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THE AUSTRALIAN NATIONAL UNIVERSITY

A Human Capital Approach to the Educational Marginalisation of Indigenous Australians

N. Biddle

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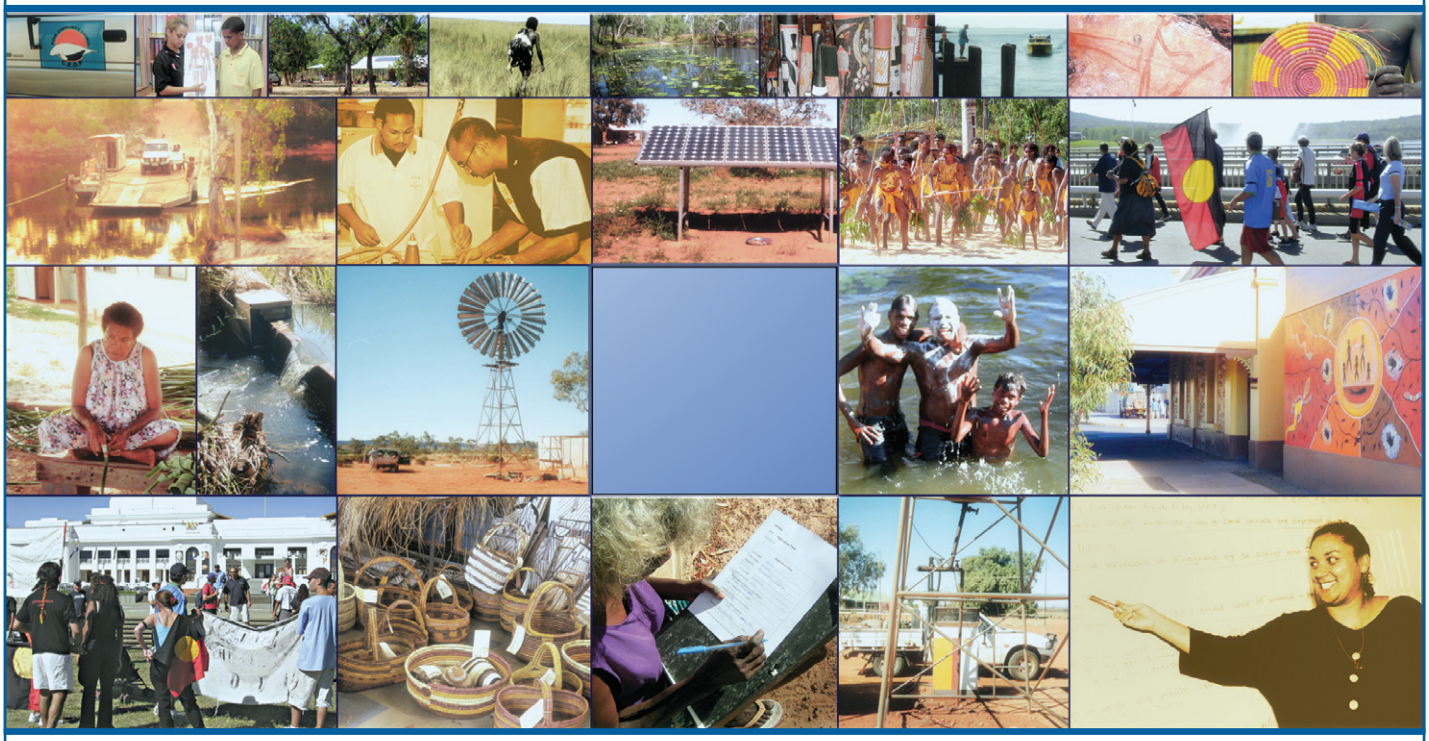

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A human capital approach to the educational marginalisation of Indigenous Australians

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ABSTRACT

Education is a key determinant at both a national and individual level for health, wellbeing and access to economic resources. What's more, education has intrinsic benefits for those who undertake it, as well as for those around them. The standard human capital model has been used by many to understand the education decisions that individuals make, as well as the consequences of these decisions for themselves and wider society. While the standard model may seem overly simple at first glance (individuals undertake education until the predicted benefits no longer outweigh the predicted costs), when the costs and benefits from education are expanded to include the social sphere, and when uncertainty about the future is taken into account, a number of insights emerge with respect to educational marginalisation. The aim of this paper is to apply some of the insights of the human capital model to better understand the education outcomes of Indigenous Australians. Regional and individual data from the census is interpreted alongside a selection of key articles and reports in order to help understand why it is that so few Indigenous people are undertaking formal education in Australia today.

Keywords: Education, human capital model, Indigenous Australians, 2001 Census, 2006 Census.

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INTRODUCTION AND OVERVIEW

In 2006, Australia ranked fourth out of 179 countries in the United Nation's Human Development Index (HDI) (United Nations Development Programme (UNDP) 2008). While Australia's HDI ranking places it amongst the highest of the group labelled 'high human development' countries, the relevance of this ranking for the Indigenous population is suspect at best. Yap and Biddle (forthcoming) estimate that if the same index approach was applied to the Indigenous population separately, then it would rank 'slightly higher than the Syrian Arab Republic and the Occupied Palestinian Territories, but slightly lower than Fiji and Sri Lanka'. In a separate analysis using data from the 2001 Census, Cooke et al. (2007) showed that Indigenous Australians also ranked substantially lower than other comparable Indigenous populations. This includes United States American Indians and Alaska Natives, the Canadian Aboriginal population and the New Zealand Maori.

HDI: Human Development Index

UNDP: United Nations Development Programme

Education is one of the key components of the HDI. At a purely mechanical level, the combined primary, secondary and tertiary gross enrolment rate is one of the three variables used to construct the index. However, and perhaps as importantly, education is a key determinant at both a national and individual level for the two other components, life expectancy and income per capita.

According to the most recent (2006) Australian Census, only 23.9 per cent of the Indigenous population aged 15 years and over had completed high school, which was slightly less than half the rate for the non-Indigenous population (49.7%).[1] More than three-quarters (76.3%) of the Indigenous population aged 15 years and over had not completed either a degree or trade qualification, which was 1.41 times the rate for the non-Indigenous population (54.1%). While these figures to a certain extent reflect a historic lack of engagement with formal education, current rates of attendance are also substantially lower for the Indigenous compared to the non-Indigenous population. Only 34.5 per cent of Indigenous Australians aged 15–24 years were attending formal education in 2006, compared to 55.3 per cent of non-Indigenous Australians.

In many ways, these national summary figures from the 2006 Census represent only a small part of the educational marginalisation faced by Indigenous Australians, with other indicators showing equally high levels of disengagement. For example, daily attendance rates for government primary schools in 2006 were estimated to be around 86 per cent for Indigenous students nationally, compared to 93 per cent for non-Indigenous students (Department of Education, Employment and Workplace Relations (DEEWR) 2008). The gap is even larger for secondary schools, with a national median of 79 per cent attendance for Indigenous government secondary school students compared to close to 90 per cent for their non-Indigenous counterparts. Among remote populations, these gaps are substantially greater (Taylor 2010; Hughes & Hughes 2010).

DEEWR: Department of Education, Employment and Workplace Relations

Low rates of attendance are both a cause and effect of poor academic achievement. In Australia all Year 3, 5 and 7 students are assessed across two areas; literacy and numeracy. According to DEEWR, 'the nationally agreed literacy and numeracy benchmarks for Years 3, 5 and 7 represent minimum standards of performance below which students will have difficulty progressing satisfactorily at school' (DEEWR 2008: 52). In 2006, across all three year levels and across reading, writing and numeracy, Indigenous students trailed the national average. The gap (in terms of the difference in the percentage of the population who achieved the minimum benchmark) ranged from 13 percentage points for Year 3 reading to 32 percentage points for Year 7 numeracy (DEEWR 2008). In general, the gap tends to widen as Indigenous students get older.

There are a number of approaches one could take in order to attempt to understand the marginalisation faced by Indigenous Australians in terms of formal education. Each of these approaches—whether it be anthropology, sociology or education pedagogy—are likely to provide unique and valuable insights.

HCM: human capital model

The approach followed in this paper utilises tools from economics and, in particular, the human capital model (HCM).

The HCM in more or less its current form was outlined by Becker (1964). At the heart of the model is the assumption that when deciding whether or not to undertake a certain type of education, potential students are rational (in the economic sense) utility maximisers who, above all, see education as an investment. An investment in education will improve one's performance in the workplace and an individual will invest until the returns to an additional unit of education (measured by increases in discounted future income) just equal the cost. That is, until marginal returns equal marginal cost.

Although the HCM has been quite influential in education research and policy making, it has also been recognised that, at least under the basic specification presented above, it has a number of limitations. The first of these is whether education enhances productivity directly (as assumed in the HCM), or instead acts as a signalling or screening device whereby already productive workers are identified (e.g. Arrow 1973; Spence 1973).

Under the alternative specification, employers assume that those with a higher innate ability find education more easy (or less costly) and are therefore more likely to invest heavily in education than those who find education a struggle. An employer is therefore more likely to hire a person with relatively high levels of education, not because the education they have undergone has made them more productive, but because it has demonstrated that they were more productive in the first place.

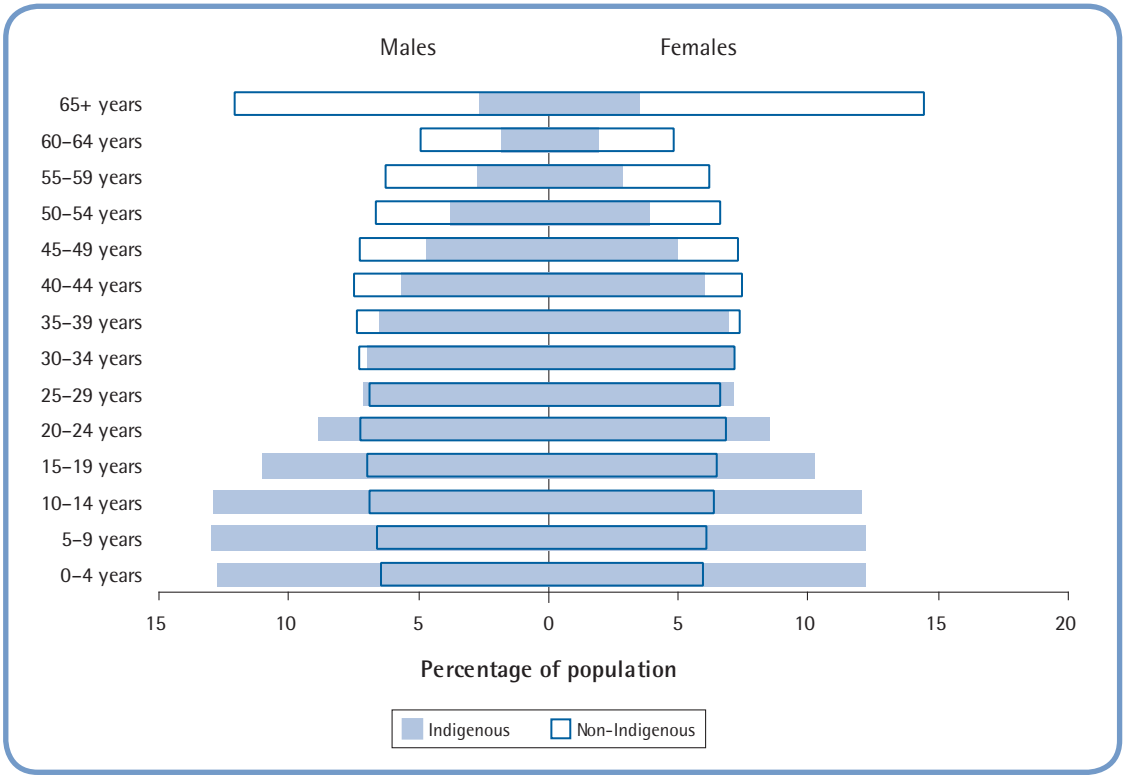
Whether or not it is human capital or screening/signalling that is driving the differences in earnings has important implications for some aspects of policy development. If governments are trying to decide on the level of investment they make in education or the type of education to focus on, then under the HCM across-the-board increases in education lead to higher economy-wide productivity: therefore there is a much stronger argument for government provision of education. Under a signalling/screening model, however, education only affects relative earnings, and therefore economy-wide increases in education have no or little effect on economic growth.

The basic HCM also assumes that a person's utility is determined mainly by their income, and if discounted future additional income is higher than the cost of education, then people will invest in education. It is likely, though, that a student's current social situation is also important in influencing their behaviour. There are also a number of other outcomes that are likely to be associated with higher education levels that people may take into account when deciding whether or not to invest in education. Although there are indirect effects that operate via income, education may also have direct effects on things like health, the schooling of one's children, the efficiency of consumer choices and the ability to plan fertility decisions (Wilson, Wolfe & Haveman 2005). Finally, the HCM assumes that potential students make decisions based on a comparison between their future income streams with and without education. However, potential students cannot know their precise future income and must therefore form expectations based on what they do know. Different students have access to different information than others, so it is possible that expectations are also formed differently (Dominitz & Manski 1996).

While there are a number of limitations or extensions to the standard HCM, it still provides a useful framework for understanding why it is that certain population groups have lower levels of engagement with formal education than others. Having identified the degree of educational disadvantage faced by Indigenous Australians at the national level, the remainder of the paper focuses on how educational marginalisation varies within the population and the processes that contribute to it from a human capital perspective.

The next section of the paper provides additional context by considering the demographic and geographic distribution of the population. This is followed by an analysis of education attainment and achievement,

Fig. 1. Percentage of population by age group, 2006



Source: Australian Bureau of Statistics (ABS) (2008).

ABS: Australian Bureau of Statistics

with the section that follows looking at current patterns of attendance. Recognising that the processes of marginalisation begin at a young age, the focus of the paper then turns to a number of child outcomes, including preschool attendance and aspects of the families in which Indigenous Australians grow up. Contrasting these 'out of school' or demand-side factors with 'in school' or supply-side factors, the section that follows looks at the schooling experience of Indigenous Australians. The final section of the paper provides a summary of the main issues raised and provides some concluding comments.

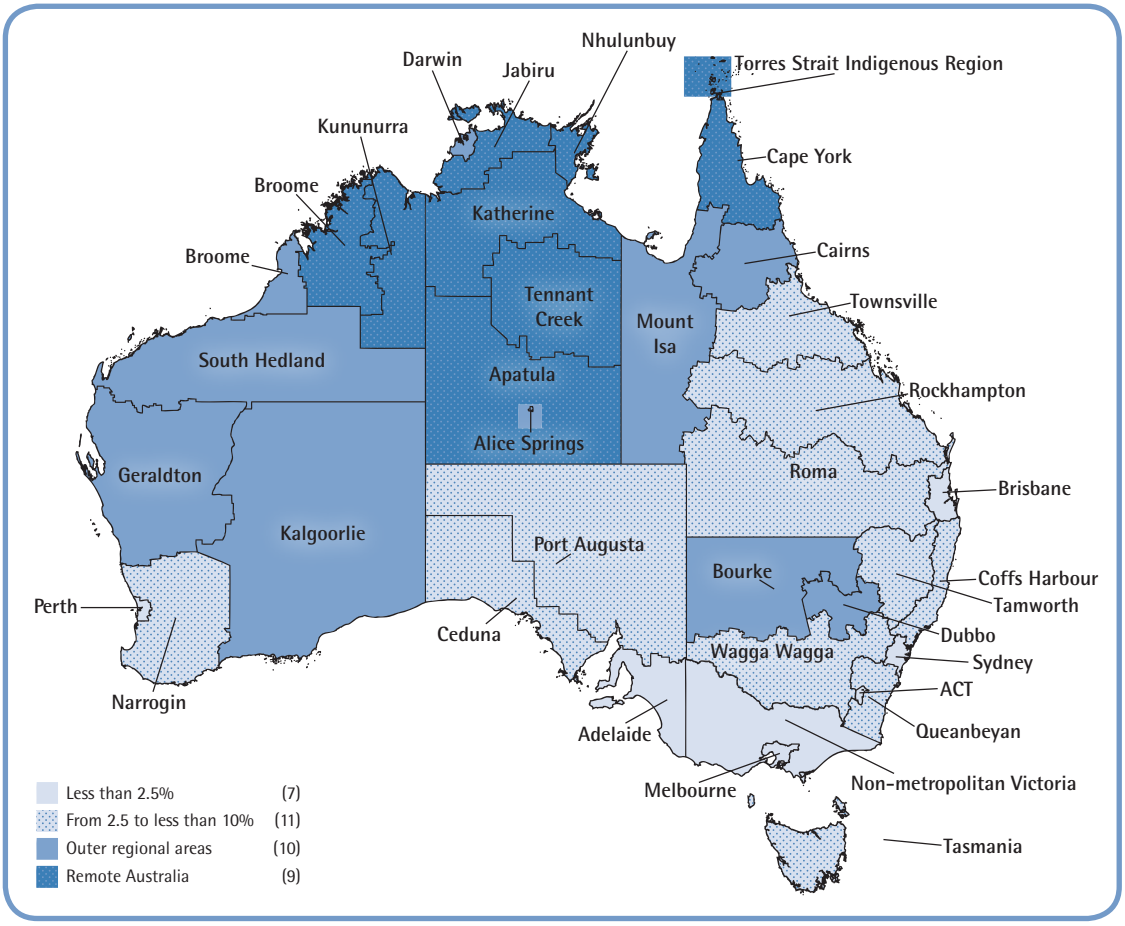
THE DEMOGRAPHY AND GEOGRAPHY OF INDIGENOUS AUSTRALIANS

Before considering the potential causes of, and responses to, Indigenous educational marginalisation relative to the non-Indigenous population, it is important to keep in mind the demographic and geographic differences between the two populations. The first thing to note is that the previously described lack of engagement with formal education is a particular issue for Indigenous Australians because of their relatively young age distribution. This is demonstrated in Fig. 1, which gives the percentage of the Indigenous and non-Indigenous population by sex in each five-year age group (with all those aged 65+ grouped together). The estimated resident populations (ERPs) that these figures are based on are given in Appendix Table A1, for both males and females.

ERP: estimated resident population

For both males and females, each of the first four age groups contain 10 per cent or more of the Indigenous population. Putting these groups together with those aged 20–24 years, 56.9 per cent of the Indigenous

Fig. 2. Share of the population who identify as being Indigenous by IREGs, 2006



Source: ABS (2008).

population in 2006 was aged under 25 years. On the other hand, only 11.6 per cent of the Indigenous population was aged 50 years and over. Compared to this, the non-Indigenous population of Australia is highly skewed towards the upper end of the age distribution. Only 32.9 per cent of the population is aged under 25 years, compared to 31 per cent of the population aged 50 years and over.

The age distributions summarised in Fig. 1 highlight potentially different focuses in terms of social and economic policy between the Indigenous and non-Indigenous populations. For the non-Indigenous population, policy is increasingly concerned with the effects and implications of ageing and retirement funding. For Indigenous Australians on the other hand, the focus of social and economic policy has remained and will remain fixed on the provision of education, training and entry into employment.

At the time of the last census, 69.4 per cent of the non-Indigenous population lived in Australia's major cities, compared to 31.8 per cent of the Indigenous population (ABS 2008). Just as there is a relative concentration amongst the preschool and school-age population, Indigenous Australians are also much more likely to live in regional and remote parts of Australia.

IREG:
Indigenous Region

The geographic distribution of the respective populations is demonstrated in Fig. 2 through the percentage of the population in each Indigenous Region (IREG) who identified as being Indigenous in 2006.[2] The first category (in palest blue) refers to those regions where less than 2.5 per cent of the population identifies as being Indigenous (roughly equal to the national average). The second category, in the next lightest

blue, is for those regions where more than 2.5 per cent, but less than 10 per cent of the population are Indigenous. The next darkest blue are those areas where between 10 and 50 per cent identify as being Indigenous. The final category in the darkest blue is for those areas where half or more of the population identify as being Indigenous.

It is clear from Fig. 2 that those regions which have a relatively low Indigenous share are the large State or Territory capital cities. So, for example, the IREG of Melbourne (in Victoria) has a population of over 3.7 million, of which only 0.4 per cent or 15,930 people are identified as being Indigenous. Similarly, Sydney (in New South Wales), the Australian Capital Territory (ACT),[3] Adelaide (in South Australia), Perth (in Western Australia) and Brisbane (in Queensland) all have a low Indigenous share. Those regions in the lightest two shades of blue generally consist of one, or occasionally several, large regional towns surrounded by mostly agricultural areas.

ACT:
Australian Capital Territory

A comparison of Fig. 2 with a map of the remoteness classification (in Appendix Table A2) shows that the nine regions in the darkest blue are generally in the most remote parts of Australia where very few non-Indigenous Australians live. The IREG with the greatest Indigenous share is the Torres Strait (in Queensland), where almost 85 per cent of the population are estimated to identify as being Indigenous. Jabiru and Apatula (both in the Northern Territory) also have an Indigenous population that makes up around 80 per cent of usual residents.

This population distribution has a number of important implications for the provision of services to the Indigenous population. Relative to the non-Indigenous population, Indigenous Australians are much more likely to live in regions and areas where issues to do with accessibility make the provision of education and training much more costly. Salary costs are substantially higher in remote regions especially, but also in smaller regional towns. Furthermore, the fixed costs in providing educational infrastructure are spread over fewer individual students. There are also significant costs involved in attending education in remote Australia for the students themselves, as well as their families. This point will be returned to a number of times throughout this paper in explaining the educational marginalisation of Indigenous Australians.

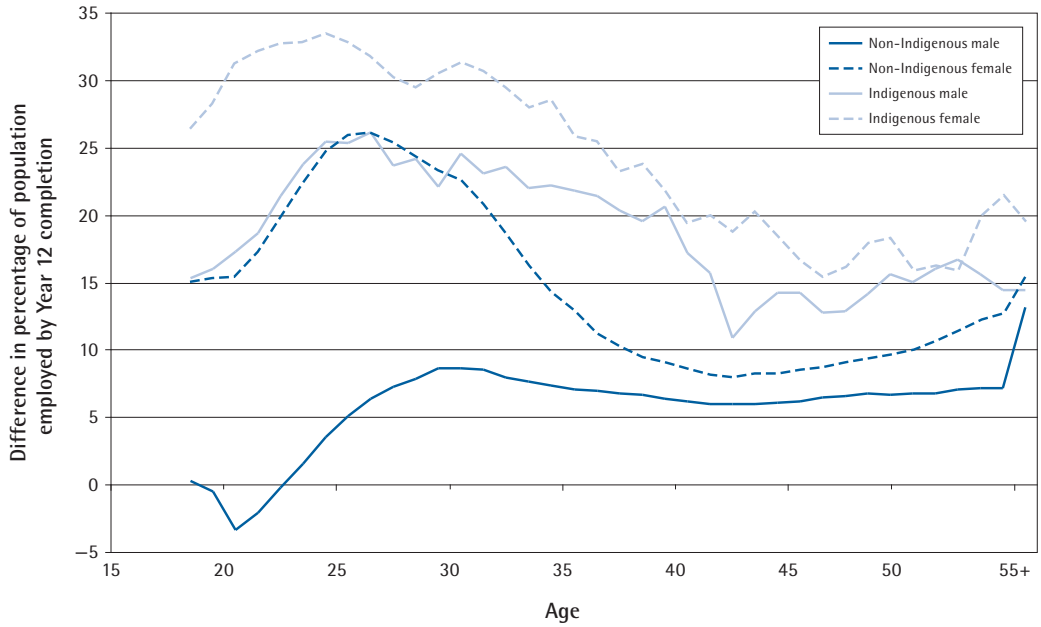
There is one important caveat regarding the distribution of the Indigenous population. While Indigenous Australians are found in relatively high numbers in remote parts of the country, in absolute terms the regions with the greatest number of Indigenous Australians are generally the capital cities and adjacent regions. Of the 517,174 total Indigenous population recorded by the census in 2006, 46,889 people or 9.1 per cent of the population live in the Sydney IREG. The next largest population is Brisbane with 46,279 Indigenous Australians, followed by the adjoining region of Coffs Harbour with 43,821 Indigenous Australians.

What the above two sets of results mean is that, while the relatively remote distribution of the Indigenous population is a key reason for their continuing marginalisation, any efforts to 'close the gap' in outcomes between Indigenous and non-Indigenous Australians at a national level can not ignore urban parts of the country. Biddle, Taylor and Yap (2008) and Biddle (2008) have demonstrated this with regards to employment and housing respectively. It is, however, no less the case for educational outcomes.

EDUCATION ATTAINMENT AND ACHIEVEMENT

At a population level, one of the main indicators of education attainment is the percentage of the population who have completed high school or, in Australia, Year 12. In addition to the broader skills and knowledge that late secondary schooling brings, for many jobs in Australia the completion of Year 12 is a minimum prerequisite. This is especially the case for those jobs with the highest pay and best conditions. For other jobs where high school completion is not an explicit criteria, having completed Year 12 is used by individual applicants as a signal of aptitude and attitude.

Fig. 3. Difference in the percentage of the population employed by Year 12 completion: Indigenous and non-Indigenous males and females, 2006



Note: Because of the relatively small Indigenous populations for certain age groups who have completed Year 12, the above graph represents a three year moving average. For example, the data point for those who are aged 20 represents the difference for those who are aged 19, 20 and 21.

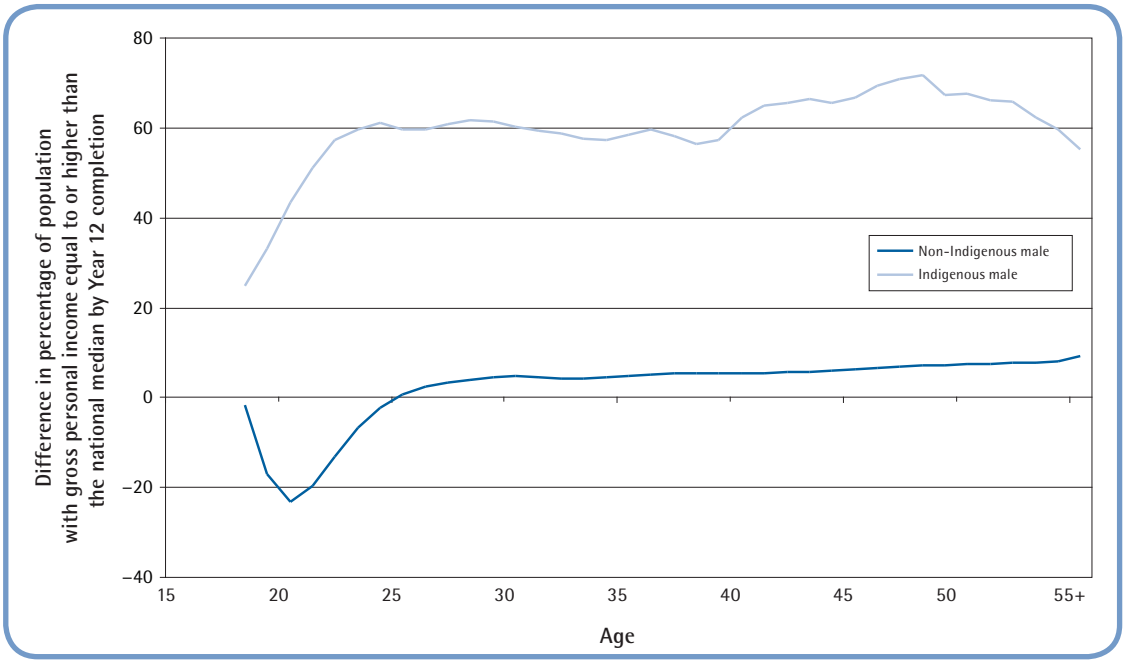
Source: Customised calculations based **on the** 2006 Census of Population and Housing.

Despite the fact that Indigenous Australians on average live near, and have access to, very different labour markets than the non-Indigenous population, the economic benefits from high school completion in terms of finding a well-remunerated job are comparable. This is demonstrated first in Fig. 3 which plots the difference in the percentage of the population who are employed between someone who has completed Year 12 and someone who has not. For those who are employed, Fig. 4 shows the difference by Year 12 completion in the percentage of the population with median weekly gross personal income equal to, or higher than, the national median.[4] These differences are plotted by age, with a separate line for Indigenous and non-Indigenous Australians and, in Fig. 3, males and females. The employment and income percentages that these figures are based on are given in Appendix Tables A2 and A3 respectively.

The first thing to note from Fig. 3 is that for both males and females, the difference in employment probabilities between those who have completed Year 12 and those who have not is greater for Indigenous compared to non-Indigenous Australians. This is reasonably consistent across age groups.

The second thing to note is that there is a bigger difference for females than there is for males, especially for the population aged 18 to (approximately) 35 years. These are of course the main child-bearing years, and hence a possible explanation for why there is a greater difference by education for females is that the relative costs of not working and caring for children full-time is greater for those with higher levels of education than those without. Alternatively, it may be that those who have completed Year 12 are in the types of occupations and industries where they are able to find flexible working or child-care arrangements. Whatever the reason, Fig. 3 shows that there are likely to be particularly large employment benefits of completing Year 12 for Indigenous females.

Fig. 4. Difference in the percentage of the employed population with gross personal income equal to or above the national median by Year 12 completion: Indigenous and non-Indigenous Australians, 2006



Note: Because of the relatively small Indigenous populations for certain age groups who have completed Year 12, the above graph represents a three year moving average. For example, the data point for those who are aged 20 represents the difference for those who are aged 19, 20 and 21.

Source: Customised calculations based on the 2006 Census of Population and Housing.

The age pattern identified in Fig. 3 is also worth noting. The biggest difference in the probability of being employed is for those in their mid- to late-twenties. The difference is likely to be relatively small in a person's early twenties because that is the time when a relatively high percentage of those who have completed Year 12 are attending full-time, post secondary education. Beyond a person's early- to mid-thirties, other things like experience and post-school qualifications are likely to reduce the employment premium from completing Year 12.

Ultimately, if the employment percentages identified in Fig. 3 were to hold across a person's working life (from age 18–54), then Indigenous females are estimated to be employed for 9.14 more years if they have completed Year 12 compared to if they have not. The difference for Indigenous males and non-Indigenous females is still quite high at 6.96 and 5.48 years respectively, although there is a relatively small premium for non-Indigenous males of 2.06 years.

Of course, for those who are employed, there are likely to be a number of differences in the type of industry and occupation between those who have or have not completed Year 12. Fig. 4 shows the difference in the percentage of the employed population, with gross personal income equal to, or higher than, the national median between those who have and who have not completed Year 12. Separate figures are given for Indigenous and non-Indigenous Australians.[5]

There is a very clear difference between employed Indigenous and non-Indigenous Australians in terms of the premium that Year 12 appears to bring in terms of having a relatively high gross personal income. From the age of about 22, the percentage of employed Indigenous Australians who have completed Year 12 with

Table 1. Indigenous and non-Indigenous population who have completed high school (Year 12) for IREGs: 2001, 2006 and percentage change

	Indigenous			Non-Indigenous			Ratio		
IREG	2001 (%)	2006 (%)	Change (%)	2001 (%)	2006 (%)	Change (%)	2001	2006	Change (%)
Queanbeyan	17.3	20.8	20.2	35.0	39.6	13.2	0.49	0.53	6.2
Bourke	9.3	13.4	43.4	24.6	28.0	13.8	0.38	0.48	26.0
Coffs Harbour	17.2	21.9	27.7	30.0	35.6	19.0	0.57	0.61	7.3
Sydney	26.1	30.6	17.1	51.1	58.5	14.6	0.51	0.52	2.2
Tamworth	12.8	17.2	34.6	31.0	35.5	14.6	0.41	0.48	17.5
Wagga Wagga	14.5	18.1	24.5	30.4	35.0	14.9	0.48	0.52	8.3
Dubbo	14.2	19.2	35.7	29.3	34.2	17.0	0.48	0.56	16.0
Melbourne	30.3	35.5	17.1	49.3	56.7	15.2	0.62	0.63	1.7
Non-metropolitan Victoria	19.0	21.0	10.8	31.7	37.1	17.0	0.60	0.57	−5.3
Brisbane	31.4	36.7	16.8	45.2	52.5	16.0	0.69	0.70	0.7
Cairns	27.9	31.6	13.3	40.2	46.4	15.3	0.69	0.68	−1.8
Mt Isa	15.7	20.1	27.8	36.3	43.2	18.9	0.43	0.47	7.5
Cape York	11.8	15.2	28.7	39.4	43.3	10.1	0.30	0.35	16.9
Rockhampton	22.4	28.6	27.9	30.3	35.7	17.8	0.74	0.80	8.6
Roma	19.1	24.5	27.9	32.7	37.8	15.7	0.59	0.65	10.6
Torres Strait	32.2	39.9	24.0	45.7	54.7	19.8	0.70	0.73	3.5
Townsville	26.8	31.5	17.4	36.8	42.3	14.9	0.73	0.74	2.2
Adelaide	21.8	26.1	19.5	38.9	45.2	16.3	0.56	0.58	2.7
Ceduna	9.9	14.4	44.9	27.6	32.8	19.2	0.36	0.44	21.6
Port Augusta	10.4	11.7	12.8	27.0	30.9	14.5	0.38	0.38	−1.5
Perth	22.9	28.1	22.6	47.3	54.1	14.2	0.48	0.52	7.3
Broome	19.7	25.7	30.3	40.8	50.4	23.5	0.48	0.51	5.5
Kununurra	8.0	12.6	57.3	40.5	48.3	19.3	0.20	0.26	31.9
Narrogin	14.6	17.5	20.1	33.1	37.4	13.1	0.44	0.47	6.2
South Hedland	12.6	16.7	32.3	37.5	44.6	18.9	0.34	0.38	11.2
Derby	14.5	16.6	14.9	43.6	48.0	10.2	0.33	0.35	4.2
Kalgoorlie	9.0	13.5	49.8	34.6	39.4	13.8	0.26	0.34	31.7
Geraldton	15.1	16.9	11.6	31.2	36.5	16.9	0.48	0.46	−4.5
Tasmania	17.2	22.6	31.6	31.2	36.6	17.5	0.55	0.62	12.0
Alice Springs	14.8	15.0	1.4	44.0	51.3	16.7	0.34	0.29	−13.1
Jabiru	5.3	8.7	62.9	43.5	48.2	10.9	0.12	0.18	46.9
Katherine	6.5	7.9	21.7	38.1	46.9	23.0	0.17	0.17	−1.1
Apatula	1.9	3.7	97.7	48.8	54.1	10.9	0.04	0.07	78.3
Nhulunbuy	4.1	8.3	103.1	43.9	50.8	15.9	0.09	0.16	75.3
Tennant Creek	4.7	5.1	8.7	34.8	42.4	21.6	0.14	0.12	−10.6
Darwin	21.5	23.5	9.6	44.8	50.9	13.5	0.48	0.46	−3.4
ACT	41.9	46.8	11.9	64.0	70.5	10.3	0.65	0.66	1.4
Australia—total	**19.4**	**23.9**	**23.0**	**42.9**	**49.7**	**15.9**	**0.45**	**0.48**	**6.2**

Note: Percentages exclude those who are currently attending high school.

Source: Customised calculations based on the 2006 Census of Population and Housing.

a gross personal income of $400 or more per week is around 60 percentage points higher than for those who have not completed Year 12. For the employed non-Indigenous population, on the other hand, the difference is in fact negative between the ages of 18 and 24, reflecting the greater work experience that those who have not completed Year 12 are able to obtain. Even beyond the age of 25, the difference in probabilities between those employed non-Indigenous Australians who have and who have not completed Year 12 never reaches above 10 per cent.

To put the differences in the percentages for the employed Indigenous population in perspective, between the ages of 25 and 40 (when the line in Fig. 4 is reasonably flat) between 79 and 84 per cent of employed Indigenous Australians who have completed Year 12 have an income at, or above, the median gross personal income range. While this is on average about 5 percentage points lower than the corresponding non-Indigenous population, the percentage of employed Indigenous Australians who have not completed Year 12 in that income range never rises above 26.5 per cent. Clearly, it is very hard for an Indigenous Australian who has not completed Year 12 to find a reasonably well-remunerated job.

The main implication from the results summarised in Figs 3 and 4 from a human capital perspective is that Indigenous Australians are unlikely to be forgoing high school education because the employment or income benefits of doing so are insufficient. There is precious little longitudinal information or policy experiments available to confirm whether the association between education and other economic outcomes is causal. However, a similar cross-sectional picture was found using more detailed methodology in Biddle (2007a), Daly and Liu (1995) and Hunter (2004). The available evidence would suggest that the economic incentive to undertake education is quite high for Indigenous Australians. The question that will be returned to is why Indigenous Australians are not responding to these incentives.

Having shown the potentially high predicted benefits of education, Table 1 outlines the extent to which Year 12 completion varies within the Indigenous population, as well as between Indigenous and non-Indigenous Australians. Using the IREGs outlined in Fig. 1, the percentage of the region's adult population who have completed Year 12 is given for 2001 and 2006, as well as the percentage change across that time period. This is given first for Indigenous Australians and then for the non-Indigenous population. The last three columns give the ratio of the Indigenous and non-Indigenous populations in 2001 and 2006, as well as the percentage change in the ratio.

Looking first at the bottom row of the table, one can see that the percentage of the Indigenous population that had completed Year 12 rose between 2001 and 2006 from 19.4 per cent to 23.9 per cent. This represents a 23 per cent increase over the last intercensal period, a little larger than the 15.9 per cent increase experienced by non-Indigenous Australians over the same period. There was, therefore, a slight convergence between the two populations, with the ratio of Indigenous to non-Indigenous percentages rising from 0.45 to 0.48. Clearly though, there is still a large gap between the two populations, with Indigenous Australians less than half as likely to have completed Year 12.

Table 1 also shows that there is as much, if not more, variation within the Indigenous population by region than there is between the Indigenous and non-Indigenous populations at the national level. In the ACT, 46.8 per cent of the Indigenous population had completed Year 12 at the time of the 2006 Census. This is not that far below the national average of the non-Indigenous population (49.7%), though the non-Indigenous percentage in the ACT is even higher still. Other regions that were substantially above the national Indigenous average were Sydney, Melbourne, Brisbane and the Torres Strait. The last of these regions is interesting because, unlike the other four regions with high completion rates, the Torres Strait is generally considered to be a very remote part of Australia (see Fig. A1). However, the result reflects the generally higher levels of education of Torres Strait Islanders relative to Aboriginal Australians, regardless of whether they live in the Torres Strait itself or on the mainland (Arthur 2003).

Table 2. Indigenous population by level of post-school qualifications for IREGs: 2006 and change from 2001

	Indigenous: 2006				Indigenous: change		Ratio: change	
IREG	Degree	Diploma	Cert.	No qual.	Degree	No qual.	Degree	No qual.
Queanbeyan	5.3	4.1	18.6	72.1	45.3	–9.1	6.5	–0.1
Bourke	2.3	2.6	10.9	84.2	65.8	–6.9	30.6	–1.3
Coffs Harbour	4.9	4.5	19.5	71.1	56.5	–8.6	9.5	1.5
Sydney	7.6	5.0	17.8	69.6	36.9	–6.7	1.6	4.5
Tamworth	2.4	2.7	15.3	79.5	100.6	–8.1	51.3	0.7
Wagga Wagga	3.2	3.3	16.0	77.4	53.5	–7.9	11.6	0.9
Dubbo	2.5	2.3	15.3	79.9	62.4	–7.3	16.9	0.8
Melbourne	9.2	6.4	19.1	65.4	34.8	–8.5	–3.8	2.7
Non-metropolitan Victoria	4.4	4.3	18.0	73.4	23.1	–6.3	–12.9	3.2
Brisbane	6.6	5.2	18.8	69.3	41.3	–9.0	1.3	3.1
Cairns	3.3	3.9	15.0	77.8	59.4	–7.8	23.9	1.5
Mt Isa	1.4	1.8	10.0	86.8	39.2	–4.4	8.2	0.3
Cape York	0.9	1.9	11.2	86.0	123.0	–7.7	91.3	–1.3
Rockhampton	3.3	2.8	16.9	77.0	56.2	–9.9	16.0	–1.3
Roma	3.6	2.8	14.6	79.0	77.9	–8.5	31.4	1.2
Torres Strait	3.0	5.8	20.5	70.7	133.1	–18.8	61.0	9.0
Townsville	3.3	3.1	15.9	77.7	56.0	–8.6	21.6	0.7
Adelaide	5.2	4.5	18.0	72.3	43.4	–8.1	2.6	1.8
Ceduna	2.7	3.2	13.8	80.3	137.9	–8.2	73.1	–0.7
Port Augusta	1.6	1.8	11.5	85.1	102.6	–5.7	61.3	–0.3
Perth	6.7	3.7	15.2	74.4	53.8	–7.9	11.3	3.7
Broome	3.1	3.6	15.2	78.1	26.2	–9.7	–5.8	3.3
Kununurra	1.3	1.8	9.2	87.7	74.4	–7.3	22.0	2.4
Narrogin	2.6	2.6	15.2	79.7	87.6	–8.3	41.6	0.0
South Hedland	1.9	1.8	13.4	82.8	53.6	–6.0	16.2	5.7
Derby	1.3	1.5	9.1	88.1	28.6	–6.8	–2.6	4.9
Kalgoorlie	1.5	1.8	10.3	86.5	39.1	–6.3	21.4	–1.8
Geraldton	2.2	2.3	12.9	82.6	109.9	–6.5	60.1	1.2
Tasmania	4.6	3.6	20.2	71.7	52.7	–8.4	11.6	2.2
Alice Springs	3.4	3.2	14.0	79.4	24.9	–6.5	–9.6	6.8
Jabiru	0.7	1.0	6.5	91.9	54.1	–4.8	16.3	3.0
Katherine	1.3	1.3	9.0	88.4	159.4	–6.2	83.2	9.1
Apatula	0.5	1.0	6.0	92.4	68.1	–4.7	30.0	2.7
Nhulunbuy	0.9	1.4	5.7	92.0	130.2	–5.3	79.6	5.6
Tennant Creek	0.9	1.6	6.4	91.1	56.3	–4.4	11.9	11.8
Darwin	4.8	4.8	16.8	73.6	56.7	–9.4	16.6	2.2
ACT	17.0	6.2	16.5	60.3	27.2	–9.4	–5.8	4.3
Australia—total	**4.4**	**3.7**	**15.7**	**76.3**	**50.9**	**–8.2**	**9.4**	**2.4**

Source: Customised calculations based on the 2006 Census of Population and Housing.

Apart from the Torres Strait, other remote regions generally had low levels of Year 12 completion in 2006. For example, there were five regions in the Northern Territory where less than one in ten adult Indigenous Australians had completed Year 12. In the region with the lowest level of completion, Apatula, only 3.7 per cent of the population had completed Year 12. Reflecting the low levels in 2001, most of the regions that had an increase in the relative percentage of the Indigenous population who had completed Year 12 (that is, compared to non-Indigenous Australians) were in remote Australia. However, there were eight regions that witnessed a decline over the last intercensal period. These were mainly in regional parts of Australia, which shows that progress in reducing the disparities between Indigenous and non-Indigenous Australians was far from consistent across the country.

One of the benefits of completing Year 12 is that it makes it much easier to gain admission into post-school education, especially at a university. Once enrolled, the skills and knowledge gained in high school are also likely to make it easier to complete either a degree or a trade-related qualification. This explains much of the gap in income and employment between those who have and those who have not completed Year 12. Of course, for those who have not completed Year 12, a post-school qualification can also have substantial income and employment benefits. Biddle (2007a) showed the substantial measured benefits of post-school education for the Indigenous population (at the time of the 2001 Census).

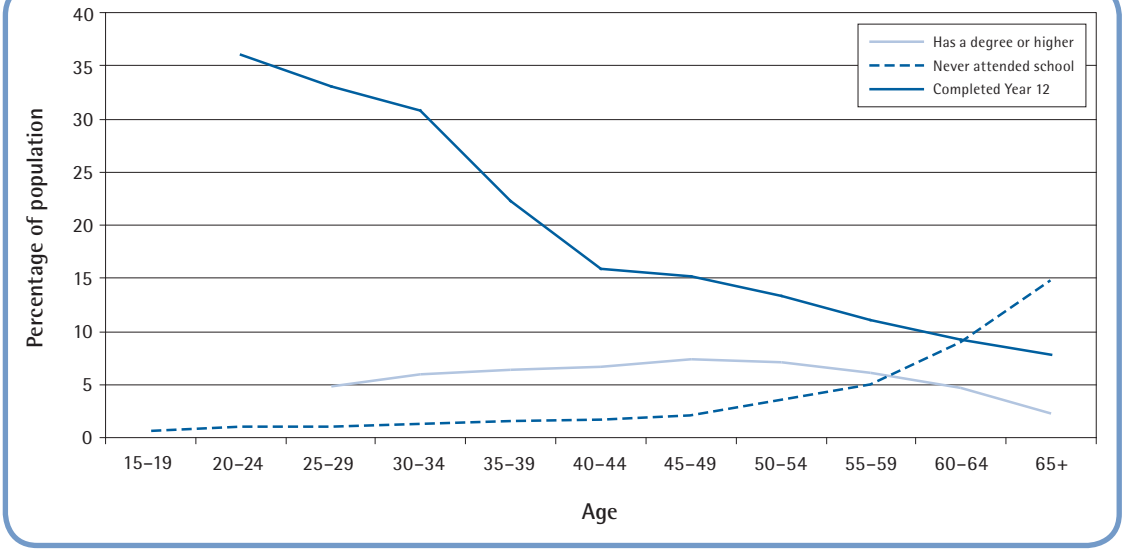
Table 2 shows the percentage of Indigenous Australians who had completed three types of education in 2006: a degree or higher; a diploma; or a certificate.[6] The remainder of the population aged 15 and over (that is, those without a qualification) is also given. The percentage change between 2001 and 2006 in two of these columns—degree or higher, and those without a qualification—is given, whereas the final two columns give the percentage change in the ratio of Indigenous to non-Indigenous outcomes over the same period.

Clearly, the vast majority of Indigenous Australians aged 15 and over do not have post-school qualifications. Nationally, this represents 76.3 per cent of the population. However, in four remote regions—Jabiru, Apatula, Nhulunbuy and Tennant Creek—this rises to above 90 per cent. The most common form of post-school qualification held by Indigenous Australians are certificates, with very few having a diploma or a degree.

While there were generally very few Indigenous Australians with a qualification in 2006, there was still a substantial increase in the percentage over the last intercensal period. Nationally, there was a 50.9 per cent increase over the period, and there were eight regions with a more than 100 per cent increase. This was associated with a general decline in the percentage of the population without a qualification.

In many ways, when competing in the labour market for well-remunerated jobs it matters less what a given person's level of education than what their level of education is relative to those with whom they are competing. It is therefore encouraging that there was an increase in the ratio of the percentage of the Indigenous compared to non-Indigenous population with a degree, both nationally and in most regions. It is worth noting, however, that in six of the regions, there was a widening in this gap.

Fig. 5. Percentage of the Indigenous population who never attended school, completed Year 12 or have a degree: by age, 2006



Source: Customised calculations based on the 2006 Census of Population and Housing.

EDUCATION PARTICIPATION AND ATTENDANCE

In many ways, the results presented in Tables 1 and 2 regarding the large increase in the percentage of the adult Indigenous population who have completed Year 12 or a degree is a reflection of the very low rates of education participation that occurred in earlier time periods. This is demonstrated in Fig. 5, which plots the percentage of the Indigenous population who have never attended school by five-year age cohorts, as well as the percentage of the population who have completed Year 12 (for those aged 20 and over) and those who have a degree (for those 25 and over).

Fig. 5 shows that Indigenous Australians aged 50 and over were much more likely to have never attended school than their younger cohorts, with a steady decline in the percentage of the population who have completed Year 12 beyond the age of 20. From around the age of 60 and beyond, there was actually a higher percentage of Indigenous Australians who had never attended school compared to those who had completed Year 12. Furthermore, while there is a gradual increase in the percentage of the population who had a degree or higher up until around the age of 45–49, beyond that age and especially beyond the age of 60 years, the percentage declines substantially. The rise in the proportion of the Indigenous population with a degree or higher up until the population in their mid-forties reflects the relatively late age at which Indigenous Australians undertake education (Biddle 2006 and later in this paper).

Ultimately, what Fig. 5 shows is that as those who grew up during periods of relatively low education participation die off and younger cohorts enter adulthood, the level of education attainment will inevitably rise. However, in assessing the response of Indigenous Australians to the apparently large economic incentives to undertake education, and from the point of view of improving future outcomes relative to the non-Indigenous population, what are important are current rates of participation. These are given in Table 3, for those aged 15–24 and those aged 25 and over. Indigenous Australians aged 15–24 are broken

Table 3. Indigenous and non-Indigenous school and non-school education participation by age group for IREGs, 2006

	Indigenous				Non-Indigenous		Ratio	
		Aged 15–24		Aged	Aged	Aged	Aged	Aged
IREG	School	Non-school	Total	25+	15–24	25+	15–24	25+
Queanbeyan	22.8	11.8	34.6	6.9	53.3	4.3	0.65	1.6
Bourke	20.5	7.1	27.6	5.4	38.5	4.0	0.72	1.36
Coffs Harbour	26.1	16.2	42.3	8.0	53.6	4.2	0.79	1.88
Sydney	23.8	16.2	40.0	7.6	60.1	6.0	0.67	1.26
Tamworth	22.4	11.9	34.3	6.8	53.1	4.6	0.65	1.48
Wagga Wagga	23.7	13.8	37.5	6.6	53.2	4.2	0.70	1.57
Dubbo	27.3	10.4	37.7	6.1	47.4	4.1	0.80	1.5
Melbourne	25.6	20.1	45.7	8.8	61.8	5.4	0.74	1.62
Non-metropolitan Victoria	27.1	14.4	41.5	7.2	54.1	3.7	0.77	1.93
Brisbane	25.0	14.5	39.5	6.9	51.2	5.1	0.77	1.36
Cairns	26.7	6.0	32.7	5.4	41.8	4.4	0.78	1.21
Mt Isa	15.6	4.5	20.1	2.9	23.9	4.5	0.84	0.65
Cape York	13.2	2.8	16.0	3.6	29.0	4.0	0.55	0.89
Rockhampton	28.2	8.4	36.6	6.3	41.3	3.8	0.89	1.69
Roma	26.0	8.2	34.2	4.9	45.1	4.0	0.76	1.24
Torres Strait	19.3	9.0	28.3	6.8	21.2	7.0	1.33	0.97
Townsville	29.0	8.8	37.8	6.4	42.6	4.5	0.89	1.43
Adelaide	27.3	14.9	42.2	9.7	54.2	5.3	0.78	1.84
Ceduna	19.2	7.8	27.0	3.6	41.3	2.9	0.65	1.22
Port Augusta	18.1	4.7	22.8	4.3	43.1	3.9	0.53	1.13
Perth	23.8	13.0	36.8	7.8	53.7	5.3	0.69	1.47
Broome	17.1	9.8	26.9	5.1	29.9	6.4	0.90	0.8
Kununurra	10.5	4.4	14.9	1.8	19.1	4.9	0.78	0.36
Narrogin	19.8	8.8	28.6	7.1	41.8	3.2	0.68	2.2
South Hedland	18.1	6.0	24.1	3.7	30.0	4.8	0.80	0.78
Derby	9.3	3.4	12.7	3.0	17.8	4.1	0.71	0.72
Kalgoorlie	17.6	5.3	22.9	3.0	32.9	3.8	0.70	0.79
Geraldton	22.9	5.7	28.6	3.5	38.4	3.1	0.74	1.11
Tasmania	24.3	17.3	41.6	6.7	52.2	4.9	0.80	1.37
Alice Springs	19.6	5.7	25.3	5.1	41.2	7.5	0.61	0.68
Jabiru	11.1	1.7	12.8	2.2	14.8	6.5	0.86	0.34
Katherine	13.9	3.3	17.2	2.9	30.8	6.3	0.56	0.46
Apatula	9.0	1.6	10.6	2.7	14.4	3.8	0.74	0.71
Nhulunbuy	16.4	3.8	20.2	4.7	37.9	6.3	0.53	0.75
Tennant Creek	8.7	3.4	12.1	2.8	18.6	3.8	0.65	0.73
Darwin	30.7	8.5	39.2	7.4	41.6	7.2	0.94	1.03
ACT	25.9	21.2	47.1	9.3	61.6	8.6	0.76	1.08
Australia—total	**23.1**	**11.4**	**34.5**	**6.3**	**55.3**	**5.1**	**0.62**	**1.23**

Source: Customised calculations based on the 2006 Census of Population and Housing.

Table 4. Apparent retention rates: Indigenous and non-Indigenous Australians, 2006

Year levels	Indigenous	Non-Indigenous	Ratio
Years 7/8–10	91.3	98.9	0.92
Years 10–12	46.7	76.0	0.61
Years 7/8–12	40.1	77.1	0.52

Source: DEEWR (2008), based on student administrative databases from each State or Territory.

down into those at school and those participating in non-school education (university or trade-based qualifications). Results are once again presented for the IREGs outlined in Fig. 1.

Nationally, 23.1 per cent of the Indigenous population aged 15–24 were participating in secondary schooling at the time of the 2006 Census, with a further 11.4 per cent participating in other forms of education, such as university or trade-based qualifications. Together, this equates to 34.5 per cent of 15–24 year olds participating in any form of education, a rate less than two-thirds that of the non-Indigenous population. There was only one region, the Torres Strait, where participation rates were higher for the Indigenous population aged 15–24 compared to the non-Indigenous population.

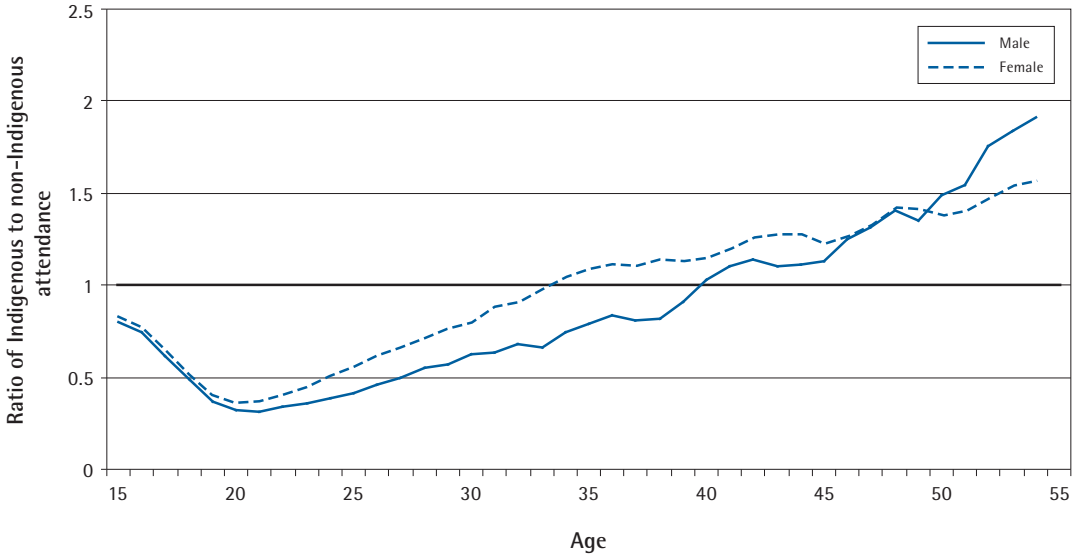
While remote regions tended to have the lowest levels of participation, there is enough variation to conclude that local conditions matter. This is highlighted by considering two regions in the Northern Territory—Nhulunbuy and Apatula. Despite being two of the most remote regions in Australia, there is considerable difference in the rate of participation, with Apatula (10.6%) having the lowest rate of participation in Australia, but Nhulunbuy (20.2%) having a relatively high rate.

Another way to express the currently low level of education attainment and participation for the Indigenous population is through apparent retention rates. That is, the estimated proportion of a particular population who reach a certain level of high school education from a given base year. These are summarised in Table 4 for the Indigenous and non-Indigenous population, alongside the ratio between the two. Three apparent retention rates are given: Years 7/8–10; Years 10–12; and Years 7/8–12.[7]

Table 4 shows that the Indigenous population enrolled in Year 10 in 2006 made up only 91.3 per cent of the population enrolled in Year 7/8, three or four years previously. While quite high, this figure is much less than the apparent retention rate of the non-Indigenous population over the same period (98.9%). The gap between the Indigenous and non-Indigenous populations widens when one expresses the Year 12 population in 2006 as a percentage of the Year 10 population two years earlier. Putting these two sets of results together, the estimated percentage of the Indigenous population from the start of the period in Year 7/8 that were still enrolled at the end of the period in Year 12 is only a little higher than half that of the non-Indigenous population. Clearly the Indigenous population drops out of high school at a much higher rate than the non-Indigenous population.

On face value, the results presented up until now for the Indigenous population call into question the validity, or at least universality, of this human capital approach to education. Figs. 3 and 4 showed the relatively large benefits of education for the Indigenous population in terms of employment probabilities and income once employed. However, Tables 1–4 showed historically and contemporarily low rates of attendance and completion. The question is, therefore, why are Indigenous Australians not responding to the apparently high economic benefits of undertaking education?

Fig. 6. Ratio of Indigenous to non-Indigenous education participation by age: Males and females, 2006



Note: Because of the relatively small Indigenous populations for certain age groups who have completed Year 12, the above graph represents a three year moving average. For example, the data point for those who are aged 20 represents the difference for those who are aged 19, 20 and 21.

Source: Customised calculations based on the 2006 Census of Population and Housing.

The answer to the above question is threefold. Firstly, Indigenous Australians are participating in education; they are just doing so later in life. Secondly, amongst youth there are high economic, social and cultural costs of education. Thirdly, Indigenous children start school with lower levels of cognitive and non-cognitive ability as valued in the formal education system, making education more difficult and more costly. Each of these explanations will be discussed in turn.

INDIGENOUS EDUCATION PARTICIPATION ACROSS THE LIFE CYCLE

The first response to the question of why Indigenous Australians are not responding to the relatively high benefits of education is that they are—they are just doing so later in life. This is demonstrated to a certain extent in the final column of Table 3, through the ratio of Indigenous to non-Indigenous education participation for the population aged 15 and over. In this age group there were 1.23 times as many Indigenous Australians undertaking education as there were non-Indigenous Australians. The age patterns of relative education attendance are further demonstrated by Fig. 6, which gives the ratio of Indigenous to non-Indigenous attendance by age. Males and females are plotted separately.

Fig. 6 shows that Indigenous Australians start off participating in education somewhat close to the same rate as non-Indigenous Australians at age 15. At that age, 82.8 per cent of Indigenous males and 86.3 per cent of Indigenous females are participating in some form of education, compared to 95.7 per cent and 96.8 per cent of non-Indigenous males and females respectively. The relative rate of participation declines dramatically, such that by the age of 20, Indigenous Australians are about one-third as likely to be participating in education as non-Indigenous Australians. Specifically, between the ages of 19 and 21, 14.7 per cent of Indigenous males were attending education compared to 45.6 per cent of non-Indigenous

females. For the same age group, the corresponding rates for Indigenous and non-Indigenous females were 17.8 and 50.1 per cent respectively.

Beyond the low relative rates of attendance reported for Indigenous Australians in their early twenties, there is a steady increase by age, at least up until the age of 54. There is a higher rate of participation in education for Indigenous females from the age of 33 and onwards, and for males from the age of 40 and onwards. Looking at the total population aged 15 and over, Indigenous males are in fact 6.4 per cent more likely to be attending education at a given point in time than non-Indigenous males, and Indigenous females are 12.6 per cent more likely—this is, of course, partly driven by the relative age profiles.

It would seem, therefore, that the level of disengagement by Indigenous Australians with education is lessened when viewed over the entire life cycle. However, three things should be kept in mind when considering these results. Firstly, the currently high rates of education attendance for Indigenous Australians beyond their mid- to late-thirties is driven mainly by the population catching up with the non-Indigenous population, due to low rates of attendance at a younger age. In other words, there is no age at which Indigenous Australians have higher levels of qualifications than the non-Indigenous population. Secondly, in Fig. 6 all types of education are considered under the general heading of education attendance or participation. However, rates of attendance at university, which has been shown to have the biggest impact on income and employment, remain low for the Indigenous population.

The final thing to keep in mind when considering the results presented in Fig. 6 is that the benefits of education accrue over a person's entire lifetime. This is true whether it be the economic, health or social benefits of education. An Indigenous Australian who completes a qualification at the age of 35 is still likely to experience a better chance of finding employment, higher income and, possibly, better health and standing within the community than if they did not. However, the total benefit of this qualification over the life course is going to be much less than if they completed that qualification when they were in their early twenties.

THE COSTS OF EDUCATION AND INDIGENOUS MARGINALISATION

Having shown that Indigenous Australians do eventually participate in education at relatively high rates, the question posed earlier can perhaps be better rephrased to: 'Why do Indigenous Australians not respond to the apparently high economic benefits of education when they are young?' In answering this question, it is worth considering the other side of the decision—the costs of education. That is, there may be very few Indigenous Australians who foresee large enough financial benefits of education to outweigh the social, cultural and unobserved economic costs. Considering these costs provides a useful way to understand the marginalisation faced by Indigenous youth with regards to formal education.

Internationally, there are a number of papers that consider the different and generally higher costs of education for minority groups. Akerlof and Kranton (2002) as well as Austen-Smith and Fryer (2005) consider situations where a minority subgroup faces a trade-off between higher wages and the social stigma one gets from their own subgroup. This stigma results from expending time in an activity associated with the majority group. These economic models follow a large body of sociological and ethnographic evidence that certain population subgroups view effort in education as a form of 'selling-out.' The most commonly cited research on this issue is *Learning to Labour: How Working Class Kids Get Working Class Jobs* (Willis 1977), which studied the resistance to dominant culture by working-class youth in inner-city England. Other examples of research in this area include Baumeister and Muraven (1996), Fordham and Ogbu (1986), and Hirschman, Lee and Emeka (2003). While the extent to which the fear of 'acting white' affects people's actual behaviour is a subject of debate, it is generally accepted that different population subgroups perceive different social outcomes from undertaking education.

Table 5. Marginal effects on the probability of participating in high school: Indigenous and non-Indigenous males and females, 2001[a]

	Indigenous		Non-Indigenous	
Explanatory variables	Male	Female	Male	Female
Aged 16	−0.273	−0.235	−0.228	−0.170
Aged 17	−0.463	−0.449	−0.434	−0.325
Speaks another language and English well	n.s.	−0.035**	0.071	0.055
Speaks another language and English not well	−0.126	−0.180	n.s.	−0.126
Torres Strait Islanderb	n.s.	0.037*	n.a.	n.a.
Born overseas	n.s.	n.s.	0.017	0.009
Parents born overseas	n.s.	n.s.	0.012	0.004
Moved between 1996 and 2001	−0.031*	−0.074	−0.043	−0.053
Victoria	n.s.	0.044*	0.042	0.045
Queensland	0.039	0.034	0.025	0.020
South Australia	0.054*	0.045*	0.026	0.024
Western Australia	−0.093	−0.065	−0.074	−0.058
Tasmania	−0.074	−0.091	−0.080	−0.100
Northern Territory	n.s.	n.s.	n.s.	n.s.
Australian Capital Territory	0.098**	0.088*	0.059	0.031
Inner regional	n.s.	n.s.	−0.003**	−0.003*
Outer regional	n.s.	n.s.	n.s.	0.006
Remote	−0.049*	n.s.	−0.017	0.011*
Very remote	−0.080	n.s.	−0.087	−0.015*
Single person household	n.s.	n.s.	−0.164	−0.191
Highest education in the household a degree	0.183	0.105	0.119	0.080
Highest education other qualification without Year 12	0.060	n.s.	0.017	0.011
Highest education other qualification with Year 12	0.148	0.069	0.078	0.053
Highest education Year 12 but no qualification	0.113	0.050	0.072	0.049
At least one adult with different Indigenous status	0.054	0.057	−0.138	−0.156
Extra person in the household	n.s.	n.s.	−0.009	n.s.
Child under 15 in the household	0.076	0.064	0.058	0.041
Extra person per bedroom	−0.045	−0.050	−0.039	−0.045
Household owns or purchasing home	0.104	0.093	0.063	0.054
Equivalised income of others in the household	0.027	0.038	0.023	0.020
Probability of the base case	0.707	0.788	0.853	0.901
Pseudo R-squared	0.1849	0.1844	0.1913	0.1984
Number of observations	8,220	8,123	264,891	251,731

Notes: a. Base case: aged 15; speaks English only; born in Australia; both parents born in Australia; does not identify as a Torres Strait Islander; did not change usual residence between 1996 and 2001; lives in New South Wales; lives in a major city; no-one in the household has completed Year 12 or has a qualifications; no adults in the household are of a different Indigenous status; no children under 15 in the household; lives in a four-person household with one person per bedroom; does not live in a household where someone owns or is renting the home; and the household has a equivalised income of $508.

b. Includes those who identify as both Aboriginal and Torres Strait Islander.

n.s. = those not significant at the 10% level.

** = those significant at the 10% but not at the 5% level.

* = those significant at the 5% but not the 1% level.

All else are significant at the 1% level.

Source: Customised calculations based on the 2001 Census of Population and Housing.

There are parallels with these international situations for the Australian Indigenous population. According to a detailed ethnographic study of the Indigenous population in an inner-city area, 'there appeared to be less shame in running the streets than fighting a losing classroom battle', and 'resisting school offered a sense of solidarity, another individual struggling against the wider oppression and rejecting success offered by the system under its own terms' (Munns & McFadden 2000: 67).

This resistance can be traced in part to the historic institutional racism faced by Indigenous Australians in the formal education system. As far back as 1840 the Protector of Aborigines in Adelaide, South Australia stated that 'Our chief hope now is decidedly in the children; and the complete success as far as regards their education and civilisation would be before us if it were possible to remove them from the influence of their parents' (cited in Parbury 1999). While this was of course not a universally held view throughout the history of Indigenous education in Australia, it is clear from Parbury (1999) and the sources cited that many saw the role of formal education as being one of civilising or 'Christianising' the Indigenous population. Even today, many Indigenous youth would have family members who were part of the stolen generation—people who were removed from their families by the State.

Given the role of previous (and potentially even current) racist practices in shaping the resistance of Indigenous youth towards formal education, the social costs and benefits of education are likely to be heavily influenced by a person's household context. Those households where someone has had a positive experience with education themselves are likely to be more encouraging of children and youths in the household attending and completing high school, and better able to mitigate some of the perceived racism and alienation that constitute a large social cost of education (Schwab 1999). Furthermore, to be successful at late secondary school, it is likely to be beneficial to have a quiet area within the home where the student can prepare for exams and assignments. The number of other people in the household interacted with, and the size and quality of the house the student lives in are therefore likely to impact on a youth's desire to continue on at school.

In addition to the social and cultural costs of education, there are also economic costs that are often not taken into account when considering the education decisions of Indigenous Australians. Primarily, the fact that Indigenous Australians live in relatively remote parts of the country (as shown in Fig. 2) means that the direct transport costs of attending school (in particular later years of secondary school) are much higher. Costs are going to be higher for those who travel long distances to an education institution on a daily basis, as well as for those who leave their place of usual residence to attend education either by staying with family members or through boarding school options. As shown in Taylor and Stanley (2005), there are many remote schools for which the infrastructure is lacking, or of sufficiently poor quality to deter Indigenous students from attending.

The impact that a person's household and area-level context can have on their lack of engagement with formal schooling is demonstrated by Table 5. For the results presented in this table, a regression approach is followed, with the probability of a person aged 15, 16 or 17 participating in high school; the main variable of interest and other characteristics of the individual; their household and their area used as explanatory variables. Results are presented as marginal effects, or the difference in the probability of participating in education for a person with that particular characteristic compared to the base case (as described below the table). A separate estimation is given for Indigenous and non-Indigenous males and females with background information on the variables available in Biddle (2007a).

According to Table 5, Indigenous males who live in remote or very remote Australia are less likely to be participating in high school than those in more urbanised parts of the country. Even after controlling for individual and geographic factors, the characteristics of a person's household were found to have a strong association with education attendance.

Table 6. Marginal effects of peer attendance on the probability of participating in high school education

	High school peer effect	Other student peer effect
Indigenous male	0.022	n.s.
Indigenous female	0.026	0.010**
Non-Indigenous male	0.032	n.s.
Non-Indigenous female	0.020	n.s.

Notes: n.s. = those not significant at the 10% level
** = those significant at the 10% but not at the 5% level
* = those significant at the 5% but not the 1% level.
All else are significant at the 1% level.

Source: Customised calculations from the 2001 Census of Population and Housing. The predicted probability of the base case, pseudo R-squared, sample size, coefficient estimates and p-values are given in Appendix Tables 7A.5–7A.8 in Biddle (2007a).

Education levels in the household generally had a significant association with a youth's probability of attending high school, especially for Indigenous males. Having someone in the household with a degree had the largest marginal effect, with both Indigenous males and females having a predicted probability close to 0.90 if they lived in such households (found by adding the marginal effect to the probability of the base case). Even for those households without anyone with a degree, the predicted difference in probability was quite large between those who have someone who has completed Year 12 and someone who has not. The marginal effect for those households where no one had completed Year 12, but someone had a non-degree qualification was in general much smaller, and the variable was insignificant for Indigenous females. That is, it is not only the level of education of those in the household that is important, but also the type of education. Nonetheless, there is a clear relationship between the education levels of those in the household and the participation rates of the younger generation therein.

The number of people in the household generally did not have a significant effect. However, the number of people per bedroom did. This implies that it is overcrowding itself that reduces education participation, rather than living in large households per se. Finally, access to economic resources, whether as measured by home ownership or income, had a significant and positive association with attendance. Whether it is education, housing or income, a person's socioeconomic context explains a large proportion of the variation in Indigenous high school participation, and is therefore a key explanation of their educational marginalisation.

Those with poor language skills are less likely to be attending high school. However, speaking a language other than English but also speaking English well does not have a significant association for Indigenous males, and is only significant at the 10 per cent level of significance for Indigenous females. In other words, it is not speaking an Indigenous language that is associated with lower attendance at high school but rather English language skills themselves.

The results in Table 5 show that those in very remote, and to a lesser extent remote, Australia are less likely to be attending high school than those in cities and regional areas. However, other characteristics of the area are also likely to have an association, including characteristics of those who live in the area. The attendance and completion rates of one's peers and role models are likely to influence the relative social acceptance of attending or not attending high school. In the language of the HCM, those areas with a high proportion of people attending or having completed education are likely to have a relatively low social cost of education.

Table 7. Marginal effects of role model completion on the probability of participating in high school education

Population subgroup and explanatory variable	Marginal effect
Indigenous male	
Percentage aged 18–29 completed Year 12	0.035
Percentage aged 30 and over completed Year 12	n.s.
Percentage aged 18–29 with qualifications	–0.017*
Percentage aged 30 and over with qualifications	0.042
Indigenous female	
Percentage aged 18–29 completed Year 12	0.035
Percentage aged 30 and over completed Year 12	n.s.
Percentage aged 18–29 with qualifications	n.s.
Percentage aged 30 and over with qualifications	n.s.
Non-Indigenous male	
Percentage aged 18–29 completed Year 12	0.026
Percentage aged 30 and over completed Year 12	0.008
Percentage aged 18–29 with qualifications	–0.002**
Percentage aged 30 and over with qualifications	0.007
Non-Indigenous female	
Percentage aged 18–29 completed Year 12	0.019
Percentage aged 30 and over completed Year 12	0.005*
Percentage aged 18–29 with qualifications	n.s.
Percentage aged 30 and over with qualifications	0.004**

Notes: n.s. = those not significant at the 10% level
** = those significant at the 10% but not at the 5% level
* = those significant at the 5% but not the 1% level.
All else are significant at the 1% level.

Source: Customised calculations from the 2001 Census of Population and Housing. The predicted probability of the base case, pseudo R-squared, sample size, coefficient estimates and p-values are given in Appendix Tables 7A.9–7A.12 in Biddle (2007a).

Results presented in Tables 6 and 7 summarise the association between education and labour market characteristics of the area in which people live, and their own participation in education. Results are presented separately for two sets of area-level variables, peer group effects and role model effects, with the results focusing on the marginal effects for these variables only. It should be kept in mind that the equations estimated still contain the individual, household and geographical variables from Table 5, with full results given in Biddle (2007a). The marginal effects in these two tables represent the predicted change in the probability of attending high school from a one-standard deviation increase in that particular variable from its mean value whilst holding all other variables constant.

The first type of area-level variable that is constructed is the proportion of the rest of the population in the area aged 15–17 who are currently attending high school (excluding those who have already completed high school). Peer group effects are calculated for Indigenous and non-Indigenous males and females

separately. The measured association between the education participation of a person's peers and their own participation can be interpreted in two ways. Firstly, it may be capturing the direct influence of other individuals in the area through things like social norms and peer group pressure. That is, if other students are attending school at a relatively high rate, then a prospective student in the area is less likely to have a social network outside of school, especially during school hours, and less likely to feel ostracised for their own attendance.

In addition to this direct effect, the peer group variable may also be capturing unobserved area-level characteristics that impact on both the individual and the individual's peers. For example, if there is a high quality school in the area responsive to Indigenous student's needs, then although this is not observed in the census, it will likely increase the attendance rate of both the individual and their peers. This will be picked up in the estimations as a correlation between the two variables. Either way, under both interpretations the association with the peer group variables and attendance of the individual will give a good summary indication of the extent to which area-level characteristics matter.

The first peer group variable is the percentage of those aged 15–17 in the area attending high school. The second variable is the percentage attending other types of education. The association with the two dependent variables are presented in separate columns with a separate row for Indigenous and non-Indigenous males and females (for whom separate estimates were undertaken).

The proportion of the population who are attending high school in the area has a significant and positive association with a person's own high school attendance for Indigenous and non-Indigenous males and females. The change in the predicted probability from a one-standard deviation increase ranges from 0.020 to 0.032 which, although not large, is still higher than the association with a number of individual and household variables (for example, household income). While it is a little difficult to interpret such a variable, at the very least it shows that characteristics of the area matter. That is, rather than geographical areas just being a collection of individuals influenced by their own or their household's characteristics, the results in Table 6 give some indication that characteristics of the area affect individual outcomes. It may also be the case that either the individual's peers are having a direct effect, or there may be some other unobserved characteristics affecting both individual and those around them. However, the results are certainly an indication that any policy response to relatively low attendance at high school needs to take geography into account.

Interestingly, the proportion of the population attending other education does not seem to have a significant negative association with whether or not the individual attends high school. Indeed, for Indigenous females, there is a small positive association. In other words, it would seem that having others in the area attending non-school education does not draw youths in the area away from high school, but rather draws its numbers from those that would not be attending any education.

The second set of area-level variables (summarised in Table 7) capture characteristics of two older cohorts of individuals in the area. The first two variables measure the percentage of the population aged 18–29 and aged 30 and over in the area that they completed Year 12. The second two measure the proportion of the same two cohorts who have completed a post-school qualification. Both sets of variables are calculated separately for Indigenous and non-Indigenous males and females.

The high school variables may be capturing the social acceptance and expectation of high school education in the area. That is, those areas with a high proportion of the population who have completed Year 12 are more likely to expect the younger generation to complete Year 12 themselves, and there may be greater acceptance in the community of the social benefits and other externalities of high school.

The qualification variables are likely to have two effects, each working in different directions. Firstly, a relatively high proportion of the population who have completed qualifications in the area may lead to

greater acceptance of an alternative form of education, leading to youths being less likely to attend high school and more likely to attend other forms of education. Alternatively, high school is often a prerequisite for other types of education and hence a high proportion of the population with qualifications may lead to students also wanting to undertake post-secondary education, and helping them see the benefit of completing high school first.

Identifying the association with the Year 12 completion rates in the area and the education participation of those aged 15–17 will help target those areas where education participation could be expected to be low. In addition, it will give some indication of the potential future externalities from increasing the attendance rates of today's youth. Because qualification levels are more amenable to current policy interventions, the association with these variables may also show ways in which the education participation of adults can improve the education participation of today's youth. Once again, results are presented as the predicted change in the probability of the particular event occurring from a one-standard deviation increase from the mean for the four role model variables.

If there are a large proportion of those aged 18–29 who have completed Year 12 in a given area, then both Indigenous and non-Indigenous youth are more likely to be attending high school. There is no association between the high school education levels of the older cohort and participation of Indigenous youth, and for the non-Indigenous population the magnitudes are quite small. This implies that youth respond to the level of high school completion of their nearest contemporaries, rather than older adults in the area.

The associations with the qualifications variables are, however, somewhat different. For Indigenous females, there is no significant association with either cohort. For males, however, having a high proportion of the population aged 30 years and over with qualifications is associated with a higher probability of attending high school. Given previous discussion in this paper has shown that Indigenous Australians obtain their qualifications at relatively high rates in their thirties and beyond, this quite possibly reflects the expectation in these areas of completing high school as a prerequisite for post-school qualifications. Compared to this, living in an area with a high proportion of the population aged 18–29 with qualifications is associated with a lower probability of attending high school for males, and Indigenous males in particular. This could reflect a socially acceptable and physically accessible alternative to high school that draws youth away from school.

THE IMPORTANCE OF THE EARLY YEARS

In most of the discussion of the results already presented in this paper, an implicit assumption has been that youth or adults make the decision about whether to complete the latter years of high school or post-school qualifications by weighing up current costs with future benefits. While this may be the case, it is also likely to be true that by the time they come to make this decision much has already occurred in their life that influences how they view formal education. To put it another way, the early years are a vital part of the explanation regarding Indigenous education marginalisation in later life.

Some of the experiences that are likely to impact on an Indigenous person's later education participation are related to their experiences in preschool and the early years of formal school. Table 8 gives the percentage of Indigenous and non-Indigenous children aged 3–5 who were attending preschool at the time of the 2006 Census (by IREG), after excluding those who had already started kindergarten or infants school. The third column gives the ratio of the percentages between the two populations.

In addition to a child's experience with early childhood education, their home environment is likely to have a strong influence on how ready they are for school and how successful the school experience is. There are a number of aspects of a child's home environment that impact on their early school experience.

Table 8. Select child outcomes by IREG, 2006

IREG	Attending preschool (3–5 years)			One parent households (0–14 years)			At least one resident employed (0–14 years)		
	Indigenous	Non-Indigenous	Ratio	Indigenous	Non-Indigenous	Ratio	Indigenous	Non-Indigenous	Ratio
Queanbeyan	50.7	66.5	0.76	49.4	19.5	2.54	52.9	84.8	0.62
Bourke	56.3	63.3	0.89	45.0	20.9	2.15	51.2	80.5	0.64
Coffs Harbour	63.2	69.6	0.91	49.9	22.7	2.20	54.2	82.4	0.66
Sydney	57.7	64.5	0.89	52.5	15.8	3.32	56.4	86.0	0.66
Tamworth	54.1	67.2	0.81	50.5	18.3	2.76	48.9	84.3	0.58
Wagga Wagga	50.8	61.9	0.82	48.4	17.8	2.73	50.8	85.7	0.59
Dubbo	50.2	63.4	0.79	51.2	18.3	2.79	50.6	84.0	0.60
Melbourne	46.4	59.1	0.79	48.4	16.2	2.99	61.6	86.6	0.71
Non-metropolitan Victoria	48.2	53.9	0.89	52.4	19.1	2.74	50.4	84.9	0.59
Brisbane	49.8	52.2	0.95	43.9	19.4	2.27	66.2	86.9	0.76
Cairns	44.6	47.2	0.94	45.1	20.0	2.26	65.8	86.4	0.76
Mt Isa	30.7	46.2	0.66	37.9	13.2	2.87	65.8	92.0	0.72
Cape York	31.8	49.0	0.65	36.2	10.8	3.36	84.8	90.0	0.94
Rockhampton	43.0	45.9	0.94	43.1	19.2	2.24	62.1	83.3	0.75
Roma	47.8	48.3	0.99	44.0	17.7	2.48	59.5	84.7	0.70
Torres Strait	39.4	65.6	0.60	31.1	11.9	2.61	85.8	91.3	0.94
Townsville	41.8	45.8	0.91	43.0	16.7	2.57	62.6	87.0	0.72
Adelaide	59.2	56.4	1.05	54.0	19.5	2.77	49.9	84.8	0.59
Ceduna	58.3	55.2	1.06	43.8	15.5	2.83	60.7	89.1	0.68
Port Augusta	52.4	55.9	0.94	44.9	21.0	2.14	58.3	79.8	0.73
Perth	48.3	51.6	0.93	50.8	16.9	3.01	52.3	87.2	0.60
Broome	38.0	51.4	0.74	36.6	11.4	3.21	67.8	87.2	0.78
Kununurra	37.2	44.0	0.85	43.6	7.6	5.75	73.0	91.8	0.79
Narrogin	50.8	51.9	0.98	40.7	17.7	2.30	53.0	85.5	0.62
South Hedland	45.2	51.7	0.87	35.8	6.9	5.20	65.7	93.6	0.70
Derby	34.0	41.8	0.81	37.4	10.1	3.71	80.2	90.6	0.89
Kalgoorlie	47.6	52.1	0.91	39.5	14.0	2.81	66.3	89.4	0.74
Geraldton	48.1	53.2	0.90	44.0	15.0	2.93	53.0	85.7	0.62
Tasmania	35.8	38.2	0.94	37.2	21.0	1.77	64.8	82.1	0.79
Alice Springs	42.8	56.2	0.76	50.8	12.4	4.09	61.0	94.1	0.65
Jabiru	27.4	54.3	0.50	28.2	12.6	2.25	69.9	86.5	0.81
Katherine	36.0	52.9	0.68	32.7	12.3	2.65	68.6	88.8	0.77
Apatula	26.5	57.5	0.46	29.6	7.0	4.24	51.7	97.4	0.53
Nhulunbuy	35.3	44.8	0.79	38.0	5.0	7.64	62.7	96.0	0.65
Tennant Creek	25.0	58.1	0.43	31.1	9.9	3.15	49.0	87.2	0.56
Darwin	47.1	54.7	0.86	46.4	17.6	2.63	62.7	89.1	0.70
ACT	55.6	51.7	1.07	43.9	16.0	2.75	67.5	91.4	0.74
Australia—total	**47.8**	**57.5**	**0.83**	**45.3**	**17.8**	**2.54**	**59.4**	**85.8**	**0.69**

Source: Customised calculations based on the 2006 Census of Population and Housing.

Two such aspects, which are presented in Table 8, are the percentage of the population in one-parent households, and the percentage of the population for whom at least one resident is employed. Percentages are given for Indigenous and non-Indigenous Australians aged 0–14 years, as well as the ratio between the two populations.

Looking at the first column of results in Table 8, one can see that nationally, less than half of the eligible Indigenous population aged 3–5 years was attending preschool at the time of the 2006 Census. Furthermore, much of the variation within the Indigenous population appears to be occurring at the State level: more than half of the population was attending preschool in all the IREGs of New South Wales; two out of the three regions in South Australia; and the Australian Capital Territory. On the other hand, there was only one other region—Narrogin in Western Australia—that had a value greater than 50 per cent. While participation was lowest predominantly in remote regions, there were a number of large cities or regional parts of the country with values below the national average. These included Melbourne, Perth, Tasmania, Alice Springs and Darwin.

Nationally, the Indigenous population has lower rates of preschool attendance than the non-Indigenous population. In considering the scale of the ratio presented in Table 8 (0.83), it is worth revisiting the value reported in Table 3 for the percentage of those aged 15–24 attending school (0.62). Crudely speaking, it would appear that disengagement with formal education starts from a young age and continues throughout an Indigenous Australian's early years. Leigh and Gong (2009) report a similar widening by age in the disparity between the Indigenous and non-Indigenous population with regards to test scores.

While there were three regions where the Indigenous rate of attendance was half the rate of non-Indigenous attendance, there were also three regions where the Indigenous population had higher rates. These were Adelaide and Ceduna in South Australia, and the Australian Capital Territory. It is worth noting that these two jurisdictions had, at the time of the 2006 Census, amongst the most generous provision of publicly funded preschools in Australia. So, while it may be the case that parents of Indigenous children are using preschool as a form of subsidised child care in these regions, this does not take away from the finding that when the government provides a high level of support, Indigenous Australians are likely to benefit from a much better start to their formal schooling.

There is strong evidence that children who live with both their parents for as many years as possible do better throughout their life across a range of outcomes, including educational attainment (Krein and Beller 1988; Haveman and Wolfe 1995). It is of course true that an intact family that is otherwise highly dysfunctional may also lead to negative outcomes, and that many children from single parent homes turn out to be highly successful youth and adults. However, all else being equal, living in a single parent household is a strong predictor of financial difficulties and instability. The fact that Indigenous children are at least two and a half times as likely to live in such households nationally is therefore a key potential explanation for the marginalisation that they face with regards to their schooling later in life. Single parent families are less likely to have time to support their child's development and more likely to struggle to pay for the learning resources that make that job easier.

The highest proportion of Indigenous children in single parent households is in the large capital cities, with more than half of the Indigenous children in Sydney, Adelaide and Perth living in such households. There are also high rates in many regional areas including Tamworth, Dubbo, non-metropolitan Victoria and Alice Springs.

There is a strong universal social security safety net within Australia. There is obviously more to disadvantage and social exclusion than income, and even looking at income alone there is still a minority of individuals and families who 'slip through the cracks', particularly amongst Indigenous Australians and those in remote Australia. This safety net notwithstanding, income from employment remains the key

Table 9. Percentage of population who meet reading, writing and numeracy benchmarks: Indigenous Australians and 'all students' by year level and geolocation, 2006

	Indigenous				All students				Ratio			
	Metro.[a]	Prov.[b]	Remote	Very remote	Metro.	Prov.	Remote	Very remote	Metro.	Prov.	Remote	Very remote
Reading												
Year 3	86.1	83.3	68.0	53.8	93.8	92.0	87.9	71.4	86.1	83.3	68.0	53.8
Year 5	72.6	67.8	58.9	34.7	89.5	86.8	80.0	57.5	72.6	67.8	58.9	34.7
Year 7	70.1	67.1	45.2	27.7	90.3	87.8	78.3	54.3	70.1	67.1	45.2	27.7
Writing												
Year 3	84.9	82.6	64.4	46.0	94.8	93.2	86.1	65.8	84.9	82.6	64.4	46.0
Year 5	85.1	78.5	62.4	41.9	94.7	93.0	83.5	63.0	85.1	78.5	62.4	41.9
Year 7	82.1	76.3	53.1	39.3	93.7	90.8	80.8	62.4	82.1	76.3	53.1	39.3
Numeracy												
Year 3	79.8	82.7	64.6	50.2	93.6	92.7	85.6	67.2	79.8	82.7	64.6	50.2
Year 5	73.7	70.2	48.6	28.6	91.3	89.5	78.6	53.4	73.7	70.2	48.6	28.6
Year 7	53.9	49.4	35.4	20.2	81.8	77.4	71.7	47.1	53.9	49.4	35.4	20.2

Note: a. 'Metro.' = metropolitan Australia.
b. 'Prov.' = provincial Australia.
Source: DEEWR 2008: 190.

source of economic resources for most families and households. An absence of even one employed person in a household is therefore a key predictor of financial disadvantage and stress.

More than just income, living in a jobless household may have an impact on how a child views and engages with society and the economy. The weak response to the employment benefits of education has been identified earlier in this paper as one of the paradoxes of Indigenous education in Australia. However, if a child has not spent much time living in a household where someone is employed, it will be difficult for them to accurately gauge the benefits that employment, and hence greater income, can bring. This lack of exposure to the benefits that education can bring is one of the aspects of welfare dependency highlighted by Noel Pearson, amongst others (Cape York Institute for Policy and Leadership (CYI) 2008b).

CYI: Cape York Institute for Policy and Leadership

Nationally, only 59.4 per cent of Indigenous children aged 0–14 live in a household where at least one person is employed. This is slightly less than 70 per cent of the non-Indigenous rate, despite the fact that Indigenous households are much larger on average than non-Indigenous households (with medians of 3.4 and 2.6 persons per household respectively).

Despite the fact that employment prospects for the Indigenous population are worst in remote Australia, the lowest percentage of children in households with an employed adult was found in the IREG of Tamworth in New South Wales. The somewhat high rates of living with employed adults in many remote regions reflects the relatively large household size in these areas, as well as the presence of the Community Development Employment Projects (CDEP) scheme in much of remote Australia.[8]

CDEP: Community Development Employment Projects

The three aspects of the early years of Indigenous children, as well as other factors such as the number of books and other education resources in the home (De Bortoli & Cresswell 2004), are all likely to contribute

in different ways to the development of a child's ability in formal education. There are two components of ability that are assumed to influence outcomes: cognitive and non-cognitive ability. Cognitive ability refers to a person's intelligence or scholastic aptitude and is traditionally measured by instruments like IQ tests. Non-cognitive ability refers to things like self-discipline, motivation and time preference that are not traditionally measured by IQ tests, but nonetheless have been found to influence academic achievement (Duckworth & Seligman 2005). Furthermore, non-cognitive ability has effects on academic achievement and future economic prospects, even after controlling for the effect of cognitive ability (Heckman & Masterov 2005).

There is no evidence to suggest that any ethnically based group has lower innate levels of ability, so it must be assumed that the distribution within the Indigenous population is no different to that of other groups. The fact that by Year 3 (when children are roughly 8–9 years old) there is already a large gap between Indigenous and non-Indigenous Australians on national literacy and numeracy tests would suggest that the constraints on the development of Indigenous children's cognitive ability start early in life and continue throughout their schooling.

This is further demonstrated by Table 9, which shows the percentage of Indigenous Australians who meet the benchmarks in reading, writing and numeracy, with those in Years 3, 5 and 7 presented separately. Results are also given for 'all Australians' as well as the ratio between the two percentages. Results are given by geolocation, a geographic disaggregation similar to remoteness.[9]

For all geolocations and for reading, writing and numeracy, the percentage of the Indigenous population who meet the benchmarks decline as year level rises. Although this also occurs for the population as a whole, the decline is much faster for the Indigenous population. This results in the gap between Indigenous Australians and the rest of the population increasing as students progress further through formal schooling. Furthermore, the gap between the Indigenous and total populations starts off higher in very remote Australia but also declines faster across year levels.

It is important to reiterate that the lower levels of ability measured for the Indigenous population are unlikely to be related to any innate qualities or lack thereof. Rather, it would be more accurate to say that the abilities that Indigenous children possess and develop are not always valued highly in the formal education system. This is an important distinction, because there is strong evidence that those with low ability find education more difficult and hence, following the language used in this paper, more costly. In other words, by the time many Indigenous Australians reach school-leaving age and for many years before, post-compulsory schooling can become difficult enough for it not to seem worthwhile economically or socially.

THE SCHOOLING EXPERIENCE OF INDIGENOUS AUSTRALIANS

The previous discussion in this paper identified a number of processes by which the education development of Indigenous Australians is constrained. These include: high economic costs associated with remoteness; high social and cultural costs; constraints on the development of education-related cognitive and non-cognitive ability; and a lack of quality early childhood education. These 'out of school' factors tell only one side of the story—the demand for education by Indigenous children and their families. However, equally important for understanding the processes of educational marginalisation is the supply side, or the way in which school and other education services are provided to the Indigenous population.

SCHOOL SECTOR

One of the potential reasons for differential development of cognitive and non-cognitive ability is the type of school sector that Indigenous and non-Indigenous students attend. In Australia, there are three main education sectors: the government sector (administered by the applicable State or Territory education departments); the Catholic school system; and other non-government schools. Government or public schools do not charge fees and generally accept students based on geographic criteria.[10] The other two sectors also receive funding from the government, but in addition they charge fees for attendance. Although they follow a similar curriculum to the government sector, Catholic and other non-government schools have greater autonomy in how they provide education and how they accept students into the school.

Of the three sectors, Indigenous school students are more likely to be attending government schools than their non-Indigenous counterparts. According to the 2006 Census, 84.2 per cent of Indigenous school students aged 5–17 were attending a government school, compared to 64.6 per cent of non-Indigenous students. On the other hand, only 5.6 per cent of Indigenous students were attending other non-government schools, compared to 14.1 per cent of non-Indigenous students. This disparity is important for understanding the development of cognitive and non-cognitive ability, as it is in this last sector where the greatest amount of resources are devoted to the education of the students.

This is not to say that economic resources are the only input into a quality school environment, nor that government schools do not provide a quality education. However parents would not be spending significant amounts of money sending their children to non-government schools if they did not think it would lead to better outcomes for their children. Analysis presented in Biddle (2007a) suggests that it is a lack of economic resources at the family and household level that result in parents of Indigenous students being less able to avail themselves of that option.

EDUCATION ATTENDANCE AND INDIGENOUS ABSENTEEISM

Leaving aside school sector, one of the biggest constraints on the development of a child's cognitive and non-cognitive ability is poor rates of attendance from a relatively young age. There is a complex causal relationship between attendance and achievement with in-school and out-of-school factors interacting with each other. On the one hand, those students who for a number of reasons are absent from school regularly are likely to miss out on regular instruction, making it difficult to achieve national benchmarks or other school-related outcomes. On the other hand, those students who would otherwise be disengaged with formal education and therefore achieve poorly regardless, are amongst those who are most likely to be absent at a particular point in time. Furthermore, according to Rothman (2001), not only does school non-attendance impact on the students themselves, but can also have a disruptive effect on other students in the class, as teachers need to devote time to helping other students to catch up.

Starting in preschool, Indigenous students are less likely to be attending class on a given day than the non-Indigenous population, with a median rate of attendance across the States and Territories of 83 and 88 per cent respectively. This gap widens into secondary school where, as has already been mentioned, over 20 per cent of Indigenous secondary school students in the government system are absent on any given day.

Perhaps more than many of the results presented in this paper, the national averages for attendance hide significant variation, with most Indigenous students attending reasonably regularly, but a large minority having very low rates of attendance (Taylor 2010). Bourke et al. (2000) identified both 'in-school' and 'out-of-school factors' as being important in explaining the variation in the attendance rate of Indigenous students

Amongst the 'out-of-school' factors, Bourke et al. (2000) identify mobility and frequent movement between schools as an important factor in determining education attendance. According to a snapshot from the 2006 Census, Biddle and Prout (2009) presented figures that showed that 4.6 per cent of Indigenous Australians of compulsory school age (5–15 years) were away from their place of usual residence on census night. While this may seem low, it is more than twice as high a rate as the non-Indigenous population (2.1%), and rises to 7.4 per cent when those in remote and very remote Australia are considered in isolation.

While these demand-side factors are in many ways beyond the control of individual schools, there are many changes that could be made to the provision of education to boost attendance and reduce absenteeism. With regards to these in-school factors, Bourke et al. state that 'one of the most important issues to be resolved, if Indigenous school attendance rates are to increase nationally, is the provision of positive welcoming school environments in which Indigenous children feel welcome, safe, valued and happy' (Bourke et al. 2000: 52). Following the language used in this paper, a more welcoming school environment is likely to decrease the social costs of education, thereby reducing absenteeism.

The other main 'out-of-school' factor that contributes to low rates of attendance is poor health. Indigenous children start off with relatively low birth weights and then continue to have worse health outcomes throughout their childhood and into adolescence (AIHW 2008). Even when at school, untreated problems related to sight and hearing lead to poor concentration and a lack of engagement with the material being covered. One of the most comprehensive studies to date of the health of Indigenous children was carried out through the Western Australian Aboriginal Child Health Survey. After considering the factors contributing to the relatively poor academic performance of Indigenous children in Western Australia, Zubrick et al. conclude that one of the main determinants is the 'higher proportions of Aboriginal students at moderate and high risk of clinically significant emotional or behavioural difficulties' (Zubrick et al. 2006: 506).

INDIGENOUS INVOLVEMENT IN EDUCATION PROCESSES

Historically, one of the criticisms of the provision of schooling to Indigenous children is the relative lack of involvement of Indigenous Australians themselves. Given the relatively small size of the Indigenous population and their geographic diversity, it is inevitable that the majority of teachers and administrators that Indigenous students encounter will be non-Indigenous. Nonetheless, there are clear potential benefits of involving Indigenous Australians where possible in various aspects of the education process. For example, Bourke et al. (2000) outlined the more welcoming environment in schools with greater Indigenous involvement, whereas Biddle (2007a) demonstrated the positive association at an area level between preschool participation and the presence of Indigenous preschool workers.

According to the 2006 Census, 1.5 per cent of the population who work in the preschool and school industry identified as being Indigenous. Looking more narrowly, only 0.8 per cent of school teachers (including early education or pre-primary teachers) identified as being Indigenous. These figures are both lower than the percentage of the general population who identified as being Indigenous (2.5%), and substantially lower than the 3.8 per cent of the preschool and school population who were identified as such. So, despite the benefits of Indigenous involvement in the delivery of education, Indigenous Australians are substantially underrepresented in this most crucial of industries and professions.

While increasing the level of direct involvement in education provision of Indigenous Australians is a stated aim of government policy in Australia (DEEWR 2008), this can only be seen as a medium- to long-term goal. It would take a number of years to provide university training to potential Indigenous school teachers, and even longer for the pool of appropriate candidates to be large enough to make significant

inroads into the level of underrepresentation. More immediately though, there are a number of ways in which Indigenous Australians could have more indirect involvement in their children's education. This includes the embracing of the concept of Indigenous learning communities (Schwab & Sutherland 2003), where schools become the focal point for the community and support a greater role for Indigenous parents in their and their children's education. This is likely to make Indigenous parents more comfortable in sending their kids to what they see as culturally inclusive preschools and schools.

AN ABORIGINAL OR TORRES STRAIT ISLANDER CURRICULUM AND PEDAGOGY

One of the benefits of having a strong Indigenous presence and contribution to all stages of the education process is the development of curricula or pedagogy that are better suited to the provision of education to the Indigenous population. Taking into account once again the size and geographic distribution of the Indigenous population, it is unlikely though that most, or even a majority, of Indigenous children will be able to undertake an education that is specifically suited to their needs.

The majority of Indigenous children in urban and regional Australia will continue to be in schools where they make up only a small minority of the student population. For this reason, it is important that all students in Australia receive an education that is sensitive to the history and culture of Indigenous Australians, just as it is important that all students receive an education that takes into account the background of those from other minority groups. Where this does not occur, this can lead to substantial marginalisation of, and resistance by, Indigenous students (Munns & McFadden 2000).

According to the federal government department responsible for education (DEEWR 2008: 26), a 'culturally inclusive curriculum should acknowledge and incorporate the knowledge, experiences and contributions of a wide variety of cultures'. One of the difficulties in providing a culturally inclusive curriculum is the ability of teachers to understand and engage with the material. This is likely to be especially difficult for non-Indigenous teachers with little direct interaction with the Indigenous population, and those who undertook their training when such information was not available as part of standard teacher training. The increasing availability of online material can go some way towards bridging this gap. Most States and Territories provide such information, with a good example being a program called 'Aboriginal education for all learners in South Australia', delivered by the South Australian education department.[11] However, the extent to which such resources are implemented in a classroom setting remains unclear.

Where Indigenous students make up a large proportion of the student body, either in remote Australia or certain towns and city suburbs, there is greater scope for incorporating Indigenous knowledge, history and culture more directly into subject matter and delivery. Ultimately though, such flexible approaches to education delivery have the potential to more effectively take into account the abilities that Indigenous Australians bring to education thereby. If done so whilst keeping within the mandated curriculum, then this has the potential to substantially reduce the social and cultural costs that Indigenous children often face in a formal education setting, whilst still allowing them to benefit from the economic and social benefits that completing high school and going on to post-school training and work can bring.

INDIGENOUS LANGUAGES IN THE SCHOOL CURRICULUM

In formal education in Australia, speaking English well is considered to be one of the main components of cognitive ability. According to the 2006 Census, around 10.8 per cent of the Indigenous population aged 5–19 speaks an Indigenous language at home. This rises to 17.0 per cent in remote Australia and 58.0 per cent in very remote Australia. Greater percentages still are likely to speak 'Aboriginal English', what

many consider to be a separate dialect to 'Standard English'. If this language background is not taken into account when children start school then the abilities that Indigenous children bring to formal education will be overlooked, and many children wrongly classified as having poor literacy skills.

While Indigenous students are usually able to study Indigenous languages in secondary schools (and a number of primary school students study their local Indigenous language as part of language tuition), there is much greater debate in Australia surrounding the role of a bilingual education which includes instruction in an Indigenous language.

In 2008, the Northern Territory Government announced that the remaining nine remote schools that followed a bilingual education program would, from 2009, revert to instruction in English only (at least for the first four classroom hours). This was done with the aim of improving English literacy outcomes. However, the Aboriginal and Torres Strait Islander Social Justice Commissioner, Tom Calma stated that not only would the move be counter-productive, as 'there is evidence that bilingual students do better in English reading literacies than English schools in their regions' but also that it could violate human rights which stipulate Indigenous people should be allowed to control their educational systems and provide education in their own languages ('Calma backs bilingual education in NT', *The Age*, 17 November 2008).

SUMMARY AND CONCLUSIONS

Low levels of education participation and completion underpin a number of poor outcomes for the Indigenous population, including low life expectancy, high morbidity across a number of highly treatable conditions, low levels of engagement with the labour market and high rates of poverty and deprivation. Results presented in this paper show that Indigenous Australians were less likely to have completed high school or have a post-school qualification; less likely to be participating in education whilst in their childhood, youth or adolescence; more likely to be absent from school on a given day; and less likely to meet national benchmarks for literacy and numeracy.

These national figures hide significant variation across the Indigenous population. It should always be kept in mind that despite having relatively low levels of participation nationally, there are many Indigenous Australians successfully engaged with education despite the many impediments that they may face. In 2006, there were 9,275 Indigenous children enrolled in preschool, 140,389 Indigenous school students, 67,841 attending Vocational Education and Training and 8,854 attending university (DEEWR 2008). With an ERP of only 517,174 people, this represents a significant investment in education.

Much of the variation in those who were not attending education can be explained by the fact that Indigenous Australians are more likely to live in remote parts of the country, where education institutions are more difficult and costly to access, as well as often lacking in basic services, adequately trained teachers or student amenities. Taking the percentage of those aged 15–24 attending education as a rough proxy for engagement with education, a relatively simple regression (Model 1) presented in Table 9 shows that a little over half of the variation across 531 Indigenous Areas in this variable can be explained by a seven-category location type classification.

Those in predominantly Indigenous remote towns and remote dispersed settlements were much less likely to be attending education than those in non-remote Australia, with those in predominantly non-Indigenous remote towns also having a significantly lower probability.

While education participation is substantially lower in the above three location types, it should be kept in mind that less than a quarter of the Indigenous population lives in remote Australia. For the remaining three-quarters of the population, participation rates are still well below those of the non-Indigenous population. In non-remote Australia, the relatively poor socioeconomic status of Indigenous Australians

Table 10. Area-level factors associated with the percentage of the Indigenous population aged 15–24 attending education, 2006

Explanatory variable	Model 1	Model 2	Model 3
Large regional towns	−2.84	n.s.	n.s.
Small regional towns and localities	−4.55	n.s.	n.s.
Regional rural areas	n.s.	n.s.	n.s.
Predominantly non-Indigenous Remote towns	−12.56	−6.73	n.s.
Predominantly Indigenous remote towns	−25.79	−11.20	−11.27
Remote dispersed settlements	−24.90	−11.68	−9.56
Percentage of population not in poverty		n.s.	−0.20
Percentage of population employed as managers or professionals		0.45	n.s.
Percentage of population who live in a house that is not overcrowded		0.11	n.s.
Percentage of population who own or are purchasing their own home		0.23	0.21
Percentage of population who have completed Year 12			0.31
Percentage of population with qualifications			0.38
Constant	41.08	19.31	24.67
R-Squared (proportion of variation explained by the models)	0.5280	0.6104	0.6674

Note: The base case location type is city areas. Details of how the location types are derived can be found in Taylor and Biddle (2008).
n.s. = those variables that were not significant at the 5% level of significance.
Source: Customised calculations based on the 2006 Census of Population and Housing.

and the neighbourhoods in which they live is likely to explain some of the remaining discrepancy between Indigenous and non-Indigenous rates of participation. According to results presented in Model 2, over 60 per cent of the variation in participation of those aged 15–24 is explained when area-specific rates of income, employment in high-skilled occupations, home ownership and overcrowding are controlled for.

There is a large body of literature discussing the intergenerational transfer of low education expectations and outcomes with one of the main determinants of a child's education progress is the education levels of his or her parents in general, and mother in particular (UNICEF 2006). It is not surprising, therefore, that the individual-level results presented in Table 5 earlier in this paper show relatively low levels of participation for those Indigenous youths who live in a household that does not contain other household members with high school or other qualifications. Furthermore, the results presented in Table 10 (Model 3) show that at an area level, relatively high levels of Year 12 completion or qualifications are associated with higher levels of education participation.

Biddle (2007a) and results presented in this paper showed that there are large economic benefits of education for the Indigenous population nationally, and for all location types. Furthermore, the relatively high rate of education participation amongst older adults is an indication of the acceptance of the benefits of education amongst Indigenous Australians themselves. However, it is only beyond the age of 34 for females and 40 for males that Indigenous rates of participation are above the rate for the non-Indigenous population, and the level of qualifications in the population never quite catches up. This shows that the

education marginalisation faced by Indigenous children and youth can have long-lasting effects that are never overcome.

The importance of the early years in providing a solid platform for education participation later in life has been long established. However, Indigenous children aged 4–5 are much less likely to attend preschool than their non-Indigenous counterparts in all but three regions across Australia. This is generally not because the parents of Indigenous children do not see the benefits of early childhood education, as Biddle (2007b) showed that much of the difference between Indigenous and non-Indigenous youth was explained by relatively low household income. The results presented in this paper also showed that Indigenous children are more likely to grow up in single parent families or those where no one is employed.

After a poor start to early childhood education, many of the processes through which education marginalisation is perpetuated can be traced to the relatively high social and cultural costs faced by Indigenous youth in formal education. This is partly a reflection of the way in which the literacy skills that Indigenous youth bring to the classroom are often discounted (Cahill & Collard 2003). However there is also strong evidence that a position of opposition to formal education is adopted by youth that, due to a history of unfavourable experiences, is sanctioned by the community (Munns & McFadden 2000). Although coming from a different perspective through the role of welfare dependence, Noel Pearson and the Cape York Institute also argue strongly that norms and a devaluing of education are key contributors to a social acceptance of not attending school or dropping out before completion (CYI 2008a).

Economic costs are also a factor, with higher transport and tuition costs for those living in remote Australia likely to impact on Indigenous Australians more than non-Indigenous Australians. Furthermore, the opportunity costs of education in terms of income forgone are likely to be more keenly felt for Indigenous youth because of the low socioeconomic status of their families. For those who live in households with relatively low access to economic resources, low-skilled employment including that through the CDEP scheme is likely to be relatively more attractive compared to carrying on at high school or undertaking a university degree.

Ultimately, it is not a lack of resources at the national level which is stopping most Indigenous Australians undertaking education, as up until the global financial crisis Australia has been running budget surpluses in the billions of dollars for much of the last decade. Rather, it is the fact that the social and economic costs of education for many individual Indigenous youth appear to be outweighing the undoubtedly high economic benefits.

Given that many of the reasons for low levels of engagement are at the societal level, Indigenous Australians will not begin to participate in education at the same rate as non-Indigenous Australians without major structural change. There is substantial debate around the efficacy of the education-related measures in the Northern Territory Emergency Response, and to a lesser extent the Cape York Agenda. These debates may only be resolved once they have been thoroughly evaluated; however, there is less debate as to whether an investment on those scales is needed to overcome the legacy of past failures of Indigenous education policy.

The above structural constraints notwithstanding, there is much that individual communities or schools can do to improve the level of engagement of youth in the area. Some examples around the innovative provision of other much needed services, intensive and targeted interventions for those most at risk, and creative curriculum modifications have already been discussed in this paper. These are invariably going to be expensive. However, Taylor and Stanley (2005) have shown that the opportunity costs of not doing so in terms of crime, employment and welfare provision are even higher.

NOTES

1. These figures are slightly different to those published by the ABS, as those who are currently at school are excluded from the analysis, as are those who did not state their usual residence on census night. However, these exclusions have no substantive impact on conclusions from the data.

2. IREGs are the least disaggregated level in the Australian Indigenous Geographical Classification (AIGC) that is constructed by the ABS to represent the distribution and characteristics of the Indigenous population. There were 37 Indigenous Regions in total for the 2006 version of the AIGC.

AIGC: Australian Indigenous Geographical Classification

3. The majority of the population in the ACT live in Canberra, the nation's capital city. The remainder of the Territory consists for the most part of sparsely inhabited rural areas or largely uninhabited national parks.

4. Because census income is available in grouped bands only, the figures are for those with income at, or above, the median income group ($400–599 per week), rather than the actual median of $466 per week.

5. Due to data restrictions relating to confidentiality, it was not possible to calculate these figures separately for males and females.

6. Based on the Australian Standard Classification of Education (ABS 2001), the ABS defines the relevant levels of education as follows:

   - Certificate level provides a knowledge and skills base ranging from an understanding of basic concepts and the ability to perform a defined range of routine and predictable activities, to a breadth, depth and complexity of knowledge incorporating some theoretical concepts and the ability to apply knowledge and skills to a variety of contexts most of which are complex and non-routine.
   - Advanced Diploma and Diploma level provides a knowledge and skills base, incorporating theoretical concepts, with substantial depth in some areas.
   - Bachelor Degree level provides a systematic and coherent broad body of knowledge, the underlying principles and concepts and the associated communication and problem-solving skills. This level develops the academic skills necessary to comprehend and evaluate new information, concepts and evidence from a range of sources.

   In this paper, those who have completed a Graduate Diploma, Graduate Certificate or Postgraduate degree are grouped with those who have completed a Bachelor degree.

7. Year 7 is the first year of high school education in New South Wales, Victoria, Tasmania and the Australian Capital Territory, whereas Year 8 is the first year of high school in Queensland, South Australia, Western Australia and the Northern Territory. Year 10 is generally the final year of junior high school, with Year 12 being the final year of senior high school in Australia (though most high school campuses contain students all the way from Years 7/8–12).

8. For more information and a discussion of the distribution of CDEP jobs, see Biddle, Taylor and Yap (2008).

9. Provincial areas include inner regional and outer regional Australia in Fig. A1.

10. In some states, there are a number of selective government schools that also take into account academic or other criteria when selecting students. This is an under-researched area for the Indigenous population, mainly due to a lack of publicly available data.

11. See <**http://www.aboriginaleducation.sa.edu.au**>.

APPENDIX 1: ADDITIONAL TABLES AND FIGURE

Table A1. Indigenous and non-Indigenous population and the percentage of the population who identify as being Indigenous, by age

	Indigenous		Non- Indigenous		Percentage Indigenous	
Age	Male	Female	Male	Female	Male	Female
0–4	32,753	31,673	639,681	605,975	4.87	4.97
5–9	33,335	31,801	653,717	621,356	4.85	4.87
10–14	33,254	31,433	685,661	649,806	4.63	4.61
15–19	28,329	26,614	697,843	662,419	3.90	3.86
20–24	22,657	22,122	725,670	701,409	3.03	3.06
25–29	18,246	18,620	689,224	677,840	2.58	2.67
30–34	17,737	18,546	723,977	729,544	2.39	2.48
35–39	16,624	18,136	741,295	748,801	2.19	2.36
40–44	14,517	15,734	746,447	755,856	1.91	2.04
45–49	12,062	13,011	727,302	741,055	1.63	1.73
50–54	9,616	10,196	667,740	674,751	1.42	1.49
55–59	6,869	7,554	628,774	628,297	1.08	1.19
60–64	4,574	5,115	491,602	488,051	0.92	1.04
65+	6,736	9,179	1,206,191	1,470,553	0.56	0.62
Total	**257,309**	**259,734**	**10,025,124**	**10,155,713**	**2.50**	**2.49**

Source: ABS (2008)

Table A2. Percentage of the population employed by Year 12 completion: Indigenous status, gender and age, 2006

	Has not completed Year 12				Completed Year 12			
	Indigenous		Non-Indigenous		Indigenous		Non-Indigenous	
Age	Male	Female	Male	Female	Male	Female	Male	Female
18	49.8	33.6	65.4	54.8	65.1	60.1	65.8	69.9
19	51.1	32.9	68.5	55.8	67.2	61.2	68.0	71.2
20	53.7	32.0	75.1	57.9	71.0	63.4	71.7	73.5
21	54.7	31.4	76.8	57.9	73.5	63.5	74.7	75.3
22	54.8	31.4	77.9	57.3	76.2	64.2	77.6	77.2
23	54.8	31.2	78.9	56.6	78.6	64.1	80.5	79.0
24	55.2	31.5	79.8	55.3	80.7	64.9	83.3	80.0
25	56.1	31.8	80.4	54.5	81.5	64.6	85.5	80.5
26	56.4	32.6	81.1	54.0	82.6	64.5	87.5	80.2
27	57.9	34.3	81.7	53.9	81.6	64.5	89.0	79.3
28	58.3	34.6	82.3	53.6	82.5	64.2	90.1	78.1
29	58.8	34.8	82.3	53.2	80.9	65.4	91.0	76.6
30	57.7	34.3	82.7	52.8	82.3	65.7	91.4	75.5
31	57.9	35.1	83.1	53.5	81.0	65.8	91.7	74.4
32	58.6	36.3	84.0	55.0	82.2	65.8	92.0	73.7
33	59.2	38.2	84.7	56.8	81.2	66.2	92.3	73.1
34	59.2	40.1	85.1	58.5	81.5	68.7	92.5	72.8
35	59.2	42.1	85.4	59.9	81.0	68.0	92.5	72.9
36	59.5	43.7	85.4	61.6	80.9	69.2	92.4	73.0
37	60.1	45.4	85.5	63.1	80.5	68.7	92.3	73.4
38	61.1	45.8	85.6	64.6	80.7	69.7	92.2	74.2
39	60.6	46.9	85.6	66.1	81.2	68.8	92.0	75.3
40	61.5	48.3	85.6	67.6	78.7	67.8	91.8	76.3
41	60.9	49.8	85.6	69.1	76.6	69.8	91.6	77.4
42	63.0	50.7	85.5	70.4	74.0	69.6	91.6	78.5
43	62.7	50.9	85.5	71.3	75.5	71.3	91.5	79.7
44	63.7	52.5	85.4	72.1	77.9	70.9	91.5	80.5
45	63.1	53.2	85.1	72.6	77.3	69.9	91.4	81.3
46	63.2	53.5	84.7	72.9	76.0	69.0	91.2	81.7
47	62.3	52.4	84.3	72.8	75.2	68.6	90.9	82.0
48	62.2	51.9	83.9	72.5	76.3	69.9	90.7	82.0
49	62.0	50.7	83.5	72.0	77.6	69.1	90.1	81.8
50	61.6	50.6	82.9	71.0	76.6	66.6	89.7	81.2
51	60.2	49.2	82.2	69.7	76.3	65.5	89.1	80.5
52	58.6	48.5	81.4	67.9	75.3	64.5	88.5	79.4
53	57.5	46.7	80.4	65.9	73.1	66.8	87.6	78.3
54	56.9	46.2	79.9	64.8	71.4	67.7	87.1	77.6
55+	32.8	20.7	35.8	21.0	47.3	40.2	49.0	36.6

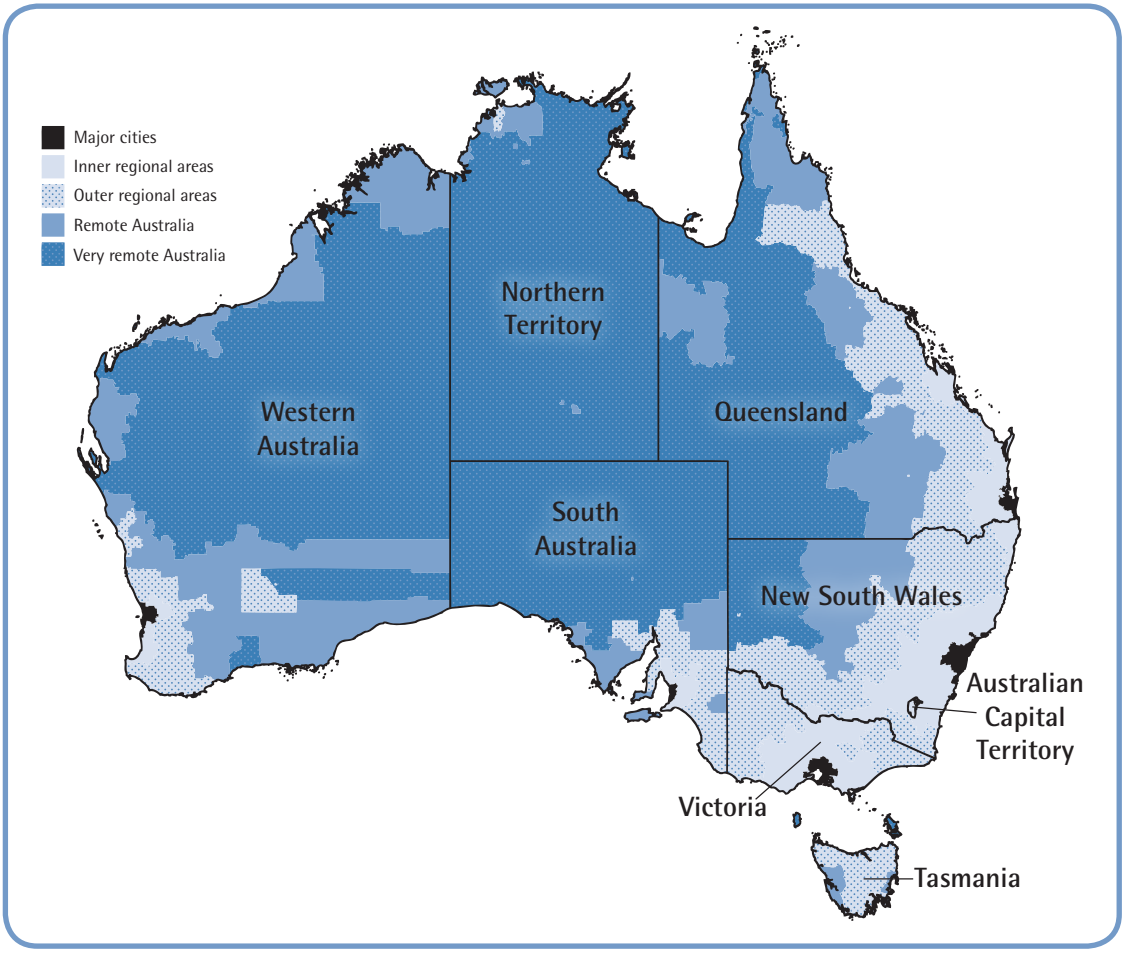
Source: Customised calculations based on the 2006 Census of Population and Housing.

Table A3. Percentage of the population with gross personal income equal to or above the national median by Year 12 completion: Indigenous status and age, 2006

	Has not completed Year 12		Completed Year 12	
Age	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
18	2.2	23.6	27.1	21.9
19	4.0	48.0	37.1	31.1
20	6.5	66.7	49.9	43.5
21	9.6	76.1	60.7	56.4
22	11.8	80.9	69.3	67.8
23	14.1	83.1	73.8	76.4
24	16.3	84.1	77.6	81.9
25	19.6	84.8	79.4	85.3
26	21.0	85.0	80.8	87.3
27	21.2	85.1	82.0	88.4
28	20.6	84.9	82.3	88.9
29	21.4	84.5	82.7	88.9
30	22.5	84.1	82.8	88.8
31	23.7	83.9	83.1	88.5
32	24.6	83.9	83.4	88.2
33	25.6	83.7	83.3	88.0
34	26.5	83.3	83.7	87.9
35	24.8	82.8	83.3	87.7
36	23.7	82.4	83.5	87.5
37	23.7	82.1	82.0	87.4
38	25.4	81.9	82.0	87.4
39	23.9	81.8	81.1	87.3
40	20.2	81.8	82.5	87.3
41	16.7	81.9	81.7	87.4
42	17.6	82.0	83.3	87.5
43	17.3	81.9	83.9	87.8
44	18.0	82.0	83.5	88.0
45	16.9	82.1	83.6	88.4
46	13.8	82.1	83.1	88.7
47	12.5	82.1	83.4	88.9
48	11.1	82.1	82.8	89.2
49	13.2	82.1	80.6	89.3
50	14.0	81.9	81.5	89.4
51	15.2	81.9	81.3	89.4
52	17.6	81.7	83.4	89.4
53	20.0	81.5	82.3	89.4
54	21.1	81.4	80.7	89.3
55+	21.8	76.0	77.2	85.2

Source: Customised calculations based on the 2006 Census of Population and Housing.

Fig. A1. 2006 remoteness classification



Source: ABS (2006).

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