

## 7. The benefits of Indigenous education: Data findings and data gaps

Nicholas Biddle and Timothy Cameron

Although the headline target for the Council of Australian Governments (COAG) Closing the Gap agenda is the elimination of the life expectancy gap between Indigenous and non-Indigenous Australians, in numerical terms, education dominates with three of the six targets related to it. This includes targets related to preschool access (Target 3), literacy and numeracy (Target 4) and Year 12 completion (Target 5). The setting of these targets clearly recognises that not only is education important in and of itself, but without reducing disparities between Indigenous and non-Indigenous Australians in education, other targets on health and employment are unlikely to be met.

Closing the gap between Indigenous and non-Indigenous Australians in education outcomes will not be easy. To indicate the scale of the challenge, consider findings from the most recent (2006) Census. First, 47.8 per cent of Indigenous 3–5 year olds (who had not started school) were attending preschool compared to 57.5 per cent of non-Indigenous children. Across the Indigenous lifecourse, this gap only widens. By age 20–24, 36.0 per cent of Indigenous Australians (who were not still at school) had completed Year 12 compared to 74.5 per cent of non-Indigenous Australians. For all education types, 34.5 per cent of Indigenous 15–24 year olds were undertaking education compared to 55.3 per cent of non-Indigenous young adults.

One potential reason for this education disparity is physical and financial access. Biddle (2010) showed that Indigenous youth were more likely to live in remote areas than their non-Indigenous counterparts and that within the Indigenous population there were substantial disparities by region in terms of education participation and attainment. Furthermore, on average Indigenous Australians grow up in families with fewer material resources meaning that financially it is more difficult to attend relatively expensive private schools (Biddle and Yap 2010).

While important, the above financial and geographic disparities alone do not explain the gap in education attendance and attainment between Indigenous and non-Indigenous Australians. In all regions, including Australia's largest capital cities, Indigenous Australians had lower levels of education than their non-Indigenous counterparts (Biddle 2010). Biddle (2007) also showed that the gap between the two populations in terms of participation also remained after

controlling for family income, employment and education. Access is not the only issue driving the disparity in education between the two populations. For most Indigenous youth there is usually one high school or a tertiary institution available relatively close by that is free or, in the case of universities, may be paid for later in life. For many Indigenous youth, it would appear that the benefits of engaging with these educational opportunities do not outweigh the costs.

To a certain extent, the choice being made by some Indigenous youth to not participate in formal education should be respected. There are many activities outside the non-Indigenous mainstream that do not require extended formal education. If an Indigenous youth or their family does not see later secondary school or post-school education as being worthwhile, then compelling them to attend is likely to be counterproductive. Not only will the negative effects outweigh the positive, but students who do not want to be at school can have a detrimental effect on those who do. However, if these students are opting out of school or post-school options without full information, then this is potential grounds for government intervention. Furthermore, it is also of concern if childhood and early school experiences are having an undue influence on the choices available to Indigenous Australians when they are considering their education options.

Ultimately, the policy response to low education participation by Indigenous Australians will be determined by the reasons why Indigenous Australians make alternative education decisions and the constraints that they face in making these decisions. Unfortunately, the data available to analyse these decisions is far from perfect. There is no longitudinal data that allows analysis of the effect of early childhood experiences on later school choice. However, we know from other contexts that the early years are crucial in determining future educational options and constraints (Cunha et al. 2006). We also do not have information for estimating accurate returns to education for Indigenous Australians, information which is crucial when trying to gauge whether economic incentives are driving the education decision.

In situations such as these where data is lacking, it is important to have a solid theoretical model, based on empirical research in other contexts but also informed by the unique circumstances of the Indigenous population. Such a model will help to identify the likely impacts on the education decision, the key research questions that need to be answered, and the data required to answer the questions. In the next section of the paper, we outline the beginnings of such a model and pose two research questions that will guide the analysis in this paper.

## A model of Indigenous education

In developing a model of Indigenous education, we begin with the well known human capital model. At the heart of the human capital model outlined by Becker (1964) is the assumption that when deciding whether or not to undertake a certain type of education, potential students are rational (in the economic sense) utility maximisers who, above all, see education as an investment. An investment in education will improve one's performance in the workplace and an individual will invest until the returns to an additional unit of education (measured by increases in discounted future income) just equal the cost. That is, until marginal returns equal marginal cost.

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

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

Whether or not it is human capital or screening/signalling that is driving the differences in earnings has important implications for some aspects of policy development. If governments are trying to decide on the level of investment they make in education or the type of education to focus on, then under the human capital model across-the-board increases in education lead to higher economy-wide productivity: therefore there is a much stronger argument for government provision of education. Under a signalling/screening model, however, education only affects relative earnings, and therefore economy-wide increases in education have little or no effect on economic growth. However, this distinction matters less when considering participation in education from the individual's point of view as they are arguably more concerned with whether they will have a higher income if they study, rather than the source of that higher income.

The basic human capital model also assumes that a person's utility is determined mainly by their income, and if discounted future additional income is higher than the cost of education, then people will invest in education. It is likely,

though, that a student's current social situation is also important in influencing their behaviour. Specifically, children who have positive attitudes to school when they are in the middle secondary years are more inclined to further school participation. They are more likely to intend completing Year 12 and consequently are also more likely to actually do so (Khoo and Ainley 2005; Marks 1998). Students who do not like school are more likely to leave without completing their secondary education (Wehlage and Rutter 1986) and children who are happy in the later years of secondary school are more likely to complete university (Dockery 2010).

Despite the above research, there is a lack of literature relating happiness at school to school completion rates both on the whole, and especially with respect to Indigenous Australians. Most literature linking education and happiness tells the other side of the story: how education affects future happiness. Higher levels of education lead to, on average, higher future incomes but it has been shown that education correlates weakly with happiness scores in rich countries (Hartog and Oosterbeek 1998). A recent study shows that Australian university graduates, despite their improved labour market outcomes, have lower levels of happiness compared to those that have only completed Year 12 (Dockery 2010).

In addition to income and school-level wellbeing, there are also a number of other outcomes that are likely to be associated with higher education levels that people may take into account when deciding whether or not to invest in education. Although there are indirect effects that operate via income, education may also have direct effects on things like health, the schooling of one's children, the efficiency of consumer choices and the ability to plan fertility decisions (Wolfe and Haveman 2001).

Finally, the human capital model assumes that potential students make decisions based on a comparison between their future income streams with and without education. However, potential students cannot know their precise future income and must therefore form expectations based on what they do know. Different students have access to different information, so it is possible that expectations are also formed differently (Dominitz and Manski 1996).

Pulling this discussion together, an economic model of Indigenous education participation would take into account the factor that Indigenous Australians start school with lower levels of cognitive and non-cognitive ability (as valued in formal education) with the gap widening throughout the early school years. When making the decision to continue on at school beyond the post-compulsory years, Indigenous students may have different potential benefits of education due to the types of labour markets they have access to. However, these returns may be estimated with uncertainty as they have relatively few role

models to provide information. There are also other non-economic returns to education that may be important, but these must be traded off against different non-economic costs of schooling.

In this paper, we focus on two aspects of the education decision. The first relates to the potential benefits of studying and the second the potential social costs of studying. Specifically, we consider the following two research questions:

- What are the apparent benefits – economic and non-economic – of education and do they vary by gender or remoteness?
- Are Indigenous Australians happier or less happy at school than non-Indigenous Australians and do any differences change after controlling for other characteristics?

## **The relationship between education attainment and wellbeing**

The first step is 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 what a particular outcome is 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 the literature used to develop the model in the previous section, as well as analysis presented later in this chapter, 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 be 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 and 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/when it becomes available. Secondly, 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, policy makers 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/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, and
- raise \$2 000: feeling that household members could raise \$2 000 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 by 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 controlling for a limited set of variables. Other explanatory variables in the model include: age; remoteness; marital status; family type; Indigenous status of others in the household; language spoken at home and mobility. We are interested in the net relationship between education and the measures of wellbeing and hence 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 Table 7.1 and Table 7.2 respectively).

For seven of the eight variables, the dependent variable is constructed as the probability of that particular event occurring (e.g. being employed as opposed to not 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).

**Table 7.1 Association between education and measures of wellbeing, Indigenous males, Australia, 2008**

Explanatory variables	Employed	Income if employed	Happiness	Sadness	Health	Cultural	Have a say	Raise \$2 000
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 plus	-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 ***



7. The benefits of Indigenous education: Data findings and data gaps

Explanatory variables	Employed	Income if employed	Happiness	Sadness	Health	Cultural	Have a say	Raise \$2 000
Changed usual residents 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	3 259	1 839	3 202	3 199	3 259	3 259	3,259	3,094

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 5 years.

\*\*\* Marginal effect for which the coefficient is statistically significant at the 1% level of significance.

\*\* Marginal effect for which the coefficient is statistically significant at the 5% level of significance.

\* Marginal effect for which the coefficient is statistically significant at the 10% level of significance.

Source: Customised calculations using the 2008 NATSISS

**Table 7.2 Association between education and measures of wellbeing, Indigenous females, Australia, 2008**

Explanatory variables	Employed	Income if employed	Happiness	Sadness	Health	Cultural	Have a say	Raise \$2,000
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 plus	-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 ***

7. The benefits of Indigenous education: Data findings and data gaps

Explanatory variables	Employed		Income if employed		Happiness		Sadness		Health		Cultural		Have a say		Raise \$2_000	
	Coefficient	Significance	Coefficient	Significance	Coefficient	Significance	Coefficient	Significance	Coefficient	Significance	Coefficient	Significance	Coefficient	Significance	Coefficient	Significance
Changed usual residents 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	4 303		1 751		4 256		4 249		4 303		4 303		4,303		4,051	

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 5 years.

\*\*\* Marginal effect for which the coefficient is statistically significant at the 1% level of significance.

\*\* Marginal effect for which the coefficient is statistically significant at the 5% level of significance.

\* Marginal effect for which the coefficient is statistically significant at the 10% level of significance.

Source: Customised calculations using the 2008 NATSISS

Beginning in the first column of Table 7.1 and Table 7.2, Indigenous males and females are both more likely to be employed if they have relatively high levels of education. This is not necessarily a causal effect as those who would otherwise be more likely to be employed are more likely to undertake education. However, it does show that if COAG is to meet its target on halving the gap in employment outcomes between Indigenous and non-Indigenous Australians, then the employment rate of the relatively low skilled will probably need to be raised by the largest proportion.

There appears to be greater variation in employment by education for females, particularly by post-school qualifications. This is a consistent finding across the literature and probably reflects the fact that females still tend to take on a greater childcare role, care within the community, and unpaid work in general (Biddle and Yap 2010). As shown in the second column of results, in deciding whether or not to work in addition or instead of providing care, the opportunity cost of not working is higher for females with relatively high levels of education.

For those who were working, there was a greater difference by education in terms of personal income for males rather than females, particularly at the lower end of the education distribution. This is explained once again by higher levels of caring responsibilities and unpaid work for females, with those females with low skills and low income having lower opportunity costs if they opt out of employment.

There is a somewhat different association between education and the two measures of emotional wellbeing for males and females. For both sexes, higher levels of education are associated with higher levels of emotional wellbeing. However, not all levels of education have an association. For males, the only differences are between those who have completed Year 9 or less and the rest of the population. For females on the other hand, those who have completed Year 10 or 11 also have lower levels of emotional wellbeing than those who have completed Year 12. Furthermore, having a diploma was associated with a lower level of sadness than having no qualification at all, whereas having a Certificate I/II was actually associated with a higher level of sadness (albeit at the 10% level of significance only). In addition to emotional wellbeing, there is also a greater health gradient for Indigenous females with regards to reporting one's health as fair or poor (in terms of statistical significance in particular).

Ultimately, all three of these measures of wellbeing are lower for those with relatively low levels of education, as is the probability of participating in cultural events, ceremonies and organisations. Undertaking formal education may impose significant social and emotional costs on Indigenous Australians (though as discussed later in this chapter, the empirical evidence for this is

mixed). However, it would appear from these results that those Indigenous adults who have completed formal education are on average happier, less sad, have better health and are more likely to engage in Indigenous cultural activities.

Perhaps the biggest difference by gender in terms of the association between the measures of wellbeing and education is with regard to the ability with which individuals feel they are able to have a say within the community on important issues. For males, those who have completed Year 9 or less have lower levels of this measure of efficacy than those who have completed Year 12. There are small differences by qualifications but these tend to not be significant or only significant at the 10% level of significance. For females on the other hand, the differences by qualification are large and consistently significant. It is possible that those who would otherwise have a high sense of efficacy are more likely to undertake education in the first place. Nonetheless, the results presented in this section give qualified support to the view that prestige or stature within one's community is one of the motivating factors in undertaking education for the Indigenous population.

The final outcome included in Table 7.1 and Table 7.2 is whether or not a person feels that their household could raise \$2 000 within a week in an emergency. This measure of financial security is much higher for those with relatively high levels of education, with differences slightly larger for females compared to males. There are three potential causal explanations for this. Firstly, those with higher levels of education have greater income and wealth. Secondly, those with higher levels of education are more likely to be married to someone who also has relatively high levels of education (so called assortative mating, see Mare 1991), compounding the income effect at the household level. Finally, those with higher levels of education may be more likely to plan their finances and seek alternative forms of credit beyond household income. However, there is also a possible reverse causal effect associated with this variable – with those with greater financial security growing up within their household and within their wider social networks better able to undertake education. Whatever the explanation, those with lower levels of education are much less likely to feel financially secure than those who have completed Year 12 or have qualifications.

In general, the results presented in Table 7.1 and Table 7.2 show a large association between education and a number of outcome measures. It is unfortunate that we cannot be more definitive with regards to the causal direction of these associations. However, one of the more consistent findings from the analysis here is that there is a much greater education gradient for females for many of the wellbeing measures analysed. Putting this another way, Indigenous females may need to have a higher level of education than an Indigenous male to have the same level of wellbeing. If this is causal and Indigenous females take this

into account when making education decisions, then this may be a reason for the generally higher levels of education participation amongst Indigenous females outlined in Biddle (2010) and demonstrated in later sections of this paper.

## Factors associated with school happiness and expectations

Results presented in the previous section suggested one potential explanation for variation within the Indigenous population in terms of education participation. Differences by education in terms of social outcomes were higher for females than males, as is education participation. However, this does not explain why Indigenous Australians are less likely to undertake education compared to the non-Indigenous population. For this, we need to consider school and family background characteristics.

We now look at one aspect of school participation results by analysing the factors associated with an index of school happiness. This index is calculated based on a factor analysis of seven variables in the Longitudinal Survey of Australian Youth (LSAY) and scaled to have a mean of zero and a standard deviation of one. However, it should be noted that results do not change qualitatively if any of the single variables that are used to construct the index are used instead.

The main aim of the analysis in this section is to test whether Indigenous Australians have a higher or lower index value than non-Indigenous Australians indicating that, at the age of 15 at least, they are more or less happy at school. To test for this, the first model includes basic demographic information only. The discussion in the second 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 after controlling for other components of the human capital model.

As the dependent variable in the analysis is continuous, we use the linear model estimated via Ordinary Least Squares (OLS). Marginal effects and statistical significance are to be interpreted in comparison to the base case, given underneath Table 7.3.

**Table 7.3 Factors associated with an index of student happiness, by Indigenous status, Australia, 2006**

	Model 1		Model 2		Model 3	
Age	0.025	*	0.026	*	0.024	*
Female	0.039	***	0.041	***	0.026	***
Indigenous	0.058	**	0.053	**	0.089	***
Born overseas	0.093	***	0.052	***	0.045	***
Mother born overseas	0.032	**	0.021		0.008	
Father born overseas	0.020		0.011		0.007	
Lives in provincial Australia	-0.019	*	-0.003		-0.005	
Lives in remote Australia	-0.034		-0.015		0.023	
Speaks a language other than English at home			0.097	***	0.080	***
Number of years of education for parent with highest level			0.014	***	0.005	**
Mother works as a manager or professional			0.027	***	-0.003	
Father works as a manager or professional			0.063	***	0.016	*
Assessed own ability as 'very well'					0.276	***
Assessed own ability as 'above average'					0.119	***
Assessed own ability as 'below average'					-0.142	***
Agree or strongly agree that 'Teachers are fair and just to me' at school					0.176	***
Agree or strongly agree that 'The work I do is good preparation for the future' at school					0.316	***
Agree or strongly agree that 'I feel safe and secure' at school					0.298	***
Index of test scores					-0.018	***
Index of test scores for school					0.019	*
Predicted index value for base case	0.140		0.094		-0.610	
Adjusted R-Squared	0.0126		0.0288		0.2964	
Number of observations	12 846		12 846		12 324	

Note: The base case individual for all estimations is: aged 15; male; non-Indigenous, born in Australia; and living in a major city. For Model 2, the base case is further defined to speak English at home; have a parent with 13 years of education (but no more); and have a mother and father not employed as a manager or professional. For Model 3, the base case is further defined to assess one's own ability at school as average; disagree or strongly disagree with the statements on their school; have an index value of zero for their test scores (the mean); and attend a school where that is the mean value.

\*\*\* Marginal effect for which the coefficient is statistically significant at the 1% level of significance.

\*\* Marginal effect for which the coefficient is statistically significant at the 5% level of significance.

\* Marginal effect for which the coefficient is statistically significant at the 10% level of significance.

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

Beginning with Model 1, we can see an Indigenous Australian is on average happier at school than a non-Indigenous Australian (born in Australia) of the same age, gender and broad region of usual residence. Looking across the models, this difference not only holds once other characteristics are controlled for, but actually widens between Model 2 and Model 3. In other words, Indigenous Australians are on average happier at school than their non-Indigenous counterparts.

This is an important finding because other research (e.g. Munns and McFadden 2000) has shown that Indigenous Australians in certain contexts resist aspects of formal education. The results presented in Table 7.3 do not contradict that research. However, the results do nonetheless suggest that there are other aspects of education that counterbalance this resistance.

A student's happiness is important in its own right. Simply for the fact that school makes up a large proportion of most people's lives, the greater one's happiness whilst at school the higher one's emotional wellbeing across the lifecourse. However, happiness is also important because of its potential impact on school completion. The standard human capital model assumes that individuals focus on the economic costs and benefits of schooling only. While students probably do take this into account, most extensions to the model recognise that a student's happiness is also important.

## Summary and data gaps

In discussing previous models of education participation and attempting to tie them to the development of a model of Indigenous education, we identified two research questions related to the costs and benefits of education. In any applied empirical analysis, the number of research questions that cannot be answered is always frustrating. However, this would appear to be particularly the case when it comes to analysing Indigenous education. Nonetheless, by combining information from a few datasets (the LSAY (Waves 1–4), and the 2008 NATSISS), we were able to partially answer some of the questions and be a little more definitive with others.

### Research question 1: What are the apparent benefits of education and do they vary by gender or remoteness?

For the most part, those with relatively high levels of education tend to have better outcomes than those without qualifications or who drop out of school



at a young age. Differences tend to be greatest for the economic variables (employment, income, financial security), but are also present for a number of broader measures of wellbeing. Differences also tend to be greatest for females and those who live in non-remote Australia – two groups within the Indigenous population with relatively high levels of participation.

## Research question 2: Are Indigenous Australians happier or less happy at school than non-Indigenous Australians and do any differences change once other characteristics are controlled for?

Using an index of student happiness, Indigenous Australians are on average happier at school at the age of 15 than non-Indigenous Australians. This difference widens after controlling for other characteristics. There is more to student utility than happiness and analysis of data on life satisfaction and other related concepts (were it available) would provide a more rounded picture of student wellbeing. Nonetheless, the results presented in this paper would tend to suggest that happiness at school is not the reason for low Indigenous completion rates.

The analysis presented in this paper utilised two data sets, the 2008 NATSISS and the 2006 cohort of the LSAY. It may seem strange to have presented analysis using a separate set of data at a conference on the NATSISS. However, this was done for two main reasons. First, because analysis of the LSAY produced interesting, policy-relevant findings that were expected to be of interest to the audience. The second reason though is that it highlighted the benefit of longitudinal data for answering policy relevant research questions. For example, by combining information across waves, it was shown that this difference in completion was explained by socioeconomic background and academic ability at age 15.

Much analysis presented of Indigenous employment, income, mobility or health would also benefit from longitudinal data. However, at present, there is no dataset that tracks individuals across the entire lifecycle. There is some information at key points (for example youth in the LSAY or children in the Longitudinal Study of Indigenous Children (LSIC)), but no information on adults. With this data gap in mind, we renew the call made in Biddle and Yap (2010) for a National Closing the Gap Survey (NCGS).

The NATSISS (and other ABS collections) provide important national level estimates that would be compromised through data attrition if they were replaced by a single longitudinal survey. However, the Indigenous population already experiences a reasonably large survey burden. One alternative would be to implement a rolling-panel approach to the collection of national statistical

datasets. A hypothetical structure of a six-year collection cycle beginning with a NATSISS in 2012 (2 years ahead of schedule) and 2018 as well as a National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) in 2015 (5 years after the current survey) and 2021 is given in Table 7.4. In the intervening years, Biddle and Yap (2010) propose that a reduced module of questions be asked that would allow key lifecourse events to be tracked and the COAG Closing the Gap targets to be analysed. Depending on costs, this survey could be carried out on a subset of the original cohort only.

**Table 7.4 Proposed National Closing the Gap Survey**

Year	Cohort 1	Cohort 2	Cohort 3	Cohort 4
2012	NATSISS			
2013	NCGS			
2014	NCGS			
2015	NATSIHS	NATSIHS		
2016		NCGS		
2017		NCGS		
2018		NATSISS	NATSISS	
2019			NCGS	
2020			NCGS	
2021			NATSIHS	NATSIHS
...				...

Note: NCGS = National Closing the Gap Survey

NATSISS = National Aboriginal and Torres Strait Islander Social Survey

NATSIHS = National Aboriginal and Torres Strait Islander Health Survey

Source: Author's extrapolation

Biddle and Yap (2010) outline three benefits of the above structure. Firstly, it will be possible for the first time to undertake robust longitudinal analysis of a core set of Indigenous outcomes across the lifecourse. This would be restricted those questions that are available on the NATSISS, the NATSIHS and the new National Closing the Gap Survey. However, this would include the major aspects of the Closing the Gap agenda covered at this conference. The second benefit of the above structure (as opposed to a single longitudinal study) would be that the sample for the major surveys would still be nationally representative. That is, Cohort 1 for the 2012 NATSISS, Cohort 2 for the 2015 NATSIHS and so on. The third major benefit is that, by overlapping the cohorts, the representativeness of the longitudinal aspects of the cohorts could be tested against the new cohorts that replace them. For example, the characteristics of Cohort 1 in 2015 could be tested against the characteristics of Cohort 2 in the same year. It may not be possible to maintain a sufficient sample to undertake robust-through-time analysis for all jurisdictions. However, the Closing the Gap targets are set at the national level, and hence it is vital that they be evaluated in these broad terms.

The above structure would clearly require a significant investment from all levels of government. It would not be possible for the ABS to follow such an approach within their existing budget. However, the investment in adequate data collection is inconsequential compared to the investment governments have made, and will need to make in order to substantially reduce Indigenous disadvantage.

## References

- Akerlof, G. A. and Kranton, R. E. 2002. 'Identity and schooling: Some lessons for the economics of education', *Journal of Economic Literature*, 40 (4): 1167–1201.
- Arrow, K. J. 1973. 'Higher education as a filter', *Journal of Public Economics*, 2 (3): 193–216.
- Becker, G. S. 1964. *Human Capital*, National Bureau of Economic Research, New York.
- Biddle, N. 2007. Does it Pay to Go to School? The Benefits of and Participation in Education of Indigenous Australians, PhD Thesis, ANU, Canberra, available at <<http://thesis.anu.edu.au/public/adt-ANU20071008.152249/index.html>>
- 2010. 'A human capital approach to the educational marginalisation of Indigenous Australians', *CAEPR Working Paper No. 67*, CAEPR, ANU, Canberra.
- 2011. 'Income, work and Indigenous livelihoods', Lecture 5, *Measures of Indigenous Wellbeing and Their Determinants Across the Lifecourse*, 2011 CAEPR Lecture Series, CAEPR, ANU, Canberra.
- and Yap, M. 2010. *Demographic and Socioeconomic Outcomes across the Indigenous Australian Lifecourse: Evidence from the 2006 Census*, CAEPR Research Monograph No. 31, ANU E Press, Canberra.
- Borland, J. and Hunter, B. H. 2000. 'Does crime affect employment status? The case of Indigenous Australians', *Economica*, 67 (265): 123–44.
- Card, D. 2001. 'Estimating the return to schooling: Progress on some persistent econometric problems', *Econometrica*, 69 (5): 1127–60.
- Clark, A. E., Frijters, P. and Shields, M. 2008. 'Relative income, happiness and utility: An explanation for the Easterlin paradox and other puzzles', *Journal of Economic Literature*, 46: 95–144.

- Cunha, F., Heckman, J. J., Lochner, L. and Masterov, D. V. 2006. 'Interpreting the evidence on life cycle skill formation', in E. Hanushek and F. Welch (eds), *The Handbook of the Economics of Education*, Elsevier Science, Amsterdam.
- Dockery, A. M. 2010. 'Education and happiness in the school-to-work transition', National Centre for Vocational Education Research, Research Report Item 2239, viewed 10 July 2012, available at <<http://www.ncver.edu.au/publications/2239.html>>
- Dominitz, J. and Manski, C. F. 1996. 'Eliciting student expectations of the returns to schooling', *Journal of Human Resources*, 31 (1): 1–26.
- Frey, B. S. and Stutzer, A. 2002. 'What can economists learn from happiness research?', *Journal of Economic Literature*, 40 (2): 402–35.
- Hartog, J. and Oosterbeek, H. 1998. 'Health, wealth and happiness: Why pursue a higher education?', *Economics of Education Review*, 17: 245–56.
- Khoo, S. T. and Ainley, J. 2005. 'Attitudes, intentions and participation', *LSAY Research Reports*, Longitudinal Surveys of Australian Youth Research Report Number 41, viewed 10 July 2012, available at <[http://research.acer.edu.au/lsay\\_research/45](http://research.acer.edu.au/lsay_research/45)>
- Leigh, A. and Ryan, C. 2008. 'Estimating returns to education using different natural experiment techniques', *Economics of Education Review*, 27: 149–60.
- Marks, G. 1998. 'Attitudes to school life: Their influences and their effects on achievement and leaving school', *LSAY Research Reports*, Longitudinal Surveys of Australian Youth Research Report Number 5, viewed 10 July 2012, available at <[http://research.acer.edu.au/lsay\\_research/62](http://research.acer.edu.au/lsay_research/62)>
- Mare, R. D. 1991. 'Five decades of educational assortative mating', *American Sociological Review*, 56 (1): 15–32.
- Munns, G. and McFadden, M. 2000. 'First chance, second chance or last chance? Resistance and response to education', *British Journal of Sociology of Education*, 21 (1): 59–75.
- Spence, M. 1973. 'Job market signaling', *The Quarterly Journal of Economics*, 87 (3): 355–74.
- Wehlage, G. G. and Rutter, R. A. 1986. 'Dropping out: How much do schools contribute to the problem?', *Teachers College Record*, 87: 374–92.

Wolfe, B. and Haveman, R. 2001. 'Accounting for the social and non-market benefits of education', in J. Helliwell (ed.), *The Contribution of Human and Social Capital to Sustained Economic Growth and Well-being*, University of British Columbia Press, Vancouver.

Yap, M. 2011. 'Gender and Indigenous wellbeing', Lecture 7, *Measures of Indigenous Wellbeing and Their Determinants Across the Lifecourse*, 2011 CAEPR Lecture Series, CAEPR, ANU, Canberra.