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DEVELOPING A BEHAVIOURAL MODEL  
OF SCHOOL ATTENDANCE: POLICY  
IMPLICATIONS FOR INDIGENOUS  
CHILDREN AND YOUTH

N. BIDDLE

Centre for  
Aboriginal Economic  
Policy Research  
ANU College of  
Arts & Social  
Sciences

CAEPR WORKING PAPER NO. 94/2014

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July 2014



# Developing a behavioural model of school attendance: policy implications for Indigenous children and youth

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*Working Paper* No. 94/2014  
ISSN 1442-3871  
ISBN 0 73154993 7

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An electronic publication downloaded from [caepr.anu.edu.au](http://caepr.anu.edu.au).

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## Abstract

To design policies that maximise the chances that Aboriginal and Torres Strait Islander (Indigenous) students will attend school on a given day, it is important to have a detailed understanding of how Indigenous students make the decision about whether to attend. In this paper, I analyse four data sets to shed light on the attendance decisions of Indigenous students: the Longitudinal Surveys of Australian Youth (LSAY), the Longitudinal Study of Australian Children (LSAC), the Longitudinal Study of Indigenous Children (LSIC), and the National Aboriginal and Torres Strait Islander Social Survey (NATSISS). I look at three aspects of the school decision: the relationship between past attendance and current academic outcomes, differences between Indigenous and non-Indigenous students in patterns of attendance, and Indigenous-specific determinants of school attendance. The results of the analysis show that, although there is strong evidence for the policy focus on school attendance, the current policy framework may be missing many of the factors that are driving actual behaviour. In the concluding section of the paper, I discuss the importance of the findings for the development of a behavioural model for school attendance, as well as some further research needed to extend our understanding. I also discuss some initial policy implications, with a particular focus on the strengths and weaknesses of alternative policies.

Keywords: School attendance; literacy and numeracy; racism and bullying.

## Acknowledgments

This paper was prepared for the Indigenous Populations Project (IPP) and draws on work previously undertaken for the Strategic Indigenous Research Project (SRP) between CAEPR and the Australian Government Department of the Prime Minister and Cabinet (PM&C). Comments collated by PM&C were greatly appreciated, as were those received by Katherine Curchin and Frances Morphy of CAEPR. Some results from the analysis in this paper were presented as part of the 2014, Semester 1 CAEPR Seminar Series with comments during this presentation contributing to the development of the paper.

## Acronyms

CAEPR	Centre for Aboriginal Economic Policy Research
CCT	Conditional Cash Transfer
IRR	Incidence Rate Ratio
LSAC	Longitudinal Study of Australian Children
LSAY	Longitudinal Surveys of Australian Youth
LSIC	Longitudinal Study of Indigenous Children
NATSIS	National Aboriginal and Torres Strait Islander Survey
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
SEAM	Student Enrolment and Attendance Measure
SCGRSP	Steering Committee for the Review of Government Service Provision
WAACHS	Western Australian Aboriginal Child Health Survey

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## Introduction, policy context and overview

### *The policy context*

All major political parties at both the state/territory and national levels have recognised and championed the importance of increased educational participation and attainment in sustainably improving the socioeconomic and wellbeing outcomes of Aboriginal and Torres Strait Islander (Indigenous) Australians. Numerically, education dominates the targets in the Closing the Gap on Indigenous Disadvantage framework: three of the six targets are devoted to it. Specifically, in 2008, the Council of Australian Governments committed to:

- ensuring that all Indigenous 4-year-olds in remote communities have access to early childhood education within five years (by 2013)
- halving the gap for Indigenous children in reading, writing and numeracy achievements within a decade (by 2018)
- halving the gap for Indigenous people aged 20–24 in Year 12 (or equivalent) attainment rates (by 2020).

Progress towards these targets has been mixed. It is possible that the early childhood education target will be met—this will not be known until later in 2014; even then, uncertainty relating to population estimates and projections makes evaluation of this target difficult. Furthermore, there is a difference between access and participation; 2011 Australian Census data suggested that there were still large gaps in participation across almost all of Australia (Biddle & Bath 2013).

According to the 2014 Closing the Gap report (Australian Government 2014: 6), ‘the target to halve the gap for Indigenous people aged 20–24 in Year 12 or equivalent attainment rates by 2020 is on track to be met’; however, ‘progress against the target to halve the gap in reading, writing and numeracy within a decade has been disappointing’ and ‘only two out of eight areas have shown a significant improvement since 2008’.

Given the mixed results on literacy and numeracy, in particular, it is not surprising that the current Australian Government has maintained, and even increased, the focus on education in its approach to Indigenous affairs. According to Prime Minister Tony Abbott in the introduction to the 2014 Closing the Gap report, ‘the Australian Government’s highest priority in Indigenous affairs is getting children to school’ (Australian Government 2014: 1).

At the national level, the current focus of Indigenous education policy is attendance. A new target has been announced to eliminate any disparities between Indigenous and non-Indigenous students in attendance rates within five years (presumably by 2019). In his speech to Parliament, Prime Minister Abbott stated that ‘we will know that this gap has been all but closed when schools achieve 90 per cent plus attendance regardless of their percentage of Aboriginal students’.

A range of policies have already been put in place to help achieve these targets. School attendance supervisors and school attendance officers are being introduced into 40 remote communities. The Australian Government has committed to expanding the Student Enrolment and Attendance Measure (SEAM) from 15 to 23 communities in the Northern Territory. The Closing the Gap report also notes that the government will continue ‘the \$22 million committed in the 2013–14 Budget to expand scholarship opportunities for Indigenous students’ (Australian Government 2014: 13).

The data clearly suggest that attendance rates for Indigenous students should be of concern for government. According to the *Overcoming Indigenous Disadvantage* (OID) report prepared by the Steering Committee for the Review of Government Service Provision in 2011 (SCRGSP 2011: 6.7), ‘attendance rates for Indigenous students, at government schools, were lower than for non-Indigenous students for years 1–10 in all states and territories’ and ‘attendance rates declined at government schools in all jurisdictions from year 5 to year 10 for both Indigenous and non-Indigenous students, but declined by more for Indigenous students’. Furthermore, using unit-record administrative data on public school students in Western Australia, Hancock et al. (2013) showed that Aboriginal students in that state had lower rates of attendance than their non-Aboriginal peers.

### *Understanding the attendance decision*

Children and youth need to attend school on a regular basis if they are to benefit academically, socially and physically. Students who do not attend school regularly are likely to fall behind their peers, with negative effects on school completion, school achievement and later life outcomes (Purdie & Buckley 2010). The initial policies and proposals from the current Australian Government provide insights into the government’s views on causes of low Indigenous attendance—they focus on remoteness, receipt of welfare, and the availability and quality of public schools.

If the attendance target of the government is to be achieved, a more detailed understanding of why a large proportion of Indigenous students might not be attending school is needed. Although this may complicate the policy process, it needs to be recognised that the causes of low rates of attendance for any population group are complex and multi-dimensional. Using the discussion in Reid (2008) as a basis, it is useful to think of three broad categories of causes of non-attendance:

- children who do not want to go to school because they dislike it
- children who enjoy school but have identified other activities with greater benefit
- children who would otherwise want to go to school but are unable to—for example, because of difficulties with health, transport or access, or a range of other reasons.

One way to conceptualise school attendance is as a daily realisation of the human capital model (first outlined by Becker 1964). Under this model, a student will decide to attend school on a given day if the benefits of doing so outweigh the costs. School non-attendance is an indication that the costs are too high or the benefits are too low.

These benefits and costs are not all economic. Although both future income and current economic costs (including opportunity costs) are likely to be important for older students, students will also take many other things into account. In terms of benefits, students are likely to consider the intrinsic academic and social enjoyment they receive from attending school, as well as monetary incentives to attend school—for example, through conditional cash transfers (Fiszbein, Schady & Ferreira 2009). Another benefit of attending school is the avoidance of sanctions (legal, financial or school based).

The costs of school attendance are perhaps even more complex. Financially, some students are likely to face a large opportunity cost (relative to their family's income) if they attend school. By attending school, they forego opportunities to supplement their family's income and resources through paid work for a business; unpaid work for a family business or farm; or more traditional hunting, fishing or gathering activities. Labour laws in countries like Australia make some of these alternative income- and resource-generating activities difficult, but it is always possible to get around such restrictions. There are also likely to be social costs of school attendance. Students who experience bullying at school as a result of their ethnicity, gender, sexuality, disability or other

characteristics are likely to face greater costs of attending school (Dupper 2013).

Young children (or even teenagers) are unlikely to make a conscious cost–benefit calculation. Rather, many of the costs and benefits, particularly the economic ones, are likely to be mediated through their parents or carers. Social norms within the family and community in which the child lives are also likely to influence the attendance decision. One way to think of this is the social cost that stems from the conflict between school attendance and a person's identity. Akerlof and Kranton (2010), and Austen-Smith and Fryer (2005) consider situations in which a minority subgroup faces a trade-off between higher wages and the social stigma it receives from within the subgroup. This stigma results from expending time on an activity associated with the majority group. Alternatively, the school (or educational institutions in general) might be perceived as promulgating values that are in conflict with those of the student's home culture.

Although these costs and benefits are unlikely to be explicitly weighed up by the individual on a daily basis, they are likely to be reflected on from time to time, and influence a person's habits and norms. Again, this will be heavily mediated through the child's carers or parents. When circumstances change (e.g. an illness or a new bullying incident), the evaluation is likely to be revised.

In general, the benefits of education are more likely to be received well into the future, whereas the costs are more likely to be immediate. The way in which a student discounts the future is therefore also likely to affect their cost–benefit calculation. Although the correlation is not perfect, a large body of evidence suggests that a person's cognitive and non-cognitive ability can affect the extent to which they are able to make choices that are in their long-term best interests (Fischhoff 2008; Stanovich, West & Toplak 2012). Since early childhood interventions have a strong impact on non-cognitive ability (Heckman, Stixrud & Urzua 2006), it is likely that early childhood education and other experiences may affect a student's academic ability and the extent to which they value the present compared with the future.

The costs and benefits of education, and how they are weighed up, are likely to vary between individuals and between population subgroups (including Indigenous students). This suggests a need for a separate analysis of the causes and consequences of Indigenous non-attendance, as well as potential policy responses.

Purdie and Buckley (2010) reviewed the available evaluations of programs that seek to increase school

attendance rates. They concluded that ‘the evidence about attendance and retention strategies that work for Indigenous students is not strong’ but that ‘education practitioners and policy makers need to be well versed in the importance of cultural factors in schooling’ and that they ‘must continue to develop policy and programs that take account of Indigenous cultures and history, and they must develop expanded understandings of what it means to participate and engage in education’ (Purdie & Buckley 2010: 20–21).

### *Overview of the paper*

This paper examines the reasons for Indigenous school attendance or non-attendance, and their implications for policy development.

Since the completion of the Purdie and Buckley (2010) review, a number of large-scale government programs have focused on school attendance. Chief among these is the Cape York Welfare Reform program in far north Queensland, and the SEAM in the Northern Territory. Although there are important differences between the two programs, a key feature of both is the potential for welfare payments for families to be affected—either directly or through the family being subject to income management—if minimum attendance rates are not met.

While focusing on the development of positive social norms (according to the Australian Government), both programs attempt to increase attendance by imposing an additional cost on non-attendance. In contrast, the OID report (SCRGSP 2011: 6.5) details a number of smaller-scale approaches that focus on encouraging students to attend school by making attendance more attractive. The relative efficacy of reducing costs and increasing benefits of school attendance is uncertain. There is also uncertainty about whether incentives to attend are more effective than disincentives not to attend. Both ‘carrots’ and ‘sticks’ are potentially useful for policies that focus on costs as well as benefits.

There is a clear need for the type of evaluations called for in Purdie and Buckley (2010). I will return to these in the concluding section of this paper. To identify the types of programs and policies whose evaluation would be useful, it is important to have detailed information on the nature of the issue—in particular, to investigate how students and their families make the decision to attend school (or not) on a given day, and the main factors that influence this decision. Crucially, our understanding of student attendance needs to be built on how students actually make their decision, not how they say they do or how policy makers think they should. There are many

complementary approaches to this question, including experimental approaches and participant observation. The approach taken in this paper is to analyse a set of nationally representative survey data.

Policies or programs that do not take into account the real reasons that children do not go to school are more likely to be ineffective or have unintended consequences than those based on a more thorough understanding. Consider the current policy focus of creating additional benefits of attendance through avoiding the suspension of welfare payments. If students do not attend because the costs are substantial, such a policy could have large negative consequences for the individual, without any benefits, for those unable or unwilling to attend. Furthermore, forcing children to attend who are currently not attending and who do not want to could have large negative consequences for the rest of the population who are already attending (through disruptive activities and other negative peer effects).

Fortunately, since the completion of Purdie and Buckley’s (2010) review, a set of new data sets that could shed light on the attendance decision has become available. This paper analyses four of them: the Longitudinal Surveys of Australian Youth (LSAY), the Longitudinal Study of Australian Children (LSAC), the Longitudinal Study of Indigenous Children (LSIC), and the National Aboriginal and Torres Strait Islander Social Survey (NATSISS). ‘Data used in the analysis’ gives a brief overview of each of these data sets and their use in understanding the attendance decisions of Indigenous children.

The sections that follow then use these data sets to examine three aspects of the school decision:

- ‘Relationship between school attendance and test scores’ considers the relationship between past attendance and current academic outcomes. In essence, is there strong statistical support for the policy focus on attendance?
- ‘The early years—comparisons between Indigenous and non-Indigenous children’ looks at differences between Indigenous and non-Indigenous students in patterns of attendance, and considers whether observable characteristics explain the difference between the two populations.
- ‘Factors associated with Indigenous school attendance’ looks at the Indigenous-specific determinants of Indigenous school attendance, recognising the distinct history of the Indigenous population.

In 'Conclusions: towards a model of school attendance', I discuss the importance of the findings for the development of a behavioural model for school attendance, and further research that is needed to extend our understanding. I also discuss some initial policy implications, with a focus on the strengths and weaknesses of alternative policies, such as conditional cash transfers to improve school attendance.

## Data used in the analysis

This paper uses four data sets to understand Indigenous school attendance. These are briefly described below.

### *Longitudinal Surveys of Australian Youth*

The LSAY focus on youth outcomes and transitions by following successful cohorts of 15-year-olds. The most recent cohort (aged 15 in 2009) had a large and reasonably representative Indigenous sample. Sampling for the survey is undertaken at the school level, using a random sample of schools and a random sample of students from each selected school. However, to obtain a sufficient sample of Indigenous students, schools with large numbers of Indigenous students were oversampled, with every Indigenous student in selected schools included in the sample.

Wave 1 of the 2009 LSAY had information on 14,251 children, of whom 1,143 were identified as being Indigenous. The sample was skewed towards urban areas: 48.9 per cent of the Indigenous sample attended a school in a major city, 42.3 per cent attended a school in provincial Australia, and the remaining 8.8 per cent attended a school in remote Australia.

Students who responded to the survey were asked two questions relating to attendance:

- whether they missed two or more consecutive months of primary school
- whether they missed two or more consecutive months of lower secondary school.

These questions are useful for analysing the potential effect of historical attendance patterns (by comparing responses with other outcome variables), but tell us very little about current patterns of attendance. They are both prone to recall bias.

### *Longitudinal Study of Australian Children*

The mostly widely used cohort study in Australia is the LSAC, sometimes referred to as Growing Up in

Australia. According to the data user guide for the survey, 'LSAC aims to provide a database for a comprehensive understanding of children's development in Australia's current social, economic and cultural environment' (AIFS 2011: 8).

The LSAC was constructed around two cohorts: the B (babies) cohort (born March 2003 – February 2004) and the K (kids) cohort (born March 1999 – February 2000). The latter is used in the analysis in this paper. In wave 1 of the LSAC, there were 4,983 children aged 4–5 years, of whom 187 were identified as being Indigenous (3.8% of the sample). By wave 4, when the children were aged 10–11 years, there were 3,940 children left in the LSAC, of whom 105 (2.7%) were identified as being Indigenous. Clearly, this is a very small sample of Indigenous children, which does not allow detailed analysis within the population. Sample attrition (dropping out of the survey between waves) was much higher for the Indigenous population than for the non-Indigenous population.

Despite the limitations of the Indigenous sample in the LSAC, the study can be used to make some broad comparisons between Indigenous and non-Indigenous children. To do so, I use the question: on how many days in the previous four weeks was the child absent? (If one of the previous four weeks was during the holidays, carers who responded to the question were asked to ignore that week.)

### *Longitudinal Study of Indigenous Children*

The LSAC and LSAY have a large enough Indigenous sample to undertake comparative analysis, but they are limited in the Indigenous-specific information that they contain. Partly in response to this lack of information, as well as the fairly low sample of Indigenous children in the LSAC, considerable resources have been devoted to the development of an Indigenous-specific cohort study—the LSIC. Also known as Footprints in Time, the LSIC is the first large-scale longitudinal survey in Australia to focus on the development of Indigenous children. The first wave of the survey was carried out between April 2008 and February 2009, and collected information on 1,687 study children and their families.

Like the LSAC, the sample for the LSIC was designed around two cohorts: babies (born between December 2006 and November 2007) and children (born between December 2003 and November 2004). The eventual sample comprised 960 children in the baby cohort and 727 in the child cohort. Although the survey administrators aimed to keep the sample within these

birth date ranges, in practice, a small number of children in the sample fell outside of them.

Because of its focus on the specific needs and circumstances of the Indigenous population, there has been considerable support within the Indigenous communities of the survey areas for the aims and goals of the LSIC. This is reflected in the relatively high sample retention across the first four waves of the survey. Ignoring those who were added to the sample after wave 1, 1,031 out of 1,671 children (61.7% of the original sample) have been counted in all four waves (FaHCSIA 2013). Although the number of children who have dropped out of the sample raises concerns about representativeness, this is a reasonably high retention rate, given the mobility of the population in question. However, a trade-off needs to be made: the inclusion of areas based on community support leads to a total sample that is not completely representative of the total Indigenous population, with children in communities that are unable to reach such support under-represented in the survey. There is a further effect of geographic clustering of individuals, with the associated effect on standard errors and inference (Hewitt 2012).

Respondents to the LSIC were asked whether the study child went to school every day that they were supposed to in the past week. This allows analysis of the factors associated with missing any days, but not the factors associated with the number of days missed (in contrast to the LSAC).

### *National Aboriginal and Torres Strait Islander Social Survey*

The final data set used in the analysis in this paper is the NATSISS. Recognising the limitations of Australian censuses and other mainstream data collections, the NATSISS contains broad information across key areas of social concern for Indigenous Australians. The most recent NATSISS was carried out in 2008; two

previous surveys were conducted in 2002 and 1994 (when it was the National Aboriginal and Torres Strait Islander Survey—NATSIS). The most recent survey, like the 1994 NATSIS, had a large child sample. No information is collected from the children themselves, but a range of information was collected from carers on 5,484 Indigenous children aged 14 years or younger.

One of the strengths of the NATSISS is that it collects information on whether the child missed any days from school without permission in the previous 12 months, as well as whether the child missed any days in the previous week. Although the effect of missing school may be similar if it was done with or without permission, the causes are likely to be very different.

### **Relationship between school attendance and test scores**

Identifying differences within the Indigenous population, and between Indigenous and non-Indigenous students is important for the targeting of Indigenous-specific programs relating to school attendance. However, to justify expenditure on these programs, it is important to determine whether missing school has an ongoing effect on school outcomes.

As noted in ‘Data used in the analysis’, respondents to the LSAY were asked two questions relating to previous absences from school: ‘Did you ever miss two or more consecutive months of primary school?’ (Question 54) and ‘Did you ever miss two or more consecutive months of lower secondary school (up to year 10)?’ (Question 55). For each of these questions, respondents are able to choose from three options: No, never; Yes, once; and Yes, twice or more. Table 1 shows the percentages of the Indigenous and non-Indigenous samples that gave each of these responses.

**TABLE 1.** Reported school absences of Indigenous and non-Indigenous students, 2009

Response	Primary school		Lower secondary school	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
No, never (%)	79.1	85.8	81.7	88.2
Yes, once (%)	15.4	10.9	12.1	9.4
Yes, twice or more (%)	5.5	3.3	6.2	2.4
Sample size	948	12,380	946	12,375

Source: Customised calculations using the 2009 Longitudinal Surveys of Australian Youth

Differences between Indigenous and non-Indigenous students presented in Table 1 match those from administrative data from the OID report (see ‘The policy context’). Indigenous students are more likely than non-Indigenous students to have missed school for two months or more, with the difference greater in secondary school. Furthermore, the greatest difference is among those who have missed two months or more of school twice or more in lower secondary school. Indigenous students in the LSAY sample were 2.6 times as likely as non-Indigenous students to report this high level of school absenteeism.

Unfortunately, the first wave of data in the LSAY is when the child is 15. This means that the absentee data are prone to recall bias. As well, there is no information on the student’s characteristics at the time the absence occurred. There is therefore very little scope within the LSAY to explain the difference between Indigenous and non-Indigenous students across the school career.<sup>1</sup> It is possible, however, to use the LSAY to compare the test scores of Indigenous and non-Indigenous students at the age of 15, and relate this to their previous absences.

Analysis of the Western Australian Aboriginal Child Health Survey (WAACHS) has shown a direct relationship between the number of days absent from school and academic performance (Zubrick et al. 2010). Hancock et al. (2013) also showed that there was a relationship between school attendance and academic achievement, using administrative data on Western Australian public school students.

Although these previous studies have been influential in building a case for interventions relating to school attendance, there are five important reasons for bolstering the previous analysis:

- The LSAY will allow an update of the Zubrick et al. (2010) analysis using more recent survey data.
- The LSAY will allow national comparisons, rather than conclusions for one jurisdiction only.
- The analysis of the WAACHS used current absences to explain current test scores. Although the LSAY also presents difficulties in identifying causal relationships (discussed in more detail in ‘Conclusions: towards a model of school attendance’), the timing of the questions means that causal relationships can more easily be proposed.
- The analysis in Hancock et al. (2013) had a limited range of controls, restricted to what was available in administrative data sets. For example, the only socioeconomic characteristics available were based

on the average of the areas where the students in a particular school lived.

- The WAACHS did not have a non-Indigenous comparator. As a result, Zubrick et al. (2010), using the WAACHS, was able to show that attendance was associated with variation within the Indigenous population, but could not explain the gap between Indigenous and non-Indigenous students. In contrast, the LSAY allows the researcher to use attendance to examine this gap.

To undertake this analysis, I used data from standardised test scores administered as part of the LSAY. Test scores are available for maths, reading and science, which I scaled across the sample to have a mean of zero and a standard deviation of 1. A further variable was created for the average standardised test score across the three disciplines. I then analysed the relationship between Indigenous status and these test scores, increasing the number and type of controls across four separate models:

- In model 1, the only explanatory variable is whether or not the student identifies as being Indigenous. This model is used to identify the size of the gap.
- In model 2, I add a range of student background characteristics and data on experiences in early childhood (a measure of family wealth was tested, but excluded because it was not significant). Specifically, in addition to Indigenous status, model 2 includes the following explanatory variables:
  - if the student is female
  - student’s current age
  - student’s current grade
  - if they speak a language other than English at home
  - number of years of education of parents (maximum of both parents)
  - if the school is in a provincial area
  - if the school is in a remote area
  - if they attended one year of preschool
  - if they attended two years of preschool
  - age at which they commenced school (in years).

Model 2 is therefore used to identify the size of the gap that is explained by background characteristics.

- Model 3 includes a student’s Indigenous status, as well as data on whether the student missed at least two months of school at any stage in primary or lower secondary school. These are included as separate

variables. Because of small samples, those who missed school for two months twice or more are included with those who missed school for that length of time only once.

- Model 4 (the full model) includes Indigenous status, student background and early childhood data, and school attendance.

Results for the Indigenous status variable in each of the four models are summarised in Fig. 1, presented as the predicted difference in test scores between Indigenous and non-Indigenous Australians as a proportion of one standard deviation.

Looking at the light blue bar in Fig. 1 (from model 1), without controlling for any observable characteristics, Indigenous students have lower test scores than non-Indigenous Australians equivalent to 0.75–0.79 of one standard deviation. The gap is slightly less for maths, and slightly more for reading and science. Comparing the results from model 2 and model 1, however, shows that a significant proportion of this difference can be explained by the student’s background and early childhood experience. About 28 per cent of the gap in science, and about 30 per cent of the gap in maths and reading, can be explained by the control variables listed above.

The results from model 3 show that school attendance is also an important explanatory variable. As one would expect, Indigenous and non-Indigenous students who missed a significant number of days in primary and/or secondary school have lower levels of measured maths, reading and science ability. Specifically, school attendance data in the LSAY explain about 18 per cent of

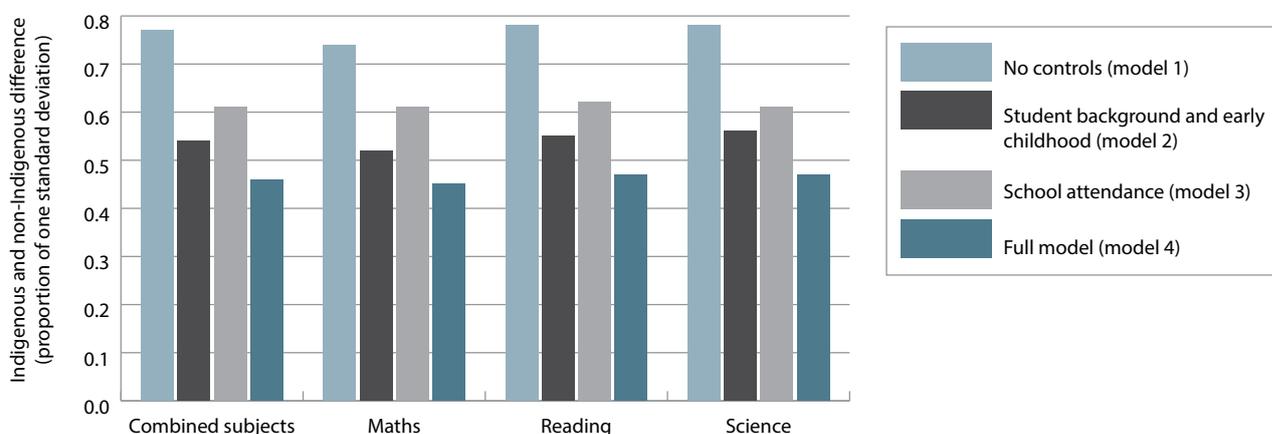
the gap in maths, 21 per cent of the gap in reading and 22 per cent of the gap in science.

Finally, the result for model 4 in Fig. 1 shows that there is still a large and statistically significant gap between Indigenous and non-Indigenous students once previous school absenteeism has been controlled for. Early childhood, socioeconomic status (as indicated by parental education) and attendance are clearly important, but they do not explain all of the difference between Indigenous and non-Indigenous students.

Because it is not possible to control for test scores before the absences occurred, the results in Fig. 1 should not be interpreted as proving a causal relationship. It is certainly possible that low school achievement in early school predicts both absenteeism and later school achievement. This aside, it is clear from the results presented in Fig. 1 that the fact that Indigenous students are more likely than non-Indigenous students to have been absent from school for extended periods is important for predicting differences in test scores at the age of 15.

To demonstrate the potential effects of absences on Indigenous test scores, I re-ran the analysis of model 4 separately for Indigenous and non-Indigenous students. The results of this analysis are summarised in Fig. 2. Results are presented as the coefficient estimates for the various explanatory variables, scaled as a proportion of a standard deviation. The asterisks after the name of the explanatory variable represent the statistical significance of the coefficient estimates for the Indigenous sample, as described below the figure.

**FIG. 1. Difference between Indigenous and non-Indigenous students in test scores, conditional on reported school absences**



Source: Customised calculations using the 2009 Longitudinal Surveys of Australian Youth

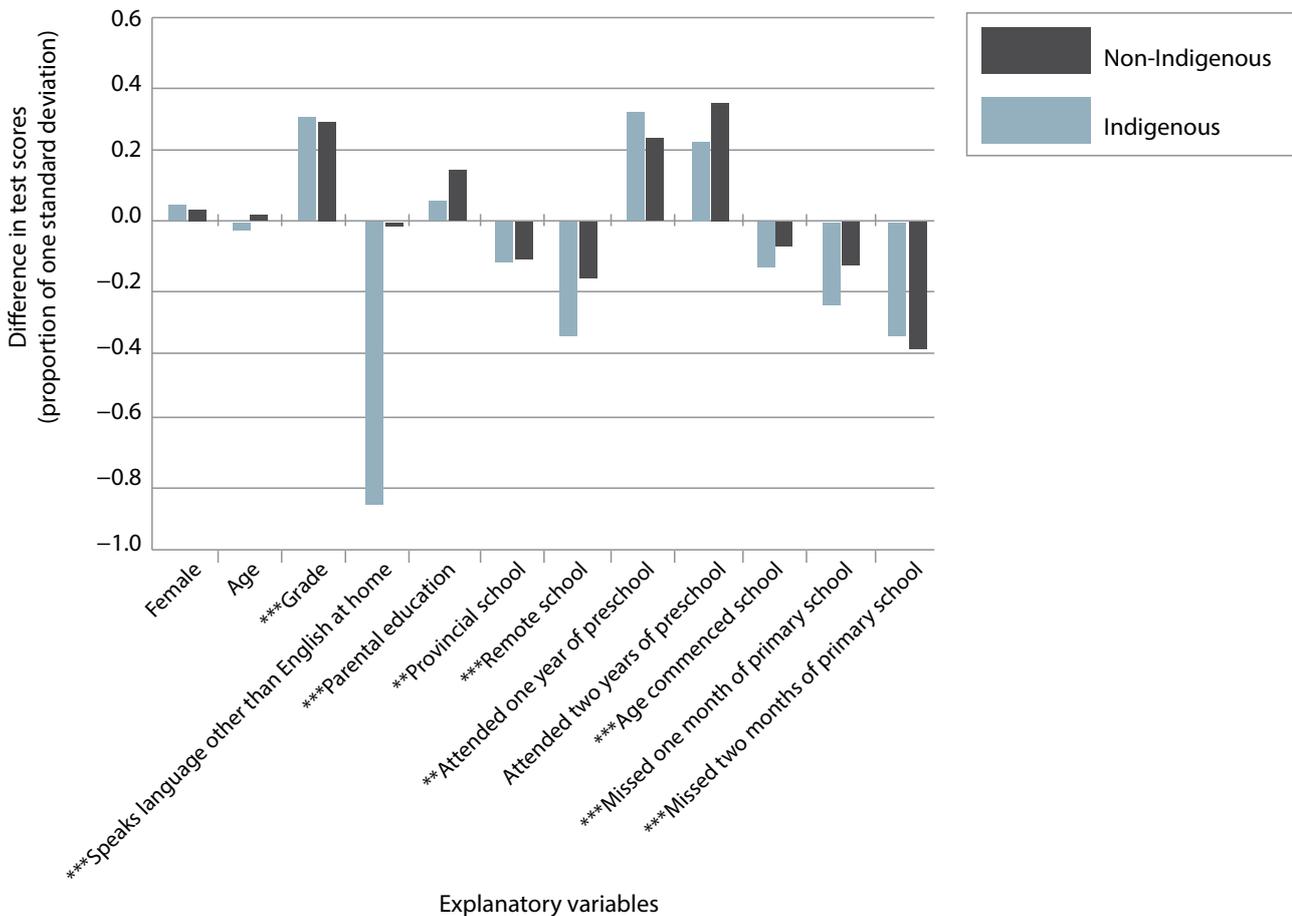
Results presented in Fig. 2 show that the variables that are associated with average test scores for the non-Indigenous population tend to have a similar association for the Indigenous population. The exception is language spoken at home: Indigenous students who speak a language other than English at home have significantly and substantially lower test scores than those who do not; there is no such difference for non-Indigenous students. A number of potential reasons for this raise further research questions. It might be that non-Indigenous students whose first language is not English receive greater support than Indigenous students. There may also be other unobserved characteristics that differentiate the two populations. Whatever the explanation, the results highlight a potentially different need for support across the two populations.

Considering the Indigenous results in isolation, a number of variables are strong predictors of variation in test scores. Of particular policy relevance is that Indigenous students at remote schools had significantly lower test scores than those at metropolitan schools. Preschool

attendance was associated with higher test scores, whereas those who started school later (and have therefore had fewer years of schooling) had lower test scores. Early childhood education appears to be an important predictor, if not necessarily a cause, of later school outcomes.

The relevant point for this paper is that, even after controlling for parental education, early childhood education, remoteness and language spoken at home, Indigenous students who miss a significant amount of school have substantially lower levels of maths, reading and science ability than those who do not. This reinforces the analysis in Zubrick et al. (2010), and shows that the results of that analysis are supported by more recent data sets and apply to all Indigenous Australians across the country.

**FIG. 2. Factors associated with average test scores for Indigenous and non-Indigenous students, 2009**



Notes: \*\*\* = variables for which the coefficient is statistically significant at the 1% level; \*\* = variables for which the coefficient is statistically significant at the 5% level;  
 Source: Customised calculations using the 2009 Longitudinal Surveys of Australian Youth

## The early years—comparisons between Indigenous and non-Indigenous children

Results presented in ‘Relationship between school attendance and test scores’ indicate that school attendance matters for later academic outcomes. This result might not be causal—for example, some students might not attend because they believe that they will have poor school outcomes. In the language used in the introduction to this paper, the benefits for these students to attend may not be worth the costs. As the students sampled in the LSIC age, we might be able to test for this reverse causality by controlling for academic outcomes at the time of school commencement when comparing attendance and academic outcomes in the later years of school.

Another point of caution is that, although absenteeism may lead to worse academic outcomes, it may lead to improvements in other outcomes of importance to those who are not attending, and their families. This depends on the other activities the child undertakes when not at school and how these are valued.

These points aside, academic outcomes are important, and at least part of the relationship with attendance is likely to be causal. To understand later Indigenous outcomes, it is therefore important to consider whether Indigenous children are more likely to be absent from school than non-Indigenous children and, perhaps more importantly, whether other characteristics available from the survey explain that difference. If such observable

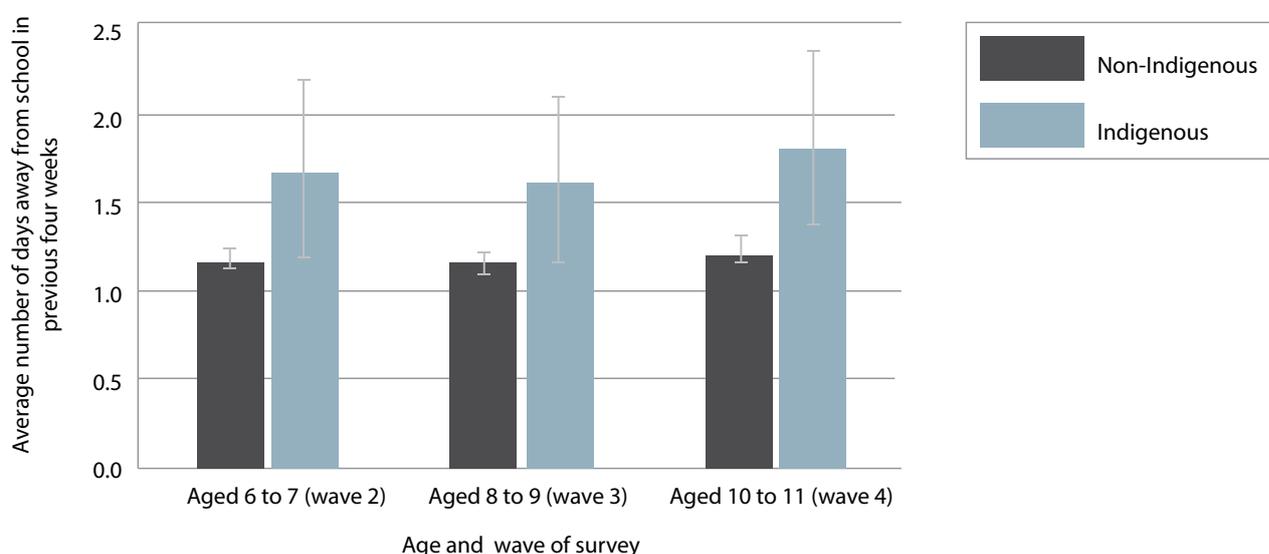
characteristics do explain the difference, these characteristics should ideally be the focus of government policy. If not, there is a strong argument for analysing Indigenous attendance separately and designing policies around the results.

Fig. 3 shows that, at least according to the LSAC, Indigenous students missed more days of school, on average, in the previous four weeks than non-Indigenous students. Results are presented as the mean number of days missed, with the ‘whiskers’ representing the 95 per cent confidence intervals around the estimates. Where the ‘whiskers’ do not overlap, we can be reasonably certain that differences between the two populations are not caused by sampling error alone. The first set of bars are from wave 2 when the children were aged 6–7, followed by wave 3 (8–9) and wave 4 (10–11). Only those students who had information in all three of these waves are included in the analysis.

The large standard errors around the Indigenous estimates (resulting from the small sample size) mean that it is difficult to be definitive about the Indigenous and non-Indigenous comparisons. Nonetheless, it would appear that Indigenous students do miss more days, with the difference larger and more likely to be statistically significant as the child ages.

Despite having a larger average in wave 3 than the non-Indigenous students, 41.9 per cent of Indigenous children missed a greater number of days in wave 4 than they did in wave 3. This is significantly and substantially larger than the 31.7 per cent of non-Indigenous children in the

**FIG. 3.** Average number of days missed from school in previous four weeks, by Indigenous status, and age and wave of survey



Source: Customised calculations using the K cohort in the Longitudinal Study of Australian Children

sample who increased their number of days missed. In contrast, there is no statistically significant difference between Indigenous and non-Indigenous children in terms of missing fewer days between wave 3 and wave 4 (25.7% and 28.4%, respectively). This provides evidence for a widening gap between Indigenous and non-Indigenous students.

The total distribution of days missed further highlights the difference between the two populations. In wave 4, only 9.95 per cent of the non-Indigenous sample missed four days or more of school over the previous four weeks. This is much lower than the 20.09 per cent of the Indigenous sample who missed at least a day per week on average during the observation window.

Indigenous students missing more days of school on average than non-Indigenous students does not necessarily justify targeted policies for the Indigenous population. If this difference is driven by observable characteristics (such as where the child lives or attends school), it is these observable characteristics that would be most efficiently targeted. To test whether this is the case, Table 2 uses a regression-style analysis, with number of days missed as the dependent variable and a limited but important set of observable characteristics as independent variables.

The first set of results in Table 2 includes Indigenous status as the only explanatory variable. Since the dependent variable is count data, an appropriate analytical technique is required. After testing for and confirming overdispersion in the sample (the standard deviation being greater than the mean), I used the negative binomial distribution to analyse the data. Results are presented as incidence rate ratios (IRRs): the estimated number of days missed for Indigenous students divided by the number of days missed for non-Indigenous students (the base case).

The second set of results looks at the other factors associated with attendance.<sup>2</sup> The final model includes these additional explanatory variables, as well as Indigenous status.

Looking at the model that uses Indigenous status only, the results show that Indigenous students in the LSAC missed almost 50 per cent more days on average in the previous four weeks than non-Indigenous students. This difference is both large and statistically significant. Indigenous status is not, however, the only determinant of levels of school attendance.

Results presented in the second model (additional explanatory variables) show that a range of other factors has a statistically significant association with school

**TABLE 2. Incidence rate ratios for factors associated with number of days missed from school in the previous four weeks, wave 4**

Explanatory variables	Indigenous status only		Additional controls		Additional controls with Indigenous status
Child is Indigenous	1.495	***			1.329 *
Age of child			1.039		1.036
Male			0.986		0.988
Health is assessed by carer as very good or good			1.370	***	1.365 ***
Health is assessed by carer as fair or poor			3.585	***	3.587 ***
Child lives in an outer regional or remote area			1.047		1.035
Index of socioeconomic status of family			0.919	**	0.923 *
Child is attending a Catholic school			0.878	*	0.881 *
Child is attending an independent school			1.022		1.027
Child is in Grade 3 or 4			1.225		1.222
Child is in Grade 6 or 7			0.883	*	0.879 *
Child changed schools during past two years			1.219	**	1.218 **
Child experienced bullying at school in previous year			1.065		1.060
Sample size	3,913		3,673		3,671

\*\*\* = variables for which the coefficient is statistically significant at the 1% level; \*\* = variables for which the coefficient is statistically significant at the 5% level; \* = variables for which the coefficient is statistically significant at the 10% level

Note: The base-case individual is non-Indigenous, is female, is reported to have excellent health, lives in a major city or inner regional area, is attending a government school, and is in Grade 5.

Source: Wave 4 of the Longitudinal Study of Australian Children

attendance. Compared with students reported as having excellent health, those with very good or good health, and especially those with fair or poor health, missed a greater number of days of school. Socioeconomic status is also important: a one-unit increase in the index resulted in 0.919 times as many days missed compared with the mean.

Finally, changing schools is associated with lower attendance. Causality with this variable may potentially run both ways. Students who were missing school previously may have changed schools in an attempt to improve attendance. On the other hand, changing schools may have led to a greater reluctance to attend school through the dislocation of social networks, or greater difficulty for school administrators in monitoring the attendance of highly mobile students within existing systems (Prout & Yap 2012). Unfortunately, it is not possible with the current data to separately identify these two effects, although there is every likelihood that they both apply.

Looking at the final model (additional explanatory variables plus Indigenous status), there is reasonably strong evidence that Indigenous students miss more days on average than non-Indigenous students, even when other factors are controlled for. Although the Indigenous status variable is significant only at the 10 per cent level of significance, this probably reflects the relatively small sample size. Most importantly, the IRR is quite high—Indigenous students missed, on average, almost an additional one-third as many days in the previous four weeks as a non-Indigenous student with the same health, geographic, socioeconomic and mobility profile.

### Factors associated with Indigenous school attendance

‘Relationship between school attendance and test scores’ and ‘The early years—comparisons between Indigenous and non-Indigenous children’ present evidence that Indigenous students have worse academic outcomes if they miss a large amount of schooling than if they do not, and that differences in attendance between Indigenous and non-Indigenous students are not driven solely by observable characteristics. This gives some support to the current policy focus on Indigenous school attendance. However, to guide that focus, it is important to understand why certain Indigenous children have low rates of attendance whereas others do not. For example, although Indigenous students in the LSAC missed more days of school on average during the previous four weeks than non-Indigenous students, 40 per cent of the

Indigenous sample in wave 4 did not miss any days. This section looks at two sets of Indigenous-specific and other factors, from the LSIC and the NATSISS.

### *Indigenous-specific factors from the Longitudinal Study of Indigenous Children*

‘Introduction, policy context and overview’ suggested that many factors may influence whether or not a child attends school on a given day. Some of these may be particular to that day (the child might be unwell, there might be one-off events at school or at home), and some may be more long term and structural—these are more amenable to policy interventions and less susceptible to randomness. Understanding what some of these structural factors are can help guide policy interventions. Furthermore, these structural factors may directly affect day-to-day variation (e.g. stress at school, leading to poor health outcomes).

The LSIC has a range of information on these structural factors. Fig. 4 summarises the association between some of these factors and the probability of attending school every day in the previous week. The first variable is an index (with a mean of zero and standard deviation of 1) that summarises the child’s response to a number of questions about their school. Using factors analysis, there are six observed variables that are assumed to be influenced by an underlying latent variable on positive attitudes to the child’s current school.<sup>3</sup> These are whether the child:

- is happy about going to school
- wishes they didn’t have to go to school
- asks parents if they can stay at home from school
- feels that their teacher is not nice to them
- feels that the children in the school are nice to them
- is picked on at school.

Results in Fig. 4 are presented as marginal effects: the difference in probability of attending school every day in the previous week compared with the base-case individual. Differences that are statistically significant at the 10 per cent level of significance are in blue; those that are not significant are in black. Analysis is based on a sample of 480 respondents with a pseudo R-squared of 0.0874.

In ‘Introduction, policy context and overview’, I noted that initial policies and proposals from the current Australian Government imply that the government’s view is that the causes of low Indigenous attendance are remoteness,

receipt of welfare, and the availability and quality of public schools. Administrative data suggest that remoteness is clearly associated with attendance. However, results presented in Fig. 4 suggest that other factors are also important. Perhaps more importantly, Fig. 4 suggests that these other factors may explain some of the variation in attendance by remoteness that is observed in administrative data. Specifically, the results that were statistically significant are the student's own view about school, and the child's gender and health.

Although one wave of data at one point in time is not sufficient evidence on which to base a whole policy framework, the results from the LSIC suggest that, for young children at least, an additional focus should be on children with poor health outcomes. Compulsory school attendance laws are important and should be enforced. However, recognising the role of the child's agency in making decisions about schooling, policies that focus on improving positive views towards school rather than forcing children to attend school should also be considered and trialled.

Given the relatively small sample size, variables that were not found to be statistically significant may still be

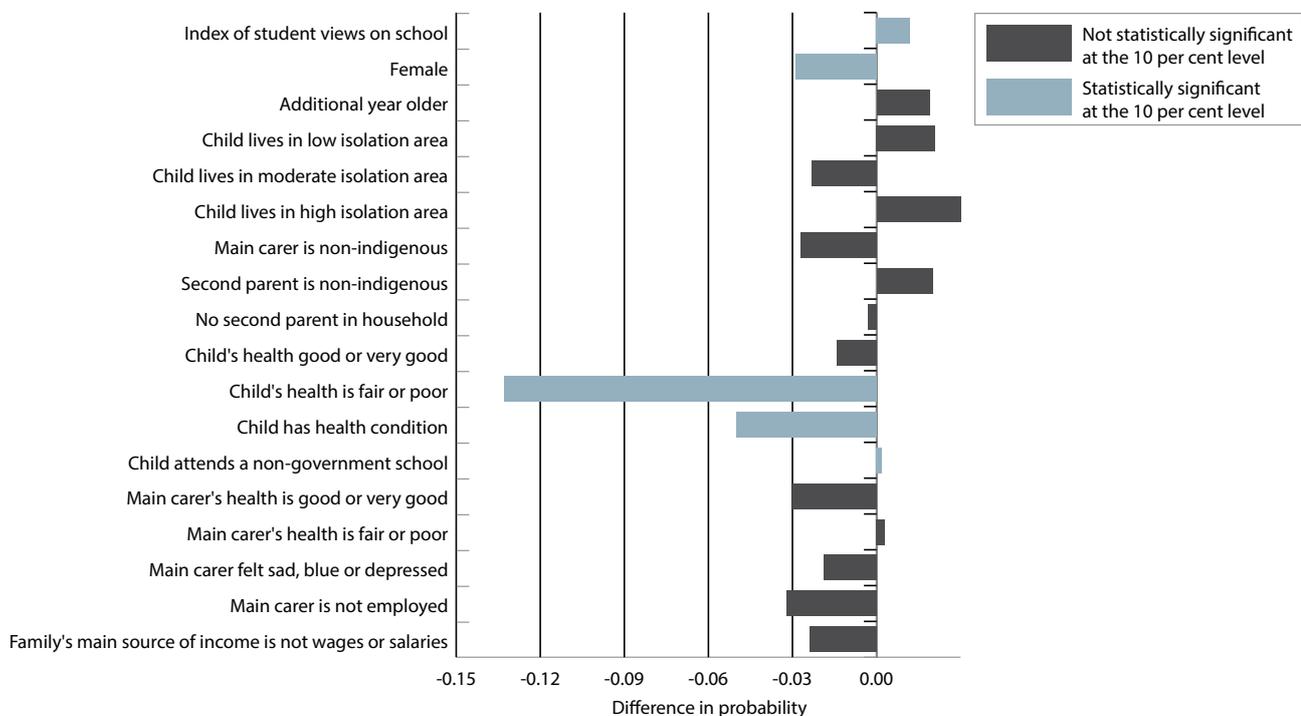
having an effect for the total population of Indigenous students. Furthermore, results might be very different for a different age cohort. It is not possible, therefore, to say conclusively that receipt of welfare or another variable would not have an effect in other contexts. Nonetheless, the results in Fig. 4 show that other causes of school non-attendance are at least as important.

*Determinants of missing school without permission*

One of the major findings from the data in Fig. 4 was that the student's views about school were a factor in predicting whether they attended school every day in the previous week. This highlights the importance of the child's own agency and decision making to understanding the attendance decision. Many school absences are likely to be through choices made by the students themselves (or in discussion with students). This is particularly the case for absences without the permission of the carer.

Absences that occur without permission may have a similar effect on academic and other outcomes as those that occur with permission (e.g. because of health

**FIG. 4. Factors associated with the probability of attending school every day in the previous week, wave 3 of the LSIC**



**Note:** The base-case individual is male, is aged 6 years, lives in a zero-isolation area, has a main carer who is Indigenous with a second Indigenous carer in the household, is reported to have excellent health without a health condition, attends a government school, has a main carer whose health is excellent and who has not experienced significant sadness; the main source of income for the family in which the child lives is wages or salaries.  
**Source:** Wave 3 of the Longitudinal Study of Indigenous Children

reasons or conflicting activities supported by the parent). However, they may have very different effects on other outcomes if children who are absent without permission are receiving considerably less supervision than those who are absent with permission. Furthermore, they give us very different information on the reasons for the absence. Absences without permission are therefore worth studying in their own right.

Fig. 5 summarises analysis of NATSISS questions relating to factors associated with whether a child missed any days in the previous 12 months without permission. Like all questions in the NATSISS, the child’s carer gave the answer to this question. This form of non-attendance is probably underestimated because the child is likely to have missed school without the knowledge of the carer on occasions. However, variation in this variable is still of interest.

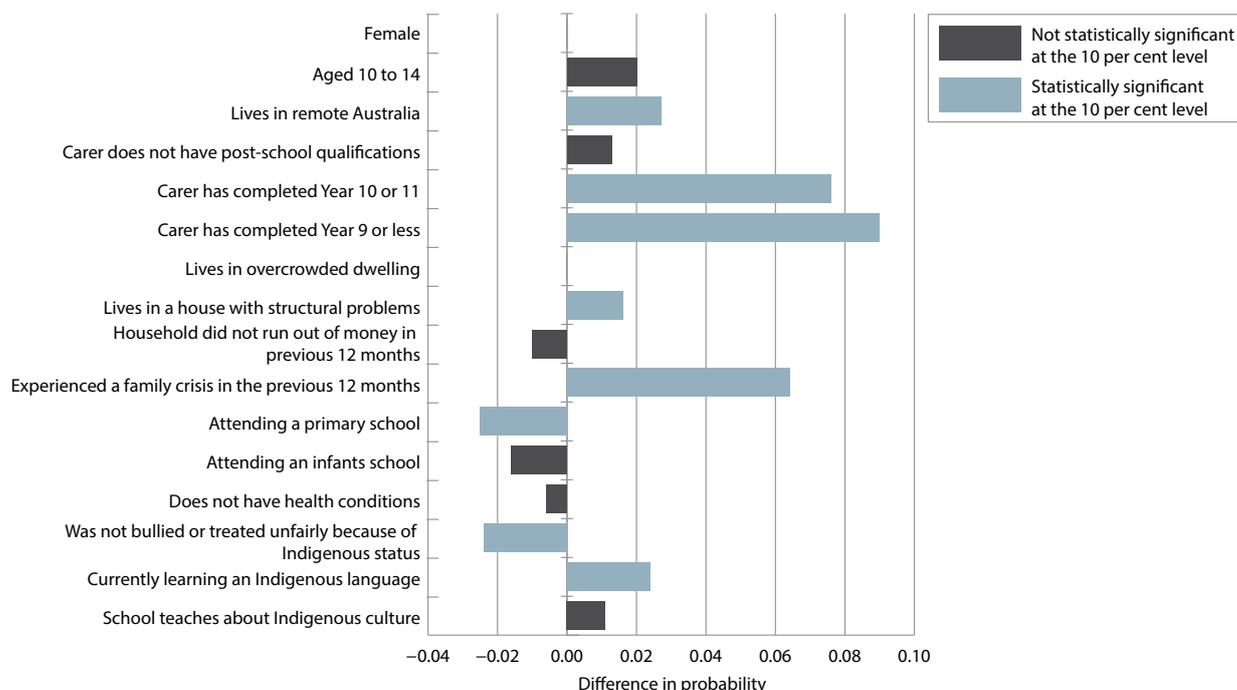
Results are again presented as marginal effects—that is, the difference in probability compared with the base-case individual. Differences that are statistically significant at the 10 per cent level of significance are in blue, whereas those that are not significant are in black. Variables that were statistically significant at the 10 per cent level were also significant at the 5 per cent level. This is because the

analysis is based on a sample of 2,398 respondents and therefore has a much greater degree of precision than the LSIC analysis. The pseudo R-squared for the analysis was 0.1327.

To put the marginal effects into context, the base-case individual has a probability of 0.034. Indigenous children who were living in remote Australia were more likely than those in non-remote parts of the country to have missed at least one day of school in the previous 12 months without permission. This result is different from what was found in the LSIC, where there was no difference according to remoteness, and supports to a certain extent the policy focus of the current Australian Government. Fig. 5 also shows, however, that a number of other variables have a much larger association with missing school without permission.

The characteristic in Fig. 5 that has the strongest association with this measure of attendance (in terms of the size of the estimated marginal effect) is the educational level of the child’s carer. Whereas there is no association with post-school qualifications, children whose carer had not completed Year 12 were significantly and substantially more likely to have missed school without permission during the period. There are a number

**FIG. 5. Factors associated with whether an Indigenous student missed any days in the previous 12 months without permission, from 2008 NATSISS**



**Note:** The base-case individual is male, is aged 5–9 years, lives in a non-remote area, has a main carer who has post-school qualifications and has completed Year 12, is attending a secondary school, and does not have any of the household, health or other experiences listed in the figure.  
**Source:** Child sample of the 2008 National Aboriginal and Torres Strait Islander Social Survey

of potential explanations for this finding. In relation to the discussion in ‘Introduction, policy context and overview’, it is likely that at least part of the explanation is that the benefits of education (including daily attendance) are more salient to students in families with high levels of education. Results presented in Fig. 5 suggests that this is true for Indigenous students, as well as for the general population.

Another variable with a large marginal effect is whether the child stayed somewhere else in the previous 12 months as a result of a family crisis. Such crises could affect attendance via three potential mechanisms:

- Crises can have a direct impact by making it much more difficult to attend school on a daily basis.
- Crises might reduce the control that a carer has over the child.
- Crises might affect the child’s health, and social and emotional wellbeing, which might in turn affect attendance.

Further research to tease out the mechanism is important. However, the results show that family instability is an important factor in unexplained absences.

The observed difference between children who attend primary school and secondary school is not directly amenable to public policy. However, it reinforces the finding from the LSAC (see Fig. 3) that the gap in attendance between Indigenous and non-Indigenous children appears to widen over time. This is possibly because children have greater autonomy as they age, and are therefore more likely to make their own decisions about whether the benefits of attendance outweigh the costs.

Another finding related to autonomy in Fig. 5 is that those students who were bullied or treated unfairly at school (because of their Indigenous status) were more likely to miss school without permission than those who were not. Since such treatment is likely to impose serious costs on a child, it is not surprising that children who are treated in this way would choose not to attend.

## Conclusions: towards a model of school attendance

The analysis presented in this paper was motivated by the belief that a detailed understanding of the way in which students make their decisions is important if policies that support and enhance the schooling aspirations of Indigenous children and their families are to be designed. Such an understanding can be expressed through a model of attendance that attempts to identify how students actually behave, not just how we think they should behave.

This model of school attendance would recognise that school attendance is an important determinant of academic outcomes. There are many potential reasons why students may not attend school on a given day or on a regular basis. However, the results presented in this paper and elsewhere show that missing school comes with a potentially large cost. This paper has shown that Indigenous students are more likely to miss school than non-Indigenous students. Furthermore, observable characteristics (such as location, health and socioeconomic background) explain some, but not all, of the difference in attendance. A range of individual, school and family characteristics are important, some of which may be unique to, or more salient for, the Indigenous population (or segments of the Indigenous population).

One of the major findings from the analysis is that health is a critical determinant of attendance. Quite simply, children are not able to go to school if they are not healthy. One of the Closing the Gap targets agreed to by governments relates to infant mortality, and this is one of the targets that appears to be on track to being met. However, there is more to health than lowering mortality, and it is clear that the ongoing poor health profile of Indigenous children is part of the explanation for high rates of school non-attendance.

A finding from the analysis that has implications for both a behavioural model and for Indigenous policy is that children who live in families on income support are only marginally less likely to attend school than those from families whose main source of income is wages and salaries; this difference is not statistically significant. For practical reasons, the Australian Government might focus on income support recipients—these are the individuals over whom the government has the greatest control. However, to make a significant reduction in non-attendance, policies need to focus on all Indigenous children.

With this broader focus in mind, it would appear that household stress, housing issues and family crises are more important predictors of non-attendance than income support. There are practical limits to what governments can do to reduce this stress. However, it is important to keep the potential effect of such stress in mind when designing policies that may increase it—for example, the suspension of welfare payments, policies that encourage mobility, or policies that might affect inter- or intra-family violence.

A model of school attendance would recognise that the school sector does not appear to have a significant association with attendance once other characteristics are controlled for. There may be other reasons to provide scholarships for students to attend non-government schools, but attendance does not appear to be one of them. What appears to be more important, based on the empirical evidence, is the experience of bullying or being treated unfairly. This highlights that Indigenous children have agency and autonomy. Consequently, any model of school attendance and policies that flow from it need to be child centred, and take into account the fact that Indigenous children are likely to have their own views on the costs and benefits of attending school. Not only are there ethical reasons for taking these costs and benefits into account, the analysis presented in this paper would also suggest that there are practical reasons.

Data from quantitative surveys can provide some information about school attendance. However, this needs to be backed up with carefully and ethically designed primary data collection. Qualitative data can provide context, explanations and hypotheses. The type of field experiments that have been used for a number of years in psychology and are increasingly being used in economics are also important. For example, we know very little about discount rates and valuing of the future compared with the present, particularly in a remote community context.

Policy evaluations are also important in that they give us information on what works in practice and what does not work, and enable us to learn from success and failure. Unfortunately, there are too few of them, and data are rarely available to the public for independent analysis.

Policy evaluations are also useful in a research context for what they tell us about decision making and, in particular, responses to government policies and other interventions. The example of the SEAM is instructive. According to the Australian Government department that reviewed it (DEEWR 2012: 1), SEAM is 'a trial designed to encourage parents on income support to ensure that

their children of compulsory school age are enrolled in and attending school regularly'. It does this through a series of notifications to the parents of children who are not attending school, which may eventually culminate in suspension of welfare payments.

Results from the evaluation of SEAM have been mixed. Although it appears that in certain situations the program might increase attendance, it does not appear to be having long-term effects on behavioural change, with 'evidence suggesting that a relapse after the compliance period is common, with an associated increase in unauthorised absences' (DEEWR 2012: iv).

A behavioural model of school attendance gives mixed support for the way in which SEAM is structured. On the one hand, SEAM builds on the behavioural literature by leveraging loss aversion, in which individuals have a preference for avoiding losses compared with receiving gains of a similar (or even smaller) amount (Camerer & Loewenstein 2004: 5). However, in the SEAM there is a long time gap between low attendance and loss of welfare payments—the research (summarised in Darley & Alter 2013) shows that smaller but more immediate penalties may be more effective. With respect to the results presented in this paper, by focusing on income at the household level, the SEAM does not take into account the autonomy and agency of the child. As well, by adding the additional financial stress of a potential loss of livelihood, the greater cognitive load could have negative rather than positive impacts on forward-thinking behaviour such as school attendance (Mullainathan & Shafir 2013). This financial stress is likely to affect both adults in the household and, partly mediated through parental experience, the child.

An alternative approach to making receipt of welfare conditional on school attendance, which has been used extensively in other contexts, is conditional cash transfers (CCTs). These have been implemented in a number of settings around the world in an attempt to address issues of poverty and development. Commencing in Latin America, their use has spread through parts of Africa, Asia and North America. These programs differ from standard transfer payments in that they involve a transfer of additional cash to identified households on top of standard entitlements, and this transfer only occurs if the household commits to investments in the human capital of their children.

Including conditions in the schemes rather than simply transferring cash to families is a deliberate tactic. The transfers are targeted towards parents who are believed to underinvest in the human capital of their children. The

assumption is that the attached conditions will ensure that parents undertake appropriate investments (Fiszbein, Schady & Ferreira 2009).

There are ongoing debates in the development literature about the efficacy and ethics of CCTs. Some evidence suggests that behaviour returns to the baseline once the payments cease (Freeland 2007). The results in this paper and elsewhere pose an additional problem for their implementation in an Indigenous context. First, Biddle (2011) showed that the relationship between income at the personal and household level, and wellbeing of adults is less strong for Indigenous Australians than for non-Indigenous Australians, and in remote Australia than in non-remote Australia. This means that behavioural change is less likely to flow from increases in income. More importantly in the context of this paper, welfare payments are received at the household level, whereas many of the determinants of attendance (such as the presence or absence of bullying) are at the student level. This returns us to the importance of child agency, and the need to ensure that children see school as a safe, worthwhile and enjoyable place.

Ultimately, the evidence presented in this paper suggests that incentives or disincentives designed to increase school attendance need to be modified for the Indigenous context. This includes being mindful of the stress and uncertainty of many Indigenous households; using things other than income as a motivation; imposing conditions at either the community or individual level, rather than at the household level; and recognising the large costs that bullying and unfair treatment are likely to have on school attendance.

These conclusions are not a prescription for large-scale policy change. Rather, they suggest the need for a set of well-thought-through and well-evaluated policy trials that are based on evidence and contribute to the evidence base. With this in mind, it is worth emphasising the point made by Purdie and Buckley (2010: 20) that 'the evidence about attendance and retention strategies that work for Indigenous students is not strong'. The policy process cannot wait for complete evidence. However, it needs to use the evidence that is available, including the evidence presented in this paper.

## Notes

1. In an analysis of previous school absences using characteristics that are potentially time invariant, age, sex and parental education did not explain differences between Indigenous and non-Indigenous students.
2. Because of the small sample size, a parsimonious model is used, with two additional variables removed from the analysis because of a lack of an observed association. These variables are whether the child moved home recently and whether the house the child lived in was cluttered (based on interviewer observation).
3. These variables all have a large loading on the first factor in the analysis and have the expected sign. Furthermore, the distribution of the eigenvalues suggests that a one-factor solution is appropriate.

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