males from *Remote* areas is much higher, based on a smaller (weighted) sample of just 90 students and regional effects remain statistically significant, though relatively weak, for both males and females, net of the effects of other characteristics. For both males and females, those from the *Mainland State Capital City* regions appear less likely to leave school early than students from elsewhere.

The major regional difference in Year 12 completion rates is, as previously reported by Marks *et al* (2000), between students from metropolitan and non-metropolitan areas, with a gap of about 10 percentage points between their completion rates. The gap is somewhat higher for males than for females, around 13 compared to 7 percentage points. Net of the effects of other characteristics, these differences are reduced to around 6 per cent for males and 4 per cent for females.

It is impossible to conclude from the LSAY data that students from *Remote* areas experience lower rates of Year 12 completion than students from other non-metropolitan regions. Indeed, it would seem that, when the effects of other background characteristics are taken into account, students from *Remote* and *Outer Provincial* areas are more likely to complete Year 12 than students from *Provincial City* and *Inner Provincial* regions and no less likely to complete Year 12 than students from *Metropolitan* regions. However, given the small sample sizes and the small number of schools from which these *Remote* area students are selected in the LSAY, it is not appropriate to draw strong conclusions about the outcomes of students from *Remote* areas.

Similarly, analyses of entry to university and participation in other forms of post-secondary education show no evidence, after taking account of differences in the other background characteristics of students, that home location has a significant effect on levels of participation.

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APPENDIX 1 MULTIPLE CLASSIFICATION ANALYSIS (MCA) RESULTS

Table A1 MCA of reading comprehension and numeracy scores, 1995 Year 9 cohort

1995 Year 9 cohort	Reading comprehension			Numeracy		
		Difference from Total score			Difference from Total score	
Background characteristics	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location						
Mainland State Capital	7575	0.00	-0.09	7539	+0.09	-0.09
Major Urban region	1262	-0.10	+0.07	1266	+0.03	+0.40
Large Provincial City	933	-0.10	-0.03	927	-0.46	-0.13
Small Provincial City	568	+0.30	+0.15	560	+0.20	+0.16
Other Provincial-inner	1216	+0.24	+0.19	1214	+0.05	+0.06
Other Provincial-outer	1397	+0.01	+0.21	1401	-0.02	+0.30
Remote area	474	-0.54	-0.17	481	-0.95	-0.66
State/Territory of school						
New South Wales	4499	+0.07	+0.16	4471	+0.16	+0.19
Victoria	3274	+0.24	+0.18	3279	+0.09	+0.03
Queensland	2465	-0.65	-0.60	2469	-0.52	-0.46
South Australia	1007	+0.37	+0.17	1013	+0.45	+0.38
Western Australia	1423	+0.16	-0.06	1397	+0.18	+0.20
Tasmania	392	-0.55	-0.40	387	-1.34	-1.22
Northern Territory	102	-0.49	+0.01	107	-0.91	-0.08
A.C.T.	264	+0.71	+0.28	264	+0.74	+0.08
Parental occupation status						
Upper	1497	+1.81	+1.02	1502	+1.68	+0.92
Upper middle	2606	+0.94	+0.52	2615	+0.88	+0.53
Lower middle	4396	-0.04	-0.05	4396	-0.05	0.00
Lower	3229	-0.40	-0.20	3216	-0.57	-0.33
Not stated	1699	-2.17	-1.20	1658	-1.67	-1.03
Parental education status						
Higher education	3382	+1.50	+0.91	3384	+1.38	+0.84
Completed secondary/Trade qual	4086	+0.18	+0.13	4076	+0.11	+0.10
Did not complete secondary	2497	-0.39	-0.24	2498	-0.66	-0.40
Not stated	3461	-1.39	-0.87	3429	-1.01	-0.65
School type						
Government	9011	-0.41	-0.24	8984	-0.20	-0.20
Catholic	2726	+0.47	+0.28	2716	+0.19	+0.02
Independent	1689	+1.43	+0.85	1687	+1.53	+1.03
Age in Year 9						
Less than 16 year	12809	+0.11	+0.08	12774	+0.06	+0.05
16 years or more	617	-2.22	-1.75	612	-1.27	-1.12
Language spoken at home						
English	11976	+0.23	+0.20	11938	+0.11	+0.07
Other	1450	-1.94	-1.61	1449	-0.89	-0.58
Gender						
Male	6549	-0.40	-0.35	6550	+0.32	+0.35
Female	6877	+0.38	+0.33	6837	-0.30	-0.34
Indigenous identification						
Not indigenous	13060	+0.07	+0.05	13017	+0.06	+0.04
Indigenous	366	-2.41	-1.69	370	-2.21	-1.43
Total score	*13426*	*13.15*	*13.15*	*13387*	*12.28*	*12.28*
Variance explained (%)			17.1			13.4

Note: All characteristics have significant effects (based on the F test statistic) at the 5% level.

Table A2 MCA of reading comprehension and numeracy scores, 1998 Year 9 cohort

1998 Year 9 cohort	Reading comprehension			Numeracy		
		Difference from Total score			Difference from Total score	
Background characteristics	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location						
Mainland State Capital	7506	-0.08	-0.15	7526	-0.12	-0.23
Major Urban region	1785	+0.47	+0.29	1787	+0.74	+0.63
Large Provincial City	968	+0.33	+0.28	968	+0.23	+0.23
Small Provincial City	552	-0.34	-0.04	590	+0.03	+0.41
Other Provincial area	2565	-0.09	+0.15	2592	-0.19	+0.08
Remote area	289	-0.53	-0.17	286	-0.69	-0.30
State/Territory of school						
New South Wales	4475	+0.17	+0.19	4546	+0.20	+0.18
Victoria	3212	-0.22	-0.09	3213	-0.24	-0.11
Queensland	2751	-0.13	-0.23	2754	+0.18	+0.08
South Australia	1034	-0.13	-0.04	1049	-0.41	-0.22
Western Australia	1431	+0.04	+0.03	1433	-0.23	-0.16
Tasmania	380	+0.23	+0.04	373	-0.12	-0.33
Northern Territory	118	+0.22	+0.20	118	+0.08	+0.15
A.C.T.	265	+0.90	+0.11	264	+0.53	-0.46
Parental occupation status						
Upper	1929	+1.78	+0.97	1936	+1.68	+0.99
Upper middle	3193	+0.86	+0.43	3220	+0.78	+0.39
Lower middle	4122	-0.12	0.00	4131	-0.13	0.00
Lower	2742	-0.84	-0.49	2760	-0.83	-0.51
Not stated	1679	-2.02	-1.15	1702	-1.72	-1.04
Parental education status						
Higher education	3994	+1.47	+0.89	4018	+1.38	+0.84
Completed secondary/Trade qual	6016	-0.19	-0.14	6041	-0.18	-0.13
Did not complete secondary	2538	-1.07	-0.67	2545	-0.99	-0.57
Not stated	1118	-1.79	-0.92	1144	-1.72	-1.00
School type						
Government	9002	-0.51	-0.31	9099	-0.42	-0.23
Catholic	2835	+0.55	+0.30	2828	+0.31	+0.07
Independent	1828	+1.64	+1.08	1821	+1.62	+1.05
Age in Year 9						
Less than 16 year	13024	+0.11	+0.09	13100	+0.08	+0.08
16 years or more	642	-2.22	-1.81	649	-1.64	-1.53
Language spoken at home						
English	12462	+0.14	+0.09	12539	+0.06	+0.01
Other	1203	-1.45	-0.92	1210	-0.62	-0.13
Gender						
Male	6993	-0.45	-0.42	7026	+0.20	+0.22
Female	6672	+0.47	+0.44	6723	-0.21	-0.23
Indigenous identification						
Not indigenous	13239	+0.10	+0.07	13313	+0.08	+0.06
Indigenous	426	-2.96	-2.18	436	-2.29	-1.69
Total score	*13665*	*12.49*	*12.49*	*13749*	*11.97*	*11.97*
Variance explained (%)			16.7			13.8

Note: All characteristics have significant effects (based on the F test) at the 5% level except for Language spoken at home on numeracy.

Table A3 MCA of reading comprehension and numeracy scores, 1995 Year 9 cohort, non-Indigenous students

1995 Year 9 cohort	Reading comprehension			Numeracy		
		Difference from Total score			Difference from Total score	
Background characteristics	Cases	Unadjusted	Adjusted	Cases	Unadjusted	Adjusted
Home location						
Mainland State Capital	7459	-0.03	-0.09	7423	+0.06	-0.09
Major Urban region	1216	-0.08	+0.06	1219	+0.03	+0.38
Large Provincial City	901	-0.05	+0.06	894	-0.45	-0.14
Small Provincial City	547	+0.27	+0.10	538	+0.24	+0.18
Other Provincial-inner	1187	+0.22	+0.19	1183	+0.06	+0.09
Other Provincial-outer	1333	+0.05	+0.21	1336	+0.02	+0.30
Remote area	416	-0.18	-0.02	424	-0.69	-0.57
State/Territory of school						
New South Wales	4405	+0.04	+0.16	4374	+0.14	+0.18
Victoria	3226	+0.21	+0.18	3230	+0.05	+0.02
Queensland	2359	-0.60	-0.60	2362	-0.48	-0.45
South Australia	995	+0.32	+0.15	1001	+0.41	+0.37
Western Australia	1369	+0.19	+0.05	1343	+0.21	+0.19
Tasmania	356	-0.40	-0.39	351	-1.28	-1.28
Northern Territory	90	-0.17	-0.04	96	-0.68	-0.07
A.C.T.	259	+0.64	+0.26	260	+0.69	+0.08
Parental occupation status						
Upper	1490	+1.76	+1.03	1493	+1.65	+0.93
Upper middle	2562	+0.93	+0.53	2569	+0.87	+0.55
Lower middle	4281	-0.06	-0.06	4279	-0.07	-0.01
Lower	3106	-0.40	-0.21	3093	-0.58	-0.36
Not stated	1621	-2.15	-1.21	1583	-1.65	-1.04
Parental education status						
Higher education	3343	+1.45	+0.90	3343	+1.34	+0.83
Completed secondary/Trade qual	3985	+0.18	+0.15	3974	+0.09	+0.09
Did not complete secondary	2405	-0.39	-0.26	2406	-0.66	-0.41
Not stated	3326	-1.39	-0.89	3294	-0.99	-0.65
School type						
Government	8699	-0.40	-0.25	8669	-0.34	-0.20
Catholic	2690	+0.44	+0.28	2680	+0.16	+0.02
Independent	1671	+1.38	+0.83	1668	+1.50	+1.02
Age in Year 9						
Less than 16 year	12469	+0.10	+0.08	12431	+0.06	+0.05
16 years or more	591	-2.21	-1.76	586	-1.23	-1.12
Language spoken at home						
English	11638	+0.24	+0.19	11596	+0.11	+0.07
Other	1422	-1.94	-1.58	1421	-0.90	-0.55
Gender						
Male	6383	-0.40	-0.35	6382	+0.30	+0.35
Female	6677	+0.39	+0.34	6635	-0.29	-0.33
Total score	*13060*	*13.21*	*13.21*	*13017*	*12.35*	*12.35*
Variance explained (%)			16.3			12.5

Note: All characteristics have significant effects (based on the F test) at the 5% level.

Table A4 MCA of reading comprehension and numeracy scores, 1998 Year 9 cohort, non-Indigenous students

1998 Year 9 cohort	Reading comprehension			Numeracy		
		Difference from Total score			Difference from Total score	
	Cases	Unadjusted	Adjusted	Cases	Unadjusted	Adjusted
Home location						
Mainland State Capital	7340	-0.12	-0.16	7356	-0.15	-0.24
Major Urban region	1739	+0.46	+0.31	1742	+0.75	+0.66
Large Provincial City	930	+0.32	+0.27	930	+0.21	+0.22
Small Provincial City	512	-0.25	-0.06	545	+0.10	+0.10
Other Provincial area	2462	-0.05	+0.18	2488	-0.16	+0.10
Remote area	254	-0.03	+0.08	251	-0.29	-0.10
State/Territory of school						
New South Wales	4316	+0.20	+0.20	4377	+0.24	+0.21
Victoria	3145	-0.26	-0.09	3143	-0.29	-0.13
Queensland	2678	-0.15	-0.24	2680	+0.17	+0.07
South Australia	998	-0.10	-0.03	1013	-0.38	-0.21
Western Australia	1381	+0.08	+0.06	1385	-0.22	-0.15
Tasmania	351	+0.28	-0.05	345	-0.11	-0.43
Northern Territory	106	+0.35	+0.05	106	+0.15	-0.04
A.C.T.	263	+0.81	+0.07	263	+0.45	-0.49
Parental occupation status						
Upper	1909	+1.72	+0.98	1916	+1.62	+0.98
Upper middle	3135	+0.82	+0.43	3160	+0.74	+0.38
Lower middle	4000	-0.15	-0.02	4006	-0.16	-0.02
Lower	2648	-0.86	-0.51	2662	-0.84	-0.53
Not stated	1547	-1.94	-1.16	1570	-1.64	-1.02
Parental education status						
Higher education	3925	+1.41	+0.87	3947	+1.35	+0.84
Completed secondary/Trade qual	5832	-0.20	-0.14	5853	-0.19	-0.13
Did not complete secondary	2421	-1.05	-0.67	2426	-0.98	-0.59
Not stated	1061	-1.75	-0.92	1086	-1.71	-1.03
School type						
Government	8657	-0.49	-0.35	8745	-0.41	-0.24
Catholic	2784	+0.51	+0.25	2777	+0.27	+0.07
Independent	1797	+1.59	+1.05	1791	+1.58	+1.05
Age in Year 9						
Less than 16 year	12627	+0.11	+0.09	12694	+0.08	+0.08
16 years or more	612	-2.17	-1.80	691	-1.65	-1.56
Language spoken at home						
English	12076	+0.14	+0.09	12143	+0.06	+0.01
Other	1163	-1.44	-0.90	1170	-0.60	-0.09
Gender						
Male	6748	-0.44	-0.42	6772	+0.21	+0.22
Female	6491	+0.46	+0.43	6541	-0.22	-0.23
Total score	*13239*	*12.59*	*12.59*	*13313*	*12.05*	*12.05*
Variance explained (%)			15.1			12.9

Note: Language spoken at home has no significant effect on numeracy. All other characteristics have significant effects (based on the F test) at the 5% level.

Table A5 MCA of reading comprehension and numeracy scores, 1995 Year 9 cohort, Indigenous students

1995 Year 9 cohort	Reading comprehension			Numeracy		
		Difference from Total score			Difference from Total score	
Background characteristics	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location						
Mainland State Capital	115	+0.12	+0.37	116	+0.44	+0.32
Major Urban region	46	+0.12	+0.18	46	+0.69	+0.92
Large Provincial City	33	-0.87	-0.63	33	-0.21	+0.13
Small Provincial City	21	+1.74	+1.63	22	-0.11	-0.03
Other Provincial-inner	29	+0.83	+0.46	30	-0.46	-0.75
Other Provincial-outer	64	+0.27	+0.20	65	+0.11	+0.19
Remote area	58	-1.19	-1.57	57	-1.19	-1.30
State/Territory of school						
New South Wales	94	+0.70	+0.02	97	+0.72	+0.40
Victoria	48	-0.12	+0.42	49	+0.14	+0.32
Queensland	106	-0.76	-0.85	107	-0.66	-0.61
South Australia	11	+1.27	+1.41	11	+0.86	+0.84
Western Australia	54	+0.26	+0.71	54	-0.02	+0.40
Tasmania	37	-0.25	-0.28	37	-0.27	-0.65
Northern Territory	12	-0.88	+1.25	11	-1.24	+0.22
A.C.T.	4	+3.09	+1.99	4	+2.22	+0.35
Parental occupation status						
Upper	7	+0.25	+0.41	9	-0.29	-0.82
Upper middle	44	+0.49	+0.29	45	-0.06	-0.14
Lower middle	116	+0.59	+0.40	118	+0.46	+0.20
Lower	122	+0.19	+0.22	123	+0.32	+0.32
Not stated	77	-1.49	-1.14	75	-1.17	-0.65
Parental education status						
Higher education	39	+1.90	+1.48	41	+1.46	+1.07
Completed secondary/Trade qual	101	-0.19	-0.45	103	+0.53	+0.29
Did not complete secondary	92	+0.29	+0.21	91	-0.06	+0.07
Not stated	134	-0.61	-0.23	135	-0.80	-0.59
School type						
Government	311	-0.10	-0.05	315	-0.08	-0.08
Catholic	37	-0.16	-0.24	37	+0.03	+0.14
Independent	18	+1.99	+1.39	18	+1.32	+1.03
Age in Year 9						
Less than 16 year	341	+0.13	+0.11	343	+0.11	+0.10
16 years or more	25	-1.73	-1.42	26	-1.41	-1.24
Language spoken at home						
English	338	+0.25	+0.27	341	+0.12	+0.12
Other	28	-3.07	-3.25	28	-1.47	-1.45
Gender						
Male	166	-0.26	-0.36	168	+0.60	+0.51
Female	200	+0.22	+0.30	201	-0.50	-0.43
Total score	*366*	*10.74*	*10.74*	*369*	*10.07*	*10.07*
Variance explained (%)			19.3			15.4

Note: State and School type, and for numeracy, Parental occupation status, have non-significant effects. All other characteristics have significant effects (based on the F test) at the 10% level.

Table A6 MCA of reading comprehension and numeracy scores, 1998 Year 9 cohort, Indigenous students

1998 Year 9 cohort	Reading comprehension			Numeracy		
		Difference from Total score			Difference from Total score	
Background characteristics	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location						
Mainland State Capital	166	+0.34	+0.46	171	+0.24	+0.19
Major Urban region	46	+0.11	-0.38	45	+0.01	-0.14
Large Provincial City	38	+1.28	+0.63	38	+1.24	+0.59
Small Provincial City	40	+0.22	+0.42	45	+0.58	+0.88
Other Provincial	102	-0.50	-0.38	103	-0.49	-0.38
Remote area	35	-1.94	-1.73	35	-1.82	-1.41
State/Territory of school						
New South Wales	159	-0.31	-0.35	168	-0.36	-0.45
Victoria	67	+0.46	+0.36	69	+0.95	+0.73
Queensland	73	+0.36	+0.24	73	+0.11	+0.12
South Australia	36	-0.67	+0.01	36	-1.10	-0.30
Western Australia	50	-0.90	-0.87	48	-0.42	-0.42
Tasmania	29	+1.50	+1.21	28	+1.10	+0.99
Northern Territory	12	+1.18	+1.38	12	+1.10	+1.31
A.C.T.	1	+2.63	+3.47	1	+2.89	+2.92
Parental occupation status						
Upper	20	+1.37	-0.46	20	+2.35	+1.37
Upper middle	58	+0.77	+0.18	60	+1.06	+0.65
Lower middle	122	+0.53	+0.68	126	+0.54	+0.56
Lower	94	+0.22	+0.18	98	-0.10	0.00
Not stated	132	-1.19	-0.76	132	-1.27	-1.03
Parental education status						
Higher education	69	+2.01	+1.94	72	+1.31	+0.89
Completed secondary/Trade qual	184	+0.02	-0.17	188	-0.01	-0.19
Did not complete secondary	117	-0.56	-0.41	119	-0.29	+0.03
Not stated	57	-1.35	-0.94	58	-1.00	-0.56
School type						
Government	345	-0.26	-0.23	354	-0.26	-0.17
Catholic	51	+0.42	+0.29	52	+0.67	+0.49
Independent	31	+2.22	+2.06	30	+1.91	+1.17
Age in Year 9						
Less than 16 year	397	+0.17	+0.16	406	+0.06	+0.07
16 years or more	30	-2.27	-2.07	30	-0.76	-0.95
Language spoken at home						
English	387	+0.16	+0.12	397	+0.12	+0.11
Other	40	-1.60	-1.20	40	-1.17	-1.13
Gender						
Male	245	-0.35	-0.40	254	+0.22	+0.19
Female	181	+0.48	+0.54	182	-0.31	-0.27
Total score	*426*	*9.53*	*9.53*	*436*	*9.68*	*9.68*
Variance explained (%)			22.8			16.2

Note: State and, for numeracy, Age, Gender and Parental education status, have non-significant effects. All other characteristics have significant effects (based on the F test) at the 10% level.

Table A7 MCA of early school leaving by gender, 1995 Year 9 cohort in 1997

1995 Year 9 cohort	Total			Male			Female		
		Deviation (%)			Deviation (%)			Deviation (%)	
	Cases	Raw	Adjusted	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location									
Mainland State Capital	5565	-3	-1	2769	-4	-1	2796	-3	-1
Major Urban region	934	0	-2	401	0	-3	533	0	-2
Large Provincial City	696	+5	+3	333	+7	+4	363	+4	+2
Small Provincial City	411	+4	+4	203	+3	+3	208	+5	+5
Other Provincial-inner	971	+5	+3	478	+7	+5	493	+2	+2
Other Provincial-outer	1120	+6	+2	527	+7	+2	593	+4	+1
Remote area	353	+4	0	190	+4	0	163	+4	-1
State/Territory of school									
New South Wales	3242	+3	+3	1620	+4	+4	1622	+1	+2
Victoria	2535	-4	-3	1214	-4	-3	1321	-5	-4
Queensland	1846	+1	-2	935	0	-3	911	+1	-2
South Australia	813	-5	-5	360	-6	-6	453	-4	-4
Western Australia	1078	+2	+2	526	0	0	552	+3	+3
Tasmania	279	+20	+15	130	+15	+10	149	+25	+20
Northern Territory	67	+4	+1	34	+7	+4	34	+1	-2
A.C.T.	188	-8	-2	82	-9	-6	106	-6	-1
Parental occupation status									
Upper	1174	-10	-3	585	-13	-4	589	-7	-1
Upper middle	2035	-5	-3	963	-6	-3	1072	-4	-2
Lower middle	3363	+2	+1	1622	+3	+2	1741	+0	0
Lower	2427	+4	+1	1137	+4	+1	1290	+3	+1
Not stated	1049	+8	+2	593	+7	+2	456	+8	+3
Parental education status									
Higher education	2582	-8	-2	1227	-9	-2	1355	-8	-3
Completed sec/Trade qual	3195	+1	0	1585	+1	0	1611	+1	0
Did not complete secondary	1808	+3	+1	761	+4	+1	1047	+3	+2
Not stated	2463	+5	+1	1327	+5	0	1135	+5	+2
School type									
Government	6618	+3	+1	3273	+4	+2	3345	+2	+1
Catholic	2117	-5	-3	954	-5	-3	1163	-4	-2
Independent	1313	-8	-2	674	-10	-3	639	-6	-1
Indigenous identification									
Not indigenous	9817	-1	0	4802	0	0	5015	-1	0
Indigenous	232	+22	+11	99	+17	+6	133	+26	+16
Age in Year 9									
Less than 16 year	9623	0	0	4649	-1	-1	4974	0	0
16 years or more	426	+11	+5	252	+16	+10	173	+2	0
Language spoken at home									
English	8998	+1	+1	4422	+1	+1	4576	+1	+1
Other	1051	-7	-10	479	-8	-12	572	-6	-8
Gender									
Male	4901	+3	+3						
Female	5148	-3	-3						
Total (%)	*10049*	*15*	*15*	*4901*	*18*	*18*	*5148*	*12*	*12*
Variance explained (%)			12.2			13.2			10.6

Note: Year 9 reading comprehension and numeracy scores included as covariates. All characteristics have significant effects (based on the F test) at the 5% level except Parental education and Indigenous identification for males, and Home location and Age in Year 9 for females.

Table A8 MCA of early school leaving by gender, 1998 Year 9 cohort in 2000

1998 Year 9 cohort	Total			Male			Female		
		Deviation (%)			Deviation (%)			Deviation (%)	
	Cases	Raw	Adjusted	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location									
Mainland State Capital	5061	-2	-1	2516	-2	-1	2544	-3	-2
Major Urban region	1203	-1	0	578	-4	-3	624	+2	+3
Large Provincial City	652	+1	+3	306	-1	+1	345	+3	+4
Small Provincial City	379	+7	+3	172	+5	+2	207	+9	+5
Other Provincial area	1731	+3	+1	851	+5	+2	881	+2	0
Remote area	192	+11	+8	90	+19	+14	103	+5	+3
State/Territory of school									
New South Wales	3031	+5	+5	1469	+6	+7	1562	+3	+4
Victoria	2155	-3	-3	1087	-3	-3	1068	-3	-3
Queensland	1859	-3	-4	957	-5	-5	902	-2	-2
South Australia	697	-1	-2	333	-2	-5	364	0	0
Western Australia	961	-1	-1	440	-1	-2	521	-1	0
Tasmania	253	+5	+2	117	0	-1	137	+8	+4
Northern Territory	81	+1	-3	36	+5	0	45	-1	-6
A.C.T.	180	-7	-4	75	-9	-3	105	-5	-6
Parental occupation status									
Upper	1373	-8	-2	662	-9	-2	711	-7	-3
Upper middle	2181	-5	-2	1062	-7	-3	1119	-3	-1
Lower middle	2908	+2	+1	1428	+4	+3	1480	+1	0
Lower	1843	+3	0	856	+3	-1	987	+3	+1
Not stated	913	+10	+5	505	+11	+5	408	+9	+5
Parental education status									
Higher education	2735	-7	-3	1363	-9	-3	1371	-6	-2
Completed sec/Trade qual	4194	+2	+1	2125	+2	+1	2069	+1	+1
Did not complete secondary	1678	+5	+2	705	+7	+3	974	+4	+2
Not stated	610	+7	0	320	+10	+1	290	+4	+1
School type									
Government	6094	+3	+1	2857	+4	+2	3237	+2	+1
Catholic	1896	-5	-3	976	-5	-4	920	-5	-3
Independent	1228	-8	-2	680	-10	-3	547	-5	-1
Indigenous identification									
Not indigenous	9002	-1	0	4392	-1	0	4610	-1	0
Indigenous	216	+24	+13	121	+20	+9	94	+27	+19
Age in Year 9									
Less than 16 year	8854	-1	0	4268	-1	0	4586	0	0
16 years or more	363	+14	+7	245	+13	+6	118	+12	+9
Language spoken at home									
English	8406	0	+1	4077	+1	+1	4329	0	+1
Other	811	-5	-9	436	-5	-10	375	-6	-8
Gender									
Male	4513	+3	+3						
Female	4704	-3	-3						
Total (%)	*9217*	*14*	*14*	*4513*	*17*	*17*	*4704*	*11*	*11*
Variance explained (%)			11.5			13.8			8.7

Note: Year 9 reading comprehension and numeracy scores included as covariates. All characteristics have significant effects (based on the F test) at the 5% level.

Table A9 MCA of Year 12 completion by gender, 1995 Year 9 cohort in 1999

1995 Year 9 cohort	Total			Male			Female		
		Deviation (%)			Deviation (%)			Deviation (%)	
	Cases	Raw	Adjusted	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location									
Mainland State Capital	4850	+4	+2	2429	+5	+2	2421	+3	+1
Major Urban region	832	-2	0	371	-3	0	461	-1	+1
Large Provincial City	615	-8	-5	286	-11	-6	329	-7	-4
Small Provincial City	344	-2	-4	167	+2	0	177	-6	-7
Other Provincial-inner	813	-6	-4	395	-8	-5	419	-4	-3
Other Provincial-outer	873	-5	-1	401	-10	-2	472	-2	+1
Remote area	279	-12	0	151	-10	+2	128	-13	-2
State/Territory of school									
New South Wales	2841	+1	0	1425	0	-1	1416	+3	+2
Victoria	2069	+4	+2	983	+3	+1	1086	+5	+4
Queensland	1700	+2	+6	847	+4	+8	852	-1	+3
South Australia	634	-3	-4	285	-3	-3	349	-5	-5
Western Australia	883	-7	-8	434	-7	-7	449	-8	-8
Tasmania	250	-25	-18	120	-27	-19	130	-24	-18
Northern Territory	69	-24	-19	34	-29	-27	35	-19	-13
A.C.T.	160	+7	+2	72	+11	+10	88	+2	-3
Parental occupation status									
Upper	975	+14	+4	488	+17	+4	487	+11	+4
Upper middle	1725	+8	+4	814	+10	+5	911	+6	+3
Lower middle	2886	-3	-2	1397	-4	-2	1489	-2	-1
Lower	2089	-4	-1	956	-5	-1	1132	-4	-2
Not stated	931	-11	-3	546	-10	-4	385	-10	-4
Parental education status									
Higher education	2212	+12	+4	1053	+14	+5	1160	+9	+3
Completed sec/Trade qual	2727	-1	0	1336	-2	-1	1392	0	0
Did not complete secondary	1546	-4	-2	658	-7	-4	888	-3	-1
Not stated	2120	-8	-3	1155	-6	-1	966	-8	-4
School type									
Government	5842	-5	-3	2894	-6	-3	2949	-4	-2
Catholic	1730	+9	+6	788	+12	+8	942	+7	+5
Independent	1034	+11	+4	519	+15	+6	515	+8	+2
Indigenous identification									
Not indigenous	8424	+1	0	4115	0	0	4309	+1	0
Indigenous	182	-26	-13	86	-19	-6	96	-32	-21
Age in Year 9									
Less than 16 year	8241	0	0	3986	+1	+1	4255	0	0
16 years or more	366	-10	-6	216	-15	-11	150	0	+1
Language spoken at home									
English	7676	-1	-2	3766	-2	-2	3910	-1	-1
Other	931	+10	+13	435	+13	+17	495	+7	+9
Gender									
Male	4201	-5	-2						
Female	4405	+5	-3						
Total (%)	*8606*	*76*	*76*	*4201*	*71*	*71*	*4405*	*81*	*81*
Variance explained (%)			14.6			16.1			11.7

Note: Year 9 reading comprehension and numeracy scores included as covariates. All characteristics have significant effects except Indigenous identification for males, and Age in Year 9 for females.

Table A10 MCA of participation in higher education by gender, 1995 Year 9 cohort in 1999

1995 Year 9 cohort	Total			Male			Female		
		Deviation (%)			Deviation (%)			Deviation (%)	
	Cases	Raw	Adjusted	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location									
Mainland State Capital	4850	+4	+1	2429	+5	0	2421	+3	+1
Major Urban region	832	-3	-1	371	-6	+1	461	-1	-2
Large Provincial City	615	-7	-2	286	-6	-1	329	-8	-3
Small Provincial City	344	0	-2	167	+3	+1	177	-4	-4
Other Provincial-inner	813	-5	-2	395	-6	-2	419	-5	-1
Other Provincial-outer	873	-4	+2	401	-8	+1	472	-1	+3
Remote area	279	-12	-2	151	-14	-5	128	-8	+2
State/Territory of school									
New South Wales	2841	0	-2	1425	-1	-3	1416	+1	-1
Victoria	2069	+7	+5	983	+8	+6	1086	+6	+4
Queensland	1700	-6	0	847	-4	0	852	-7	0
South Australia	634	+2	+1	285	+2	+2	349	0	0
Western Australia	883	-4	-4	434	-5	-3	449	-4	-5
Tasmania	250	-11	-2	120	-11	-4	130	-10	0
Northern Territory	69	-15	-11	34	-19	-15	35	-11	-8
A.C.T.	160	+4	-3	72	+1	-5	88	+8	-1
Parental occupation status									
Upper	975	+24	+10	488	+26	+11	487	+23	+10
Upper middle	1725	+9	+3	814	+9	+2	911	+9	+4
Lower middle	2886	-5	-3	1397	-6	-3	1489	-4	-3
Lower	2089	-7	-3	956	-7	-2	1132	-8	-3
Not stated	931	-13	-1	546	-10	-1	385	-14	-2
Parental education status									
Higher education	2212	+20	+10	1053	+19	+8	1160	+21	+11
Completed sec/Trade qual	2727	-3	-1	1336	-3	-1	1392	-2	-1
Did not complete secondary	1546	-8	-4	658	-9	-5	888	-8	-3
Not stated	2120	-12	-6	1155	-9	-3	966	-15	-9
School type									
Government	5842	-6	-3	2894	-6	-3	2949	-5	-2
Catholic	1730	+9	+5	788	+9	+5	942	+8	+6
Independent	1034	+18	+6	519	+21	+10	515	+15	+2
Indigenous identification									
Not indigenous	8424	0	0	4115	0	0	4309	0	0
Indigenous	182	-14	+3	86	-7	+9	96	-21	-2
Age in Year 9									
Less than 16 year	8241	+1	0	3986	+1	0	4255	0	0
16 years or more	366	-12	-7	216	-10	-6	150	-12	-9
Language spoken at home									
English	7676	-2	-2	3766	-2	-2	3910	-1	-2
Other	931	+13	+19	435	+15	+20	495	+12	+19
Gender									
Male	4201	-5	-5						
Female	4405	+5	+5						
Total (%)	*8606*	*31*	*31*	*4201*	*26*	*26*	*4405*	*35*	*35*
Variance explained (%)			23.1			24.3			21.5

Note: Year 9 reading comprehension and numeracy scores included as covariates. All characteristics have significant effects except Home location and Indigenous identification.

Table A11 MCA of participation in higher education by gender, Year 12 completers, 1995 Year 9 cohort in 1999

1995 Year 9 cohort	Total			Male			Female		
		Deviation (%)			Deviation (%)			Deviation (%)	
	Cases	Raw	Adjusted	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location									
Mainland State Capital	3871	+3	0	1844	+3	0	2026	+2	0
Major Urban region	617	-3	-1	250	-8	+2	368	-1	-2
Large Provincial City	415	-5	-1	172	-3	+1	244	-7	-3
Small Provincial City	254	+1	0	122	+3	+3	132	-2	-2
Other Provincial-inner	570	-4	-2	250	-4	-2	320	-4	-1
Other Provincial-outer	617	-3	+2	244	-8	+1	373	-1	+3
Remote area	178	-11	-4	92	-16	-11	87	-4	+3
State/Territory of school									
New South Wales	2195	-1	-3	1015	-1	-3	1180	0	-2
Victoria	1653	+7	+6	724	+10	+8	930	+5	+4
Queensland	1316	-8	-2	636	-8	-2	680	-8	-2
South Australia	459	+4	+3	195	+5	+5	265	+3	+2
Western Australia	605	-2	-3	278	-4	-3	327	0	-3
Tasmania	126	-1	+2	52	-4	-4	74	+1	+5
Northern Territory	36	-11	-8	14	-19	-15	22	-7	-5
A.C.T.	132	+1	-4	59	-7	-6	73	+8	-1
Parental occupation status									
Upper	871	+21	+9	427	+23	+10	444	+20	+8
Upper middle	1448	+7	+2	658	+7	+1	790	+7	+3
Lower middle	2107	-5	-3	930	-6	-4	1177	-4	-2
Lower	1494	-7	-3	626	-8	-2	868	-8	-3
Not stated	604	-13	0	333	-11	0	271	-13	-1
Parental education status									
Higher education	1919	+18	+9	897	+16	+6	1042	+19	+10
Completed sec/Trade qual	2036	-3	-1	915	-3	-1	1121	-3	-1
Did not complete secondary	1105	-8	-4	418	-10	-5	687	-8	-3
Not stated	1444	-13	-7	743	-10	-4	701	-15	-10
School type									
Government	4147	-5	-3	1879	-6	-3	2268	-5	-2
Catholic	1474	+6	+4	649	+6	+3	824	+6	+5
Independent	902	+15	+5	444	+18	+9	458	+12	+1
Indigenous identification									
Not indigenous	6432	0	0	2929	0	0	3503	0	0
Indigenous	91	-8	+7	44	0	+14	47	-14	0
Age in Year 9									
Less than 16 year	6282	0	0	2853	0	0	3429	0	0
16 years or more	241	-12	-9	120	-8	-7	121	-14	-12
Language spoken at home									
English	5721	-1	-3	2606	-2	-3	3114	-1	-3
Other	803	+11	+20	367	+12	+20	436	+10	+19
Gender									
Male	2973	-4	-5						
Female	3550	+3	+4						
Total (%)	*6523*	*41*	*41*	*2973*	*37*	*37*	*3550*	*44*	*44*
Variance explained (%)			20.7			22.2			19.6

Note: Year 9 reading comprehension and numeracy scores included as covariates. All characteristics have significant effects except Home location and Indigenous identification.

Table A12 MCA of participation in vocational training by gender, school leavers not entering university, 1995 Year 9 cohort in 1999

1995 Year 9 cohort	Total			Male			Female		
		Deviation (%)			Deviation (%)			Deviation (%)	
	Cases	Raw	Adjusted	Cases	Raw	Adjusted	Cases	Raw	Adjusted
Home location									
Mainland State Capital	3009	+1	0	1600	+1	0	1409	+1	+1
Major Urban region	559	-2	-1	279	-2	-1	279	-1	0
Large Provincial City	445	-4	-3	216	-7	-6	229	-2	-1
Small Provincial City	230	-1	-1	115	-3	-3	115	+1	0
Other Provincial-inner	580	-1	-1	301	-1	-2	278	0	0
Other Provincial-outer	613	0	+1	314	+2	+2	299	-2	-1
Remote area	212	-1	+3	127	+3	+8	85	-7	-3
State/Territory of school									
New South Wales	1887	+3	+4	1013	+2	+2	874	+5	+6
Victoria	1208	0	-1	612	+1	+1	596	-2	-2
Queensland	1219	1	+1	643	+2	+3	575	0	-1
South Australia	381	-4	-5	181	-5	-6	200	-3	-4
Western Australia	626	-4	-5	332	-3	-5	293	-5	-5
Tasmania	178	-12	-10	91	-13	-10	87	-12	-10
Northern Territory	49	-11	-11	27	-12	-13	22	-11	-8
A.C.T.	99	-5	-4	52	-5	-5	47	-4	-3
Parental occupation status									
Upper	406	+1	+2	215	-2	-1	191	+5	+5
Upper middle	990	+1	+1	504	+1	+2	486	+1	0
Lower middle	2028	+3	+3	1067	+6	+5	961	+1	+1
Lower	1516	-2	-2	738	-2	-2	777	-2	-2
Not stated	707	-7	-8	428	-10	-13	279	-3	-2
Parental education status									
Higher education	1013	0	-1	540	-2	-4	473	+2	+1
Completed sec/Trade qual	1865	+3	+3	976	+3	+2	889	+3	+4
Did not complete secondary	1134	-2	-1	523	-1	-2	611	-1	-1
Not stated	1635	-3	-2	914	-2	+1	721	-4	-4
School type									
Government	4145	0	0	2196	0	0	1948	-1	-1
Catholic	999	+2	+1	493	0	0	506	+3	+2
Independent	504	0	0	264	-1	-1	240	+2	+1
Indigenous identification									
Not indigenous	5499	0	0	2883	0	0	2615	0	0
Indigenous	148	-8	+7	69	-18	-15	79	-6	-6
Age in Year 9									
Less than 16 year	5356	0	0	2775	0	0	2581	0	0
16 years or more	291	-2	-4	178	-5	-4	113	0	-4
Language spoken at home									
English	5168	-1	-1	2714	-1	-1	2454	0	0
Other	479	+8	+8	238	+14	+16	241	+2	0
Gender									
Male	2953	+2	+2						
Female	2694	-3	-2						
Total (%)	*5499*	*51*	*51*	*2953*	*53*	*53*	*2694*	*49*	*49*
Variance explained (%)			2.0			3.1			1.8

Note: Year 9 reading comprehension and numeracy scores included as covariates. Characteristics having significant, but weak, effects are State/Territory of school for both genders, Parental occupation status, Indigenous identification and Language spoken at home for males, and Parental education status and Year 9 reading comprehension score for females.

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