5. Education participation

Australians who complete additional years of education experience a range of positive outcomes throughout their lives. Their incomes may be higher, employment easier to obtain and their health better (Borland 2002; Card 2001; Wolfe and Haveman 2001). There are likely to be spillover effects to the household and community as a result of the individual's investment in education. People with higher education levels may act as positive role models for others around them, thereby increasing overall levels of education. A more highly educated population may also lead to more active engagement in democracy, community governance and resource management. Wei (2004) estimated that the contribution of investment in education to the stock of human capital in Australia has increased quite considerably since the early 1980s, further confirming the emphasis that is placed on the importance of education.

While it is difficult to construct completely accurate estimates of the returns to education in the absence of experimental or at the very least longitudinal data, analysis of available cross-sectional data suggests that they are at least as high for the Indigenous compared to the non-Indigenous population. Daly (1995), Junankar and Liu (2003), Hunter (2004), and Biddle (2006a, 2006b) show that the employment, income and health benefits of completing Year 12 are quite high for the Indigenous population and often higher than for the non-Indigenous population. Biddle (2007) also showed consistently high predicted income and employment benefits of education by geography and education sector, as well as large health benefits. It is not surprising, therefore, that reducing the gap in education attendance and attainment between Indigenous and non-Indigenous Australians is one of the focuses of COAG's Closing the Gap agenda.

According to the 2006 Census, only 23.9 per cent of the Indigenous population aged 15 years and over has completed high school – 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 have not completed either a degree or trade qualification, which is 1.41 times the rate for the non-Indigenous population (54.1%). 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

---

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.

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.

Low rates of attendance are both a cause and an effect of poor academic achievement. In Australia all Year 3, 5 and 7 students are assessed across the areas of 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 trail the national average. The gap (in terms of the difference in the percentage of the population who achieved the minimum benchmark) ranges 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 progress to higher grades.

While the benefits of education for the Indigenous population and the gaps that currently exist are well recognised, there are a number of constraints in meeting the government's targets and a number of these constraints are summarised below. More detail is given in Biddle (2010), in a study which takes a human capital approach to Indigenous education marginalisation and focuses on the larger social and economic costs of education for the Indigenous population. A summary of the discussion is outlined below.

Relative concentration in remote Australia

While the majority of Indigenous Australians live in regional or urban Australia, there is still a greater concentration of Indigenous Australians in remote Australia compared to the non-Indigenous population. Access to schools in remote Australia is far less consistent than in other parts of the country, and can be significantly affected by seasonal variation and the student's access to economic resources.

Low English language ability

According to the 2006 Census, a greater percentage of non-Indigenous Australians aged 5–15 years speak a language other than English at home (14.1%), compared to Indigenous Australians (12.8%). However, of those that do speak a language other than English, Indigenous Australians aged 5–15 years are much more likely to be reported as speaking English not well or not at all

(20.2%), compared to their non-Indigenous population counterparts (6.1%). Unless schools are supportive of such language constraints, formal education for people from a non-English speaking background is likely to be more difficult and their latent cognitive abilities undervalued.

High geographic mobility

As shown in the previous chapter, Indigenous Australians of school age are more likely to change usual residence than non-Indigenous Australians in the same age group (at least before other characteristics are controlled). Even more so, Indigenous youth are more likely to be away from their place of usual residence on a temporary basis. Once again, unless supported by the school, both types of mobility can be disruptive for a student's academic progress.

Role models and peer effects

An Indigenous 15–17 year old who lives in an area with few Indigenous adults who have completed Year 12, or few Indigenous youth of their own age attending high school, are less likely to be attending high school themselves. Furthermore, Indigenous youth living in a household with low levels of education are also less likely to be attending education, with all these associations holding after controlling for an extensive range of individual, household and area-level variables. A lack of role models and peers with experience in, or positive feelings towards, formal education can make it much less likely that a youth will see education as being worthwhile.

Exposure to the criminal justice system

Indigenous youth are much more likely to have been arrested and incarcerated than the non-Indigenous population. Hunter and Schwab (1998) looked at household and socioeconomic factors in trying to explain education participation. They find that having been arrested was a strong predictor for not attending high school. Furthermore, early school leaving is also likely to be a predictor of youth involvement in criminal activity leading to further disengagement from formal education.

Poor health

There is a large body of international literature that has identified the relationship between health and education outcomes (Wolfe and Haveman 2001). However, Zubrick et al. (2006) is the only large-scale empirical study to look at the relationship between physical and emotional health of Indigenous children on

the one hand and education participation on the other. The authors found that higher rates of absence from school due to health problems and emotional or behavioural difficulties both had a significant association with poor academic performance.

The gap in early childhood education

Quality preschool education can have substantial positive effects for the children that attend, easing the transition to school and providing a boost to a child's self esteem as well as their future scholastic ability (Barnett 1995, 1998). Heckman and Masterov (2005) also outline a number of effects on non-cognitive ability and social, economic and emotional wellbeing. While there are no empirical studies that test the effect of preschool education for Indigenous Australians, the general finding that quality preschool education benefits children who are least likely to otherwise do well at school means that reducing the gap between Indigenous and non-Indigenous Australians in terms of preschool attendance is one way in which future education disparities could be reduced.

Economic costs of undertaking education

Undertaking formal education requires significant investment from the individual and their family. The highest cost is in terms of income foregone, however there are also likely to be direct costs including fees and course materials. Indigenous university students report higher levels of economic disadvantage than other students, with one in four reporting that they regularly go without food and other necessities because they cannot afford them (Universities Australia 2007). These economic costs may be compounded by a lack of amenities at home, including adequate space to undertake home-based study and lack of access to information and communications technology (Biddle 2007).

While education completion rates reflect a historic lack of engagement with formal education, the results presented in this chapter show that current rates of participation are also substantially lower for the Indigenous compared to the non-Indigenous population. Circumstances and conditions before a child reaches 15 years of age are likely to determine to a large extent the decision regarding whether to continue on at school or not. Unfortunately though, there is very little education-related information on the census for individuals aged 6–14 years. All members of that age group are assumed to be participating in education, even if other empirical evidence shows that this is not necessarily the case (Taylor 2010). Furthermore, there is no information on the probability of actually attending school on a given day, despite the recognition that rates of attendance can have significant effects on a student's progress.

Despite the above limitations, there are a number of measures on the census that, when viewed from a lifecourse perspective, can give significant insights into Indigenous education participation. Accordingly, the results presented in this chapter are divided into three sections. The results in the first section look at the probability of participating in any type of post-compulsory education (that is, formal education for ages 15 years and over). Recognising that not all education has the same level of economic benefit, the second section of results focuses on non-school students and considers the factors associated with attending a university as opposed to another type of tertiary institution. The results in the final section return to high school students and consider the probability of attending a non-government as opposed to a government school.

Post-compulsory education participation

The first set of results presented in this paper shows the probability of participating in education across adulthood (15 years and over). All forms of education are grouped together in the graph, including high-school, vocational education and training (VET) – often referred to as technical and further education (or TAFE), and university (undergraduate and postgraduate).

Fig. 5.1 Probability of participating in education, age 15 years and over, 2006
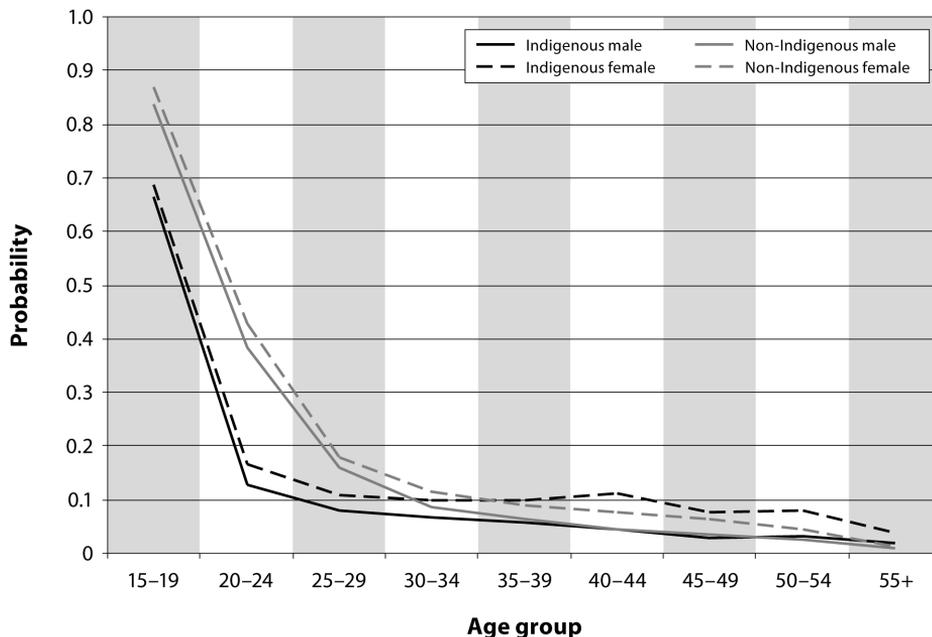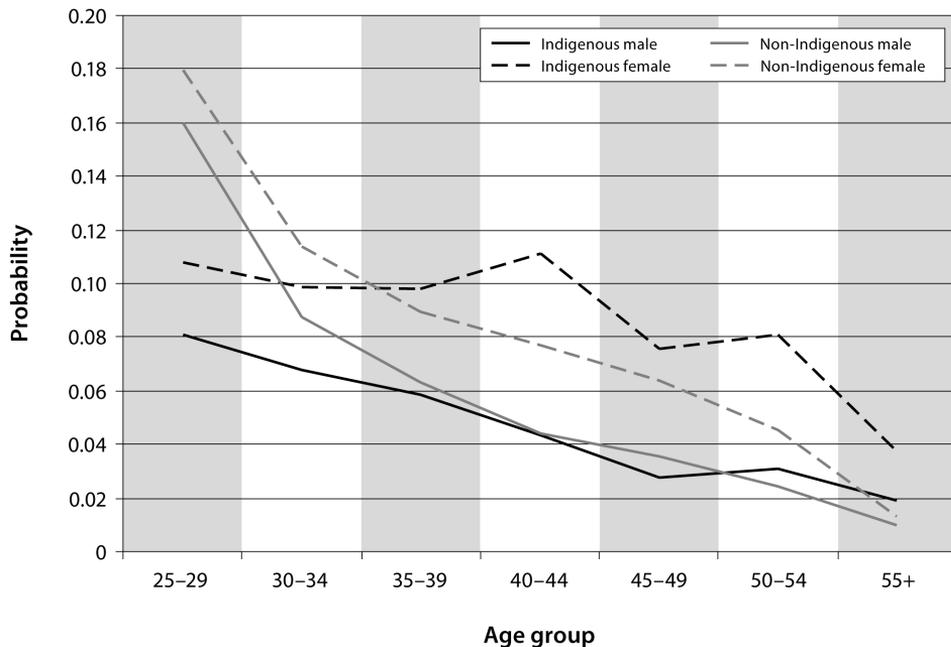

Source: Customised calculations using the 2006 5% CSF

Clearly (and not surprisingly), education participation is highest amongst 15–19 year olds. Around 85 per cent of non-Indigenous 15–19 year olds were participating in some form of education, according to the 2006 Census. This is substantially higher than the participation rate for the Indigenous population, which is around 67 per cent. Both percentages decline substantially into the next five-year age group (20–24 year olds), however the decline is much larger for the Indigenous compared to the non-Indigenous population. Around 15 per cent of Indigenous Australians of that age group were participating in education, compared to 40 per cent of the non-Indigenous population.

There are some differences by gender for these two age groups, with Indigenous and non-Indigenous females having higher rates of participation than males. However, while significant, these differences are minor compared to the differences between the respective Indigenous and non-Indigenous populations. The differences in education between Indigenous and non-Indigenous Australians reduce substantially from the 25–29 year age group and beyond. This part of the graph is a little difficult to interpret due to the scale used, so it is replicated in Fig. 5.2 with more appropriate values on the y-axis.

Fig. 5.2 Probability of participating in education, age 25–55 years plus, 2006

Source: Customised calculations using the 2006 5% CSF, ABS Census of Population and Housing

For both genders, participation rates converge around the 35–39 year age group. For females, the level of participation for this age group is around 10 per cent; for males it is around 6 per cent. Beyond this age group, participation rates for Indigenous and non-Indigenous males stay reasonably similar, whereas participation rates for Indigenous females are higher than for non-Indigenous females. For females, therefore, there is some catch-up in terms of education attainment from mature age students.

Modelling post-compulsory education across the lifecourse

There are three main findings from Figures 5.1 and 5.2. Education participation is highest amongst the young; females have higher rates of participation than males; and Indigenous Australians have substantially lower rates of participation when young, but similar or higher rates of participation from the mid-thirties onwards. In this section, we consider whether these stylised facts hold after controlling for other characteristics. Reflecting the substantially different rates of participation for the young compared to the mature aged, and the different factors influencing the education decision, education participation is modelled separately for 15–24 year olds (Table 5.1) compared to ages 25 years and over (Table 5.2).

Table 5.1 Factors associated with the probability of participating in education, population aged 15–24 years who were not attending high school, 2006

Explanatory variables[a]	Total population		Indigenous population[c]	
	Model 1	Model 2	Model 3	Model 4
Indigenous	−0.219	−0.152		
Female	0.044	0.091	0.076	0.074
Aged 15–19	0.454	0.418	0.402	0.384
Aged 15–19, female	n.s.	−0.023	−0.033	−0.029*
Victoria		0.033	0.078	0.073
Queensland		−0.066	−0.018*	−0.018*
South Australia		−0.022	n.s.	n.s.
Western Australia		−0.056	−0.026*	−0.023*
Tasmania		0.045	n.s.	n.s.
Northern Territory		−0.115	−0.036	−0.043
Australian Capital Territory		0.053	n.s.	n.s.
Major city		0.077	0.043	0.039

Changed usual residence in the last 5 years		n.s.	n.s.	n.s.
Changed usual residence in the last year		−0.062	n.s.	n.s.
Completed Year 9 or less		−0.043	−0.055	−0.050
Completed Year 10 or 11		−0.117	−0.042	−0.038
Has a degree or higher		−0.184	n.s.	n.s.
Has a Diploma or Certificate only		n.s.	−0.054*	−0.051*
Speaks another language and English well		0.165	−0.028*	−0.027*
Speaks another language and English not well or not at all		0.205	n.s.	n.s.
Never married		0.148	0.113	0.084*
Divorced, separated or widowedc		n.s.	***	***
Has had at least one child (for females)		−0.187	−0.074	−0.067
Has a 'core activity' need for assistance		−0.079	n.s.	n.s.
Provides unpaid child care (all)		−0.090	n.s.	n.s.
Provides unpaid child care for children other than own		0.102	n.s.	n.s.
Provides unpaid assistance for someone with a disability		n.s.	n.s.	n.s.
Lives in a mixed Indigenous and non-Indigenous household				0.036
Probability of the base caseb	0.382	0.293	0.086	0.079
Pseudo R-Squared	0.1753	0.2116	0.2240	0.2297
Number of observations	121 551	90 386	2 640	2 524

a. n.s. = Those variables that were not significant at the 10% level of significance.

* = Those variables that were significant at the 10% level of significance but not the 5% level.

b. The base case for the total population is non-Indigenous. For all estimates, the base case is aged 20–24 years and in addition, for Models 2–4 (for the total population and for the Indigenous estimates), the base case lives in New South Wales, outside a major city, did not change usual residence in the last five years, has completed Year 12, does not have any qualifications, speaks English only, is currently married, has not had any children, and does not provide unpaid child care or assistance to someone with a disability. For Model 4, an additional characteristic of the base case is that they are living in an Indigenous-only household.

c. All Indigenous Australians in the sample who were divorced, separated or widowed were not participating in education. They were excluded from the estimates in Models 3–4.

Source: Customised calculations using the 2006 5% CSF, ABS Census of Population and Housing

The results from Model 1 confirm that young Indigenous adults are less likely to be participating in education than their non-Indigenous contemporaries. While the results from Model 2 show that after controlling for a range of other characteristics (including a person's prior education attainment) the difference between Indigenous and non-Indigenous Australians in the sample decreases. However, the coefficient is still significant and the marginal effect is still quite large. There are a number of interesting results from Models 3 and 4 regarding the factors associated with education participation for Indigenous 15–24 year

olds. However, the result with perhaps the greatest policy significance is the finding that Indigenous females who have had at least one child are significantly and substantially less likely to be attending education than other females. As mentioned earlier, it is difficult to establish causality with this relationship. It is easy to understand why a young female with a child or children would find participating in education more difficult and more costly. However, it may also be the case that females who would not otherwise consider participating in education (for unobservable reasons) would see the opportunity cost of having children as being reasonably low. Chances are that both explanations are valid and therefore reducing the high fertility rates of young Indigenous females (shown in Chapter 3), or making education less of a burden for females with children, is likely to reduce at least in part the gap between Indigenous and non-Indigenous females in terms of education participation.

As interesting perhaps as the variables that were significant in Models 3 and 4, is variables that were not significant. Some of these variables may become significant with a larger sample size. However, 2 640 observations should be sufficient to pick up most effects. It is interesting, therefore, that young Indigenous adults who changed usual residence in the previous year or in the previous five years do not have a higher probability of participation compared to young Indigenous adults who did not move over the period. It is likely that there are reverse-causality effects that are impacting in opposite directions.

The results presented in Table 5.2 replicate the analysis for Australians aged 25 years and over, focusing on non-school education. There are a few observations in the sample where a person aged 25 years and over is attending high school. These observations are excluded from the analysis as the motivations for non-school compared to high school attendance at that age are likely to be quite different. Looking at the results presented in Model 1, after controlling for age and sex, there is no significant difference between Indigenous and non-Indigenous Australians aged 25 years and over in terms of education participation. This is compared to a probability that was 0.219 lower for those aged 15–24 years (shown in Table 5.1). Furthermore, Model 2 shows that after controlling for the set of socioeconomic controls available on the 5% CSF, Indigenous Australians aged 25 years and over have a significantly higher probability of attending education than a non-Indigenous Australian with otherwise identical (observable) characteristics.

Table 5.2 Factors associated with the probability of participating in education, population aged 25 years and over, 2006

Part A: Demographic and geographic variables

Explanatory variables[a]	Total population		Indigenous population	
	Model 1	Model 2	Model 3	Model 4
Indigenous	n.s.	0.016		
Female	0.027	0.021	n.s.	n.s.
Aged 25–29	0.071	0.036	n.s.	n.s.
Aged 35–39	−0.024	−0.011	n.s.	n.s.
Aged 40–44	−0.043	−0.019	n.s.	n.s.
Aged 45–49	−0.052	−0.025	−0.040	−0.043
Aged 50–54	−0.063	−0.031	−0.043	−0.049
Aged 55 +	−0.077	−0.040	−0.063	−0.064
Aged 25–29, female	−0.011	−0.007	n.s.	n.s.
Aged 35–39, female	0.006*	0.009	n.s.	n.s.
Aged 40–44, female	0.023	0.020	0.061*	0.063*
Aged 45–49, female	0.023	0.023	n.s.	n.s.
Aged 50–54, female	0.022	0.023	n.s.	n.s.
Aged 55 +, female	−0.007	0.006	n.s.	n.s.
Victoria		−0.003	n.s.	n.s.
Queensland		−0.002*	−0.022	−0.023
South Australia		0.007	n.s.	n.s.
Western Australia		−0.003	−0.025	−0.023*
Tasmania		0.013	n.s.	n.s.
Northern Territory		0.006*	−0.034	−0.034
Australian Capital Territory		0.019	n.s.	n.s.
Major city		n.s.	n.s.	n.s.
Probability of the base case[b]	0.087	0.047	0.082	0.085
Pseudo R-Squared	0.0984	0.1241	0.1000	0.0980
Number of observations	612 431	518 121	6 993	6 731

Part B: Socioeconomic and other variables

Explanatory variables[a]	Total population		Indigenous population	
	Model 1	Model 2	Model 3	Model 4
Changed usual residence in the last 5 years		0.012	n.s.	n.s.
Changed usual residence in the last year		n.s.	n.s.	n.s.
Completed Year 9 or less		−0.026	−0.053	−0.052
Completed Year 10 or 11		−0.019	−0.034	−0.037
Has a degree or higher		0.037	0.117	0.129
Has a Diploma or Certificate only		−0.009	n.s.	−0.025
Speaks another language and English well		0.015	0.027*	n.s.
Speaks another language and English not well or not at all		0.063	0.080	n.s.
Never married		0.021	n.s.	n.s.
Divorced, separated or widowed		0.024	0.022	0.023*
Has had at least one child (for females)		−0.010	n.s.	n.s.
Has a 'core activity' need for assistance		n.s.	n.s.	n.s.
Provides unpaid child care (all)		n.s.	−0.014	n.s.
Provides unpaid child care for children other than own		0.004	n.s.	n.s.
Provides unpaid assistance for someone with a disability		0.010	n.s.	n.s.
Lives in a mixed Indigenous and non-Indigenous household				n.s.
Probability of the base case[b]	0.087	0.047	0.082	0.085
Pseudo R-Squared	0.0984	0.1241	0.1000	0.0980
Number of observations	612 431	518 121	6 993	6 731

[a.] n.s. = Those variables that were not significant at the 10% level of significance.
 * = Those variables that were significant at the 10% level of significance but not the 5% level.

[b.] The base case for the total population is non-Indigenous. For all estimates, the base case is aged 30–34 years and in addition, for Models 2–4 (for the total population and for the Indigenous estimates), the base case lives in New South Wales, outside a major city, did not change usual residence in the last five years, has completed Year 12, does not have any qualifications, speaks English only, is currently married, has not had any children, and does not provide unpaid child care or assistance to someone with a disability. For Model 4, an additional characteristic of the base case is that they are living in an Indigenous-only household.

Source: Customised calculations using the 2006 5% CSF, ABS Census of Population and Housing

The predicted difference in Model 2 between Indigenous and non-Indigenous Australians of 0.016 may not seem large, especially when compared to the corresponding marginal effect of −0.152 in Table 5.1. However, when it is compared to the probability of the relevant base case (0.047), the relative size of the difference becomes apparent. Biddle (2007) showed that in 2001, Indigenous Australians on average participated in education at a later age than non-Indigenous Australians. By combining a modelling approach with a lifecourse perspective, it has been possible in this chapter to show the even more important finding that mature-age Indigenous Australians with similar characteristics are participating in education at a higher rate than non-Indigenous Australians. While it is important to note that Indigenous Australians aged 25 years and over are more likely to undertake education than their non-Indigenous counterparts, it is also important to keep in mind that even when viewed over the lifecourse, Indigenous education attainment is still substantially lower. That is, the proportion of the population with some form of qualifications does not come close to converging (Biddle 2010). This not only highlights the importance of bridging the even larger gap amongst 15–24 year olds, but also understanding the factors that are associated with Indigenous education participation so as to identify constraints on raising the rate of participation even further. The results presented in Models 3 and 4 are therefore quite instructive. Indigenous Australians who have not completed Year 12 are significantly less likely to be attending education than those who have. Given that the decision to continue on at high school is made at a much younger age than the ages in the sample, there is unlikely to be any reverse causality present in this relationship (that is, individuals opting for high school as opposed to non-school education). It would seem, therefore, that high school education encourages, rather than substitutes for education later in life. Similarly, individuals with a university degree are more likely to be participating in education than individuals without any qualifications.

A final interesting point from Table 5.2 is that females who have had at least one child do not have a significantly different probability of attending education than females without children. This is in stark contrast to the findings presented in Table 5.1 (for 15–24 year olds), which showed that high rates of fertility were associated with lower levels of education participation amongst young adults. While this does not seem to be the case amongst females aged 25 years and over, there is also not a positive coefficient, meaning that there is no catch-up later in life for females who have children when they are young.

University participation

Not all types of education have the same economic or social benefits. Not surprisingly, individuals with a university education have higher income and

employment prospects than those who have completed a certificate or diploma only. However, the direct and indirect costs of attending university (including income foregone) are also higher. Even after taking this into account, Biddle (2007) found higher predicted income and employment benefits from university education as opposed to VET.[2] The educational disadvantage summarised in the previous section may be even greater still when one focuses on university as opposed to other tertiary education.

So, while Indigenous adults may participate in formal education at comparable rates to their non-Indigenous counterparts (at least beyond the age of 25), it is important to consider whether there are significant differences in the type of education that is being undertaken and whether this varies across the lifecourse. The percentage of students aged 15 years and over who were studying at a university as opposed to another tertiary institution is shown in Fig. 5.3. Individuals attending high school are excluded from the analysis, as are those not attending any form of education.

Fig. 5.3 Probability of a tertiary student participating in university education, 2006
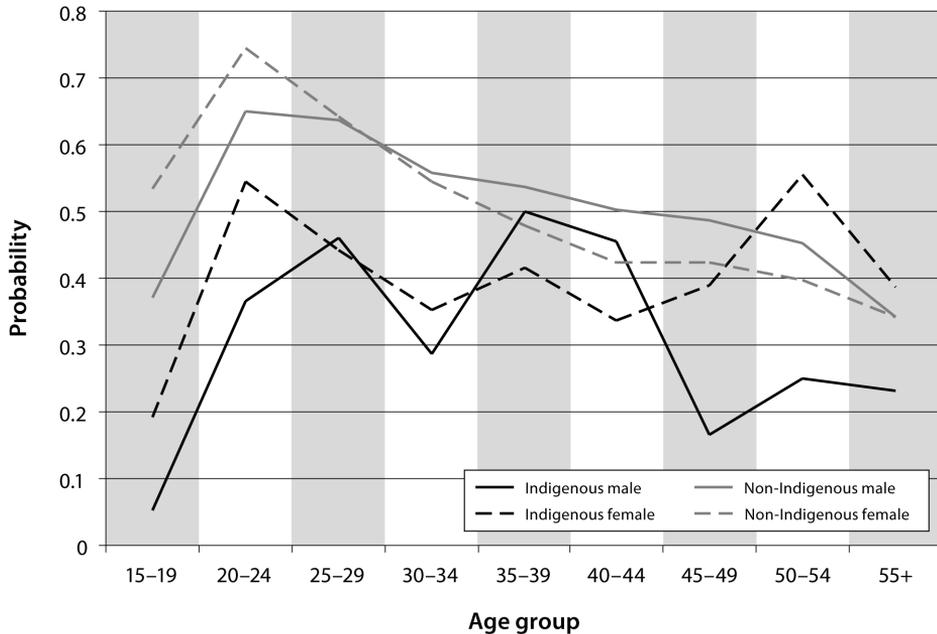
Source: Customised calculations using the 2006 5% CSF, ABS Census of Population and Housing

---

2   There are also likely to be substantial differences depending on the type of degree undertaken. However, the sample of Indigenous university students is not sufficiently large to undertake such a delineated analysis.

For non-Indigenous male and female tertiary students, the peak age of university attendance is the early twenties. More than 70 per cent of non-Indigenous female tertiary students of that age were attending university, alongside around 65 per cent of non-Indigenous males. For the Indigenous population, on the other hand, there is not only more volatility across the lifecourse, but attendance at university stays reasonably high (that is, as a proportion of tertiary students). Indeed, for the 50–54 and 55–plus age groups, Indigenous female tertiary students had a higher rate of university participation compared to non-Indigenous male and female tertiary students.

Modelling university participation across the lifecourse

The results for the factors associated with university participation are presented in Fig. 5.3. Once again, the sample is restricted to individuals attending some form of tertiary education. The results from Model 1 show that Indigenous tertiary students are significantly less likely to be attending a university as opposed to another form of tertiary institution after controlling for age and sex. With a marginal effect of –0.189 compared to the base case of 0.557, the gap in university education is quite substantial. However, when other characteristics are controlled for (in Model 2), the difference is no longer significant. Indigenous tertiary education students are no less likely to be attending university than non-Indigenous Australians with similar observed characteristics. While the insignificant result in Model 2 may appear to be somewhat heartening at first glance, the conclusion is a little less positive when one considers the explanatory variables that draw out most of the variance in university attendance. Specifically, people with lower previous levels of education (both in terms of high school and post-school education) are substantially less likely to be attending university. So, while the lower levels of participation found in Model 1 are not anything to do with indigeneity per se, they do appear to be related to education marginalisation from a young age.

Table 5.3 Factors associated with the probability of attending a university, tertiary education students, 2006

Part A: Demographic and geographic variables

Explanatory variables[a]	Total population		Indigenous population	
	Model 1	Model 2	Model 3	Model 4
Indigenous	−0.189	n.s.		
Female	n.s.	0.028	0.245	0.260
Aged 15−19	−0.190	−0.079	n.s.	n.s.
Aged 20−24	0.091	0.099	n.s.	n.s.
Aged 25−29	0.079	0.059	0.327	0.274
Aged 35−39	n.s.	0.037	0.439	0.461
Aged 40−44	−0.051	0.053	0.435	0.452
Aged 45−49	−0.071	0.057	n.s.	n.s.
Aged 50−54	−0.105	n.s.	n.s.	n.s.
Aged 55 +	−0.213	−0.091	n.s.	n.s.
Aged 15−19, female	0.164	0.094	n.s.	n.s.
Aged 20−24, female	0.117	0.083	n.s.	n.s.
Aged 25−29, female	n.s.	n.s.	n.s.	n.s.
Aged 35−39, female	−0.046	n.s.	−0.250	−0.188
Aged 40−44, female	−0.068	−0.051	−0.287	−0.200
Aged 45−49, female	−0.047	n.s.	n.s.	n.s.
Aged 50−54, female	n.s.	n.s.	n.s.	n.s.
Aged 55 +, female	n.s.	n.s.	n.s.	n.s.
Victoria		0.033	n.s.	n.s.
Queensland		0.090	n.s.	n.s.
South Australia		0.033	n.s.	n.s.
Western Australia		0.075	n.s.	n.s.
Tasmania		0.072	n.s.	n.s.
Northern Territory		0.211	0.301	0.496
Australian Capital Territory		0.066	n.s.	n.s.
Major city		0.073	0.158	0.161
Probability of the base case[b]	0.557	0.467	0.317	0.212
Pseudo R-Squared	0.0479	0.1848	0.2652	0.2864
Number of observations	64 164	54 828	837	787

Part B: Socioeconomic and other variables

Explanatory variables[a]	Total population		Indigenous population	
	Model 1	Model 2	Model 3	Model 4
Changed usual residence in the last 5 years		0.029	0.083	n.s.
Changed usual residence in the last year		n.s.	n.s.	n.s.
Completed Year 9 or less		−0.388	−0.291	−0.199
Completed Year 10 or 11		−0.321	−0.224	−0.160
Has a degree or higher		0.219	0.326	0.312
Has a Diploma or Certificate only		−0.296	−0.273	−0.192
Speaks another language and English well		n.s.	n.s.	−0.134
Speaks another language and English not well or not at all		−0.298	−0.285	−0.196
Never married		0.032	−0.089	n.s.
Divorced, separated or widowed		n.s.	0.151	0.188
Has had at least one child (for females)		−0.037	n.s.	n.s.
Has a 'core activity' need for assistance		−0.229	n.s.	n.s.
Provides unpaid child care (all)		n.s.	−0.098	n.s.
Provides unpaid child care for children other than own		n.s.	n.s.	n.s.
Provides unpaid assistance for someone with a disability		−0.016	n.s.	n.s.
Lives in a mixed Indigenous and non-Indigenous household				n.s.
Probability of the base case[b]	0.557	0.467	0.317	0.212
Pseudo R-Squared	0.0479	0.1848	0.2652	0.2864
Number of observations	64 164	54 828	837	787

[a.] n.s. = Those variables that were not significant at the 10% level of significance.

  * = Those variables that were significant at the 10% level of significance but not the 5% level

[b.] The base case for the total population is non-Indigenous. For all estimates, the base case is aged 20–24 years and in addition, for Models 2–4 (for the total population and for the Indigenous estimates), the base case lives in New South Wales, outside a major city, did not change usual residence in the last five years, has completed Year 12, does not have any qualifications, speaks English only, is currently married, has not had any children, and does not provide unpaid child care or assistance to someone with a disability. For Model 4, an additional characteristic of the base case is that they are living in an Indigenous-only household.

Source: Customised calculations using the 2006 5% CSF, ABS Census of Population and Housing

Non-government school attendance

Results presented in the previous sections showed that Indigenous Australians aged 25 years and over are more likely to be participating in education than

a non-Indigenous Australian with similar observable characteristics. However, Biddle (2010) showed that this does not result in sufficient catch-up across the lifecourse to bring parity in participation in education completion. In addition, the results presented in Table 5.2 also showed that individuals who complete high school are more likely to undertake education later in life than those who do not, with the results presented in Table 5.3 showing that they are more likely to be attending university as opposed to other tertiary institutions. Finally, the benefits of education accrue over the lifecourse, so a person who undertakes education when they are 35 years old is likely to receive fewer lifetime benefits than people who complete the same level of education when they are young. For all three reasons, the factors that shape the high school decision clearly matter.

One factor that had not been included in any empirical analysis of Indigenous high school completion or participation is a person's cognitive and non-cognitive ability. According to Carneiro and Heckman (2003), Tobias (2003), and discussed in detail with regards to Indigenous Australians in Biddle (2010), students with relatively high ability are more likely to complete high school because they either have higher benefits from, or lower costs associated with, education. While it is unlikely that the distribution of natural ability across the Indigenous population is any different to the distribution for the non-Indigenous population, by the time a person reaches late secondary school there are a number of institutional or external factors that are likely to have had an impact.

The skills that are rewarded through the education system and the contemporary labour market are only one set from a larger range of abilities. As the Indigenous population makes up only a small percentage of the total population, the abilities that they value are less likely to be amongst the abilities that are rewarded. One policy response to this is to better accept and integrate into the school system the abilities of Indigenous students. A further impediment to the development of ability is likely to be intergenerational. That is, because the adult Indigenous population has been constrained in their educational attainment, they may be less able to prepare their children for Western school and assist in other ways throughout their school career.

One institutional factor that may impede skills development is the relatively low rates of preschool attendance for the Indigenous population. This low rate of attendance is likely to influence how ready a child is to start school. Biddle (2007) showed that Indigenous three, four and five year olds are less likely to attend preschool than the non-Indigenous population. A large part of this difference was explained by household and family level socioeconomic characteristics. However, having an Indigenous preschool worker in the area, also has a positive association. While school preparedness and attendance at a good quality preschool is important for the development of a person's cognitive and non-cognitive ability, so too are the amount of resources devoted to a

person's education throughout their school life. Students who attend schools that are well resourced are likely to have greater access to their teacher, an improved range of educational resources, and possibly greater attention to their individual curriculum needs. For students from a low socioeconomic background, the resources channelled through their schools are crucial in at least partly addressing the relative lack of resources they receive towards their own education and development outside school. In addition to preschool attendance, therefore, Indigenous Australians may have lower levels of skills development when they reach late secondary school because of the level of resources available to them throughout their earlier school career. This in turn may be influenced by the type of school that a child attends, including whether they attend a government or non-government school.

The school system in Australia can be categorised into three broad sectors. The first, the government sector, is provided by State governments, does not charge school fees and has an obligation to provide a place for every eligible student regardless of background or financial position. In 2006, 70.9 per cent of primary students and 61.8 per cent of secondary students were attending government schools. Non-government schools, on the other hand, do charge school fees, although these school fees make up varying proportions of their total revenue. While these schools have a range of affiliations, the largest is the Catholic school system – which accounts for 19.1 per cent of primary and 21.5 per cent of secondary school students. Other non-government (or independent) schools made up the remaining 10.0 per cent of primary and 16.7 per cent of secondary school students (ABS 2006a).

The proportion of students attending non-government schools has increased quite substantially in the last 30–40 years. This has been caused in part by Commonwealth Government funding to non-government schools that began in the early 1950s and has increased reasonably steadily (even on a per-capita basis) since. Ryan and Watson (2004) show that the increase in funding has not led to a fall in school fees charged by non-government schools, but rather an increase in the amount of resources devoted to each student. This in turn has led to the maintenance of numbers of students with relatively high socioeconomic status attending non-government schools (and independent schools in particular). In Australia the resources devoted to students in non-government schools is on average higher than in government schools (Le and Miller 2003). Le and Miller also showed that even after controlling for the type of student who attends, non-government school students had a higher rate of school completion than the students in government schools. Hence, because Indigenous Australians attend non-government schools at a relatively low rate, their skills development may lag behind that of the non-Indigenous population, explaining some of the gap in school completion.

There are a number of factors that are likely to influence whether a child attends a non-government as opposed to a government school. These can be broadly categorised into three types: access, equity and preferences. Identifying factors that have a significant and substantial association with the probability of an Indigenous student attending a non-government school, as well as how these associations differ from the non-Indigenous population, will help in developing policy responses to low school completion rates. Furthermore, it is important to test whether the probability of attendance is still different for the Indigenous population after controlling for the observable characteristics of the individual.

Modelling non-government school attendance

The dependent variable in the following analysis is the probability that an infants, primary or secondary student (aged 5–19 years) is attending a non-government school as opposed to a government school. While there are likely to be differences between the outcomes of students attending a Catholic school as opposed to an 'other' non-government school, the sample size does not allow for a separate analysis of the two. Three sets of explanatory variables are used for the following estimations that have not been used up until now in this paper. The first is a control for whether the student is in infants or primary school as opposed to secondary school. Recognising that there are considerable resource requirements related to attendance at a non-government school, variables are also included (at the household level) in an attempt to control for current and permanent income or wealth. The first of these is the equivalised income of the household in which the child lives, with the base case having an equivalised income in the middle two quartiles, and a variable each for whether the household is in the first or fourth quartile. The other explanatory variable is for whether or not a person lives in a house that is owned or being purchased by a household member, with the base case being a household occupied under private or community rental. This is used as a proxy (albeit an imperfect one) for household wealth.

Table 5.4 Factors associated with the probability of attending a non-government school, for infants, primary and secondary school students, 2001–06

	Total population		Indigenous population	
Explanatory variables[a]	Model 1	Model 2	Model 3	Model 4
Indigenous	−0.173	−0.087		
Female	0.017	0.017	0.068	0.062
Aged 5–9	−0.016	n.s.	0.039*	0.036*
Aged 15–19	0.066	−0.020	n.s.	n.s.
Aged 5–9, female	−0.014	−0.017	−0.064	−0.059
Aged 15–19, female	n.s.	n.s.	n.s.	n.s.
Victoria		0.016	−0.048	−0.043*
Queensland		0.007*	n.s.	n.s.
South Australia		0.032	n.s.	n.s.
Western Australia		0.012	0.066	0.068
Tasmania		n.s.	n.s.	n.s.
Northern Territory		0.045	n.s.	0.044*
Australian Capital Territory		n.s.	0.125	0.107*
Major city		0.045	0.030	0.026
Changed usual residence in the last 5 years		−0.011	n.s.	n.s.
Changed usual residence in the last year		n.s.	n.s.	n.s.
Speaks another language and English well		n.s.	n.s.	0.048*
Speaks another language and English not well or not at all		n.s.	−0.105	−0.094
Primary or infants student		−0.081	−0.032*	−0.028*
Lives in a single-parent family		−0.034	−0.026	n.s.
Lives in a household without anyone employed		−0.024	−0.053	−0.048
Lives in a household where no-one has completed Year 12		−0.102	−0.028	−0.024
Household equivalised income in bottom quartile		−0.059	n.s.	n.s.
Household equivalised income in top quartile		0.162	0.101	0.094
Home owned or being purchased		0.121	0.098	0.086
Lives in a household with Indigenous and non-Indigenous adults				0.027
Lives in a household with non-Indigenous adults only				n.s.
Probability of the base case[b]	0.333	0.324	0.165	0.149
Pseudo R-Squared	0.0095	0.0580	0.0615	0.0625
Number of observations	144 645	123 252	4 092	4 089

[a.] n.s. = Those variables that were not significant at the 10% level of significance.

* = Those variables that were significant at the 10% level of significance but not the 5% level

b. The base case for the total population is non-Indigenous. For all estimates, the base case is aged 10–14 years and in addition, for Models 2–4 (for the total population and for the Indigenous estimates), the base case lives in New South Wales, outside a major city, speaks English only, is a high school student, lives in a couple family with children, has someone in the household employed, has someone in the household who has completed Year 12, lives in a household with equivalised income in the middle two quartiles, and lives in a dwelling that is not owned or being purchased. For Model 4, an additional characteristic of the base case is that they are living in an Indigenous-only household.

Source: Customised calculations using the 2006 5% CSF, ABS Census of Population and Housing

The results from Model 1 show that after controlling for age and gender only, Indigenous school students are significantly and substantially less likely to be attending a non-government as opposed to government school. To put the magnitude of the difference into perspective, a non-Indigenous male aged 10–14 years has a predicted probability of attending a non-government school equal to 0.333. An Indigenous male of the same age has a predicted probability of 0.160, less than half that of their non-Indigenous counterpart. This difference reduces substantially once other socioeconomic characteristics are controlled for (from −0.173 to −0.087), however it is still significant and, relative to other variables in the model, quite large. For example, the difference between Indigenous and non-Indigenous Australians in terms of non-government school participation is greater than the difference between an infants or primary school student and one attending secondary school, as well as the difference between someone who lives in a household with equivalised income in the bottom rather than the middle two quartiles.

Clearly, much of the difference between Indigenous and non-Indigenous Australians in non-government school participation results from the lower socioeconomic status of Indigenous students and their household. Models 3 and 4 also demonstrate that socioeconomic outcomes are associated with variation within the Indigenous population. Indigenous students who live in a household where no-one is employed or no-one has completed Year 12 are less likely to be attending a non-government school than the base case, whereas Indigenous students who live in a household where the equivalised income is in the top quintile, or who own or are purchasing their home are more likely to be attending.

Education participation across the Indigenous lifecourse

Although there is debate around the margins in terms of the size of any direct effect, individuals with higher levels of education tend to have better health, better employment prospects and a higher standard of living. Quite

rightly, therefore, education is one of the centrepieces of COAG's Closing the Gap agenda and one of three components of the United Nations Development Programme's Human Development Index. Low levels of education participation and attainment comprises a large part of the explanation for the ongoing socioeconomic disadvantage faced by Indigenous Australians.

Focusing on education participation in adulthood, there are three main stylised facts from previous research that are confirmed from the analysis presented in this paper. Not surprisingly, education participation is highest amongst the young, females have higher rates of participation than males, and Indigenous Australians have substantially lower rates of participation when young. One of the more important findings from the analysis, however, is that Indigenous Australians have higher rates of participation from the mid-thirties onwards, especially after controlling for other characteristics. This suggests a different education lifecourse for Indigenous Australians. To a certain extent, the education that Indigenous adults undertake is likely to bring lower economic benefits than for the average non-Indigenous Australian. Not only does the education occur much later in life, leading to less time for the benefits to accrue, but it is more likely to take the form of VET rather than university study. While this latter difference disappears once other characteristics are controlled for, this is mainly because of lower levels of high school education for the Indigenous population. What happens in adolescence and young adulthood in terms of education attainment clearly has large and long-lasting effects throughout the lifecourse. If one also accepts that attendance at a non-government school brings advantages to the student (and evidence presented in Le and Miller (2003) suggests that it does), then the results presented in this chapter have also shown that throughout their school career Indigenous Australians are likely to be at a disadvantage compared to the average non-Indigenous Australian. This may explain the substantially lower levels of education participation during the part of the lifecourse generally associated with skills development.

There are two obvious policy responses to this situation. The first would be to reduce the education disadvantage faced by students attending a government as opposed to non-government school. To the extent that school resources (including the salary offered to teachers) explains this disadvantage, a redirection of funds from non-government to government schools would potentially contribute towards COAG's Closing the Gap targets. However, such a policy change is likely to be politically difficult, given the number of voters who have attended or who currently have children attending a non-government school. The second policy response would be to increase the number of Indigenous students attending a non-government school. This would potentially occur through a reduction in socioeconomic disadvantage. However, this could only realistically be seen as a long-term goal and, furthermore, there is still a large gap between Indigenous

and non-Indigenous students after controlling for socioeconomic status. An alternative option would be to mandate a certain number of Indigenous-specific scholarships be made available for any non-government school to receive government funds. The two drawbacks of a policy such as this are that it ignores the large number of disadvantaged non-Indigenous Australians unable to afford the fees required to attend a non-government school, and that taking high-achieving Indigenous students out of government schools has the potential to disadvantage the Indigenous students that remain behind through the loss of positive peer group effects (Biddle 2007). Whatever the policy response, the results presented in this section have highlighted the potential for differential access to high-resource non-government schools, which may pose some difficulties for COAG in achieving the Closing the Gap targets.