

Potential factors influencing Indigenous education participation and achievement: support document

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Analysis of the 2008 National Aboriginal and Torres Strait Islander Social Survey

Recognising the limitations of the census and other mainstream data collections, the Australian Bureau of Statistics has carried out a number of social surveys focused specifically on Indigenous Australians. The most recent of these was carried out in 2008, with two previous surveys, one in 2002 and another in 1994. The 2008 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) was conducted from August 2008 to April 2009, with broad information collected across key areas of social concern for Indigenous Australians. Importantly, there were a number of wellbeing measures collected that were developed specifically for the Indigenous population. This allows us to look at differences by education attainment across a range of economic and social variables.

The major limitation of the NATSISS is that there is no non-Indigenous sample against which comparisons can be made. Although there was a General Social Survey carried out in 2006 on the total Australian population, it understandably does not have information on many of the wellbeing indicators specific to the Indigenous population.

We begin the presentation of results in this paper by using the NATSISS to consider the relationship between an Indigenous Australian's level of education and a number of outcome measures. Ideally, we would like to be able to measure a return to education across a number of domains. Returns are usually calculated by comparing the benefit of education—the average difference in a particular outcome measure for a person with a given level of education and another person with a lower level of education but otherwise identical characteristics—with the cost. If this return was lower for the Indigenous population across a range of measures, then this might explain why Indigenous Australians are less likely to participate in education.

Unfortunately, it is not possible to measure such returns to education with the data available. This is because although we know a particular outcome for a person with a given level of education (on average), we do not observe what their outcome would be if they had a different level of education (the counterfactual). What we can and do measure is the average difference within the Indigenous population between those with a given level of education and a separate set of individuals with a different level of education. This would be roughly equivalent to a return to education (after taking into account costs), if the level of education was the only thing that differed between the two groups. However, we know from analysis presented later in the paper that those with different levels of education also differ in important ways.

Specifically, we know from other contexts that having higher levels of cognitive and non-cognitive ability makes education easier or less costly (Card 2001). Similarly, those who are more intrinsically motivated and who value the future relatively highly are also more likely to undertake and complete education. This would not be an issue if education was the only thing that these characteristics affected. However, they are also potentially associated with a number of the outcome measures that are considered to be measures of wellbeing or that influence wellbeing directly. For example, being highly numerate makes education easier, but it also makes it easier to obtain a job whatever a person's education levels.

If these other factors were observable, then we could control for them in the model and still estimate a return to education. However, while they are often observable to the individual making the decision, they are rarely observable to the researcher attempting to estimate a return to education. This is particularly the case with cross-sectional data. Longitudinal databases with a much greater age range than is currently available or evaluations of policies that add a degree of randomness to the education decision would allow us to shed some light on this issue.

While it is not possible to calculate a return to education with currently available data, it can still be instructive to compare the average difference in outcomes by education across a number of domains of interest. This is useful for three reasons. First, although there are undoubtedly omitted variable biases when trying to estimate returns to education with cross-sectional data, they are not always large (Leigh & Ryan 2008). A simple comparison by education level can therefore identify those outcomes where returns to education are potentially high—areas for further study with better data if and when it becomes available. Second, it is not clear whether individuals use such a sophisticated analysis when deciding to undertake education. It is entirely possible that they make a simple comparison between those with and without a particular qualification when making their decision.

The final reason for calculating average differences by education is that, even if returns to education are necessary for studying the education decision, when targeting policy towards adults one might still be interested in the extent to which one particular group in the population has better outcomes than another. That is, in certain contexts, policymakers are less concerned with what is causing the difference in outcomes as opposed to what types of people have relatively poor outcomes on average.

With that in mind, we calculate differences by education across eight measures or determinants of wellbeing:

- Employment
- Income for those employed
- Happiness – Feeling happy in the past four weeks all or most of the time
- Sadness – Feeling so sad that nothing could cheer one up at least a little bit of the time in the past four weeks
- Health fair/poor – Reporting one’s own health as being fair or poor (as opposed to good, very good or excellent)
- Cultural – Being involved in cultural events, ceremonies or organisations in the previous 12 months
- Have a say – Feeling that one is able to have a say within the community on important issues all or most of the time
- Raise \$2k – Feeling that household members could raise \$2000 in an emergency within a week

Differences are calculated separately by high school education and post-school qualifications. For the former, those who have completed Year 9 or less and those who have completed Year 10 or 11 are compared separately with those who have completed Year 12. In terms of post-school qualifications, individuals are compared based on their highest qualification, with those with no qualifications treated as the base case and four other qualification types compared – those with a degree or higher; those with a diploma; those with a certificate I/II; and those with a certificate III/IV.

Comparisons are made using a modelling framework with a limited set of variables controlled for. Other explanatory variables in the model include age, remoteness, marital status, family type, the Indigenous status of others in the household, language spoken at home, and mobility. Other variables that are likely to be strongly influenced by education or which could potentially be influenced by the dependent variables are not included in the model. Separate estimates are undertaken for males and females (in Tables 1 and 2 respectively) and by remoteness (in Tables 3 and 4).

For seven of the eight variables, the dependent variable is constructed as the probability of that particular event occurring (for example being employed as opposed to not being employed). For income, on the other hand, the dependent variable is the natural log of personal income (with results converted back to linear personal income). Descriptive statistics for these models are given in Appendix Table A1.

Table 1 Association between education and measures of wellbeing — Indigenous males, 2008

Explanatory variables	Employed	Income if employed	Happiness	Sadness	Health	Cultural	Have a say	Raise \$2000
Aged 15–24	–0.028	–315***	0.052**	–0.090***	–0.222***	0.008	–0.128***	–0.017
Aged 25–34	0.010	–114***	0.041*	–0.071***	–0.135***	0.001	–0.071***	–0.048*
Aged 55+	–0.262***	–67	0.052**	–0.096***	0.110***	–0.008	0.051*	0.069***
Lives in remote Australia	0.099***	–60	0.096***	–0.022	–0.094***	0.160***	0.022	–0.056**
Not married	–0.236***	–384***	0.013	–0.005	–0.046	–0.045	–0.052	0.012
Lives in a couple family with children	0.003	13	0.004	–0.030	–0.063**	0.071***	0.031	–0.073**
Lives in a couple family with no children but dependents	0.053*	109	0.003	–0.025	–0.072*	–0.063	0.151***	–0.030
Lives in a single parent family with children	0.059*	311***	–0.041	–0.013	0.017	0.031	0.042	–0.154***
Lives in a single parent family with no children but dependents	0.075**	250**	–0.039	0.032	0.097*	–0.010	0.067	–0.101**
Lives in an ‘other’ family type	0.109***	404***	–0.103**	0.062	0.053	–0.006	0.049	–0.113**
Has a non-Indigenous person living in the household	0.085***	66*	–0.011	–0.054**	–0.025	–0.206***	0.028	0.171***
Main language spoken at home is not English	–0.020	–346***	0.025	0.085***	–0.052*	0.156***	0.164***	–0.170***
Changed usual residence in the previous five years	–0.031*	13	–0.015	0.021	0.031	0.000	–0.061***	–0.049**
Completed Year 10 or 11 only	–0.111***	–178***	–0.012	0.023	0.010	–0.063**	–0.037	–0.079***
Completed Year 9 or less	–0.294***	–278***	–0.068**	0.091***	0.151***	–0.076***	–0.057**	–0.199***
Has a degree or higher as highest qualification	0.152***	373***	0.060	–0.026	–0.061	0.180***	0.058	0.147***
Has a diploma as highest qualifications	0.136***	294***	–0.053	0.053	–0.077	0.177***	0.060	0.142***
Has a certificate I or II as highest qualification	0.056**	139**	0.040	–0.016	–0.003	0.098***	0.048	0.023
Has a certificate III or IV as highest qualification	0.142***	218***	0.009	–0.029	–0.058**	0.070***	0.046*	0.091***
Probability of base case	0.768	959	0.729	0.362	0.314	0.630	0.320	0.674
Pseudo/Adjusted R-Squared	0.1582	0.2681	0.0256	0.0245	0.1219	0.1103	0.0485	0.1315
Number of observations	3259	1839	3202	3199	3259	3259	3259	3094

Source: Customised calculations using the 2008 NATSISS.

Note: The base case individual is: aged 35–54; lives in non-remote Australia; is married; lives in a couple family without children, with Indigenous Australians only in the household; speaks English at home; and did not change usual residence in the previous five years. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

Table 2 Association between education and measures of wellbeing — Indigenous females, 2008

Explanatory variables	Employed	Income if employed	Happiness	Sadness	Health	Cultural	Have a say	Raise \$2000
Aged 15–24	-0.169***	-270***	0.050**	-0.032	-0.155***	-0.042*	-0.101***	-0.027
Aged 25–34	-0.086***	-25	0.017	-0.035*	-0.111***	-0.041**	-0.066***	-0.025
Aged 55+	-0.315***	-77**	0.080***	-0.101***	0.071***	-0.031	0.056**	0.117***
Lives in remote Australia	0.099***	38	0.078***	0.000	-0.065***	0.138***	-0.005	-0.018
Not married	0.096***	-209***	0.006	0.025	-0.022	0.035	-0.013	0.018
Lives in a couple family with children	-0.103***	-72**	0.033	-0.038	-0.027	0.045*	-0.017	-0.072***
Lives in a couple family with no children but dependents	-0.018	9	0.036	0.004	0.010	-0.044	0.012	0.073*
Lives in a single parent family with children	-0.272***	333***	-0.039	0.008	0.029	-0.052	0.055	-0.207***
Lives in a single parent family with no children but dependents	-0.118**	233***	-0.007	0.004	0.055	-0.055	0.046	-0.191***
Lives in an 'other' family type	-0.135***	323***	-0.025	-0.004	0.093**	-0.082*	0.032	-0.128***
Has a non-Indigenous person living in the household	0.125***	-59**	0.024	-0.056***	-0.016	-0.186***	0.047**	0.178***
Main language spoken at home is not English	-0.020	-189***	0.063***	0.028	-0.023	0.092***	0.100***	-0.186***
Changed usual residence in the previous five years	-0.049***	26	-0.043***	0.058***	0.009	0.023	-0.024	-0.079***
Completed Year 10 or 11 only	-0.136***	-106***	-0.039*	0.067***	0.043*	-0.025	-0.024	-0.119***
Completed Year 9 or less	-0.317***	-188***	-0.122***	0.120***	0.147***	-0.074***	-0.085***	-0.260***
Has a degree or higher as highest qualification	0.259***	382***	-0.039	-0.028	-0.058*	0.173***	0.119***	0.183***
Has a diploma as highest qualifications	0.225***	357***	0.033	-0.084**	-0.052*	0.150***	0.137***	0.093***
Has a certificate I or II as highest qualification	0.110***	57	0.013	0.050*	0.030	-0.002	0.066**	-0.006
Has a certificate III or IV as highest qualification	0.236***	180***	0.040*	-0.030	-0.048**	0.109***	0.071***	0.114***
Probability of base case	0.649	717	0.710	0.391	0.263	0.689	0.283	0.664
Pseudo/Adjusted R-Squared	0.1814	0.2866	0.0257	0.0212	0.0855	0.0813	0.0337	0.1614
Number of observations	4303	1751	4256	4249	4303	4303	4303	4051

Source: Customised calculations using the 2008 NATSISS.

Note: The base case individual is: aged 35–54; lives in non-remote Australia; is married; lives in a couple family without children, with Indigenous Australians only in the household; speaks English at home; and did not change usual residence in the previous five years. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

Table 3 Association between education and measures of wellbeing — Indigenous Australians in non-remote areas, 2008

Explanatory variables	Employed	Income if employed	Happiness	Sadness	Health	Cultural	Have a say	Raise \$2000
Female	-0.132***	-282***	-0.015	0.104***	0.008	0.079***	-0.001	-0.054***
Aged 15–24	-0.083***	-459***	0.043**	-0.064***	-0.141***	-0.004	-0.103***	-0.022
Aged 25–34	-0.037**	-92**	0.030*	-0.043**	-0.080***	-0.024	-0.048***	-0.037**
Aged 55+	-0.284***	-132**	0.057***	-0.101***	0.090***	-0.004	0.048**	0.100***
Not married	-0.040	-428***	0.021	0.026	-0.039	0.012	0.014	0.032
Lives in a couple family with children	-0.043**	-105**	0.013	-0.036*	-0.038**	0.060***	-0.019	-0.076***
Lives in a couple family with no children but dependents	0.013	100	0.022	-0.028	-0.027	-0.049	0.062**	0.020
Lives in a single parent family with children	-0.099***	568***	-0.095**	-0.002	0.033	-0.036	-0.006	-0.217***
Lives in a single parent family with no children but dependents	-0.011	277***	-0.034	-0.007	0.081**	-0.022	-0.008	-0.189***
Lives in an 'other' family type	-0.003	482***	-0.080**	0.023	0.092**	-0.051	-0.034	-0.169***
Has a non-Indigenous person living in the household	0.090***	-90***	-0.002	-0.053***	-0.018	-0.194***	0.031*	0.138***
Main language spoken at home is not English	-0.124**	-354**	-0.011	0.175***	0.061	0.162***	0.025	-0.221***
Changed usual residence in the previous five years	-0.043***	23	-0.017	0.034**	0.031**	0.032**	-0.031**	-0.074***
Completed Year 10 or 11 only	-0.111***	-218***	-0.029	0.050***	0.057***	-0.052***	-0.017	-0.092***
Completed Year 9 or less	-0.302***	-356***	-0.099***	0.138***	0.190***	-0.087***	-0.052***	-0.240***
Has a degree or higher as highest qualification	0.163***	458***	-0.008	-0.027	-0.040	0.194***	0.119***	0.153***
Has a diploma as highest qualifications	0.145***	384***	0.000	-0.044	-0.056**	0.199***	0.113***	0.086***
Has a certificate I or II as highest qualification	0.063***	121**	0.020	0.015	0.010	0.048**	0.042*	0.004
Has a certificate III or IV as highest qualification	0.144***	217***	0.007	-0.019	-0.052***	0.109***	0.042**	0.084***
Probability of base case	0.781	1124	0.740	0.313	0.225	0.597	0.296	0.732
Pseudo/Adjusted R-Squared	0.1883	0.2985	0.0153	0.0355	0.1000	0.0541	0.0264	0.1331
Number of observations	5003	2381	4968	4961	5003	5003	5003	4724

Source: Customised calculations using the 2008 NATSISS.

Note: The base case individual is: male; aged 35–54; is married; lives in a couple family without children, with Indigenous Australians only in the household; speaks English at home; and did not change usual residence in the previous five years. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

Table 4 Association between education and measures of wellbeing — Indigenous Australians in remote areas, 2008

Explanatory variables	Employed	Income if employed	Happiness	Sadness	Health	Cultural	Have a say	Raise \$2000
Female	-0.153***	-27	-0.050***	0.103***	0.031	0.017	-0.070***	-0.027
Aged 15–24	-0.089***	-158***	0.049**	-0.035	-0.225***	-0.054**	-0.174***	-0.018
Aged 25–34	-0.042***	-48	0.012	-0.051**	-0.181***	-0.028	-0.129***	-0.031
Aged 55+	-0.197***	-1	0.066***	-0.071**	0.078**	-0.043*	0.080**	0.056*
Not married	-0.071***	-159***	-0.015	-0.020	-0.032	-0.026	-0.126***	-0.019
Lives in a couple family with children	-0.028	61	0.024	-0.022	-0.028	0.039*	0.059*	-0.052
Lives in a couple family with no children but dependents	-0.001	19	-0.010	0.056	0.016	-0.063	0.117**	-0.043
Lives in a single parent family with children	-0.028	250***	0.016	0.040	0.026	0.026	0.218***	-0.141***
Lives in a single parent family with no children but dependents	0.017	209**	-0.005	0.060	0.058	-0.045	0.186***	-0.064
Lives in an 'other' family type	0.022	199***	-0.027	0.031	0.052	-0.030	0.186***	-0.021
Has a non-Indigenous person living in the household	0.031*	131***	0.023	-0.017	0.025	-0.156***	0.004	0.252***
Main language spoken at home is not English	-0.004	-189***	0.047***	0.046**	-0.043*	0.067***	0.153***	-0.159***
Changed usual residence in the previous five years	-0.015	7	-0.048***	0.053***	-0.024	-0.017	-0.059***	-0.038
Completed Year 10 or 11 only	-0.091***	-61**	-0.017	0.038	-0.049	-0.017	-0.055*	-0.110***
Completed Year 9 or less	-0.224***	-123***	-0.068**	0.032	0.025	-0.036	-0.129***	-0.199***
Has a degree or higher as highest qualification	0.113***	364***	-0.001	-0.025	-0.097	0.126***	0.034	0.168***
Has a diploma as highest qualifications	0.097***	379***	0.017	-0.040	-0.053	0.038	0.120*	0.163***
Has a certificate I or II as highest qualification	0.057***	77*	0.020	0.043	0.033	0.017	0.116***	-0.004
Has a certificate III or IV as highest qualification	0.107***	210***	0.069**	-0.060*	-0.027	0.033	0.142***	0.140***
Probability of base case	0.878	646	0.818	0.327	0.312	0.839	0.373	0.584
Pseudo/Adjusted R-Squared	0.1697	0.1990	0.0235	0.0180	0.1034	0.0544	0.0704	0.1082
Number of observations	2559	1209	2490	2487	2559	2559	2559	2421

Source: Customised calculations using the 2008 NATSISS.

Note: The base case individual is: male; aged 35–54; is married; lives in a couple family without children, with Indigenous Australians only in the household; speaks English at home; and did not change usual residence in the previous five years. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

Analysis of the 2006 Census

The aim of the census is to collect a range of demographic and socioeconomic information on the entire population of Australia at a particular point in time. The most recent census for which data is available was carried out on 8 August 2006. Results from the census carried out on 9 August 2011 will be available for analysis in late 2012. In this paper, we use data from the 2006 Census to look at the geographic distribution of Indigenous education participation of 15-19 year-olds. In the main report that this paper accompanies, we also summarise previous research that analysed preschool participation and attendance in non-private schools.

The two major advantages of the census for analysis of Indigenous outcomes are the large sample size and the availability of a non-Indigenous comparison population. Specifically, there were 171 108 Indigenous children aged 0-14 years in the 2006 Census, alongside 3 541 603 non-Indigenous children of the same age. There were also 43 014 Indigenous 15-19 year-olds with information on education attendance alongside 1 174 519 non-Indigenous Australians of the same age. Such large samples allow for detailed analysis across a range of demographic and geographic characteristics.

Table 5 demonstrates the much lower rates of education participation for those Indigenous (and non-Indigenous) Australians who live in relatively remote areas. The table focuses on the percentage of 15-19 year-olds who were reported to be attending an educational institution at the time of the 2006 Census. This could be high school, TAFE or other vocational education and training (VET), or a university. Percentages are given separately depending on where the individual lived five years previously. This is done to control for the fact that mobility rates are quite high amongst the 15-19 year-old population (in part because of movement for post-school education), and that the area in which one grew up is more likely to influence one's education decision (rather than where one currently lives, which is likely to be as much influenced by it).

Table 5 Per cent of 15–19 year-olds who were attending an educational institution, by remoteness area five years ago

Remoteness area five years earlier	Count of 15–19 year-olds	Indigenous		Non-Indigenous		
		Percentage of total population	Percentage attending education	Count of 15–19 year-olds	Percentage of total population	Percentage attending education
Major cities	12 845	32.2	58.1	727 263	67.0	77.9
Inner regional	9 000	22.5	55.9	234 569	21.6	71.3
Outer regional	8 766	22.0	53.8	106 006	9.8	69.2
Remote	3 705	9.3	43.2	13 671	1.3	68.0
Very remote	5 618	14.1	32.9	3 830	0.4	67.0
Total	39 934	100.0	51.7	1 085 339	100.0	75.5

Source: Customised calculations using 2006 Census.

Analysis of the Australian Early Development Index

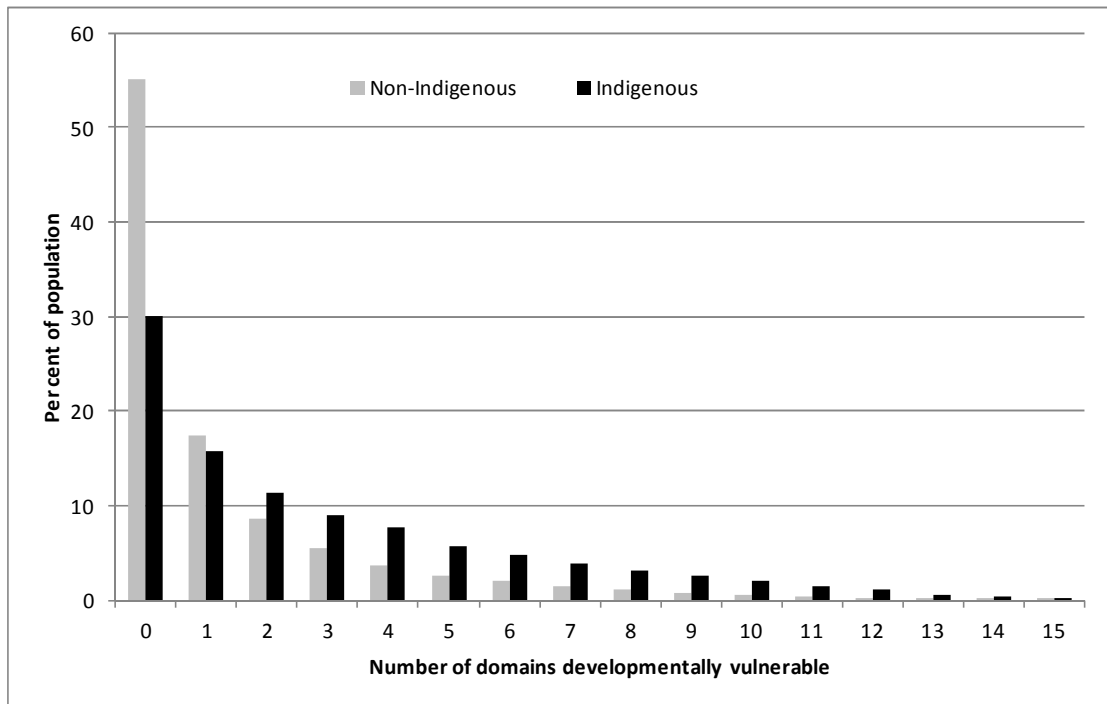
The fourth set of research questions covered in the main report that this paper accompanies is whether Indigenous children start school with different strengths and weaknesses than non-Indigenous children and—if so—do these differences remain once preschool participation has been controlled for? To consider these questions, we utilise a new set of data, the Australian Early Development Index (AEDI). Collected for the first time in 2009, the AEDI is based on a checklist completed by the teachers of children in their first year of full-time school. The checklist measures five key areas or domains of early childhood development: physical health and wellbeing, social competence, emotional maturity, language and cognitive skills (school-based), and communication skills and general knowledge.

Like the census, the AEDI is designed to be a population collection, with information sought on all children in their first year of full-time school. While coverage is not completely universal, information was collected for 261 203 children (97.5% of the estimated national five year-old population). This response rate is substantially higher than that of the population census, reflecting the large amount of resources devoted to the AEDI and, in particular, the support given to the collection by teachers across Australia.

While it was not designed exclusively for Indigenous children, there was considerable effort devoted to ensure the data collected was also useful in an Indigenous context. In total, there was information collected on 12 452 Indigenous children nationwide. Once again, the usefulness of the AEDI is limited somewhat by its narrow population focus. However, for the population in scope, it provides a very rich source of cross-sectional data.

Figure 1 gives the percentage of the relevant non-Indigenous and Indigenous populations based on how many domains in which they are identified as being developmentally vulnerable.

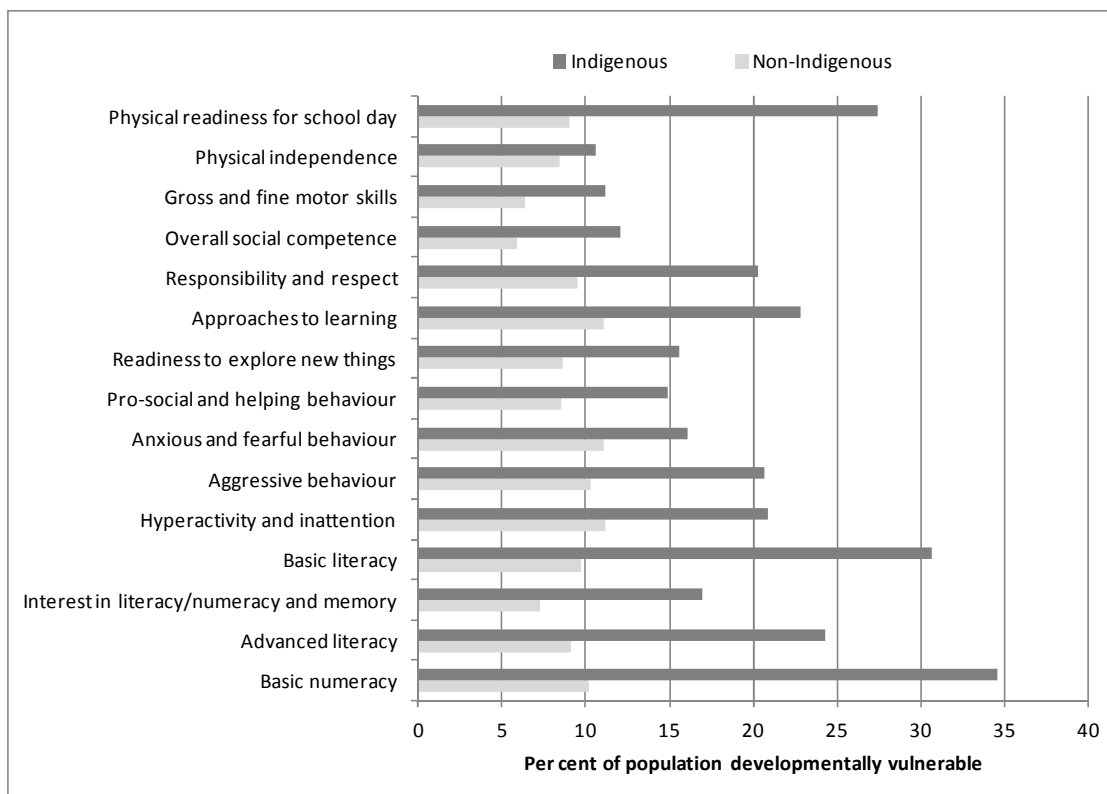
Figure 1 Number of domains in which Indigenous and non-Indigenous children in first year of school are identified as being developmentally vulnerable, 2009



Source: Customised calculations using the 2009 AEDI.

Figure 2 summarises the percentage of the Indigenous and non-Indigenous population who are identified as being developmentally vulnerable separately by the 15 available domains.

Figure 2 Percentage of Indigenous and non-Indigenous children in first year of school who are identified as being developmentally vulnerable by domain, 2009

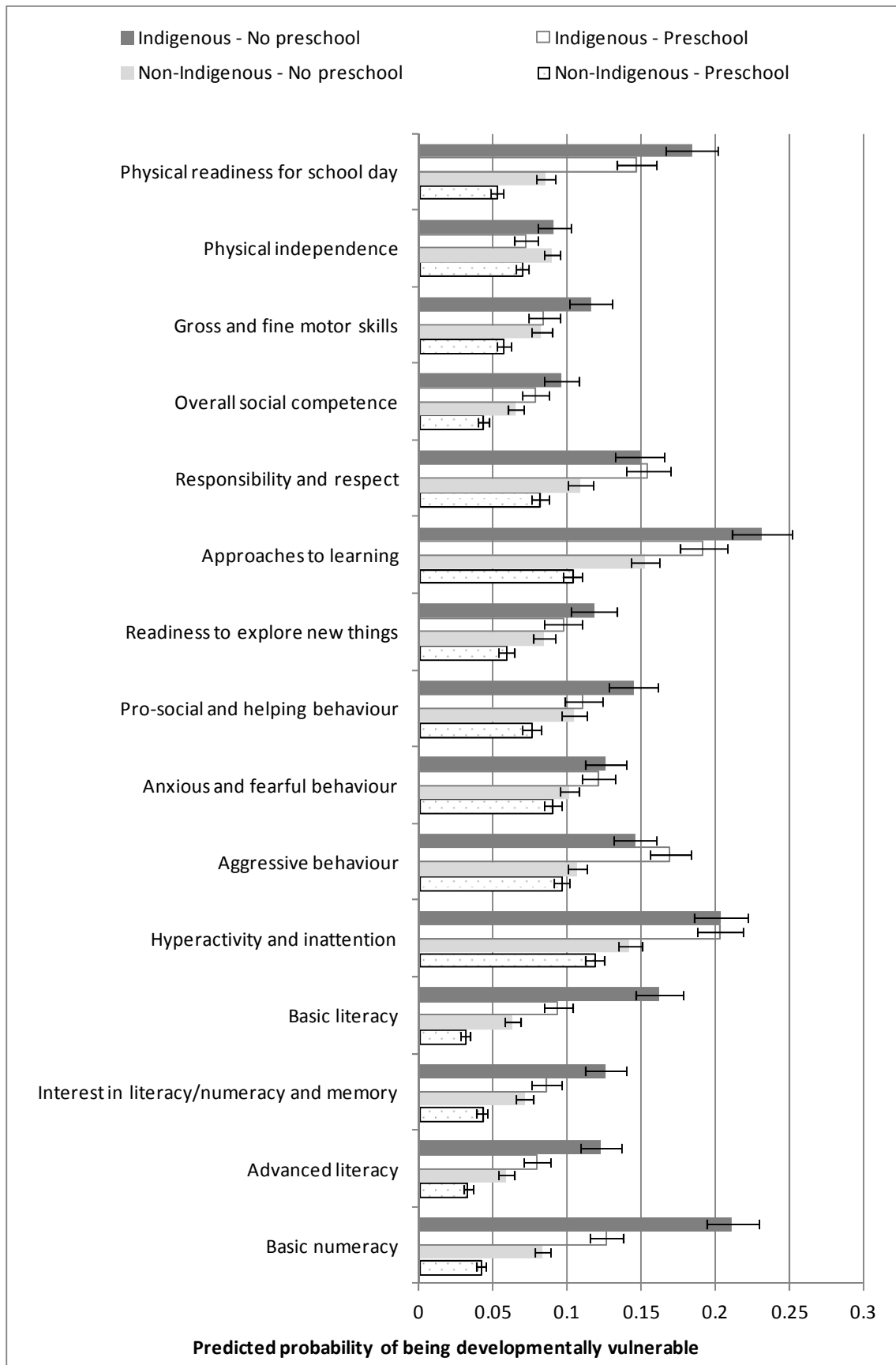


Source: Customised calculations using the 2009 AEDI.

In order to test whether preschool explains the variation in the individual domains summarised in Figure 2, we undertake a set of econometric analyses. These models test explicitly for differences in developmental vulnerability between Indigenous and non-Indigenous children after controlling for whether or not the child was reported to have attended preschool or not. In the model, we also control for the child's gender, the month at which they were tested, the level of remoteness of the area in which they lived, the level of socioeconomic advantage/disadvantage, and the state or territory in which they lived. While there are other data items on the AEDI that may explain developmental vulnerability like language ability, absence from school or physical disability, we do not control for them in the model as they are potentially affected by preschool, our main variable of interest.

The main results from this analysis are summarised in Figure 3. The figure shows the percentage of Indigenous and non-Indigenous children who were predicted as being developmentally vulnerable in their first year of school, conditional on whether they attended preschool or not. These predictions are found by holding constant other aspects of the model at a particular base case, as described underneath the table. The error bars represent the 95% confidence interval for that prediction.

Figure 3 Predicted probability of being developmentally vulnerable by domain — Indigenous and non-Indigenous children by preschool status, 2009



Source: Customised calculations using the 2009 AEDI.

Note: Predicted probabilities are for: males; with checklist carried out in June; and living in a major city in NSW in the most advantaged neighbourhood decile.

Analysis of the Longitudinal Survey of Australian Youth – Wave 1

It is possible to use cross-sectional surveys to look at the association between a given outcome and a range of other explanatory variables. With some surveys, it is even possible to test for differences between Indigenous and non-Indigenous Australians after controlling for these explanatory variables. However, it is not possible with cross-sectional surveys to analyse what led to the respondent being in that particular circumstance. For this, we need longitudinal databases.

The two most commonly used longitudinal databases in Australia are the Household Income and Labour Dynamics in Australia (known as the 'HILDA') survey and the Longitudinal Survey of Australian Youth (LSAY). The former has information on a range of outcomes across the lifecourse, starting in young adulthood. The Indigenous sample, however, is reasonably small and not necessarily representative of the Indigenous population (especially those in remote areas). The LSAY, on the other hand, focuses on youth outcomes and transitions, and has a large and much more representative Indigenous sample.

In this paper, data from the 2006 cohort of the LSAY is analysed in detail. Wave 1 of the survey includes information on 14 170 respondents who were aged about 15 years at the time of the survey. Of these, 1080 were Indigenous, with 42.3% of the Indigenous sample attending a school in a major city, 46.7% attending a school in provincial Australia, and the remainder attending a school in remote Australia. Unfortunately, there is no geographic information on the child's place of usual residence—only where their school is located.

One of the limitations of longitudinal data is that it is difficult to track individuals through time. Migration, mobility and other changes in circumstances lead to respondents dropping out of the survey across waves. This sample attrition is particularly an issue for Indigenous Australians. Only 518 or 48.0% of Indigenous students who were in Wave 1 of the survey remained in the survey by Wave 2, compared to 67.5% of non-Indigenous respondents. Attrition rates decline in subsequent waves, with 84.4% of those surveyed in Wave 2 available in Wave 3, and 79.9% of these respondents available in Wave 4. These high rates of attrition are particularly problematic if those who remain in the sample have different characteristics to those who drop out. We consider the potential biases involved when discussing relevant results in the paper.

In Table 6, we analyse the factors associated with the probability of a 15 year-old in the LSAY attending a non-government school. We analyse two separate models, with the first including a range of demographic and geographic variables, and the second a set of socioeconomic variables. Results are presented as marginal effects or differences in the predicted probability from the base case (as outlined below the table). The statistical significance of the coefficients is once again indicated by the number of asterisks next to the marginal effects.

Table 6 Factors associated with attending a non-government school — Indigenous and non-Indigenous Australians, 2006

	Model 1	Model 2
Age	0.051	0.054
Female	0.095***	0.098***
Indigenous	0.120**	0.107**
Born overseas	0.203***	0.110**
Mother born overseas	0.076***	0.051*
Father born overseas	0.040	0.015
Lives in provincial Australia	-0.045*	-0.008
Lives in remote Australia	-0.099	-0.065
Speaks a language other than English at home		0.230***
Number of years of education for parent with highest level		0.032***
Mother works as a manager or professional		0.069***
Father works as a manager or professional		0.147***
Predicted probability for base case	-0.111	-0.223
Adjusted R-Squared	0.0124	0.0293
Number of observations	12 328	11974

Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Note: The base case individual for all estimations is: aged 15; male; non-Indigenous; born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

In order to test whether Indigenous Australians are less happy at school than non-Indigenous students, we calculated an index of student happiness from Wave 1 of the 2006 LSAY. Students were asked whether they strongly agree, agree, disagree, or strongly disagree that their school is a place with 30 particular characteristics. To calculate the index of student happiness, we undertook a factor analysis of responses to seven of these statements about their school:

- I feel happy.
- I like learning.
- I get enjoyment from being here.
- I really like to go each day.
- I enjoy what I do in class.
- I get excited about the work that we do.
- I find that learning is a lot of fun.

This index is scaled to have a mean of zero and a standard deviation of one.

To test for differences between Indigenous and non-Indigenous children, the first model includes basic demographic information only. The discussion in the first section of this paper outlined how in previous research socioeconomic status is associated with happiness at school. In addition to testing whether this holds in the LSAY, the analysis presented in Model 2 allows us to test whether any differences between Indigenous and non-Indigenous Australians remain after controlling for language spoken at home, parental education and parental occupation.

The final model includes a number of school-specific variables. This includes an assessment of one's own ability, other information on school satisfaction, an index of the individual's test scores across maths, English and science (administered as part of the international component of the LSAY), and

the average test scores of individuals in one's school. In essence, Model 3 allows us to test whether there are differences between Indigenous and non-Indigenous Australians in terms of happiness once other components of the human capital model are controlled for.

As the dependent variable in the analysis is continuous, we use the linear model estimated via ordinary least squares. Marginal effects and statistical significance are to be interpreted in comparison to the base case, given underneath the table.

Table 7 Factors associated with an index of student happiness — Indigenous and non-Indigenous Australians, 2006

	Model 1	Model 2	Model 3
Age	0.051	0.054	0.068**
Female	0.095***	0.098***	0.096***
Indigenous	0.120**	0.107**	0.216***
Born overseas	0.203***	0.110**	0.115***
Mother born overseas	0.076***	0.051*	0.027
Father born overseas	0.040	0.015	0.002
Lives in provincial Australia	-0.045*	-0.008	-0.004
Lives in remote Australia	-0.099	-0.065	-0.038
Speaks a language other than English at home		0.230***	0.232***
Number of years of education for parent with highest level		0.032***	0.010*
Mother works as a manager or professional		0.069***	0.009
Father works as a manager or professional		0.147***	0.067***
Assessed own ability as 'very well'			0.729***
Assessed own ability as 'above average'			0.351***
Assessed own ability as 'below average'			-0.590***
Index of test scores			0.035**
Index of test scores for school			0.090***
Predicted index value for base case	-0.111	-0.223	-0.380
Adjusted R-Squared	0.0124	0.0293	0.1384
Number of observations	12 328	11 974	11 941

Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Note: The base case individual for all estimations is: aged 15; male; non-Indigenous; born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. For Model 3, the base case is further defined as: assesses one's own ability at school as average; has an index value of zero for their test scores (the mean); and attends a school where that is the mean value. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

To obtain a more rounded picture of Indigenous wellbeing whilst at school, we replicated the econometric modelling presented in Table 7 using five additional indices. The index name, label and component variables for each of the indices is summarised below:

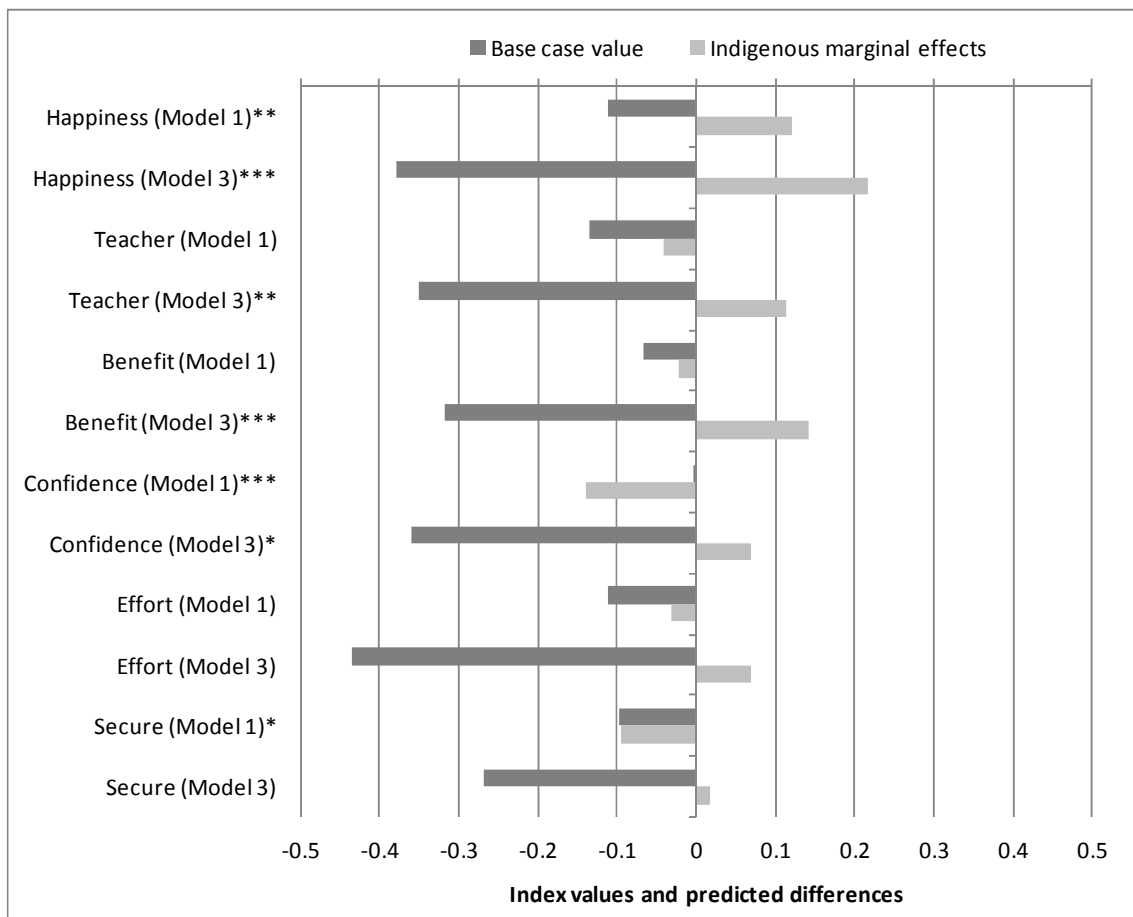
- Student happiness (Happiness) – I feel happy; I like learning; I get enjoyment from being here; I really like to go each day; I enjoy what I do in class; I get excited about the work that we do; I find that learning is a lot of fun.
- Views towards teachers (Teachers) – Teachers are fair and just to me; Teachers listen to what I say; Teachers give me the marks I deserve; Teachers take a personal interest in helping me with my school work; Teachers help me do my best; Teachers treat me fairly in class.
- Belief in benefit of current schooling (Benefit) – The work we do is interesting; The things I learn are important to me; The work I do is good preparation for my future; I have acquired skills that

will be of use to me when I leave school; The things I learn will help me in my adult life; I am given the chance to do work that really interests me; The things I am taught are worth learning.

- Confidence in own achievement (Confidence) – I achieve a standard in my work which I consider satisfactory; I always achieve a satisfactory standard in my work; I know how to cope with the work; I know I can do well enough to be successful; I am a success as a student.
- Effort towards schooling (Effort) – I have learnt to work hard; I like to ask questions in class; I like to do extra work; I always try to do my best.
- Feelings of safety and security (Secure) – I feel safe and secure.

We summarise the results for the main variable of interest (Indigenous status) in Figure 4. Figure 4 gives the results for the most parsimonious model which controls for demographic and geographic characteristics only (Model 1), as well as the full model with socioeconomic and student characteristics (Model 3). For each of the dependent variables and each of the models, the predicted value for the base case is given, as well as the marginal effect for Indigenous status. The number of asterisks after the variable label identifies the statistical significance of the Indigenous status variable (as documented underneath the figure).

Figure 4 Relationship between Indigenous status and indices of student happiness and wellbeing, 2006



Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Note: The base case individual for all estimations is: aged 15; male; non-Indigenous; born in Australia; and lives in a major city. For Model 3, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); has a mother and father not employed as a manager or professional; assesses one's own ability at school as average; has an index value of zero for their test scores (the mean); and attends a school where that is the mean value. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

In order to test for differences in the probability of expecting to complete Year 12, we again use econometric techniques. Three models are estimated, with the first controlling for demographic factors, the second for socioeconomic factors, and the third for school-level factors (including the index of student happiness analysed earlier). Unlike the estimates in the previous section (which were based on the linear model), the analysis in Table 8 takes into account the binary nature of the dependent variable and uses the probit model. Significance is interpreted the same way, although the magnitude of the association is presented as differences in the predicted probability. These marginal effects need to be interpreted alongside the probability of the base case, given in the third-last line of the table.

Table 8 Factors associated with the probability of expecting to complete Year 12 — Indigenous and non-Indigenous Australians, 2006

	Model 1	Model 2	Model 3
Age	0.041**	0.047**	0.014
Female	0.107***	0.135***	0.114***
Indigenous	-0.055**	-0.036	0.045**
Born overseas	0.062***	0.026	0.001
Mother born overseas	0.056***	0.054***	0.039**
Father born overseas	0.050***	0.049***	0.043***
Lives in provincial Australia	-0.082***	-0.059***	-0.024*
Lives in remote Australia	-0.173***	-0.139***	-0.083*
Speaks a language other than English at home		0.141***	0.124***
Number of years of education for parent with highest level		0.026***	0.009***
Mother works as a manager or professional		0.072***	0.024**
Father works as a manager or professional		0.101***	0.024**
Assessed own ability as 'very well'			0.091***
Assessed own ability as 'above average'			0.069***
Assessed own ability as 'below average'			-0.094***
Index of student happiness			0.094***
Index of test scores			0.128***
Proportion of school who expected to complete Year 12			0.070***
Predicted probability of base case	0.752	0.673	0.765
Pseudo R-Squared	0.0472	0.0859	0.2710
Number of observations	13 099	12 698	11 844

Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Note: The base case individual for all estimations is: aged 15; male; non-Indigenous; born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. For Model 3, the base case is further defined as: assesses one's own ability at school as average; has an index value of zero for their happiness and test scores (the mean); and attends a school where around 83.1% of students expect to complete Year 12 (the Australian average). Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

We also look at the probability of a student expecting to undertake any post-school study.

Four models are estimated, with the first three similar to those estimated for Year 12 expectations. That is, Model 1 includes demographic and geographic controls, Model 2 includes socioeconomic characteristics, and Model 3 includes a range of school-based characteristics. The fourth model includes whether or not the student expects to complete Year 12 as an additional explanatory variable.

Table 9 Factors associated with the probability of expecting to undertake post-school study – Indigenous and non-Indigenous Australians, 2006

	Model 1	Model 2	Model 3	Model 4
Age	0.024	0.021	-0.003	-0.002
Female	0.147***	0.154***	0.146***	0.094***
Indigenous	-0.072***	-0.068***	-0.028	-0.029*
Born overseas	0.108***	0.056**	0.056**	0.042**
Mother born overseas	0.092***	0.070***	0.062***	0.039***
Father born overseas	0.088***	0.072***	0.059***	0.038***
Lives in provincial Australia	-0.102***	-0.078***	-0.044***	-0.025***
Lives in remote Australia	-0.231***	-0.203***	-0.135***	-0.067**
Speaks a language other than English at home		0.215***	0.193***	0.136***
Number of years of education for parent with highest level		0.022***	0.012***	0.007***
Mother works as a manager or professional		0.035***	0.004	-0.002
Father works as a manager or professional		0.069***	0.019	0.010
Assessed own ability as 'very well'			0.124***	0.091***
Assessed own ability as 'above average'			0.094***	0.061***
Assessed own ability as 'below average'			0.005	0.038*
Index of student happiness			0.072***	0.036***
Index of test scores			0.076***	0.029***
Proportion of school who expected to undertake post-school study			0.055***	0.039***
Individual expects to complete Year 12				0.315***
Predicted probability of base case	0.482	0.426	0.424	0.188
Pseudo R-Squared	0.0549	0.0732	0.1239	0.1568
Number of observations	12 698	12 323	11 446	11 466

Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Note: The base case individual for all estimations is: aged 15; male; non-Indigenous, born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. For Model 3, the base case is further defined as: assesses one's own ability at school as average; has an index value of zero for their happiness and test scores (the mean); and attends a school where around 58.8% of students expect to undertake post-school education (the Australian average). Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

A separate set of analysis is carried out on those Indigenous and non-Indigenous youth who do expect to undertake post-school study, with the dependent variable being the probability of expecting to undertake university education.

Table 10 Factors associated with the probability of expecting to undertake university studies — Indigenous and non-Indigenous Australians who expect to undertake any post-school qualifications, 2006

	Model 1	Model 2	Model 3	Model 4
Age	-0.011	-0.015	-0.042	-0.033*
Female	-0.022**	-0.005	0.010	0.002
Indigenous	-0.088***	-0.068*	0.051	0.035
Born overseas	0.092***	0.096***	0.118***	0.118***
Mother born overseas	0.038***	0.036*	0.026	0.019
Father born overseas	0.039***	0.050***	0.044**	0.036**
Lives in provincial Australia	-0.015	0.009	0.044**	0.041***
Lives in remote Australia	-0.039	-0.012	0.054	0.089
Speaks a language other than English at home		0.101***	0.109***	0.083***
Number of years of education for parent with highest level		0.028***	0.019***	0.013***
Mother works as a manager or professional		0.057***	0.018	0.011
Father works as a manager or professional		0.112***	0.054***	0.044***
Assessed own ability as 'very well'			0.119***	0.106***
Assessed own ability as 'above average'			0.098***	0.080***
Assessed own ability as 'below average'			-0.144***	-0.072***
Index of student happiness			0.081***	0.051***
Index of test scores			0.143***	0.120***
Proportion of school who expected to undertake post-school study			0.074***	0.058***
Individual expects to complete Year 12				0.534***
Predicted probability of base case	0.791	0.690	0.669	0.183
Pseudo R-Squared	0.0227	0.0674	0.2033	0.2521
Number of observations	7449	7253	6857	6823

Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Note: The base case individual for all estimations is: aged 15; male; non-Indigenous; born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. For Model 3, the base case is further defined as: assesses one's own ability at school as average; has an index value of zero for their happiness and test scores (the mean); and attends a school where around 46.5% of student expect to undertake university (the Australian average). Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

Analysis of the Longitudinal Survey of Australian Youth – Waves 1–4

The first dependent variable used in this section is the probability that a person had left school without having completed Year 12. Although the dependent variable is calculated using data from Waves 2-4 of the LSAY, the explanatory variables all come from Wave 1 of the survey. This is to ensure that, as much as possible, the explanatory variables are influencing the dependent variable rather than vice versa. Three models are once again estimated, with Models 1 and 2 having the same set of explanatory variables as in the previous section. Model 3 includes some of the variables used in the previous section but also includes the number of hours worked and a student's expectations at the age of 15.

Table 11 Factors associated with the probability of dropping out of school before completing Year 12 – Indigenous and non-Indigenous Australians, 2006-09

	Model 1	Model 2	Model 3
Age	-0.062***	-0.081***	-0.091***
Female	-0.072***	-0.098***	-0.078***
Indigenous	0.109***	0.089***	0.037
Born overseas	-0.034	0.006	0.018
Mother born overseas	-0.051***	-0.050***	-0.050*
Father born overseas	-0.033**	-0.033*	-0.025
Lives in provincial Australia	0.109***	0.086***	0.065***
Lives in remote Australia	0.138***	0.114***	0.020
Speaks a language other than English at home		-0.151***	-0.162***
Number of years of education for parent with highest level		-0.024***	-0.008
Mother works as a manager or professional		-0.078***	-0.029
Father works as a manager or professional		-0.106***	-0.071***
Assessed own ability as 'very well' when 15			-0.128***
Assessed own ability as 'above average' when 15			-0.043**
Assessed own ability as 'below average' when 15			0.085**
Index of student happiness when 15			-0.021**
Worked 1–4 hours when 15			-0.039
Worked 5–9 hours when 15			0.019
Worked 10–14 hours when 15			0.051**
Worked 15–19 hours when 15			0.075**
Worked 20 or more hours when 15			0.188***
Index of test scores when 15			-0.146***
Expected to complete Year 12 when 15			-0.422***
Predicted probability of base case	0.215	0.315	0.614
Pseudo R-Squared	0.0436	0.0860	0.2800
Number of observations	7367	7200	6581

Source: Customised calculations using Waves 1–4 of the LSAY (enumerated between 2006 and 2009).

Note: The base case individual for all estimations is: aged 18; male; non-Indigenous; born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. For Model 3, the base case is further defined as: assesses one's own ability at school as average; has an index value of zero for their happiness and test scores (the mean); did not work whilst 15; and expected to complete Year 12 when 15. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

In the second set of analysis, we look at the tertiary entrance score achieved by those who had completed Year 12 by Wave 4. This score is standardised across states and territories, with a minimum value of one and a maximum value of 99.95.

Table 12 Factors associated with tertiary entrance ranking for those who have completed Year 12 – Indigenous and non-Indigenous Australians, 2006-09

	Model 1	Model 2	Model 3
Age	-0.1	0.0	-1.1
Female	1.4***	1.9***	3.3***
Indigenous	-8.4***	-7.0***	-3.9***
Born overseas	2.8***	1.3	1.0
Mother born overseas	0.8	1.1*	0.9
Father born overseas	-0.2	0.3	0.7
Lives in provincial Australia	-3.3***	-2.0***	-2.2***
Lives in remote Australia	0.0	2.1	2.6
Speaks a language other than English at home		1.5	2.2***
Number of years of education for parent with highest level		1.5***	0.8***
Mother works as a manager or professional		3.1***	1.3***
Father works as a manager or professional		4.1***	2.3***
Assessed own ability as 'very well' when 15			9.8***
Assessed own ability as 'above average' when 15			4.9***
Assessed own ability as 'below average' when 15			-3.5*
Index of student happiness when 15			0.6**
Worked 1–4 hours when 15			1.5*
Worked 5–9 hours when 15			0.6
Worked 10–14 hours when 15			-0.4
Worked 15–19 hours when 15			-1.2
Worked 20 or more hours when 15			-2.7*
Index of test scores when 15			9.3***
Expected to complete Year 12 when 15			6.1***
Predicted score for base case	77.0	70.8	56.1
Adjusted R-Squared	0.0199	0.0955	0.3945
Number of observations	3994	3943	3687

Source: Customised calculations using Waves 1–4 of the LSAY (enumerated between 2006 and 2009).

Note: The base case individual for all estimations is: aged 15 in base period; male; non-Indigenous; born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. For Model 3, the base case is further defined as: assesses one's own ability at school as average; has an index value of zero for their happiness and test scores (the mean); did not work whilst 15; and expected to complete Year 12 when 15. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

In Table 13, we consider whether differences in post-school study hold after controlling for a range of characteristics. The dependent variable in the analysis is whether an individual in the sample (who had completed or left school by Wave 4) was undertaking study in their first year after school.

The first two models in the analysis are similar to those presented earlier, with Model 1 containing demographic and geographic characteristics and Model 2 including socioeconomic characteristics (in addition to those variables in Model 1). Model 3 includes a range of additional characteristics of the individual when they were 15, including their school and post-school expectations, as well as their highest year of schooling. Results are once again presented as marginal effects, with the base case characteristics given below the table.

Table 13 Factors associated with the probability of studying during the first year out of high school — Indigenous and non-Indigenous Australians

	Model 1	Model 2	Model 3
Age	-0.052**	-0.056***	-0.052**
Female	-0.034***	-0.027**	-0.032**
Indigenous	-0.117***	-0.090***	-0.065**
Born overseas	0.105***	0.068**	0.061**
Mother born overseas	0.014	-0.003	-0.004
Father born overseas	0.064***	0.053***	0.040**
Lives in provincial Australia	-0.086***	-0.064***	-0.061***
Lives in remote Australia	-0.142***	-0.112***	-0.098**
Speaks a language other than English at home		0.139***	0.120***
Number of years of education for parent with highest level		0.022***	0.017***
Mother works as a manager or professional		0.010	-0.005
Father works as a manager or professional		0.035***	0.005
Assessed own ability as 'very well' when 15			0.100***
Assessed own ability as 'above average' when 15			0.052***
Assessed own ability as 'below average' when 15			-0.080**
Index of student happiness when 15			0.037***
Worked 1–4 hours when 15			0.020
Worked 5–9 hours when 15			-0.003
Worked 10–14 hours when 15			-0.027
Worked 15–19 hours when 15			-0.011
Worked 20 or more hours when 15			-0.106***
Index of test scores when 15			0.053***
Did not expect to complete Year 12 when 15			-0.108***
Expected to undertake post-school study when 15			0.101***
Completed Year 9 or less			-0.137
Completed Year 10			0.023
Completed Year 11			-0.076***
Predicted probability for base case	0.462	0.414	0.489
Pseudo R-Squared	0.0205	0.0295	0.0638
Number of observations	7372	7203	6389

Source: Customised calculations using Waves 1–4 of the LSAY (enumerated between 2006 and 2009).

Note: The base case individual for all estimations is: aged 18; male; non-Indigenous; born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. For Model 3, the base case is further defined as: assesses one's own ability at school as average; has an index value of zero for their happiness and test scores (the mean); did not work whilst 15; and expected to complete Year 12 when 15; but did not expect to undertake post-school study. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

In order to analyse university education specifically, we focus our analysis on those students who completed Year 12 and obtained a tertiary admissions rank. We constrain our analysis to this population because we have already considered the factors associated with what this rank is (earlier in Table 12). However, doing so reduces the available sample substantially, with only 97 Indigenous Australians in the LSAY with valid information on their admissions rank and their student status in their first year after leaving school. Because of this, we run a very simplified model, with demographic, geographic and socioeconomic variables the only controls beyond a person's reported admission rank. Results are presented in Table 14, with the dependent variable being the probability of undertaking university study during the first year after high school for those who obtained university entrance scores.

Table 14 Factors associated with the probability of undertaking university during the first year out of high school — Indigenous and non-Indigenous Australians with a tertiary admissions rank

	Model 1	Model 2	Model 3
Age	-0.135***	-0.138***	-0.148***
Female	0.007	0.017	-0.008
Indigenous	-0.041	-0.026	0.058
Born overseas	0.083***	0.057*	0.041
Mother born overseas	0.051***	0.046**	0.036*
Father born overseas	0.059***	0.061***	0.056***
Lives in provincial Australia	-0.171***	-0.159***	-0.146***
Lives in remote Australia	-0.392***	-0.349***	-0.400***
Speaks a language other than English at home		0.098***	0.088***
Number of years of education for parent with highest level		0.019***	0.001
Mother works as a manager or professional		0.032*	-0.006
Father works as a manager or professional		0.041**	-0.008
One standard deviation increase in tertiary admission rank			0.163***
Predicted probability for base case	0.671	0.604	0.691
Pseudo R-Squared	0.0466	0.0548	0.1624
Number of observations	3853	3804	3804

Source: Customised calculations using Waves 1–4 of the LSAY (enumerated between 2006 and 2009).

Note: The base case individual for all estimations is: aged 18; male; non-Indigenous; born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. For Model 3, the base case is further defined as: has a tertiary admissions rank of 77. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

The range of student wellbeing questions on the LSAY is much less for tertiary as opposed to secondary school students. One question though that summarises student wellbeing reasonably well is whether the student agrees that they really like being a student. The sample for the analysis of this variable is those respondents in the LSAY who were in their first year of tertiary studies in either Waves 3 or 4 of the LSAY. The dependent variable in the analysis is the probability that they agreed or strongly agreed that they like being a student. Models 1 and 2 of the analysis are similar to those in previous tables, with demographic and geographic variables included in the first specification and socioeconomic characteristics added to the second. Model 3 includes these variables, as well as test scores when the student was 15 (in Wave 1), the highest year of school that they completed, and the type of qualification that they are studying for. Marginal effects and statistical significance are presented as before (as explained underneath the table).

Table 15 Factors associated with whether or not tertiary student agrees or strongly agrees that they really like being a student — Indigenous and non-Indigenous Australians, 2008–09

	Model 1	Model 2	Model 3
Age	0.009	0.012	0.012
Female	-0.005	-0.005	-0.001
Indigenous	0.056*	0.079**	0.076**
Born overseas	0.015	0.008	0.013
Mother born overseas	-0.032*	-0.043**	-0.042**
Father born overseas	0.025*	0.025	0.022
Lives in provincial Australia	-0.015	-0.011	-0.003
Lives in remote Australia	0.012	0.016	0.014
Speaks a language other than English at home		0.030	0.027
Number of years of education for parent with highest level		0.001	-0.002
Mother works as a manager or professional		0.020	0.011
Father works as a manager or professional		0.006	0.000
Index of test scores when 15			0.011
Completed Year 10			-0.004
Completed Year 11			-0.089*
Currently studying towards a certificate			-0.067***
Currently studying towards a diploma/advanced diploma			-0.027
Predicted probability for base case	0.904***	0.888***	0.900***
Pseudo R-Squared	0.0058	0.0096	0.0235
Number of observations	2743	2692	2678

Source: Customised calculations using Waves 1–4 of the LSAY (enumerated between 2006 and 2009).

Note: The base case individual for all estimations is: aged 18; male; non-Indigenous, born in Australia; and lives in a major city. For Model 2, the base case is further defined as: speaks English at home; has a parent with 13 years of education (but no more); and has a mother and father not employed as a manager or professional. For Model 3, the base case is further defined as: has an index value of zero for their test scores (the mean); has completed Year 12; and is studying towards a degree. Marginal effect for which the coefficient is statistically significant at the 1% level of significance are labelled ***; those statistically significant at the 5% level of significance only are labelled **; whereas those statistically significant at the 10% level of significance only are labelled *.

One of the first things to note from Table 15 is the very low Pseudo R-Squared from the analysis, showing that very little of the variation in the dataset is explained by the variables included in the model. As the aim of the analysis is to test for differences between Indigenous and non-Indigenous students in an informative way (rather than build the most accurate predictive model), we are not overly concerned with the low values. However, they should be kept in mind when interpreting the results.

Data limitations and data needs

The analysis presented in this paper and discussed in more detail in the main report that it accompanies was heavily reliant on empirical analysis of secondary data sources. In order to understand the causes and consequences of Indigenous education participation and attainment, a range of data sources was used. The 2008 NATSISS was used to look at the relationship between education attainment and a range of wellbeing measures. The census was used to make comparisons between Indigenous and non-Indigenous Australians both at the national and local level. The AEDI was used to assess school readiness and to gain some insight into differences by Indigenous status in the role of preschool in the transition to school. Finally, the LSAY provided the bulk of results, including on private school attendance, student wellbeing and expectations, completion and participation.

Each of these datasets had particular strengths and weaknesses. The NATSISS, while having a range of outcome measures, did not have a non-Indigenous sample against which to make comparisons. We do not—and cannot at the moment—know whether the differences in subjective wellbeing by education documented in this paper are of the same order of magnitude for non-Indigenous Australians as they are for the Indigenous population. The census, on the other hand, does have a comparable non-Indigenous sample. However, the outcome measures on it are limited to standard socioeconomic variables like employment and income (important, but only part of the picture). Furthermore, because the census is self-enumerated, it suffers from a range of non-sample errors and problems of undercount. There were roughly 2.5 times as many records for which the respondent's Indigenous status was not stated as there were respondents identified as being Indigenous.

The AEDI also has a large sample of non-Indigenous children. Unlike the census though, response rates are quite high, with schools and teachers given significant training, time and (importantly) funds to complete the checklist. As the survey was completed by teachers, however, there is very little family background information available. Those children who attend preschool were shown to be less likely to be developmentally vulnerable than those who do not. However, previous analysis of the census has shown that children who attend preschool are more likely to come from high-income and/or highly educated families. We do not and cannot at this stage know whether Indigenous children who attend preschool have better outcomes than other Indigenous children from a similar background who do not.

It is possible to answer similar questions using the LSAY (for high school education at least). Indeed, some of the more policy-relevant findings from the analysis presented in this paper were when differences in outcomes between Indigenous and non-Indigenous Australians disappeared once a range of background information was controlled for. While the Indigenous sample in the LSAY starts off quite large, there is a precipitous decline between Waves 1 and 2, with 562 of the 1080 original respondents being lost from the sample. Sample attrition is also present, though not as large, between Waves 2 and 3, as well as between Waves 3 and 4. The 2006 Indigenous cohort of the LSAY starts off being quite representative of the 15 year-old Indigenous Australian population (hence the strong focus in this paper on results from Wave 1). However, this representativeness diminishes through time, as we can be pretty sure that attrition is far from random. Even with sample weights, we cannot be sure whether the findings from the analysis are real or an artefact of the data.

There were a number of data sources that were considered for this paper but, after initial consideration and sometimes even preliminary analysis, were not included. A few sample surveys were considered but not included, as the information was not as up-to-date as the available

alternatives. This includes the 2004-05 National Aboriginal and Torres Strait Islander Health Survey and earlier versions of the census, the NATSISS and the LSAY. Other datasets were rejected from the final analysis due to a small or unrepresentative Indigenous sample. This includes the Household Income and Labour Dynamics in Australia survey, as well as the Survey of Education and Training. A final set of surveys provided useful summary data—like the Student Outcomes Survey—but did not have a unit record file readily available for individual-level analysis. The Labour Force Survey is another data source that, if made available in a usable format, might be useful in answering policy-relevant questions on Indigenous education.

An additional subset of data that was not presented at all in this paper is administrative datasets. That is, data that is collected as a by-product of administrative processes or for reporting and evaluation. Although such data is not usually collected for research purposes, it is often released to the public in aggregate (or occasionally individual) form to support statistical analysis. A useful example of such data collections is VOCSTATS, a repository of VET statistics designed and administered by NCVET.

VOCSTATS has a number of uses for Indigenous education policy and planning. It is possible to identify where Indigenous VET students are living, what their demographic characteristics are, and what level and type of courses they are studying towards. It is also possible to identify the geographic distribution of student outcomes. What the database is not terribly useful for though is identifying the reasons that Indigenous students choose to study in the first place. Like other administrative datasets, there is no information on those not in the system. However, these non-students are the other half of the education decision. One might be tempted to compare the Indigenous student population in VOCSTATS to the local population in the census. However, the numerator and the denominator very rarely line up due to differences in scope, coverage and timing. For example, an initial calculation of VET participation rates using what would appear to be the relevant comparison population from the census resulted in a range from zero to over 100%. This variability was compounded when one looked at particular demographic groups.

Other administrative collections that are potentially useful for policy and planning purposes are the National Preschool Census, the My School website and the data that underlies it—the National Assessment Program - Literacy and Numeracy (NAPLAN), and the Higher Education Student Statistics collection. All of these collections have an Indigenous identifier, albeit of varying quality, as well as a range of geographic information and outcome data. With the exception of NAPLAN though, what they lack is information on students not attending preschool, school or higher education. Like with VOCSTATS, one is forced to use census data or the population estimates that come from it as the denominator.

Ultimately, while administrative data may be relatively cheap (because it is being collected anyway), to understand why or why not Indigenous Australians participate in different forms of formal education and what the outcomes of that education might be, the only option is good quality survey data. Although not analysed in this paper, the Longitudinal Study of Indigenous Children has the potential to provide insights into the role of preschool education in the school readiness of young Indigenous Australians by allowing analysts to compare the outcomes of those who did and did not attend preschool both before and after participation. One might also hope that the Indigenous attrition rate between Waves 1 and 2 of the 2009 LSAY cohort is substantially lower than it was for the 2006 cohort.

One aspect of Indigenous education that we are currently lacking information on is the decision to engage in education and training for Indigenous adults. Beyond the age of 35, Indigenous Australians participate in education at a generally higher rate than non-Indigenous Australians. According to data from the 2006 Census, 6.0% of those aged 35-54 were participating in education—1.4 times the relevant non-Indigenous rates. This reflects catch-up to a certain extent, especially for females who may have had to delay education participation due to child-rearing responsibilities. It also reflects a relatively low-opportunity cost of education due to low rates of employment and low wages for those who are employed. Nonetheless, Indigenous Australians do appear to be engaging in education as mature-age students.

While these rates of participation are high relative to the non-Indigenous population, intentions to study are even higher still. According to (weighted) data from the 2008 NATSISS, 47.7% of Indigenous Australians aged 25-34 years intend to study in the next five years. This rate falls only slightly to 34.4% for those aged 35-54 years. Based on actual participation data, it is likely that many of these intentions will not be met. In order to help understand why such intentions are not being met, it would be useful to have a longitudinal database that allows researchers to compare the characteristics of those who intended to study and did not end up doing so with those who were eventually successful in meeting their ambitions. Unfortunately such data does not exist.

We, as authors, have previously advocated for a longitudinal survey that contains information across the Indigenous lifecourse. One of us, in a co-authored paper with Mandy Yap in the *Indigenous Law Bulletin*, outlined a specific proposal that would involve the integration of the NATSISS and National Aboriginal and Torres Strait Islander Health Survey samples into a new National Closing the Gap Survey (Biddle & Yap 2010). In the meantime, important research questions can and should be probed using the Longitudinal Study of Indigenous Children and the LSAY. However, until we have good quality longitudinal data for all Indigenous Australians, a large part of the lifelong learning patterns of the population will remain obscured.

References

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Appendix A: Data tables

Table A1 Coefficient estimates and p-values corresponding to Table 6 (Factors associated with attending a non-government school)

	Model 1		Model 2	
Age	0.071559	(0.098)	0.05712	(0.201)
Female	0.003598	(0.884)	0.011646	(0.648)
Indigenous	-0.42447	(0)	-0.30585	(0)
Born overseas	-0.14877	(0.003)	-0.23282	(0)
Mother born overseas	0.002581	(0.94)	0.022408	(0.529)
Father born overseas	0.026825	(0.424)	0.042145	(0.228)
Lives in provincial Australia	-0.31855	(0)	-0.24209	(0)
Lives in remote Australia	-1.43511	(0)	-1.36222	(0)
Speaks a language other than English at home			-0.02827	(0.615)
Number of years of education for parent with highest level			0.078785	(0)
Mother works as a manager or professional			0.20783	(0)
Father works as a manager or professional			0.328237	(0)
Constant	-1.29814	(0.057)	-2.39631	(0.001)
Number of observations		13 099		12 698

Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Note: Associated p-values in brackets.

Table A2 Details for factor analysis of student wellbeing

	Happiness	Teacher	Benefit	Confidence	Effort
Variable name					
Variable1	st46n05	st46n02	st46n01	st46n07	st46n04
Variable2	st46n08	st46n06	st46n03	st46n14	st46n11
Variable3	st46n09	st46n12	st46n10	st46n21	st46n15
Variable4	st46n17	st46n16	st46n13	st46n26	st46n19
Variable5	st46n18	st46n22	st46n20	st46n30	
Variable6	st46n23	st46n29	st46n25		
Variable7	st46n24		st46n27		
Eigenvalues					
Factor1	3.86218	3.13892	3.65183	2.47494	1.44289
Factor2	0.20232	0.10959	0.28263	0.02465	-0.00793
Factor3	0.05609	-0.04089	-0.01289	-0.08376	-0.14664
Factor4	-0.05319	-0.08637	-0.05855	-0.13623	-0.20383
Factor5	-0.09812	-0.11775	-0.09728	-0.15041	
Factor6	-0.13920	-0.15242	-0.11669		
Factor7	-0.15142		-0.17450		
Loading on Factor1					
Variable1	0.6662	0.6664	0.6283	0.7067	0.6542
Variable2	0.7475	0.7732	0.7198	0.7271	0.5085
Variable3	0.7821	0.6629	0.7733	0.6466	0.5903
Variable4	0.7739	0.6561	0.7567	0.6721	0.6387
Variable5	0.7835	0.7654	0.7608	0.7596	
Variable6	0.6918	0.8008	0.6444		
Variable7	0.7397		0.7578		

Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Table A3 Details for principal components analysis of student test scores

	Value 1	Value 2	Value 3	Value 4	Value 5
Eigenvalues					
Factor1	2.73499	2.73532	2.73746	2.73226	2.73413
Factor2	0.167456	0.165014	0.161752	0.16707	0.165773
Factor3	0.097555	0.0996627	0.100792	0.100674	0.100094
Loading on Factor1					
Maths	0.5746	0.5751	0.5748	0.5754	0.5750
Reading	0.5725	0.5725	0.5732	0.5722	0.5726
Science	0.5849	0.5843	0.5839	0.5844	0.5844

Table A4 Coefficient estimates and p-values corresponding to Table 8 (Factors associated with the probability of expecting to complete Year 12)

	Model 1		Model 2		Model 3	
Age	0.135846	(0.011)	0.134189	(0.015)	0.047249	(0.462)
Female	0.396269	(0)	0.422169	(0)	0.44585	(0)
Indigenous	-0.16565	(0.016)	-0.09798	(0.187)	0.156986	(0.047)
Born overseas	0.212187	(0.006)	0.074002	(0.385)	0.004424	(0.965)
Mother born overseas	0.189272	(0)	0.156506	(0.001)	0.133829	(0.013)
Father born overseas	0.16928	(0)	0.141453	(0.002)	0.149145	(0.005)
Lives in provincial Australia	-0.24109	(0)	-0.15824	(0)	-0.07584	(0.071)
Lives in remote Australia	-0.48258	(0)	-0.36356	(0.002)	-0.24779	(0.07)
Speaks a language other than English at home			0.443679	(0)	0.496696	(0)
Number of years of education for parent with highest level			0.072579	(0)	0.029522	(0.001)
Mother works as a manager or professional			0.210079	(0)	0.081016	(0.04)
Father works as a manager or professional			0.304401	(0)	0.08084	(0.046)
Assessed own ability as 'very well'					0.339094	(0)
Assessed own ability as 'above average'					0.249188	(0)
Assessed own ability as 'below average'					-0.2787	(0)
Index of student happiness					0.352616	(0)
Index of test scores					0.521782	(0)
Proportion of school who expected to complete Year 12					1.472829	(0)
Constant	-1.35602	(0.106)	-2.50897	(0.004)	-1.59488	(0.122)
Number of observations		13 099		12 698		11 844

Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Note: Associated p-values in brackets.

Table A5 Coefficient estimates and p-values corresponding to Table 9 (Factors associated with the probability of dropping out of school before completing Year 12)

	Model 1		Model 2		Model 3	
Age	-0.23462	(0)	-0.081	(0)	-0.23172	(0.004)
Female	-0.27729	(0)	-0.098	(0)	-0.20009	(0)
Indigenous	0.331631	(0)	0.089	(0.003)	0.096938	(0.299)
Born overseas	-0.12371	(0.189)	0.006	(0.871)	0.047965	(0.693)
Mother born overseas	-0.18689	(0)	-0.050	(0.008)	-0.128	(0.055)
Father born overseas	-0.1186	(0.021)	-0.033	(0.077)	-0.06484	(0.312)
Lives in provincial Australia	0.331938	(0)	0.086	(0)	0.175514	(0)
Lives in remote Australia	0.411731	(0)	0.114	(0.007)	0.053284	(0.711)
Speaks a language other than English at home			-0.151	(0)	-0.40983	(0.001)
Number of years of education for parent with highest level			-0.024	(0)	-0.01989	(0.111)
Mother works as a manager or professional			-0.078	(0)	-0.07552	(0.119)
Father works as a manager or professional			-0.106	(0)	-0.18155	(0)
Assessed own ability as 'very well' when 15					-0.32475	(0)
Assessed own ability as 'above average' when 15					-0.11071	(0.036)
Assessed own ability as 'below average' when 15					0.232358	(0.02)
Index of student happiness when 15					-0.05526	(0.026)
Worked 1–4 hours when 15					-0.09994	(0.349)
Worked 5–9 hours when 15					0.050391	(0.471)
Worked 10–14 hours when 15					0.557742	(0)
Worked 15–19 hours when 15					-0.37073	(0)
Worked 20 or more hours when 15					-1.16135	(0)
Index of test scores when 15	2.730459	(0.007)	4.089193	(0)	4.023345	(0.001)
Expected to complete Year 12 when 15	7367		7200		6581	
Constant					0.557742	(0)
Number of observations					-0.37073	(0)

Source: Customised calculations using Waves 1–4 of the LSAY (enumerated between 2006 and 2009).

Note: Associated p-values in brackets.

Table A6 Coefficient estimates and p-values corresponding to Table 10 (Factors associated with tertiary entrance ranking for those who have completed Year 12)

	Model 1		Model 2		Model 3	
Age	-0.130	(0.887)	0.049	(0.955)	-1.085	(0.152)
Female	1.427	(0.005)	1.896	(0)	3.314	(0)
Indigenous	-8.392	(0)	-7.033	(0)	-3.906	(0.004)
Born overseas	2.751	(0.006)	1.312	(0.195)	1.045	(0.216)
Mother born overseas	0.799	(0.246)	1.116	(0.099)	0.864	(0.135)
Father born overseas	-0.239	(0.726)	0.257	(0.701)	0.745	(0.191)
Lives in provincial Australia	-3.349	(0)	-1.963	(0.002)	-2.238	(0)
Lives in remote Australia	0.012	(0.995)	2.089	(0.257)	2.628	(0.102)
Speaks a language other than English at home			1.460	(0.15)	2.227	(0.009)
Number of years of education for parent with highest level			1.489	(0)	0.826	(0)
Mother works as a manager or professional			3.062	(0)	1.295	(0.004)
Father works as a manager or professional			4.061	(0)	2.257	(0)
Assessed own ability as 'very well' when 15					9.845	(0)
Assessed own ability as 'above average' when 15					4.885	(0)
Assessed own ability as 'below average' when 15					-3.484	(0.059)
Index of student happiness when 15					0.597	(0.014)
Worked 1–4 hours when 15					1.513	(0.064)
Worked 5–9 hours when 15					0.646	(0.285)
Worked 10–14 hours when 15					-0.377	(0.557)
Worked 15–19 hours when 15					-1.194	(0.207)
Worked 20 or more hours when 15					-2.667	(0.068)
Index of test scores when 15					9.331	(0)
Expected to complete Year 12 when 15					6.106	(0)
Constant	78.915	(0)	50.656	(0)	61.594	(0)
Number of observations	3994		3943		3687	

Table A7 Coefficient estimates and p-values corresponding to Table 11 (Factors associated with the probability of expecting to undertake post-school study)

	Model 1		Model 2		Model 3		Model 4	
Age	0.060718	(0.182)	0.0523	(0.259)	-0.00665	(0.892)	-0.00672	(0.893)
Female	0.374285	(0)	0.389161	(0)	0.36809	(0)	0.308491	(0)
Indigenous	-0.18196	(0.004)	-0.178	(0.006)	-0.07177	(0.283)	-0.11483	(0.099)
Born overseas	0.273811	(0)	0.142047	(0.023)	0.142235	(0.033)	0.145183	(0.03)
Mother born overseas	0.23281	(0)	0.177145	(0)	0.155441	(0)	0.13718	(0.001)
Father born overseas	0.221003	(0)	0.180877	(0)	0.14885	(0)	0.131679	(0.001)
Lives in provincial Australia	-0.26125	(0)	-0.20485	(0)	-0.11311	(0.001)	-0.09482	(0.01)
Lives in remote Australia	-0.62571	(0)	-0.57623	(0)	-0.36393	(0.004)	-0.28427	(0.038)
Speaks a language other than English at home			0.547806	(0)	0.490359	(0)	0.429297	(0)
Number of years of education for parent with highest level			0.056052	(0)	0.029495	(0)	0.025115	(0.002)
Mother works as a manager or professional			0.088159	(0.002)	0.009078	(0.761)	-0.00601	(0.843)
Father works as a manager or professional			0.173565	(0)	0.049314	(0.107)	0.037992	(0.223)
Assessed own ability as 'very well'					0.313371	(0)	0.300472	(0)
Assessed own ability as 'above average'					0.237987	(0)	0.205968	(0)
Assessed own ability as 'below average'					0.012104	(0.855)	0.132953	(0.055)
Index of student happiness					0.181107	(0)	0.124971	(0)
Index of test scores					0.191505	(0)	0.103639	(0)
Proportion of school who expected to undertake post-school study					0.776487	(0)	0.764049	(0)
Individual expects to complete Year 12							0.893238	(0)
Constant	-0.95705	(0.183)	-1.7009	(0.021)	-0.93087	(0.236)	-1.5592	(0.051)
Number of observations	12 698		12 323		11 446		11 466	

Source: Customised calculations using Wave 1 of the LSAY (enumerated in 2006).

Note: Associated p-values in brackets.

Table A8 Coefficient estimates and p-values corresponding to Table 12 (Factors associated with the probability of expecting to undertake university studies)

	Model 1		Model 2		Model 3		Model 4	
Age	-0.03891	(0.549)	-0.04271	(0.527)	-0.11418	(0.131)	-0.13196	(0.091)
Female	-0.07584	(0.045)	-0.01451	(0.713)	0.027703	(0.531)	0.006734	(0.883)
Indigenous	-0.27716	(0.002)	-0.18391	(0.057)	0.14469	(0.18)	0.12385	(0.283)
Born overseas	0.380083	(0)	0.2961	(0.001)	0.357988	(0)	0.381757	(0)
Mother born overseas	0.140411	(0.008)	0.106118	(0.055)	0.073222	(0.242)	0.068199	(0.286)
Father born overseas	0.144948	(0.005)	0.14736	(0.007)	0.123985	(0.042)	0.128978	(0.038)
Lives in provincial Australia	-0.04995	(0.275)	0.025685	(0.589)	0.125849	(0.021)	0.146134	(0.01)
Lives in remote Australia	-0.12904	(0.489)	-0.03444	(0.859)	0.154771	(0.449)	0.298053	(0.163)
Speaks a language other than English at home			0.314729	(0)	0.327912	(0.001)	0.278063	(0.005)
Number of years of education for parent with highest level			0.079772	(0)	0.052528	(0)	0.04886	(0)
Mother works as a manager or professional			0.168294	(0)	0.050983	(0.271)	0.041227	(0.388)
Father works as a manager or professional			0.352886	(0)	0.155212	(0.001)	0.155651	(0.001)
Assessed own ability as 'very well'					0.363721	(0)	0.34804	(0)
Assessed own ability as 'above average'					0.291559	(0)	0.270196	(0)
Assessed own ability as 'below average'					-0.37492	(0)	-0.31599	(0.004)
Index of student happiness					0.23859	(0)	0.17781	(0)
Index of test scores					0.446459	(0)	0.386456	(0)
Proportion of school who expected to undertake post-school study					1.081181	(0)	1.000184	(0)
Individual expects to complete Year 12							1.478131	(0)
Constant	1.394288	(0.175)	0.099914	(0.926)	0.96429	(0.423)	-0.02322	(0.985)
Number of observations	7449		7253		6857		6823	

Source: Customised calculations using Waves 1–4 of the LSAY (enumerated between 2006 and 2009).

Note: Associated p-values in brackets.

Table A9 Coefficient estimates and p-values corresponding to Table 13 (Factors associated with the probability of studying during the first year out of high school)

	Model 1		Model 2		Model 3	
Age	-0.13247	(0.012)	-0.14625	(0.006)	-0.13148	(0.024)
Female	-0.08645	(0.003)	-0.07007	(0.02)	-0.08096	(0.015)
Indigenous	-0.30329	(0)	-0.23813	(0.001)	-0.16571	(0.033)
Born overseas	0.26333	(0)	0.173266	(0.015)	0.153098	(0.045)
Mother born overseas	0.035855	(0.376)	-0.00748	(0.858)	-0.00943	(0.835)
Father born overseas	0.159668	(0)	0.134355	(0.001)	0.101075	(0.024)
Lives in provincial Australia	-0.22008	(0)	-0.16784	(0)	-0.15707	(0)
Lives in remote Australia	-0.37277	(0)	-0.30091	(0.002)	-0.25351	(0.021)
Speaks a language other than English at home	2.287904	(0.006)	0.349259	(0)	0.303294	(0)
Number of years of education for parent with highest level			0.057184	(0)	0.042912	(0)
Mother works as a manager or professional			0.025204	(0.431)	-0.01274	(0.715)
Father works as a manager or professional			0.088224	(0.006)	0.012022	(0.735)
Assessed own ability as 'very well' when 15			1.672608	(0.049)	0.252481	(0)
Assessed own ability as 'above average' when 15					0.131161	(0.001)
Assessed own ability as 'below average' when 15					-0.20535	(0.015)
Index of student happiness when 15					0.09326	(0)
Worked 1–4 hours when 15					0.049295	(0.476)
Worked 5–9 hours when 15					-0.00762	(0.875)
Worked 10–14 hours when 15					-0.06898	(0.162)
Worked 15–19 hours when 15					-0.0276	(0.684)
Worked 20 or more hours when 15					-0.27644	(0.001)
Index of test scores when 15					0.133915	(0)
Did not expect to complete Year 12 when 15					-0.28106	(0)
Expected to undertake post-school study when 15					0.254694	(0)
Completed Year 9 or less					-0.36098	(0.202)
Completed Year 10					0.057899	(0.375)
Completed Year 11					-0.19482	(0.001)
Constant	0.462		0.414		1.692646	(0.07)
Number of observations	7372		7203		6389	

Source: Customised calculations using Waves 1–4 of the LSAY (enumerated between 2006 and 2009).

Note: Associated p-values in brackets.

Table A10 Coefficient estimates and p-values corresponding to Table 14 (Factors associated with the probability of undertaking university during the first year out of high school)

	Model 1		Model 2		Model 3	
Age	-0.35145	(0)	-0.3492	(0)	-0.38953	(0)
Female	0.018703	(0.654)	0.044398	(0.294)	-0.02202	(0.622)
Indigenous	-0.11131	(0.406)	-0.06691	(0.623)	0.173982	(0.223)
Born overseas	0.244593	(0.004)	0.152114	(0.091)	0.118978	(0.213)
Mother born overseas	0.145213	(0.01)	0.121755	(0.034)	0.104319	(0.084)
Father born overseas	0.169463	(0.002)	0.16301	(0.004)	0.166775	(0.005)
Lives in provincial Australia	-0.444	(0)	-0.4028	(0)	-0.38486	(0)
Lives in remote Australia	-1.0276	(0)	-0.92336	(0)	-1.04782	(0)
Speaks a language other than English at home			0.266757	(0.003)	0.27111	(0.005)
Number of years of education for parent with highest level			0.050752	(0)	0.003839	(0.788)
Mother works as a manager or professional			0.084057	(0.064)	-0.01769	(0.713)
Father works as a manager or professional			0.10845	(0.017)	-0.02234	(0.643)
One standard deviation increase in tertiary admission rank					0.034637	(0)
Predicted probability for base case	5.715825	(0)	4.84157	(0)	3.624294	0.005
Pseudo R-Squared	0.0466		0.0548		0.1624	
Number of observations	3853		3804		3804	

Source: Customised calculations using Wave 1 to 4 of the LSAY (enumerated between 2006 and 2009).

Note: Associated p-values in brackets.