# 13 Measuring factors that improve outcomes

Analysing the relationship between different factors and measures of wellbeing provides insight into possible ways that outcomes could be improved, and where interventions may be targeted most effectively.

In line with the broadening of focus from *overcoming disadvantage* to *improving wellbeing* (a key development for the previous edition of this report, see section 2.2 in chapter 2 for more information), this chapter has changed from previous editions and now focuses on contributors to positive outcomes in place of the previous focus on multiple disadvantage.

Aboriginal and Torres Strait Islander Australians experience poorer outcomes on average than non‑Indigenous Australians for the indicators covered in this report. While not discounting that disadvantage, it is also important to acknowledge the unique aspects and strengths of Aboriginal and Torres Strait Islander cultures in terms of connection to land, culture, spirituality and ancestry, and family, kinship, and community which contribute to resilience and can moderate the impact of stressful life events (Zubrick et al. 2014).

Researchers are increasingly using large datasets such as the Census, national survey collections, and administrative data collections, to examine the relationships between characteristics of Aboriginal and Torres Strait Islander Australians and associated outcomes (see CAEPR (2013) for a range of examples).

Different aspects of wellbeing often seem to occur together — for example, education may be linked with employment outcomes, and both may be linked with income.

* Section 13.1 presents information on the interactions between selected proxy measures of the COAG targets, headline indicators and other indicators. The data do not indicate cause and effect relationships between different indicators — that is, the data do not demonstrate that an outcome in one area is the cause of another outcome — rather, they show where there are relationships between different factors. (For more information about the type of data required to measure causality see Biddle 2014 and Productivity Commission 2013).
* Section 13.2 presents the results of recent research by the Productivity Commission into factors associated with outcomes in literacy and numeracy for primary school students.

## 13.1 Interactions between measures of wellbeing**[[1]](#footnote-1)**

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| Box 13.1.1 Key messages |
| * This chapter presents information on the associations between different factors that can help improve outcomes. By identifying some of these factors Aboriginal and Torres Strait Islander people and governments may be able to more effectively target policies or programs to improve outcomes.
* Section 13.1 presents descriptive statistics drawing on selected education and employment measures in this report, and their interaction with other factors.
* Nationally in 2014‑15, for, Aboriginal and Torres Strait Islander Australians:
* there were strong associations between having a non‑school qualification and employment, higher incomes, living in uncrowded households and other positive outcomes (figure 13.1.1)
* the proportion with a non‑school qualification who were employed and had high incomes was similar in remote and non‑remote areas (figure 13.1.1)
* those who were employed were more likely than those who were unemployed, to have higher incomes, live in uncrowded households and were less likely to be a daily smoker, though for some factors these results varied by remoteness (figure 13.1.2; tables 13A.1.4, 13A.1.5, 13A.1.7 and 13A.1.9).
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This section examines interactions between different measures of wellbeing for Aboriginal and Torres Strait Islander Australians. Section 2.2 in chapter 2 provides more information on the concept of wellbeing and its measurement. Where a particular population with a particular characteristic also experiences another characteristic, the two aspects are assumed to be linked or associated in some way; for example, high levels of educational attainment appear to be linked with higher employment rates.

The approach to measuring associations between various indicators is described in box 13.1.2. Data are drawn from the ABS National Aboriginal and Torres Strait Islander Social Survey (NATSISS) 2014‑15.

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| Box 13.1.2 Measuring associations between the selected proxy measures of the COAG targets, headline indicators and strategic change indicators/areas |
| The analysis in this section looks at outcomes in education and employment against selected measures of wellbeing using data from the ABS NATSISS 2014‑15. Subgroups (age, sex and remoteness) with different education and employment characteristics are compared against selected indicators of disadvantage. |
| Selected measures of wellbeing | COAG target/ headline indicator/strategic change indicator/area |
| Highest year of school was year 10 or above | 4.6 Year 12 attainment |
| Employment | 4.7 Employment |
| Unemployment | 4.7 Employment |
| Not in the labour force | 4.7 Employment |
| Without a non‑school qualification | 4.8 Post‑secondary education |
| Has profound or severe core activity restriction | 4.9 Disability and chronic disease |
| In the highest quintile of equivalised gross weekly household income | 4.10 Household and individual income |
| In the 2nd to 4th quintiles of equivalised gross weekly household income | 4.10 Household and individual income |
| In the lowest quintile of equivalised gross weekly household income | 4.10 Household and individual income |
| Arrested in the last 5 years | 4.13 Imprisonment and juvenile detention |
| Whether ever incarcerated | 4.13 Imprisonment and juvenile detention |
| Had unfair experience in the last 12 months because Aboriginal or Torres Strait Islander | 5.1 Valuing Indigenous Australians and their cultures |
| Has difficulty communicating with English speakers | 5.3 Engagement with services |
| Whether can attend or participate in cultural events | 5.7 Participation in community activities |
| Has good/very good or excellent self‑assessed health status | 8.1 Access to primary health care |
| Has fair/poor self‑assessed health status | 8.1 Access to primary health care |
| Current daily smoker | 8.4 Tobacco consumption and harm |
| Has low/moderate psychological distress (K5) | 8.7 Mental health |
| Has high/very high psychological distress (K5) | 8.7 Mental health |
| Living in a home owned by someone in the household | 9.3 Home ownership |
| Principal source of personal income was wages and salary (includes own Incorporated business) | 9.4 Income support |
| (continued next page) |
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| Box 13.1.2 (continued) |
| Principal source of personal income was government pension, allowance or benefits | 9.4 Income support |
| Living in an uncrowded household | 10.1 Overcrowding in housing |
| Alcohol consumption did not exceed 2009 lifetime risk NHMRC guidelines | 11.1 Alcohol consumption and harm |
| Alcohol consumption exceeded 2009 lifetime risk NHMRC guidelines | 11.1 Alcohol consumption and harm |
| The analysis:* classifies the population into various subgroups; (for example has a non‑school qualification or has no non‑school qualification; is employed or is unemployed)
* compares the proportions of people in each population subgroup who experience other outcomes (for example, comparing the proportions of people *with* and *without* a non‑school qualification living in an uncrowded household).
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This section provides a brief overview of the data, with more information available in the attachment tables. The analysis in this section shows proportions of people with particular combinations of characteristics shown in the attachment tables, and is different to the multivariate econometric analysis used in section 13.2. As with other sections in this report, only statistically significant differences are highlighted in the text.

### Non‑school qualifications

In 2014‑15, Aboriginal and Torres Strait Islander Australians aged 20–64 years *with* a non‑school qualification[[2]](#footnote-2) were more likely than those *without* a non‑school qualification to experience other positive outcomes, including:

* being employed (62.1 per cent compared with 39.8 per cent)
* having wages and salary (including own incorporated business) as their principal source of income (52.3 per cent compared with 33.6 per cent)
* living in a high income household[[3]](#footnote-3) (10.7 per cent compared with 2.8 per cent)
* living in a home owned by someone in the household (34.6 compared with 19.8 per cent)
* having left school after completing year 10 or above (83.7 per cent compared with 65.1 per cent) (table 13A.1.1).

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| Figure 13.1.1 Aboriginal and Torres Strait Islander Australians aged 20–64 years non‑school qualification status — with selected characteristics, 2014‑15**a,b** |
|  Figure 13.1.1 Aboriginal and Torres Strait Islander Australians aged 20–64 years non school qualification status — with selected characteristics, 2014-15  Income  More details can be found within the text surrounding this image.  |
| a See table 13A.1.3 for more information on caveats to these data. b Error bars represent 95 per cent confidence intervals around each estimate.  |
| *Sources*: ABS (unpublished) National Aboriginal and Torres Strait Islander Social Survey 2014‑15; table 13A.1.3. |
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Figure 13.1.1 shows interactions between selected outcomes for Aboriginal and Torres Strait Islander Australians with and without non‑school qualifications in 2014‑15 by remoteness.

* For those *with* a non‑school qualification, the proportions by employment and income type were not significantly different between remote and non‑remote areas — proportions in uncrowded households and homes owned by residents were higher in non‑remote areas than remote areas.
* For those *without* a non‑school qualification, the proportions employed or with a wage income, living in uncrowded households or homes owned by residents were higher in non‑remote areas than non‑remote areas.

For more information about associations between non‑school qualifications and other factors (including disaggregation by age and sex) see tables 13A.1.1–3. For more information about non‑school qualifications in general, see section 4.8 ‘Post‑secondary education — participation and attainment’.

### Employment, unemployment and participation in the labour force

Nationally in 2014‑15, Aboriginal and Torres Strait Islander Australians who were employed were more likely to have higher incomes, higher educational attainment, live in uncrowded households, live in homes owned by a member of the household and less likely to be a daily smoker, compared to those who were unemployed or not in the labour force (figure 13.1.2; tables 13A.1.1 and 13A.1.7).

In 2014‑15, for Aboriginal and Torres Strait Islander Australians aged 15–64 years, those who were *employed* were more likely than those who were *unemployed* to:

* have a non‑school qualification (60.4 per cent, compared to 45.3 per cent [32.5 per cent for those not in the labour force]), except for those in remote areas who have been employed for less than 12 months (47.4 per cent)
* have completed schooling to year 10 or above (83.8 compared to 77.1 per cent), except for those employed in remote areas (76.3 per cent, with 75.0 per cent for unemployed people in remote areas)
* be living in an uncrowded household (86.6 per cent compared to 76.5 per cent), except for those employed in remote areas (68.7 per cent, with 59.9 per cent for unemployed people in remote areas)
* live in a home owned by a member of the household ((39.7 per cent compared to 16.8 per cent) (tables 13A.1.4, 13A.1.5, 13A.1.7 and 13A.1.9).

Those who were employed were less likely than those who were unemployed to be daily smokers (32.0 per cent compared to 50.2 per cent) — in both non‑remote (33.5 per cent compared to 46.5 per cent) and remote areas (42.7 per cent compared to 59.4 per cent) (tables 13A.1.4, 13A.1.5, 13A.1.7 and 13A.1.9).

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| Figure 13.1.2 People aged 15–64 years, employed, unemployed and not in the labour force — with selected characteristics, 2014–15**a, b** |
| **Employed****Unemployed** **Figure 13.1.2 People aged 15‑64 years, employed, unemployed and not in the labour force — with selected characteristics, 2014-15  Unemployed  More details can be found within the text surrounding this image.** **Not in the labour force**Figure 13.1.2 People aged 15‑64 years, employed, unemployed and not in the labour force — with selected characteristics, 2014-15  Not in the labour force  More details can be found within the text surrounding this image.  |
| a See tables 13A.1.5 and 13A.1.9 for more information on caveats to these data. b Error bars represent 95 per cent confidence intervals around each estimate. |
| *Source*: ABS (unpublished) National Aboriginal and Torres Strait Islander Social Survey 2014‑15; tables 13A.1.5 and 13A.1.9. |
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For more information on characteristics of people who were employed, unemployed or not in the labour force (including disaggregations by length of time employed and unemployed, age and sex), see tables 13A.1.4–9. For more information about employment, unemployment or labour force characteristics in general see sections 4.7 and 9.1.

### Attachment tables

Attachment tables for this chapter are identified in references throughout this chapter by an ‘A’ suffix (for example, table 13A.1.1). These tables can be found on the web page (www.pc.gov.au/oid2016).

## References

Biddle, N. 2014, *Data about and for Aboriginal and Torres Strait Islander Australians*, Issue paper no. 10, Produced for the Closing the Gap Clearinghouse, Canberra: Australian Institute of Health and Welfare & Melbourne: Australian Institute of Family Studies.

CAEPR (Centre for Aboriginal Economic Policy Research) 2013, *Census papers - CAEPR - ANU - CAEPR - ANU*, http://caepr.anu.edu.au/publications/censuspapers.php (accessed 26 August 2016).

Productivity Commission 2013, ‘Better Indigenous Policies: The Role of Evaluation’, *Better Indigenous Policies: The Role of Evaluation - Roundtable proceedings*, http://www.pc.gov.au/research/conference-proceedings/better-indigenous-policies (accessed 20 August 2014).

Zubrick, S.R., Shepherd, C.C., Dudgeon, P., Gee, G., Paradies, Y., Scrine, C. and Walker, R. 2014, ‘Social Determinants of Social and Emotional Wellbeing’, *Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice - 2nd edition*, http://apo.org.au/node/39689 (accessed 30 July 2014).

## 13.2 Factors related to primary education achievement**[[4]](#footnote-4)**

| Box 13.2.1 Key messages |
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| * The Productivity Commission recently undertook a research project that used quantitative analysis to examine the factors that contribute to the literacy and numeracy achievement of Aboriginal and Torres Strait Islander primary school students (and, for comparison, non‑Indigenous students).
* For both Aboriginal and Torres Strait Islander students and non‑Indigenous students, most of the variation in achievement is attributable to student‑level characteristics (things that vary between students in a school, like demographic background) rather than school‑level characteristics (things that vary between schools, like staff numbers and school fees paid).
* Socioeconomic status explains more of the variation in literacy and numeracy achievement than any other characteristic observed in the dataset for both Aboriginal and Torres Strait Islander students and non‑Indigenous students.
* But characteristics observed in the dataset collectively explain less than one‑third of the total variation in student achievement. Most of the unexplained variation is due to differences between students (rather than between schools).
* These results mesh with findings from the broader education literature — children have individually different learning styles and needs that are not readily categorised according to demographic characteristics.
* Even after observed characteristics are taken into account, Aboriginal and Torres Strait Islander students have lower test scores, on average, than non‑Indigenous students. This means there are factors unobserved in the data that explain differences in achievement.
* There are some schools where Aboriginal and Torres Strait Islander students do considerably better (and worse) than might be expected given their characteristics and those of the school they attend. Insights from the systematic evaluation of high (and low) achieving schools could shed light, in a cost effective way, on what works best to lift achievement of Aboriginal and Torres Strait Islander students.
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Formal education is central to life outcomes. Higher levels of educational attainment can facilitate better health, more secure and higher paying jobs and a much lower likelihood of living in poverty. Literacy and numeracy skills developed through education are fundamental to a person’s quality of life — and to educational attainment. Without the ability to read, for example, many things in life are more difficult.

Primary schooling is a critical period for the development of literacy and numeracy skills. Most Aboriginal and Torres Strait Islander students finish primary school with a good foundation for further learning, but many do not (section 4.4). Education research suggests that there is a range of factors that might influence education achievement. These include characteristics of the broader social environment in which a child lives, the school they attend, their peers, teachers and family, and of the students themselves. Many of these characteristics lie outside the control of education policy makers, schools or teachers. But to the extent that characteristics of this type tend to be associated with achievement, an understanding of that association might help in the development of education policy targeting improved achievement.

### Examining the contributors to literacy and numeracy achievement

The Productivity Commission recently undertook a research project examining factors that contribute to the literacy and numeracy achievement of Aboriginal and Torres Strait Islander primary school students (and, for comparison, of non‑Indigenous students). Drawing on newly available national quantitative data, the project used statistical analysis to address the following questions:

* What are the relative contributions of school‑level characteristics (variables that are constant across individual schools) and student‑level characteristics (variables that are specific to each student) to Aboriginal and Torres Strait Islander primary school students’ literacy and numeracy achievement?
* Among school‑level characteristics and student‑level characteristics, what matters most to literacy and numeracy achievement?
* Are the most important contributors to literacy and numeracy achievement the same for Aboriginal and Torres Strait Islander and non‑Indigenous primary school children?

This analysis was supplemented with a literature review around the question of what works best to improve literacy and numeracy achievement among Aboriginal and Torres Strait Islander primary school students.

This section provides a summary of this research. The full report, *Indigenous Primary School Achievement*, is available on the Commission’s website(PC 2016).

### About the dataset

The project made use of data for primary school students from the Australian Curriculum, Assessment and Reporting Authority (ACARA). These data include information for 2013 and 2014 about the literacy and numeracy achievement of all Australian Year 3 and Year 5 students who participated in the National Assessment Program — Literacy and Numeracy (NAPLAN) tests in those years, along with information about student and family demographics and characteristics of the schools these students attended.[[5]](#footnote-5)

While students cannot be personally identified, information for each student and the school they attend can be linked — which permits a richer analysis than would be possible if data were available only for students or only for schools. The data cover all Australian primary school students and thus support analysis of achievement among Aboriginal and Torres Strait Islander students. In 2014, for example, the data included about 290 000 Year 5 students in total, about 14 600 of whom were Aboriginal and Torres Strait Islander students.

While the ACARA data contain useful information, and support policy relevant insights, only a subset of the characteristics thought to be associated with education achievement are measured — or observed — in the dataset (first column in figure 13.2.1). Measures for some of the unobserved characteristics exist in other data sources but were not available for the project, or not available for all students (second column in figure 13.2.1). For some other unobserved characteristics, data do not exist (third column in figure 13.2.1). Two sets of observed characteristics are defined for the statistical analysis — school‑level characteristics (shaded green) and student‑level characteristics (shaded blue).

| Figure 13.2.1 Characteristics that influence student achievement**a,b,c** |
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| Figure 13.2.1 Characteristics that influence student achievement  More details can be found within the text surrounding this image.  |
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| a The figure provides examples of characteristics. It is not an exhaustive list. b The figure categorises unobserved characteristics according to whether relevant information exists at a national level. Unobserved data that exist include data that are believed to be held in administrative records. c LBOTE is an abbreviation for ‘language background other than English’. |
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### Insights from the analysis

Simple analysis of the dataset indicates that there is wide variation in literacy and numeracy achievement among both Aboriginal and Torres Strait Islander primary school students and non‑Indigenous primary school students (figure 13.2.2). But Aboriginal and Torres Strait Islander students are much more likely to record lower scores, and less likely to record higher scores, than non‑Indigenous students. Aboriginal and Torres Strait Islander students are also less likely to meet national minimum standards for literacy and numeracy than non‑Indigenous students (see section 4.4 for more information).

| Figure 13.2.2 Distribution of reading scores for Aboriginal and Torres Strait Islander students and non‑Indigenous students (Year 5, 2014) |
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| Figure 13.2.2 Distribution of reading scores for Aboriginal and Torres Strait Islander students and non-Indigenous students (Year 5, 2014)  More details can be found within the text surrounding this image.  |
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 |
| *Source*: Productivity Commission estimates based on ACARA data (unpublished). |
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Many commentators focus on gaps in educational achievement between Aboriginal and Torres Strait Islander and non‑Indigenous students in remote and very remote areas (particularly in the Northern Territory), with Aboriginal and Torres Strait Islander primary school students in these areas on average achieving well below non‑Indigenous primary school students. But gaps in literacy and numeracy achievement between Aboriginal and Torres Strait Islander primary school students and non‑Indigenous primary school students are present across all regions (and across all states and territories). Further, remote and very remote students make up a relatively small share (20 per cent) of all Aboriginal and Torres Strait Islander primary school students (figure 13.2.3).

When the contributions of Aboriginal and Torres Strait Islander students in different parts of the country to the national gap are assessed, no single geographic area makes a dominant contribution (figure 13.2.4).

| Figure 13.2.3 Gaps in education achievement by remoteness and the proportion of Aboriginal and Torres Strait Islander year 5 students by remoteness area, 2014**a,b** |
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| Figure 13.2.3 Gaps in education achievement by remoteness and the proportion of Aboriginal and Torres Strait Islander year 5 students by remoteness area, 2014  More details can be found within the text surrounding this image.  |
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 |
| a Excludes 1975 Aboriginal and Torres Strait Islander students (14 per cent) and 16 454 non‑Indigenous students (6 per cent) who either did not participate in the reading test or had no defined region. b ‘NMS’ is an acronym for national minimum standard. |
| *Source*: Productivity Commission estimates based on ACARA data (unpublished). |
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| Figure 13.2.4 Contributions to the national gap in year 5 reading scores, by remoteness, 2014**a** |
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| Figure 13.2.4 Contributions to the national gap in year 5 reading scores, by remoteness, 2014  More details can be found within the text surrounding this image.  |
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 |
| a Excludes 1917 Aboriginal and Torres Strait Islander students (13 per cent) and 16 208 non‑Indigenous students (6 per cent) who did not participate in the reading test. |
| *Source*: Productivity Commission estimates based on ACARA data (unpublished). |
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#### Breaking down the variation in achievement

Using a regression‑technique called ‘multi‑level modelling’, the variation in achievement described above can be broken down into four groups:

* explained student‑level variation (variation between students within a school that can be explained by student‑level characteristics in the dataset)
* unexplained student‑level variation (variation between students within a school that cannot be explained by student‑level characteristics in the dataset)
* explained school‑level variation (variation between schools that can be explained by school‑level characteristics in the dataset)
* unexplained school‑level variation (variation between schools that cannot be explained by school‑level characteristics in the dataset).

Figure 13.2.5 show this breakdown for the literacy and numeracy achievement of students in Year 5.

| Figure 13.2.5 Shares of total variation in achievement by Indigenous status (Reading and numeracy, Year 5, 2013 and 2014 pooled)**a** |
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| Figure 13.2.5 Shares of total variation in achievement by Indigenous status (Reading and numeracy, Year 5, 2013 and 2014 pooled)  More details can be found within the text surrounding this image.  |
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| a Explained student or school‑level variation is attributable to characteristics observed within the ACARA data. Unexplained variation is associated with unobserved characteristics. |
| *Source*: Productivity Commission estimates based on ACARA data (unpublished). |
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##### Student‑level characteristics matter more to achievement than school‑level characteristics

* For both Aboriginal and Torres Strait Islander students and non‑Indigenous students, most of the variation in achievement is attributable to student‑level, rather than school‑level characteristics. Many prior studies that do not separate students by Indigenous status have reached similar results (Gemici, Lim and Karmel 2013; Lamb 2015; Lamb et al. 2004; Lokan, Greenwood and Cresswell 2008; Marks 2010; Nous Group 2011; Rothman and McMillan 2003).
* However, for Aboriginal and Torres Strait Islander students, (explained and unexplained) school‑level variation accounts for a somewhat larger share than for non‑Indigenous students.
* This is due largely to students in very remote areas, where about 40 per cent of the variation in achievement among Aboriginal and Torres Strait Islander students is attributable to schools.
* This could be because Aboriginal and Torres Strait Islander students within each very remote community share similar social and family influences, or it could be because schools are smaller in very remote areas, so students attending the same school are more likely to have been taught by the same teachers.[[6]](#footnote-6)
* While school‑level characteristics account for a small share of total variation overall, this does not necessarily mean that the influence of school‑level initiatives on achievement is permanently limited. It may be possible for schools to have more influence than they do.
* There are some schools where students do better than their characteristics would suggest (see below). If there were more schools where this was the case, there might be less variation in student achievement, students’ characteristics might make a smaller contribution to variation in achievement, and the contribution of schools might be larger.

##### Much of the variation in achievement is unexplained

Overall, much of the total variation in student achievement remains unexplained by the characteristics observed in the ACARA data.

* Student‑ and school‑level characteristics observed in the ACARA data explain, at most, 30 per cent of the total variation, for both Aboriginal and Torres Strait Islander students and non‑Indigenous students.
* This is not just a function of the relatively limited range of student‑ and school‑level characteristics observed in the ACARA dataset. Other research, using datasets with richer information about schools and students, and looking only at the general student population, has only been able to explain at most about half of the variation in student achievement.
* Linking more information with the current ACARA data would enable richer analysis of student achievement, but it is likely that a large share of the variation in student achievement would remain unexplained — and our understanding of what might work best to lift achievement may not be markedly advanced by data of this type. A key reason for this is that student achievement tends to vary widely for each characteristic considered (it does not cluster on the basis of particular characteristics)
* The conclusion that a large share of variation in achievement is associated with unobserved student‑level characteristics is well‑established in the relevant literature. As discussed further below, it meshes with the view from the literature about what works best to lift achievement — strategies that target the learning needs of individual students.

#### Socio‑economic status accounts for some but not all of the explained variation in achievement

A technique called dominance analysis was used to examine which of the school‑ and student‑level characteristics observed within the ACARA data made the largest contribution to explaining variation in student achievement.

The results (figure 13.2.6) suggest that:

* for both Aboriginal and Torres Strait Islander students and non‑Indigenous students, characteristics related to socioeconomic status[[7]](#footnote-7) (at a student and school level) are among the largest contributors. For Aboriginal and Torres Strait Islander students, these characteristics account for 10 per cent of total variation in achievement. For non‑Indigenous students, these characteristics account for 13 per cent of total variation in achievement
* for Aboriginal and Torres Strait Islander students, other characteristics are also large contributors. Particularly, school attendance rates (accounting for nearly 5 per cent of total variation) and the percentage of Aboriginal and Torres Strait Islander students within a school (accounting for about 4 per cent of total variation).

While the analysis suggests that social disadvantage (reflected in socio‑economic status and the percentage of Aboriginal and Torres Strait Islander students within a school) is a key factor in Aboriginal and Torres Strait Islander students’ achievement, it is important to remember that most (about 70 per cent) of variation in achievement remains unexplained.

| Figure 13.2.6 Relative importance of different observed characteristics in explaining NAPLAN reading achievement**a,b**Year 5, 2013 and 2014 pooled |
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| Figure 13.2.6 Relative importance of different observed characteristics in explaining NAPLAN reading achievement Year 5, 2013 and 2014 pooled  More details can be found within the text surrounding this image.  |
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 |
| a Results presented are general dominance statistics, which reflect the average contribution of a set of observed characteristics to the model’s total variation. b The relative importance of calendar year was not examined, but was included in all dominance analysis regressions. Calendar year explained 1 per cent or less of the variation in NAPLAN scores. c Student socioeconomic status (SES): mother’s and father’s highest education level, mother’s and father’s occupation. d School socioeconomic status (SES): percentage of mothers and fathers by highest education level, percentage of mothers and fathers by occupation, school fees and parent contributions per student (standardised by school sector) interacted with school sector. e Other characteristics: school sector, combined school indicator, average class size, non‑teaching staff per student, number of enrolments, percentage of students with a language background other than English, test participation rate, student mobility indicator. f School finances per student: recurrent funding (less school fees), capital income deductions, capital expenditure. |
| *Source*: Productivity Commission estimates based on ACARA data (unpublished). |
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#### Aboriginal and Torres Strait Islander students have lower test scores on average, even after accounting for differences in observed characteristics

Even after other observed characteristics are taken into account, Aboriginal and Torres Strait Islander primary school students have lower test scores on average than non‑Indigenous students (figure 13.2.7).

* Taking into account observed characteristics, the test scores of Aboriginal and Torres Strait Islander students in metropolitan areas are lower, on average, than those of non‑Indigenous students in those areas.
* Aboriginal and Torres Strait Islander students are further behind their non‑Indigenous peers, holding other characteristics equal, the more remote the region in which they attend school.
* In contrast, after taking other characteristics into account, non‑Indigenous students in more remote areas have higher test scores than their metropolitan peers.

| Figure 13.2.7 Differences in achievement, holding other observed characteristics equal (reading and numeracy, Year 5, 2013 and 2014 pooled)**a,b,c** |
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| Figure 13.2.7 Differences in achievement, holding other observed characteristics equal (reading and numeracy, Year 5, 2013 and 2014 pooled)  Compared with non-Indigenous students in metropolitan regions.  More details can be found within the text surrounding this image.  |
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| a Regression coefficients on Indigenous status and on Indigenous $×$ remoteness interaction terms have been summed together where relevant to produce these estimates. b Vertical lines represent 95 per cent confidence intervals. c Relationships for categorical variables should be interpreted relative to the default category noted in the subtitle. |
| *Source*: Productivity Commission estimates based on ACARA data (unpublished). |
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This suggests that Aboriginal and Torres Strait Islander students have characteristics that are unobserved in the ACARA data that result in differences in achievement relative to non‑Indigenous students. What these might be is unclear. Among many possible explanations from the literature on Aboriginal and Torres Strait Islander education (but typically untested using large‑scale datasets, if at all) are the effects of: relatively low rates of attendance at a student level[[8]](#footnote-8); speaking Aboriginal English; relatively high rates of hearing loss; relatively low expectations for achievement among Aboriginal and Torres Strait Islander students, their parents and their teachers; discrimination by peers, teachers or school systems; and a lack of acknowledgment of, and support for, Aboriginal and Torres Strait Islander culture among teachers and within schools.[[9]](#footnote-9)

#### Differences in observed characteristics can only explain about half of the gap in achievement

In 2014, the mean reading score for Year 5 Aboriginal and Torres Strait Islander students was 426, and for non‑Indigenous students it was 506 — a gap of 80 points.

A statistical technique called Blinder‑Oaxaca decomposition was used to examine the extent to which gaps in reading and numeracy test scores between Aboriginal and Torres Strait Islander students and non‑Indigenous students was because the two groups had different characteristics (for example, different socioeconomic backgrounds) or because the association between their characteristics and achievement was different (for example, if coming from a low socioeconomic background has a smaller association with achievement for one group).

The results suggest that differences in observed characteristics account for about half of the gap in average test scores. In other words, if the average Aboriginal and Torres Strait Islander student had the same observed characteristics as the average non‑Indigenous student, the gap between their test scores would be half as large.

#### Some schools defy expectations

There are some schools where the analysis suggests that Aboriginal and Torres Strait Islander students do considerably better than might be expected given their characteristics and the observed characteristics of those schools, and some where they do considerably worse.[[10]](#footnote-10) Perhaps there is something about the culture in these schools, the school leadership or teacher quality that contribute. The Commission cannot discern why this is so from the ACARA data and all schools in the dataset are de‑identified. However, if they were identified, they could be systematically examined to see if there is something that could be learned from them. Before undertaking this work however, it would be useful to cross check the results from this analysis using other methods of examining school performance to secure confidence that the schools identified for evaluation really are particularly effective, or ineffective, over time in educating Aboriginal and Torres Strait Islander students.

### Insights from the literature on what works

The broader education literature suggests that the key to improving student achievement, for all students, is high quality instruction — including assessment of each child’s learning needs, identification of strategies to meet them and evaluation of the effectiveness of those strategies, that is, individualised instruction. This emphasis on the importance of individualised instruction for improving achievement aligns with the observation from analysis of the ACARA data that unobserved student characteristics are the main contributor to variation in student achievement. According to the literature, high quality instruction is facilitated by:

* effective use of data in assessing where students are at and evaluating the impact of teaching interventions
* high expectations (including a student’s expectations of him or herself)
* positive student wellbeing
* strong student–teacher relationships
* supportive school and system leadership, including with respect to professional development of the teaching workforce.

While the education literature does not tend to be specific to Aboriginal and Torres Strait Islander students, there is no evidence to suggest that the fundamentals of what works best in supporting achievement for Aboriginal and Torres Strait Islander students is any different to those for non‑Indigenous students. But, as discussed in the statistical analysis above, Aboriginal and Torres Strait Islander students do have unobserved characteristics that differ from those of non‑Indigenous students.

To effectively individualise instruction for Aboriginal and Torres Strait Islander students, teachers need to take into account the particular challenges (and opportunities) faced by these students. The available evidence suggests that a culture of high expectations in schools and strong student–teacher, and community, relationships are particularly important to Aboriginal and Torres Strait Islander students’ achievement. Recognition of, and support for, culture are also important.

### Some policy‑related observations

The ACARA data used in the study contribute markedly to the national education evidence base. That said, the newly available data are only a subset of the characteristics thought to matter to student achievement. Gaps in the evidence base remain. In part, these gaps could be filled with information held by states and territories (figure 13.2.1). Information about student health and individual attendance rates are noteworthy examples. But, it is unclear whether understanding of how to improve achievement would be markedly advanced by richer national‑level data alone.

The fact that much of the variation in student achievement is a function of unexplained differences between students suggests that a ‘one size fits all’ approach to improving achievement is unlikely to be effective for Aboriginal and Torres Strait Islander students. Different students bring different things to the classroom. And just because a student has a certain set of observed characteristics (for example, a low socioeconomic background) does not predestine them to lower achievement. Strategies that target the needs of individual Aboriginal and Torres Strait Islander students, whatever their background characteristics, are likely to be particularly important in improving achievement.

Despite a long history of policy attention, large disparities in educational achievement persist between Aboriginal and Torres Strait Islander students and non‑Indigenous students. Better evaluation of initiatives is clearly needed. Given the importance of unobserved factors to variation in achievement, insights from evaluation of high and low achieving schools (the achievement ‘outliers’) could shed light, in a cost effective way, on what works best to lift achievement of Aboriginal and Torres Strait Islander students. While there are some isolated published instances of outlier school evaluation, the findings of this project suggests that systematic evaluation of schools that do a particularly good job of educating Aboriginal and Torres Strait Islander students is needed to better inform policy development to reduce the gap in educational achievement.

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1. The Steering Committee notes its appreciation to Dr Nicholas Biddle, Centre for Aboriginal Economic Policy Research, who reviewed a draft of this section of the report. [↑](#footnote-ref-1)
2. Non-school qualifications in this section includes all qualifications from certificate I and above. This differs from section 4.8, where data are restricted to qualifications of certificate III and above. [↑](#footnote-ref-2)
3. Defined as the highest quintile of equivalised gross weekly household income (see section 4.10 for detail). [↑](#footnote-ref-3)
4. The production of the PC research report from which the material in this section is sourced included an external review process. [↑](#footnote-ref-4)
5. The numbers presented in this report may differ slightly from those published in ACARA’s National
 Report on Schooling due to an updated dataset. [↑](#footnote-ref-5)
6. The influence of teachers on achievement will be reflected at a school level, to the extent that it is constant across schools, and at a student level to the extent that it is specific to each student. Therefore, school‑level variation may capture the effects of teaching more in very remote areas [↑](#footnote-ref-6)
7. Student-level socioeconomic status was captured with variables that indicate a student’s parents’ occupation and highest level of education. School-level socioeconomic status was captured with variables for percentage of parents by highest education level and percentage of parents by occupation at a student’s school, school fees and parent contributions per student (standardised by school sector) interacted with school sector. [↑](#footnote-ref-7)
8. Hancock et al. (2013, p. 169), using data including measures of attendance at a student level for all Western Australian students (both Indigenous and non‑Indigenous), concluded that ‘higher rates of absence are uniformly associated with progressively worse achievement’. Using data from the Longitudinal Survey of Australian Youth (Year 9 students), Biddle (2014) concluded that lower levels of attendance among Aboriginal and Torres Strait Islander students accounted for about 20 per cent of the achievement gap with non‑Indigenous students. [↑](#footnote-ref-8)
9. Chapter 4 of the PC research report, includes an overview of key literature sources (PC 2016). [↑](#footnote-ref-9)
10. Controlling for observed student-level and school-level characteristics, thirteen schools were identified as performing within the top five per cent in *both* reading and numeracy tests for both Year 3 and Year 5 Aboriginal and Torres Strait Islander students. A further 33 schools were identified as performing within the top five per cent on either reading *or* numeracy tests for both Year 3 and Year 5 Aboriginal and Torres Strait Islander students. [↑](#footnote-ref-10)