Student Attendance and Educational Outcomes: Every Day Counts

A report prepared for the Department of Education, Employment and Workplace Relations

by

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EXECUTIVE SUMMARY

This report documents the findings of a detailed study of the relationship between attendance at school and student outcomes. The study was commissioned by the Australian Government Department of Education, Employment and Workplace Relations (DEEWR) in 2012, and conducted by The University of Western Australia (Centre for Child Health Research, Telethon Institute for Child Health Research) using unique data provided by the Western Australian Department of Education (WA DoE).

The primary aims of the study were to assess patterns of attendance over time, how these patterns vary across schools and students with different characteristics, and how these patterns of attendance contribute to student outcomes. In addition, the research team were asked to consider attendance measures that could be used at a national level to enhance national reporting.

The study made novel use of data collected as part of the routine administrative processes of the WA DoE and represents the first time these data have been used in a systematic population study of these aims. The data and approach have enabled us to demonstrate the relationship between attendance and achievement and how this is affected by aspects of disadvantage.

DATA AND METHODOLOGY

The study was based on all students who were enrolled in the public school system in Western Australia at any point from 2008 to 2012. The data included information collected by schools on students and their caregivers upon enrolment, attendance records, and the results of the National Assessment Program – Literacy and Numeracy (NAPLAN). This information was collated by the WA DoE and linked together in order to provide a comprehensive picture of the educational history for each student. The process of linking these records also meant that students could be tracked across schools, allowing an assessment of student mobility. Our analyses were restricted to students enrolled in Years 1 to 10 and included more than 2.4 million records for over 415,000 individual students.

Our results showed that attendance rates of Western Australian students for any given year level were highly consistent with published data for students in other states and territories of Australia. While there is some variation across jurisdictions in the age of school entry and transition to secondary school, due to the high level of consistency in attendance across jurisdictions we believe that the study findings will be generalisable to other states and territories and have national policy relevance.

We focussed our analyses on a set of key characteristics that describe schools and students. These included measures of geographic remoteness and the socio-economic status of the school, student factors such as gender, Aboriginal status and the number of times that students moved schools. We also included key characteristics of parents and caregivers, including their educational attainment and occupational status.

We examined attendance and absence using three main measures: attendance rate; authorised absence rate; and unauthorised absence rate. The attendance rate was based on the total number of half-days a student attended school as a percentage of the total number of half-days

available to attend. Conversely, the absence rates represented the number of half-days a student was absent as a percentage of the total number of half-days available to attend. A key part of this project was assessing the differences in authorised absence, those where a legitimate reason is given for absence, such as illness, and unauthorised absences, which are absences that are unexplained or where the reason is not deemed to be acceptable by the school Principal.

We used NAPLAN scores in the numeracy, reading and writing domains to assess student achievement. NAPLAN tests are administered every year throughout Australia to students in Years 3, 5, 7 and 9.

Our analyses drew on all of this information to examine the complex relationships between school and student characteristics and attendance at school, and how these relate to student achievement. We used a range of methods to explore these connections, from simple descriptive statistics to complex statistical modelling (see Chapter 2).

KEY FINDINGS

Children have highly stable attendance throughout the primary years. Attendance rates fall in secondary school.

Attendance rates were consistently high in each year of primary school (around 92%), and remained so over the study period (2008 – 2012). In addition to these aggregate attendance rates, we found that individual students generally had a similar level of attendance from year to year.

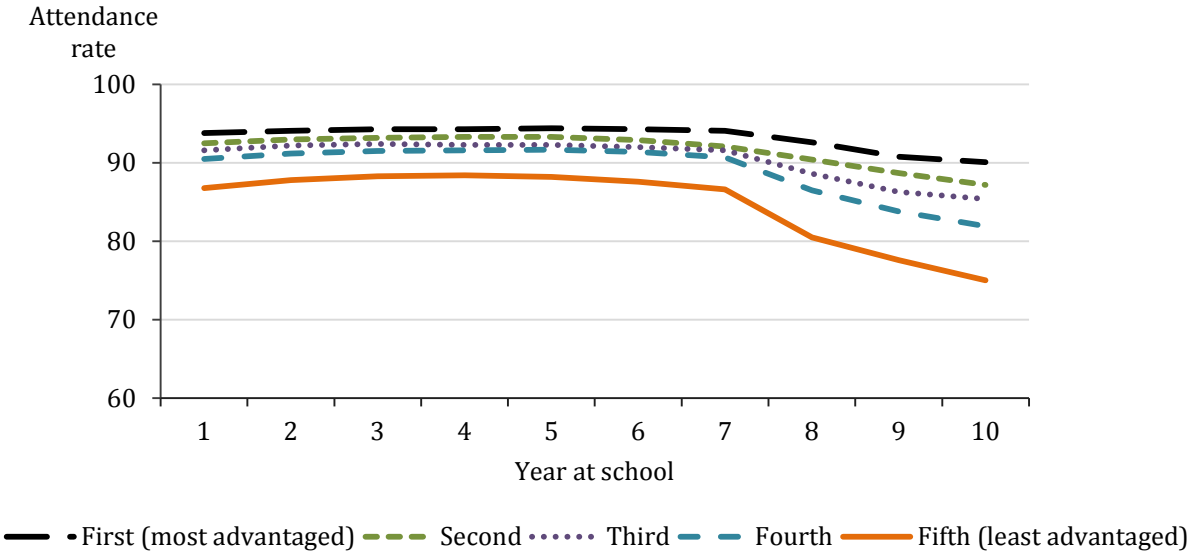
Attendance rates declined markedly from the first year of secondary schooling (from Year 8). This pattern was evident among all student sub-groups (as in the Figure overleaf).

Disparities in attendance rates are evident from Year 1. They are carried into, and become wider, in secondary school.

We found unequivocally that relative disadvantage was associated with poorer attendance, from the very beginning of formal schooling. Students in schools with a lower Socio-Economic Index (SEI), Aboriginal students, students who were highly mobile and those whose parents had lower levels of education and occupational status, all had lower levels of attendance, on average. These attendance gaps were established early (by at least Year 1), and are influenced by factors and events prior to school entry. The Figure overleaf (Figure i) shows an example of this pattern using the school SEI measure. The figure also shows that these gaps remain constant throughout primary school, but become wider when students enter high school. These patterns were observed repeatedly, across all indicators of disadvantage and using different types of analysis (e.g. both cross-sectional and longitudinal).

Initiatives aimed at improving attendance need to start early

Figure i: Average attendance rates, by year of school and Socio-Economic Index for schools (SEI)



Attendance matters for achievement, and every day counts.

In all analyses, average academic achievement on NAPLAN tests declined with any absence from school and continued to decline as absence rates increased. The nature of the relationship between absence from school and achievement, across all sub-groups of students strongly suggests that every day of attendance in school contributes towards a child's learning, and that academic outcomes are enhanced by maximising attendance in school. There is no "safe" threshold.

The effects of absence also accumulate over time. We found that absence from school was related to academic achievement in numeracy, reading and writing not only in the current year, but in future years as well. Parents need to be aware of these relationships, and understand that when their child misses school it can have an ongoing impact on their learning.

Encourage parental awareness of the importance of attending school

Unauthorised absences are more strongly associated with achievement than authorised absences.

Unauthorised absences had a significantly stronger association with achievement than authorised absences, and this was seen consistently in Years 3, 5, 7 and 9. Even small amounts of unauthorised absence from school were associated with substantial falls in average NAPLAN test scores. It is likely that unauthorised absences reflect more than just time away from school, but also possibly behavioural and school engagement issues. We noted that distinct gaps in unauthorised absences between more and less advantaged students emerged from Year 1, and this may reflect differences in parental attitudes towards education.

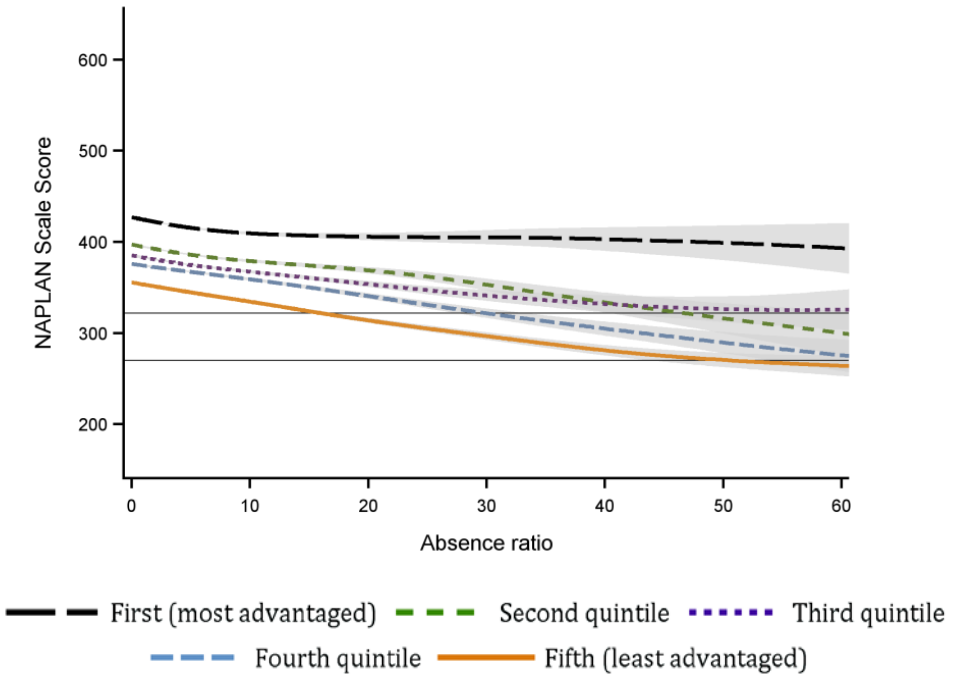
Reducing unauthorised absences should be the key focus of attendance strategies

Some students are more adversely affected by absence than others.

There are distinct gaps in achievement depending on where students live, their socio-economic status, mobility and Aboriginal status, and these gaps were observed at all levels of attendance. For example, even amongst students with perfect attendance records, students in high SEI schools achieved at much higher levels than students in low SEI schools. Amongst disadvantaged students, achievement declined rapidly with increasing levels of absence (see Figure ii below).

More advantaged children had relatively high achievement levels irrespective of their level of attendance at school. This pattern is particularly evident in the primary school years, and suggests that more advantaged children have alternative and effective resources that help them achieve learning objectives, both at school and in the home, during the early years of school.

Figure ii: Year 3 numeracy results, by Socio-Economic Index for schools (SEI)



Attendance strategies focussed on disadvantaged students would yield benefits to achievement

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Most achievement disparities are in place at the outset of Year 3. Improving the attendance of disadvantaged students may help to reduce these, or prevent the gaps from becoming wider.

Disadvantaged students achieved at significantly lower levels at Year 3, and these achievement gaps remained in place throughout the school years. While some of the differences could be attributable to differences in attendance patterns, the largest gaps in Year 3 achievement were observed for students from low SEI schools, Aboriginal students, and students who were highly mobile.

Improvements in absence rates over time, particularly for unauthorised absences, protected students from falling further behind and in some cases were related to improvements in NAPLAN scores. Likewise, declines in absence rates were related to declines in NAPLAN achievement, although more so numeracy than reading achievement. We also found that low-achieving students had a propensity for poor attendance in later years even when their initial attendance was good. Educational support and learning opportunities offered by schools to address the achievement gaps can only be effective if students are there to receive them.

Encourage parents and provide support through schools to help students catch up after missing school

FINAL CONSIDERATIONS

This study focussed on the association between attendance at school and academic achievement in the context of a range of other factors. There are, of course, many other factors that contribute to student learning and academic achievement that we have not been able to examine. While students need to attend school to benefit from what schools have to offer, degree of engagement with school learning, curriculum fidelity and content, availability of enrichment resources within the school environment, extra-curricular learning opportunities, and the quality of teaching and educational leadership have all been identified as important factors in improving student success.

The reasons for absences and poor achievement are likely to be multi-faceted, and any approach to improving the outcomes for disadvantaged students will require multiple approaches with shared responsibility between students, parents, schools and a range of government agencies. The data are clear about where greater effort is needed. The results indicate that a child's onward attendance pattern is largely established in the first years of school. Vigorous efforts spent in considering ways to establish attendance excellence and high expectations about attendance in the commencing years of school, along with monitoring and intervention, are likely to yield benefits to onward educational and life outcomes.

Educators cannot do this alone: The community needs to be included

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PROJECT OVERVIEW

CHAPTER 1 WHY IS ATTENDANCE IMPORTANT?

BACKGROUND

The fundamentals of education

Education has long been recognised as a fundamental human right and an important building block in the development of children and broader society (United Nations, 1948). Those who do well in the early and elementary stages of education tend to do better in subsequent stages and develop the critical skills and abilities needed to become productive and responsible adults (Keating & Hertzman, 1999; Zubrick et al., 2006).

It is well documented that effective participation and engagement in formal education settings is an important precursor to educational success (Murray et al., 2012). Despite this, the level of participation and engagement – even in compulsory education processes – can generally be viewed on a spectrum. This has been a feature of the educational literature across a range of countries over many decades, and underscores the fact that there is typically a segment (usually a minority) of the population who have persistent difficulties in this area (Reid, 2008). Children from disadvantaged backgrounds are more likely to have problems with engaging in formal education settings—non-attendance at school among Aboriginal students, for example, has been formally recognised as a major problem in Australia since at least the mid-1980s (Gray & Beresford, 2002). Further, survey data from Western Australia identified that poor attendance at school is one of the major factors driving Aboriginal disadvantage. The Western Australian Aboriginal Child Health Survey suggested that as much as one-third of the gap in educational attainment between Aboriginal and non-Aboriginal children could be attributed to poorer rates of school attendance for Aboriginal children (Zubrick et al., 2006).

The empirical literature is replete with examples of the importance of early educational engagement. Regular attendance in the primary school years, for example, has been shown to provide children with the basic skills for learning and educational outcomes, and assists the development of social skills including communication, self-esteem, teamwork and friendship building (Australian Institute of Health and Welfare, 2009). In addition, poor participation and engagement is linked to adverse outcomes throughout the lifecourse. Limited school participation, for example, is associated with a greater chance of dropping out of school for both mainstream and ethnic minority groups (Schwab, 1999), disruptive and delinquent behaviour (Finn, 1989), and may lead to a cycle of rebellion against authority (Marsh, 2000). These outcomes have later implications for employment, a range of health risk behaviours (drug and alcohol abuse), homelessness, poverty, welfare dependence, and involvement in the justice system (Alexander, Entwisle & Horsey, 1997; Epstein & Sheldon, 2002; Hallfors et al., 2002; Rothman, 2001). This reinforces the notion that participation in school is a means to educational and developmental ends and not the end itself.

While the evidence-base unequivocally supports the view that there are lifelong benefits to full participation in school, managing poor attendance is costly and time consuming. These costs extend to the classroom setting, as students with persistent attendance

problems can take up more of a teacher's time and be disruptive and frustrating to other students (Reid, 2008; Rothman, 2001). There are programs that have been shown to effectively *address* poor attendance. However, they are not always seen to deliver value for money when considered against initiatives that are designed to *prevent* poor attendance, e.g. programs that provide support to students and families that are experiencing difficulties, and address issues such as domestic violence, substance abuse, behavioural problems and low self-esteem (Brookes, Goodall, & Heady, 2007).

Participation and engagement are multifaceted concepts and broadly encompass whether a child is enrolled in a school or pre-school education system, whether they attend when enrolled and whether they engage in the learning process when they attend. These elements can be measured in various ways. Numbers of enrolments, duration and type of non-attendance, and participation and retention rates are common metrics, and typically form part of the reporting systems of most education providers – particularly in school settings. In isolation, none of these measures provides a complete metric for engagement.

Measuring attendance

Attendance is an important, albeit crude, indicator of participation in education. In this regard, attendance can be thought of as being necessary, but not sufficient, for educational engagement and learning. It provides a proxy measure of a child's exposure to educational programs and the opportunities they contain, although this provides no insight into what goes on for individual students once they are in the educational setting. Furthermore, school-reported absences typically understate the extent of the problem—particularly for disadvantaged populations—because those who drop out of school altogether are not enrolled to be recorded as absent (Gray & Beresford, 2002). As such, measures of attendance need to be considered concurrently with enrolment indicators in order to get a fuller picture of non-participation.

Historically, establishing a clear picture of attendance (or non-attendance) in school in Australia has been problematic. There are inconsistencies in the way absences are recorded and even a lack of agreement about the phenomenon and its definitions (Purdie & Buckley, 2010). These inconsistencies can extend both across and within jurisdictions. For example, reporting systems that record attendance in detail (each and every half-day) may identify children who attend but are persistently absent for part of many days (chronic fractional non-attenders) while other systems may not do this. At the school level, the classification of 'authorised' or 'unauthorised' absences may differ depending on the discretion and judgement of the school and Principal. Further, the pressure on schools to meet attendance standards and targets (potentially for financial incentives) leaves reporting processes open to manipulation (Reid, 2008). These and other issues have been recognised by educators and administrators for many years and have been the catalyst for the development of a national framework for the consistent collection and reporting of school attendance data, and the development of information that will support robust educational research (Australian Curriculum Assessment and Reporting Authority, 2011).

Gaps in the evidence-base

It is well understood that if students do not regularly attend school their subsequent learning and performance suffers. It is also well understood that students from disadvantaged backgrounds are less likely to attend school on a regular basis than students who are better off. However, there are still gaps in the knowledge base which are important considerations from an educational policy perspective. For example, what is the minimum level of school attendance required to achieve good outcomes, and does this level vary for students from different backgrounds? What is the interplay between student characteristics and the school they attend? For example, does a poor student attending a wealthy school have better outcomes than if they had attended a poorer school?

Research from the 1993 Western Australian Child Health Study showed that 14% of students were absent for over half a day a week (or 20 days per year) and would be considered to be at risk for lowered academic achievement (Zubrick et al., 1997). Additionally, research from the United States has shown that the effect of school attendance is stronger for students from low-SES backgrounds than high-SES backgrounds (Balfanz & Byrnes, 2012). It is therefore likely that the minimum level of school attendance required for satisfactory educational achievement may be different for students from different backgrounds, and for schools with different student populations.

In recognition of the importance of school attendance, both State and Federal Governments fund a number of initiatives aimed at improving school attendance for students who are at risk. However, despite such initiatives, poor attendance and engagement at school remains a major concern, particularly for Aboriginal and Torres Strait Islander students, students from a low socio-economic background and students in remote locations.

Data to inform policy and practice

The availability of quality data is central to understanding the links between school attendance and achievement. Schools routinely collect such data to monitor the attendance and progress of their students. These data are also collated by state education departments to monitor how schools and students are performing. The richness and depth of such data are a valuable resource for informing the development of student attendance policy. At a basic level the description of the "typical" attendance behaviours of school aged children would provide parents, communities and schools with a contemporary view that largely remains opaque. At a wider level, a national data collection and reporting framework would help to align the information across the states, leading to policy development that is appropriate at the national level.

Education requirements in Western Australia

The Western Australian school system encompasses Kindergarten (two years prior to Year 1), Pre-Primary (one year prior to Year 1), and Year 1-12. Year 8 represents the first year of secondary schooling for the majority of school students, although some students make this transition in Year 7.

The pre-compulsory education period is from the beginning of the year in which a child turns 4 years and 6 months, until the end of the year in which they reach 5 years and 6 months. Since 2008, education has been compulsory for children from the beginning of the year they turn 6 years and 6 months (generally according with Year 1), until the end of the year in which they turn 17 (generally according with Year 12). For Year 11 and 12 students, there is a range of approved options that meet participation requirements, including full-time school attendance, enrolment with a state training provider (formerly known as a TAFE), apprenticeships and traineeships, employment or some combination of these.

From 2013 Pre Primary (one year prior to Year 1) will become a compulsory year of schooling in Western Australia. From 2015 Year 7 students in public schools will be educated in secondary settings.

Terminology

The term 'Aboriginal' is used throughout this report to refer to the original inhabitants of the Australian continent—Aboriginal and Torres Strait Islander peoples. The term is used for the purpose of brevity and in preference to 'Indigenous'. While 'Aboriginal' is a more specific term to 'Indigenous', we acknowledge that it excludes any description of language group or country and is not the preferred term among all Aboriginal and Torres Strait Islanders. It is, however, widely accepted in Western Australia and, given that this report is based on data on Western Australian students, has been chosen for use throughout this report.

OVERVIEW OF REPORT

In this report we address four key aims, to:

- investigate patterns of school attendance and absence among schools and students over time;
- describe how these patterns vary across schools and students with different characteristics;
- investigate how these patterns of attendance and absence contribute to school and student outcomes over time, and;
- investigate what measures of attendance patterns could be used at a national level to enhance national reporting.

This report is divided into four sections. The first section (this chapter and Chapter 2) provides an introduction to the research topics and outlines the relevance and importance of the project. Chapter 2 focuses on the research methods: we provide a detailed description of the datasets used in the study, including an assessment of the data quality and an outline of limitations. Chapter 2 includes only a broad description of the analytic techniques used in the study; more detailed information on specific techniques is provided in the chapters in which they are applied.

The second section of the report focuses on patterns of student attendance. First, we provide a descriptive overview of attendance rates according to a range of student, school and caregiver characteristics (Chapter 3). We then employ more advanced analytic techniques in order to tease out the independent contribution of the characteristics to attendance outcomes (Chapter 4). We examine attendance in terms of where students start out, how their attendance trajectories change over time, and the factors that influence each of these aspects.

We focus on student achievement in the third section of the report. Initially, we provide an overview of NAPLAN scores and how they differ according to student, school and caregiver characteristics (Chapter 5). The remaining chapters then examine the nuances in the relationships between attendance and achievement. Chapter 6 uses spline models to visually illustrate the associations between attendance and achievement, and how these differ among various sub-groups of students. Importantly, these models provide an opportunity to examine whether the shape of the relationship between attendance and achievement is linear (does “every day count”?) or if there are specific turning points (where poor attendance becomes a problem with respect to achievement). This section concludes with a detailed examination of the independent effect of attendance upon achievement once other student characteristics are accounted for (using multivariate modelling techniques; Chapters 7 and 8). We examine these relationships in terms of achievement in 2012, and in terms of progress over time.

The last section is devoted to discussing the results of Sections 2 and 3. We synthesise the evidence from earlier chapters, provide an explanation for the key observations and trends, and consider the implications for policy, practice and future data collection activities.

CHAPTER 2 STUDY DATA AND METHODOLOGY

CHAPTER OVERVIEW

This chapter outlines the design of the study and the research methods employed. It includes a detailed description of the datasets used (scope, content and quality) and an overview of the main analytic techniques. More detailed information on specific techniques is provided in each results chapter (Chapters 3–8).

METHODS SUMMARY

The project examines the aforementioned aims with a quantitative analytic framework applied to a series of linked administrative datasets provided by the WA DoE.

We have undertaken a rigorous process of validation and data cleaning to ensure the datasets are fit for purpose. Our validation strategy has included data confrontation against published WA DoE attendance and performance estimates, and checks of baseline cohort populations and changes using published Australian Bureau of Statistics (ABS) sources and generated tables from Census unit record files.

We have used a range of statistical techniques to address the research aims. These have produced a combination of descriptive and inferential statistical outputs. Simple univariate and cross-tabulation data are used to describe population characteristics, while regression techniques are used to highlight the association between educational outcomes (attendance and performance) and potential risk factors. Outputs are displayed in both tabular and graphical formats.

The multivariate regression models applied in Chapters 4, 7 and 8 used a multilevel framework, which enables a more accurate estimation of the effects of student and school-level factors on attendance and performance outcomes. Generalised Additive Models have also been applied in Chapter 6 to account for the possible non-linear nature of associations between continuous measures of attendance and educational outcomes, and the results have been presented as nonparametric spline curves (see Chapter 6 for further details on spline curves).

As the study data are based on administrative records for the entire school cohort, descriptive statistics on this population are presented on the assumption that there is no sampling error. However, when making comparisons across time it is possible that random fluctuations in the make-up of the schools' population from one year to the next would cause some changes in the figures over time. The modelling strategy used in this study allows for an assessment of the likely magnitude of such fluctuations in the data across time, and 95% confidence intervals and *p*-values have been included as appropriate for these comparisons.

All analyses were performed using SAS: version 9.3 (SAS Institute Inc., Cary, NC, USA, 2000–08).

OVERVIEW OF PROJECT DATA

The data used in this project are a by-product of the routine administrative processes of the WA DoE. We have used information collected by schools on students and their caregivers upon enrolment, attendance information on students that has been recorded by teachers, and the results of the National Assessment Program of Literacy and Numeracy (NAPLAN). In addition, we have used summary characteristics of each public school in Western Australia, which includes aggregated information on the attendance and performance of their students. This information has been collated by the WA DoE—from a range of data warehouses and systems—and linked together (see section on Linking data, below) in order to provide a comprehensive picture of the educational history of each student.

A brief description of these data sources is provided below. The databases include:

Student-level datasets

- Student Enrolments
- Student Attendance
- Student Assessments (NAPLAN results)
- Caregiver Information

School-level dataset

- School Details

Note that the final student-level datasets were provided by the WA DoE in mid-October 2012 and therefore only include enrolment information (and associated attendance, assessment and caregiver information) to that time. While some additional enrolments (and modifications to existing enrolments) will have occurred after this period (for 2012 data), they are likely to represent a small number of records.

Linking data

WA DoE staff undertake a range of data quality checks as part of the systematic processes of collecting student enrolment, attendance and assessment information. This includes detecting and eradicating duplicate records prior to linking. Linkages across the datasets were conducted by the WA DoE. In brief, students were matched on the datasets using name, address and date of birth information. Linkages were established by creating several identification numbers that would match records across the datasets.

After receiving the student- and school-level datasets, we undertook a detailed regime of data cleaning and validation. This included checks of the quality of links of multiple enrolment records for the same student: aggregate distributions of the number of enrolment records; and consistency of IDs and other variables within and across datasets. Only a very small number of records were considered to be potential bad links. These were referred to WA DoE for further investigation and removed from the project datasets where appropriate.

Scope and Coverage

Data were provided by the WA Department of Education for the population of primary and secondary students in Western Australia enrolled in a government school at any time between Semester 1, 2008 and Semester 2, 2012, inclusive. Students who were *only* enrolled in private sector educational institution during this period are therefore not included in the estimates presented in this report.

The project is focused solely on students who are in Years 1-10 during the period of interest. This decision has been made on the basis that upper secondary school students (Years 11-12) have a broader range of non-school training options available to them which obscures their patterns of attendance and engagement in the school system.

The data capture those students who are enrolled for the full duration of the period of interest (2008-2012), as well as those that are enrolled for a part of the period. Student enrolments that span Kindergarten or Pre-Primary, or Years 11-12 have been removed from student records so that only enrolment information for Years 1-10 are retained.

The data include information on all enrolments per student in 2008-2012, enabling an assessment of the number of enrolments in Western Australian schools and an analysis of mobility trends. A student's enrolment at a school may cease for a variety of reasons, including moving into private education, migrating out of state or overseas, leaving school (before or after formal completion), illness or death. This project was not able to discern *why* students were no longer enrolled. However, the data were captured for students who left the public system and then returned to it.

For reference, the Census of Population and Housing highlights that only a small proportion of children move out of Western Australia during their schooling. Only 1% of 8-15 year-old children in Western Australia in 2005 had moved to another state or territory in the 1-year period up to the 2006 Census, while 5% had made this move in the 5-year period to 2006 (Australian Bureau of Statistics, 2012). These figures suggest that the data churn related to families moving out of state is likely to be minimal. Consequently, WA DoE data support the notion that loss of students from the cohort (pre-completion) is primarily accounted for by students shifting to private sector schools—particularly in the transition from Years 6 to 7 and Years 7 to 8.

Data sources: characteristics and quality issues

Student Enrolments

Student enrolments data contained information on all students who were enrolled in a public school at any point from Semester 1, 2008 to Semester 2, 2012 (inclusive), collected primarily from the School Information System (SIS). The information includes static descriptors of the student's circumstance and dynamic indicators of the enrolment status of the student and the enrolment record. It should be noted that the values for each variable in this database are those that are current at the time the database was extracted by WA DoE for use in this project (mid-October 2012). For past enrolments, the values represent those that were current upon closing the enrolment.

Point of enrolment information for the student includes:

- Gender
- birth date
- the student's previous school
- residential postcode
- country of birth
- the date of arrival in Australia (and any relevant visa details)
- the main language spoken at home
- religion
- Aboriginal[1] status
- disability status, and
- the date that the enrolment began.

The dataset also includes a range of dynamic indicators of the student's enrolment circumstances:

- education level
- full- or part-time status
- whether the student was repeating a grade
- indicators of guardianship status, and
- whether the student was attending an Intensive English Centre[2].

Each enrolment record includes details on whether it is a current or former enrolment and the date that the enrolment concluded (if relevant). A range of WA DoE-generated school and student identifiers have enabled student information to be merged across datasets and to school-level variables.

The database contained one record per enrolment per student. As a result, there were multiple records for those students who had changed schools during the period of interest (including those who had transitioned from primary to secondary school in 2008-2012).

After validation and cleaning, the final analysis file contained information on approximately 420,000 unique students enrolled during the 2008-2012 period. The number of students enrolled in Year 1 to 10 for each year in the period is provided in Table 2.1. These student numbers were validated against published figures from the WA DoE 2012 Annual Report. Whilst there are some differences between the figures, we consider the variation to be within reasonable parameters.

[1] The term 'Aboriginal' is used here and throughout this report (for the purpose of brevity) to refer to the original inhabitants of the Australian continent—Aboriginal and Torres Strait Islander peoples.

[2] Intensive English Centres in Western Australia provide specialist English language instruction for students whose first language is not English. Instruction is normally provided for between one and two years in order to prepare the student for mainstream curriculum.

TABLE 2.1: NUMBER OF WESTERN AUSTRALIAN PUBLIC SCHOOL STUDENTS ENROLLED IN YEAR 1 TO YEAR 10, 2008–2012

	Department of Education[a]	*Project Database*	*% difference*
2008	183,305	171,103	-6.7%
2009	184,614	174,088	-5.7%
2010	182,788	178,036	-2.6%
2011	183,626	183,774	0.1%
2012	187,903	191,298	1.8%

a. Sourced from the Western Australian Department of Education Annual Report 2011-12.

Non-response

Most student enrolment variables had relatively small amounts of missing data (<1%). The exception was main language spoken at home, which contained a 'not stated' response in about a quarter of cases. We examined the characteristics of non-responding cases in order to ascertain the degree of bias in this group of records and determine the usefulness of the variable for subsequent analysis. Table 2.2 indicates that there were differences in the profile of students with missing information on main language spoken at home compared with students with valid information. Students with missing information were more likely to live in inner regional areas, and less likely to live in the metropolitan area than other students. In addition, there were differences in the socio-economic profile: students with missing information had an N-shaped profile, and were most commonly in schools in the third quintile of the Socio-Economic Index for schools (SEI; see Chapter 3 for more details on the construction of the SEI). Given these differences, some caution should be exercised when interpreting results that include the main language spoken at home by the student.

TABLE 2.2: PROFILE OF STUDENTS WITH AND WITHOUT DATA ON MAIN LANGUAGE SPOKEN AT HOME BY THE STUDENT

School and student characteristics	*Provided (%)*	*Missing (%)*
Gender—		
Male	51.6	51.2
Female	48.4	48.8
Total	*100.0*	*100.0*
Aboriginal status—		
Aboriginal	6.6	7.7
Not Aboriginal	92.3	89.4
Total	*100.0*	*100.0*
School SEI (quintile)		
First (most advantaged)	25.1	20.8
Second	21.8	21.0
Third	18.7	25.8
Fourth	19.3	19.8
Fifth (least advantaged)	15.1	12.6
Total	*100.0*	*100.0*
Remoteness—		
Major cities	68.6	61.1
Inner Regional	11.1	18.2
Outer Regional	11.0	9.9
Remote	5.5	7.6
Very remote	3.9	3.3
Total	*100.0*	*100.0*

Student Attendance

Each school is responsible for recording accurate information on a student's attendance at school. Schools in Western Australia typically record a student's attendance on a daily basis (recording information for every half-day) into a school information system. All but three schools use a standard system and provide a finalised unit record file of student attendance to WA DoE at the end of Semester 1 each year. Since 2010 the WA DoE have been able to access school attendance data directly, theoretically foregoing the need for schools to submit attendance data to the central WA DoE office. Analysis conducted on data captured directly by WA DoE may differ slightly over time if post-period modifications are applied by schools.

The Student Attendance database contains attendance information for all in-scope enrolments over the period of interest. The attendance information used in this project has been provided at an aggregate semester level, and includes records for Semester 1 of 2008 and 2009, and Semesters 1 & 2 of 2010-2012. The data for Semester 2, 2010 onwards has been collated directly by WA DoE. The attendance database contained the following key variables:

- Semester and year
- Education level of student
- Total number of available half-days that a student could attend school in the semester (generally equates to the length of the semester, minus any days a student was not enrolled)
- Number of authorised half-day absences in the semester
- Number of unauthorised half-day absences in the semester

Attendance data were recorded separately for individual enrolments. For example, if a student changed schools during a semester, they would have two attendance records for that semester. In these cases of multiple enrolments, records were combined to produce aggregate attendance data for a student in a given semester. Where records were combined, the other relevant student data (e.g. Aboriginal status, school SEI) was selected from the record that had the least amount of missing data.

There were no significant missing data or quality issue for the student attendance database.

Advice from WA DoE suggested that attendance data are less consistent in Semester 2, particularly toward the end of the school year (and especially for Year 11 and 12 students). In addition, Semester 2 data were only available for part of the study period—from 2010 onwards. As such, the focus of this project has been on attendance in the first semester of each year.

Student Assessments (NAPLAN Results)

The Student Assessments database stores all NAPLAN results for each in-scope student over the period of interest. The results represent the primary assessment information to determine student educational performance in this project.

NAPLAN tests have been administered each year since 2008 to all students in Years 3, 5, 7 and 9 throughout Australia. They provide nationally comparable data on student performance across the range of student achievement, providing an indication of how students are performing. The NAPLAN tests are designed to provide a single scale of achievement across 10 bands from Years 3 to 9 in aspects of reading, writing, language conventions and numeracy. Importantly, the NAPLAN scales enable comparisons to be made between students and groups of students within an assessment period and across time, so that it is possible to see how much progress has been made in each domain of learning.

Along with student background information such as year level, gender, Aboriginal status and birth date, the NAPLAN data included a range of metrics for the following subjects:

- Numeracy
- Reading
- Writing
- Spelling
- Grammar and Punctuation

A range of metrics were available for each subject, including national NAPLAN and WA-specific measures:

National metrics

- A scaled test score
- Proficiency Band: the scaled test score categorised into 10 bands

WA-specific metrics

- Achievement categories: the scaled test score categorised as limited, satisfactory, good or excellent, which broadly align with teacher grades (D/E, C, B and A)
- Progress categories (for students with longitudinal information—for example, Year 3 test scores in 2009 and Year 5 scores in 2011): a measure of progress, based on the change in NAPLAN score from the score achieved by like students in the school in the previous test.

Caregiver Information

The Caregiver Information database contains information on the nominated caregivers of all in-scope enrolments. At the time of student enrolment, caregivers are asked a series of questions regarding their relationship to the student, languages spoken and socio-economic circumstances. This project has drawn on the following caregiver data:

- Relationship of caregiver to student
- Parental responsibility of caregiver
- Occupation
- School educational attainment
- Non-school educational attainment

Information on the caregivers' education and occupation should provide an excellent opportunity to examine the family socio-economic circumstances and the association with school attendance. Unfortunately, these variables contain substantial amounts of missing data: information on the education of the caregiver was not available for about 29-33% of students; the same was true for about 38-39% of students with respect to caregiver occupation. We also note that there is a substantial change in these proportions across the study period, with the proportion of missing data decreasing from 2008 to 2012 (see table in Appendix A). As a result, we have not included caregiver variables in any analysis that compares outcomes across time, on the basis that we may have a compositional shift in the students with valid responses over time.

To determine the usefulness of these variables in ongoing analysis, the data were examined for non-response bias. Using the student information collected from the other databases, the characteristics of students with missing caregiver information are provided in Table 2.3 and Table 2.4 below.

The tables broadly indicate that, while the gender profile was relatively similar, students with missing information on the educational attainment and occupation of their caregivers were more likely than other students to be Aboriginal, and live in less advantaged areas and remote locations. For example, 8.9% of students that had missing data on the educational attainment of their mother were Aboriginal; the same was true of 4.7% of

students with valid information on maternal education (Table 2.3). Further, there can be differences in the outcomes of students from these two groups—for example, the mean numeracy score tended to be 10-20 points lower for students with missing information on their mother's educational attainment relative to students with a valid response. As a consequence, caution should be exercised when interpreting results that include caregiver education and occupation characteristics. To maximise use of the data and minimise bias, the analyses throughout this report include the cases where the caregiver information is missing.

TABLE 2.3: PROFILE OF STUDENTS WITH AND WITHOUT DATA ON CAREGIVER EDUCATION[a]

	Data on the mother[b]		*Data on the father[c]*	
School and student characteristics	*Provided (%)*	*Missing (%)*	*Provided (%)*	*Missing (%)*
Gender—				
Male	51.5	51.6	48.0	48.1
Female	48.5	48.4	52.0	51.9
Total	*100.0*	*100.0*	*100.0*	*100.0*
Aboriginal status—				
Aboriginal	4.7	8.9	3.1	6.1
Not Aboriginal	94.6	88.8	96.3	91.5
Total	*100.0*	*100.0*	*100.0*	*100.0*
Socio-Economic Index for schools (SEI)—				
First (most advantaged)	26.8	18.9	29.3	20.8
Second	23.1	19.9	23.9	21.0
Third	20.1	22.9	19.8	23.7
Fourth	18.2	21.9	17.2	20.8
Fifth (least advantaged)	11.8	16.4	9.8	13.7
Total	*100.0*	*100.0*	*100.0*	*100.0*
Remoteness—				
Major cities	68.6	60.7	70.2	62.4
Inner Regional	13.8	14.1	13.4	14.9
Outer Regional	10.2	12.4	9.4	11.7
Remote	5.5	7.3	5.2	7.0
Very remote	2.0	5.5	1.9	4.1
Total	*100.0*	*100.0*	*100.0*	*100.0*

[a] Includes responses by caregivers regarding highest school educational attainment and/or highest post-school educational attainment.

[b] Restricted to caregivers that indicated that they had parental responsibility for the student (including stepmothers).

[c] Restricted to caregivers that indicated that they had parental responsibility for the student (including stepfathers).

TABLE 2.4: PROFILE OF STUDENTS WITH AND WITHOUT DATA ON CAREGIVER OCCUPATION[a]

School and student characteristics	*Data on the mother[b]*		*Data on the father[c]*	
	Provided (%)	*Missing (%)*	*Provided (%)*	*Missing (%)*
Gender—				
Male	48.5	48.5	48.0	48.1
Female	51.5	51.5	52.0	51.9
Total	*100.0*	*100.0*	*100.0*	*100.0*
Aboriginal status—				
Aboriginal	4.0	8.9	2.6	6.3
Not Aboriginal	95.3	88.8	96.8	91.5
Total	*100.0*	*100.0*	*100.0*	*100.0*
Socio-Economic Index for schools (SEI)—				
First (most advantaged)	27.9	18.9	30.1	20.9
Second	23.0	20.7	24.0	21.2
Third	20.0	22.5	19.7	23.2
Fourth	17.8	21.6	16.8	20.8
Fifth (least advantaged)	11.3	16.3	9.4	13.8
Total	*100.0*	*100.0*	*100.0*	*100.0*
Remoteness—				
Major cities	68.9	62.0	70.1	63.6
Inner Regional	13.7	14.1	13.4	14.7
Outer Regional	10.0	12.2	9.4	11.2
Remote	5.4	7.0	5.2	6.7
Very remote	2.0	4.7	1.9	3.7
Total	*100.0*	*100.0*	*100.0*	*100.0*

[a] Includes responses by caregivers regarding highest school educational attainment and/or highest non-school educational attainment.

[b] Restricted to caregivers that indicated that they had parental responsibility for the student (including stepmothers).

[c] Restricted to caregivers that indicated that they had parental responsibility for the student (including stepfathers).

School Details

The School Details database contained information on all public schools (including Independent Public Schools) that were in operation in Western Australia for part or all of the study period, i.e. from Semester 1, 2008 to Semester 2, 2012. The information was collected primarily from the School Directory (SDR), and includes descriptors of the school and its location in addition to aggregate information on student enrolments, attendance and NAPLAN participation and performance from 2008-2012.

School descriptors include:

- WA DoE School region
- WA DoE classification
- SEI (Socio-Economic Index for schools)
- A range of geographic identifiers (including level of remoteness).

Final analysis files

Two separate files were created to cater for the range of analytic techniques required in the project. Both files have the same scope (they contain all in-scope enrolment records and all variables from all five datasets provided by the WA DoE) and were created by merging together unique student-level identifiers and school-level identifiers, but differ significantly in structure.

The first file includes a separate record for each student for each semester that they were enrolled between Semester 1, 2008 and Semester 2, 2012, inclusive. This dataset has been termed the *Analysis Long File* (~2,500,000 records) and forms the basis of the cross-sectional and time series analysis undertaken in the project. The second file includes a single record for each student (with separate fields for each variable by semester). This dataset has been termed the *Analysis Wide File* (~420,000 records) and forms the basis of the student-level longitudinal analysis that was undertaken in Chapter 7.

SECTION 2
ATTENDANCE

BACKGROUND

Average daily attendance rates are a universal metric and are routinely reported by all school education authorities in Australia. This type of measure is available for schools and education districts and at state/territory and national levels, and separately for disadvantaged population groups. Overwhelmingly, reports indicate that aggregate average attendance rates are high in Australian schools (Steering Committee for the Review of Government Service Provision, 2012). They also tend to show that the vast majority of absences are explained or authorised (Zubrick et al., 1997).

While these data are informative it is important to also look at the number and proportion of students that fall into at-risk categories of attendance. This is because a school can have average daily attendance of 90% and still find that 40% of its students are persistently absent (since on different days, different students can make up the 90%). There appear to be quite divergent views of what level of absence constitutes a risk to outcomes in school and later life. In school sectors, these differences tend to define the framework that educational authorities use to measure and report on attendance in their jurisdiction.

At-risk attendance is defined and labelled in many ways with terms that include: severe non-attendance; chronic truancy, persistent absenteeism; and chronic absence. These are used regularly in the Australian, US and UK literature. Undoubtedly, these terms have different connotations and meanings, and may have markedly different implications for onward development.

The categories of at-risk attendance in the Western Australian school jurisdiction are based on empirical findings from the 1993 Western Australian Child Health Survey (WACHS). This survey found that students who were, on average, absent for over half a day a week (e.g. 20 days per year, equating to 14% of all students) would be considered to be at-risk for lowered academic competence (Zubrick et al., 1997) those with the worst record are considered 'severe' non-attenders (attendance for less than 60% of the school year). This definition of 'at-risk' attendance accords with definitions of 'chronic truancy' in Australia and 'chronic absence' in US literature (Gray & Beresford, 2002), though the definition of 'regular' attendance may be more conservative in Western Australia (10 days or less) than the US (missing 5 or less days) (Epstein & Sheldon, 2002).

Recent US evidence suggests that 'chronic' absenteeism is concentrated in a relatively small number of schools, and within certain grade levels. The youngest and the oldest school students tend to have the highest rates of chronic absenteeism, with students attending most regularly in the middle primary school years (grades 3–5) (Balfanz & Byrnes, 2012). Truancy patterns have other notable characteristics—evidence suggests they are most likely to occur on Fridays and later in the school day, while whole-day truancy may occur more frequently on Mondays (Rothman, 2001).

There is a paucity of reliable data on the school attendance patterns of Aboriginal students, and this partly reflects the added complexity of accurately assessing absences among this population group, e.g. Aboriginal families tend to be more mobile and this can make Aboriginal students hard to track in reporting systems. The available data, however, consistently show that the attendance patterns of Aboriginal students are substantially

worse than their non- Aboriginal counterparts (Scwhab, 1999; Zubrick et al., 2006). Absences among Aboriginal students tend to be higher in more remote areas, with rates peaking for males in the upper school years of remote communities (Australian Research Alliance for Children & Youth et al., 2007). Data from South Australia highlight that most Aboriginal absences are unexplained (65%; compared with 37% of non- Aboriginal absences; Schwab, 1999). This is supported by Western Australian data that indicate that almost half (48%) of Aboriginal students had more than 10 days of unexplained absence per year (Zubrick et al., 2006).

Though not yet nationally consistent, student attendance data has been reported nationally since 2007 for Year 1–10 and by Aboriginality. In 2012 the Australian Curriculum, Assessment and Reporting Authority (ACARA) completed a national student attendance data convergence exercise, so that nationally consistent student attendance data will be reported for all schools and all sectors from 2014.

CHAPTER 3 PATTERNS OF SCHOOL ATTENDANCE

Background

This chapter provides a profile of student attendance and absence in Western Australia across 2008–2012.

Four key outcomes have been examined: (1) the distribution of student absence rates; (2) average attendance rates over time; (3) average authorised and unauthorised absence rates over time; and (4) proportion of students at educational risk.

Highlights

- In Year 1, 81% of the most advantaged primary students attended school regularly (that is, at least 90% of the time). Only 57% of primary students in the least advantaged SEI quintile attended school this regularly.
- For Year 10 students, 65% of the students in the most advantaged SEI quintile attended school regularly, compared with 36% of students in the least advantaged quintile.
- The average attendance rate for non-Aboriginal students was 92% in Year 1 and 86% for those in Year 10. In contrast, the average attendance rate for Aboriginal students was around 79% for students in Year 1 and 63% for those in Year 10.
- For the most mobile students—those with at least 5 enrolments—the proportion who were at severe educational risk (attending school less than 60% of the time) increased from 15% in Year 1, to 19% in Year 7, to 37% in Year 8 and to 45% in Year 10.

Summary of findings

- Attendance rates are consistently high in primary school and fall away sharply in the secondary years.
- Attendance rates are distinctly lower for students who are more mobile, those attending schools in remote areas, students with worse socio-economic circumstances, and Aboriginal students.
- Disparities in attendance are evident from Year 1, and are carried into and become wider in secondary school.
- Unauthorised absences appear to account for most of the gap in attendance rates between different student groups, at all levels of education.
- Attendance patterns are established early, and are likely to be influenced by factors that exist outside of the school environment, such as caregiver attitude towards education.

DATA AND METHODS

The analysis in this chapter is conducted on the Analysis Long File (see *Overview of Project Data* section in Chapter 1). The key outcome variables include attendance rates, absence (total, authorised and unauthorised) rates, and educational risk categories. Outcome variables are examined for primary and secondary school students, and by school-level socio-economic and geographic indicators, and the characteristics of students and their caregivers.

Analyses are presented in three ways: first using the distribution of student absence rates, i.e. the proportion of students along the spectrum of different rates of absence; second, average attendance and absence rates; and third, using established educational risk categories (see *Definition of Educational Risk*, below) and whether the proportion of students falling into each category has changed over the period of interest.

The analysis was conducted at a cross-sectional level (e.g. what are the overall differences between metropolitan and remote schools) and with a time series view (e.g. have any differences emerged over the period of interest). Accordingly, and in-line with the introductory nature of this chapter, the analytic techniques presented here are descriptive in nature (primarily restricted to simple univariate and cross-tabulation frequencies and proportions, and means). Analyses requiring more complex statistical methodology or longitudinal analyses at the student-level, such as attendance/absence and educational performance trajectories, are examined in later chapters.

Measuring attendance

Types of absence

Consistent reporting standards for attendance across educational jurisdictions are currently the focus of considerable attention in Australia. At present, the way that authorised and unauthorised absences are defined and operationalised in Western Australia is broadly consistent with other States and Territories.

Authorised absences include those where the reason provided by the parent or caregiver is considered to be legitimate and deemed acceptable by the Principal, for example, illness. Authorised absences also include suspensions and absences due to cultural or religious events. *Unauthorised absences* include those where students are absent without explanation, and where follow-up from the school fails to establish an acceptable reason from the parent or caregiver, or if the student was found to be truant.

It should be noted that there can be variation in the interpretation and application of these definitions between schools. For example, and anecdotally, the expectation of an acceptable absence may differ between Principals in remote settings and those in metropolitan Perth. There is no way of assessing the extent of these differences in WA DoE datasets or a method for adjusting for any bias.

A full list of attendance and non-attendance codes and descriptors in use in the Western Australian jurisdiction is provided in Appendix B.

Available days

The total number of half-days that students were available to attend school was equivalent to the number of days in the school semester minus any days students were not required to attend (e.g. public holidays) and days of non-enrolment. This variable is used as the denominator in the calculation of the following attendance metrics, which are applied to the analysis in this and subsequent chapters:

- *Overall attendance rate*. The number of half-days attended (calculated as the total number of half-days the student was available to attend minus the number of half-day of absence) divided by the total number of half-days available to attend, expressed as a percentage.
- *Authorised absence rate*. This is calculated as the number of half-days of authorised absences as a percentage of the total half-days available to attend.
- *Unauthorised absence rate*. This is calculated as the number of half-days of unauthorised absences as a percentage of the total half-days available to attend.
- *Overall absence rate*. This is calculated as the complement of the overall attendance rate. The number of authorised and unauthorised half-day absences was summed to create the total number of half-day absences. The rate is then calculated as a percentage of the total number of half-days available to attend.
- *Unauthorised absence ratio*. The proportion of total absences that was unauthorised.

It should be noted that all attendance metrics calculated in this chapter are based on students' Semester 1 attendance records.

Definition of Educational Risk

The educational risk categories used in this chapter were a response to data collected from the 1993 WA Child Health Survey (WACHS; see *Background* section, above) and adopted for monitoring purposes by the WA DoE. The categories, defined below, represent the levels of school attendance rates that place children at educational risk. The appropriateness of these definitions in the contemporary educational setting is reviewed using current data, in Chapter 4.

The range of categories of educational risk are:

- Regular –90% attendance or greater
- Indicated – 80-89% attendance
- Moderate – 60-79% attendance
- Severe – Less than 60% attendance

These categories thus represent increasing levels of educational risk with those achieving "Regular" status representing no or lowest levels of educational risk.

On average there are 200 half-days of school available for students to attend each semester. An attendance rate of 90% therefore equates to a student being in attendance for 180 half-days, or 90 full days out of 100. This attendance rate therefore equates to no more than 10 days of school being missed per semester, two full weeks for the semester, or four weeks of the school year. Conversely, a student with an attendance rate of 60% would be absent from school around two months of a semester, or four months of the year. Over the course of the primary school years, such a student would have missed out on over two years of education.

Student characteristics

Student characteristics were measured in this Chapter using information from the Student Enrolments database. We have included three key variables, including a derived measure of student mobility:

- *Aboriginal status*. This item has been derived based on information from the Student Enrolments and Student Assessments databases. Students with two or more pieces of information across multiple enrolments or assessments indicating that they were Aboriginal (across these datasets) were classified as 'Aboriginal' for the purposes of this study. Those with 1 or 2 pieces of information on Aboriginal status were classified as Aboriginal if one of them indicated they were Aboriginal.
- *Main language spoken at home (English; Other; Not stated)*. The information from the earliest enrolment record was used in cases where the response to this question changed over time.
- *Student mobility*. The data source provides both the date that an enrolment begins and concludes thus enabling us to view mobility from two perspectives: (1) the quantum of mobility, measured by either the number of enrolments or the number of schools attended. The derived value for these two variables was the same in the vast majority of cases, except where a student had left a school and returned after a period in another school. The number of enrolments is used in preference to the number of schools in most mobility analyses that follow; (2) the timing of student mobility. We have categorised a change of schools as either occurring at the end of the school year, during the school year but at the end of the term, or in mid-term. This has been done on the basis that mid-term and mid-year moves are likely to be more disruptive than those occurring at the end of the school year (indeed they may also be precipitated by a more turbulent set of circumstances, e.g. parental break-up, exclusion, etc.). Both indicators exclude the transition from primary school to high school as a change of schools.

  In addition, we have created a composite variable (nine-part categorical variable) from the two student mobility measures described above, combining the number of enrolments (quantum of mobility) with the timing of student mobility—the variable includes categories for students with: one enrolment; one school move, at the end of the school year; one school move, at the end of a term; one school move, mid-term; two school moves, both at the end of the school year; two school moves, one at the end of a term; two school moves, one mid-term; three school moves; and four school moves or more.

  Student mobility indicators are calculated based on all enrolment records for a student during the course of the study period. As a result, it should be borne in mind in all subsequent analyses that the outcome of interest (attendance or performance, for example) may have occurred before some (or all) school moves had been made.

Caregiver characteristics

As stated in Chapter 2, the quality of the caregiver education, occupation and language spoken data is limited, with approximately a third of the responses to these questions coded as "not stated/unknown". Students with missing caregiver information were more likely than other students to be Aboriginal, and live in less advantaged areas and remote locations, and to have lower levels of achievement—accordingly, caution should be exercised when interpreting results that include these variables. In addition, response analysis suggests that there is a compositional change in the population of students in our data with valid responses to these variables over the study period, where the amount of missing data reduces each year from 2008 to 2012 (see Appendix A). As a consequence, caregiver characteristics are not included in any of the analyses examining change over calendar years in this or subsequent chapters.

Caregiver characteristics were measured in this Chapter using two key variables:

- *Caregiver occupation.* Occupation was been coded for those caregivers that indicated that they had parental responsibility for the student and were employed at some stage in the year prior to enrolment. Separate variables were created for mothers (includes stepmothers), fathers (includes stepfathers) and other caregivers. Occupation is categorised using a classification based on the Australian Standard Classification of Occupation (ASCO). Four categories have been derived for the purposes of this analysis:
    - — Group 1 includes senior management in large business organisation, government administration and defence, and qualified professionals
    - — Group 2 includes other business managers, arts/media/sportspersons and associate professionals
    - — Group 3 includes tradespeople, clerks and skilled office, sales and service staff
    - — Group 4 includes machine operators, hospitality staff, assistants, labourers and related workers.

- *Caregiver educational attainment*. A composite variable has been created on the basis of the caregivers' response to two separate questions: highest school educational attainment and highest non-school educational attainment. Caregivers that indicated they had an Advanced diploma, Diploma or Bachelor degree (or above) were coded as having a non-school qualification, otherwise the responses to highest school educational attainment were used to determine caregiver educational attainment:
    - — Year 9 or equivalent or below
    - — Year 10 or equivalent
    - — Year 11 or equivalent
    - — Year 12 or equivalent
    - — Non-school qualification
    - — Not stated/unknown

School-level characteristics

The data source contains a wide range of variables that describe the characteristics of each public school in Western Australia. It also contains aggregate-level information on the student body. For example, attendance rates can be considered according to student-level Aboriginal status, or according to the proportion of students within a school who are Aboriginal.

The analyses in this chapter focus on a small set of key school contextual variables—these include:

- *Socio-Economic Index for schools (SEI)*. This variable is used to measure the socio-economic disadvantage of the students in a school and the areas that they live in. The measure was constructed using data collected by the Australian Bureau of Statistics at the 2006 Census, and uses the residential addresses of students mapped to ABS collection districts. The SEI is based on 5 dimensions, including education, occupation, Aboriginality (proportion of Aboriginal students in the school), family income and family structure. The SEI dimensions and their weightings were selected to maximise the correlation of the SEI with student achievement. While the SEI is derived by the WA DoE for use in the Western Australian jurisdiction, it is broadly equivalent to and correlates well with the Index of Community Socio-Educational Advantage (ICSEA) that is used at a national level to predict performance on NAPLAN tests.

  To facilitate comparisons between schools with high and low SEI, schools were divided into quintiles according to the distribution of SEI values across all Western Australian schools.

- *Remoteness.* Geographic remoteness is defined using the Australian Standard Geographic Classification (ASGC) Remoteness Structure, which is based on the plus version of the Accessibility/Remoteness Index of Australia, a widely used classification of remoteness in Australia (Australian Bureau of Statistics, 2006). The five categories of remoteness reflect differences in access to services and opportunities for social interaction, and include Major cities, Inner Regional Australia, Outer Regional Australia, Remote Australia and Very Remote Australia (see Appendix C for a map of remoteness areas, Australian Bureau of Statistics, 2001).

RESULTS

Distribution of student absence rates

Figure 3.1 and Figure 3.2 display the distribution of student absence rates in primary and secondary school. The figures highlight that the majority of students have relatively low rates of absence from school year. The distribution for secondary students in Figure 3.1 is flatter than that for primary students, and features a peak at 2% absence. This demonstrates clearly that secondary students are more likely to miss a greater proportion of school than students in primary school. Figure 3.2 provides some further insight and suggests that differences in the profiles of absence between primary and secondary school are mainly attributable to differences in unauthorised absences. That is, there is a relatively similar pattern of authorised absence in primary and secondary school but greater unauthorised absence in later years of schooling.

The shape of the distribution of absence rates differs by SEI quintile, although this applies more to unauthorised than authorised absences. Figure 3.3 reveals that the tail of the distribution of unauthorised absence is longer in the least advantaged SEI quintile, in both primary and secondary school. In other words, fewer students in the least advantaged SEI schools had 0-1 days per semester of unauthorised absence (and greater proportions had missed 2 or more days) when compared with students in the most advantaged schools.

A similar pattern was observed by Aboriginal status, highlighting that many Aboriginal students miss substantial portions of the school year. The distribution of authorised and unauthorised absences among Aboriginal students was roughly equivalent, in both primary and secondary years (Figure 3.4)—this suggests that Aboriginal students commonly have both types of absence.

FIGURE 3.1: DISTRIBUTION OF STUDENT ABSENCE RATES, PRIMARY AND SECONDARY YEARS, 2008-2012

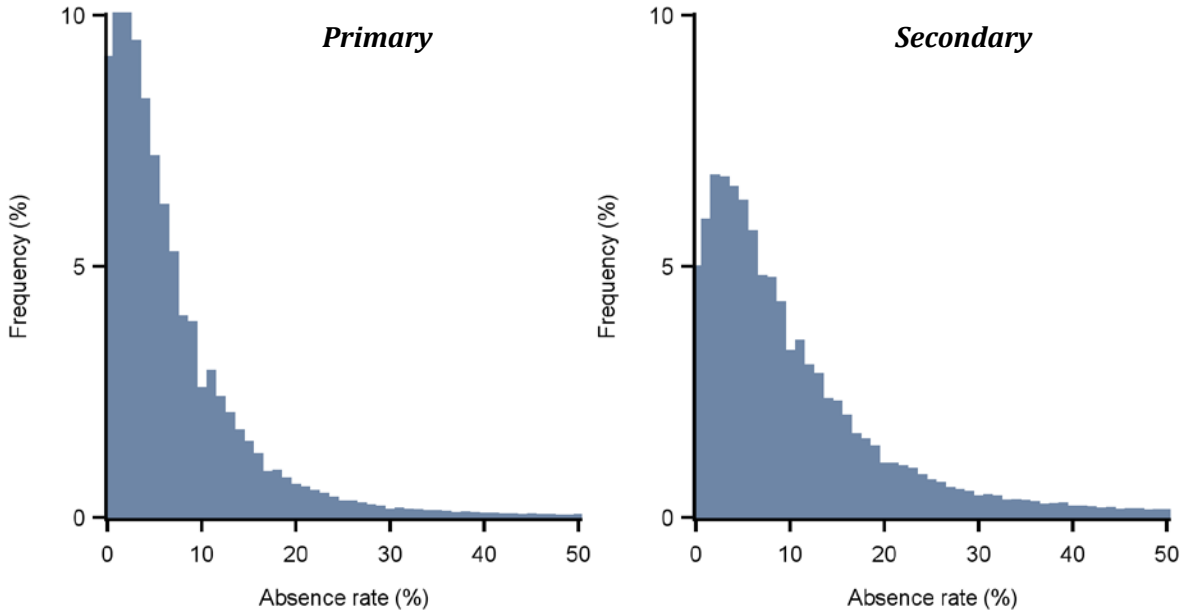


FIGURE 3.2: DISTRIBUTION OF AUTHORISED AND UNAUTHORISED ABSENCE RATES, PRIMARY AND SECONDARY YEARS, 2008-2012

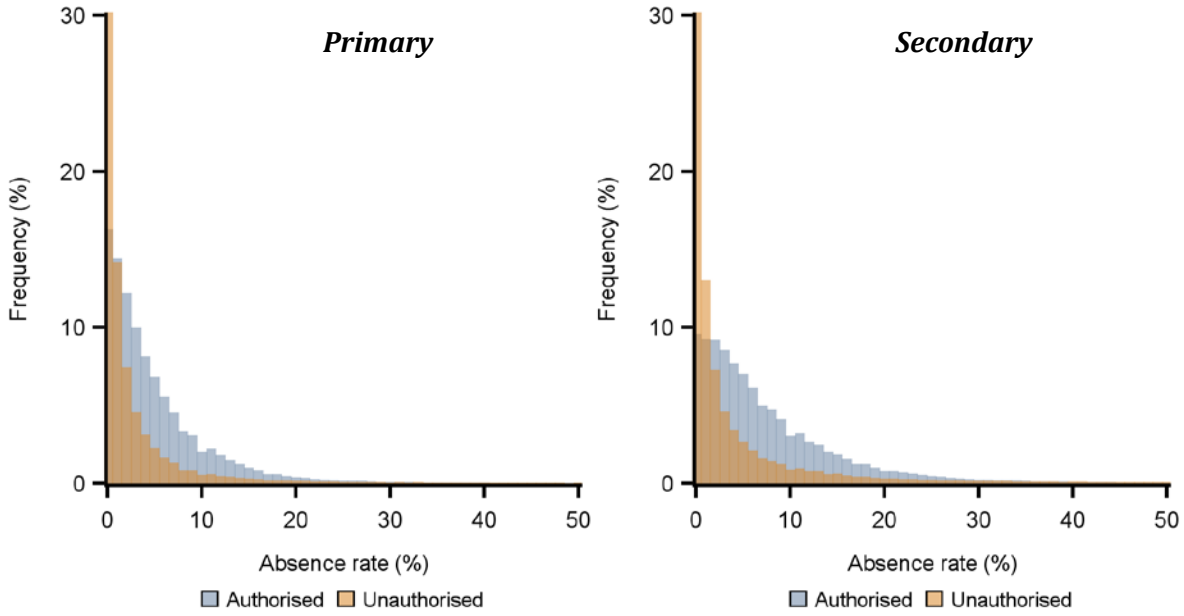


FIGURE 3.3: DISTRIBUTION OF AUTHORISED AND UNAUTHORISED ABSENCE BY SCHOOL SOCIO-ECONOMIC INDEX (SEI), PRIMARY AND SECONDARY YEARS, 2008-2012

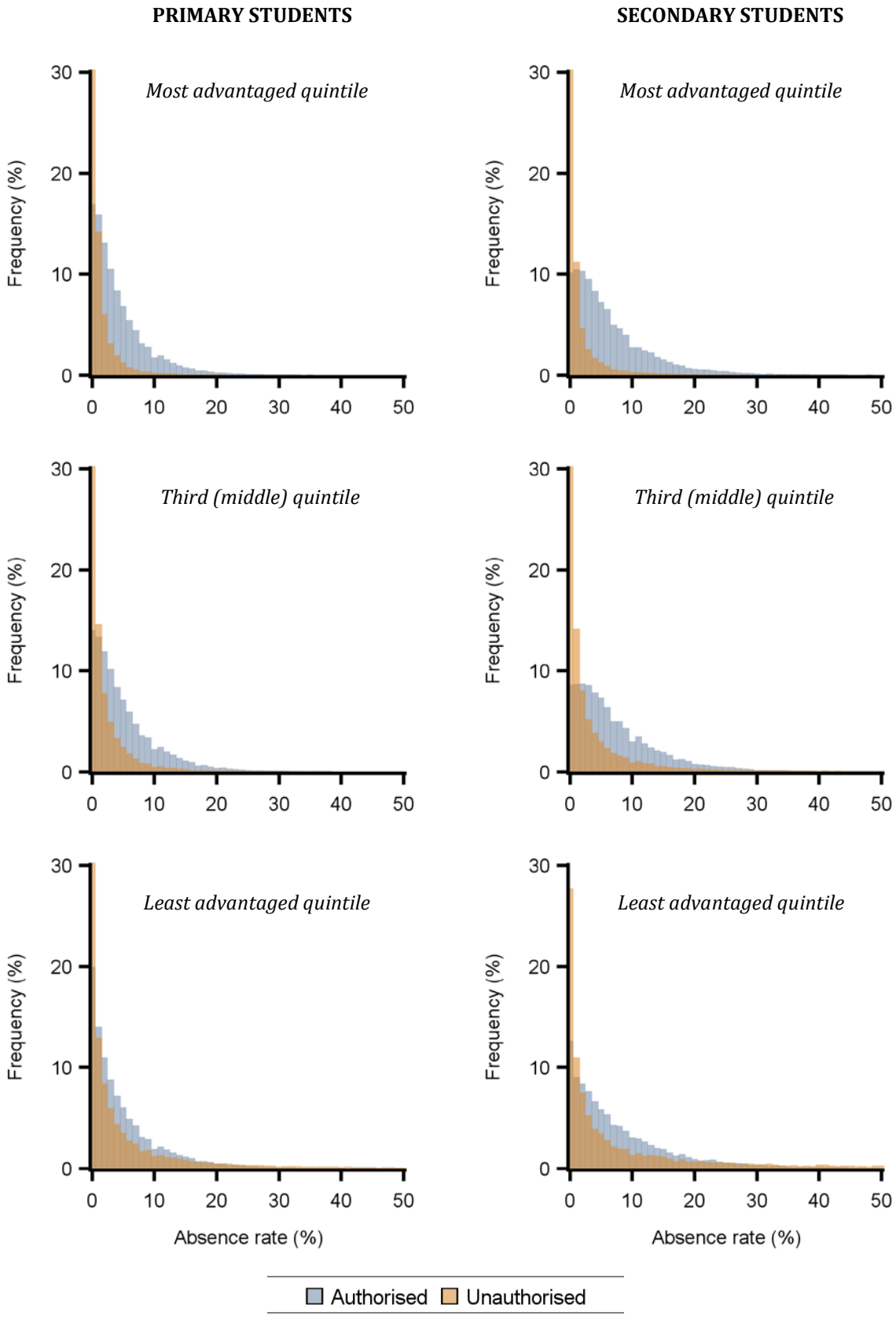
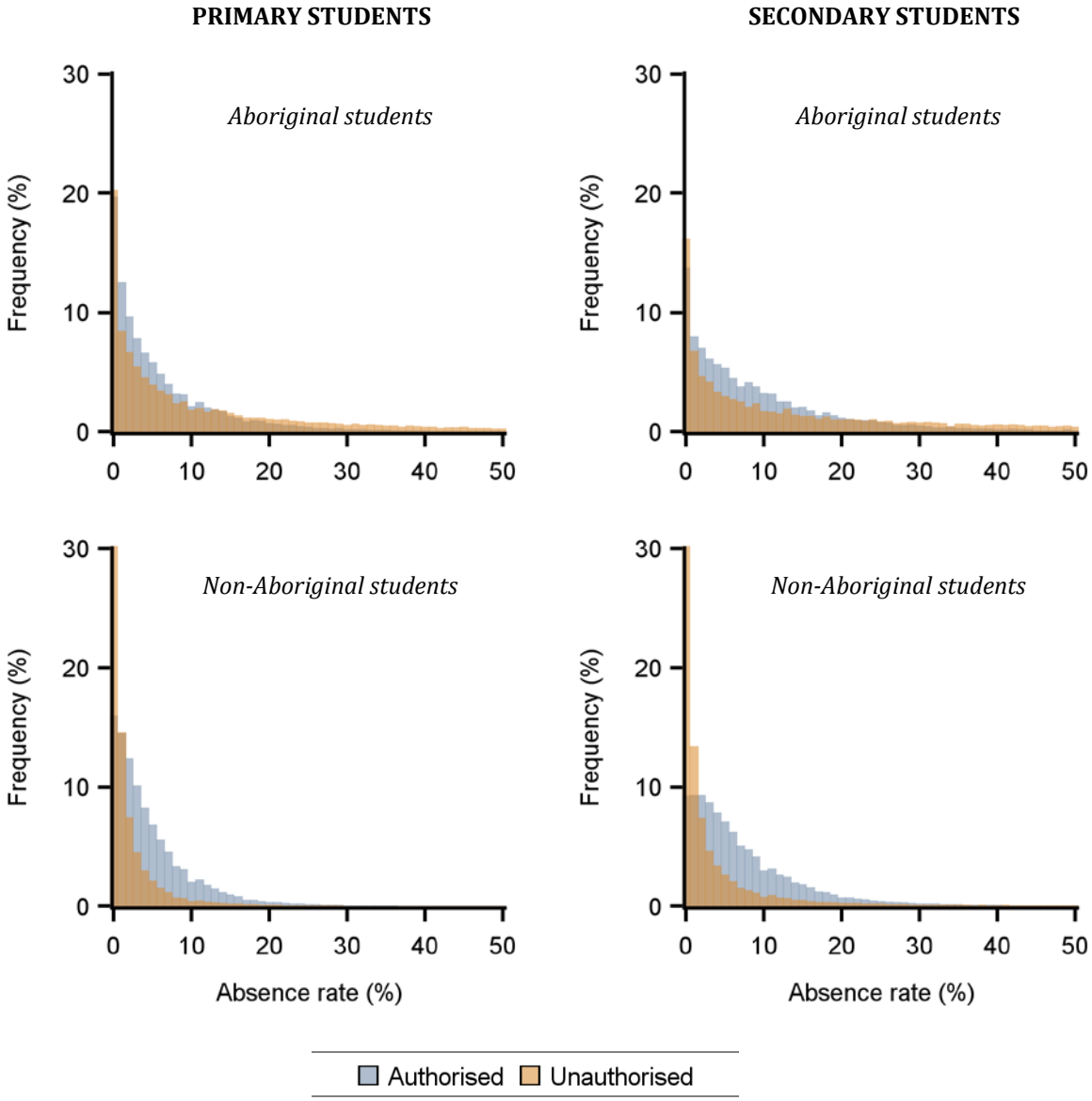


FIGURE 3.4: DISTRIBUTION OF AUTHORISED AND UNAUTHORISED ABSENCE BY ABORIGINAL STATUS OF THE STUDENT, PRIMARY AND SECONDARY YEARS, 2008-2012



Average rates of attendance and absence: Summary

This section examines average rates of attendance among student population groups. We present attendance rates in two ways; one provides attendance rates by calendar year to examine if the changed throughout the 2008-2012 period for the primary and secondary student population. The second approach shows average attendance rates by year of school (Years 1 to 10), which can provide an indication as to whether there is a particular time or grade at which attendance starts to decline for particular groups of students.

Figure 3.5 shows the average attendance rates for primary and secondary students, and Figure 3.6 the authorised and unauthorised absence rates for the 2008–2012 period. Overall, attendance rates were very stable across the period, although very small changes were evident among secondary students. The attendance rate for secondary students declined slightly from 87.8% in 2008 to 86.9% in 2012. This decline reflects a corresponding increase in authorised absences (rather than unauthorised absences), from 7.3% to 8.3% between 2008 and 2012.

Figure 3.7 highlights that student attendance rates remained stable across the primary school years and tended to fall progressively from the start of secondary school. In effect, the average rate of attendance for Year 1 students is about 92%. Since a 90% attendance rate equates to being absent at most, half a day a week, Figure 3.7 shows that the average rate of attendance for primary school children is just above this level – in other words, most Year 1 students are absent less than half a day a week. About 5% of available student days in primary school are recorded as authorised absences, while unauthorised absences constitute about half that proportion.

Figure 3.7 also shows that by Year 10, average attendance rates had fallen to 86.1%. This means that the average rate of attendance for a Year 10 student is between 4 and 4.5 days a week, or conversely, that on average, Year 10 students are absent for half a day to a full day per week. The rates of both types of absence increase into secondary school—to 8.4% for authorised absences and 5.5% for unauthorised absences by Year 10.

Figure 3.8 shows the proportion of students in each year level falling into the educational risk categories (regular, indicated, moderate and severe). Around 72-76% of primary school students were regular attenders—that is, they attend school for at least 90% of the time and are missing no more than half a day of school per week. This corresponds to 61.4% of Year 8 students, and falls to about half of students in Year 9 (54.9%) and Year 10 (51.5%).

About one in five primary students were considered to be at indicated educational risk, with smaller proportions in the moderate (6-7%) and severe (about 2%) educational risk categories. The increasing rate of absence as children move into later years of schooling was associated with increasing educational risk. The proportion in each of the moderate and severe educational risk categories increased equally by about 6-7 percentage points from Year 7 to Year 10.

FIGURE 3.5: AVERAGE ATTENDANCE RATES FROM 2008 TO 2012, PRIMARY AND SECONDARY STUDENTS

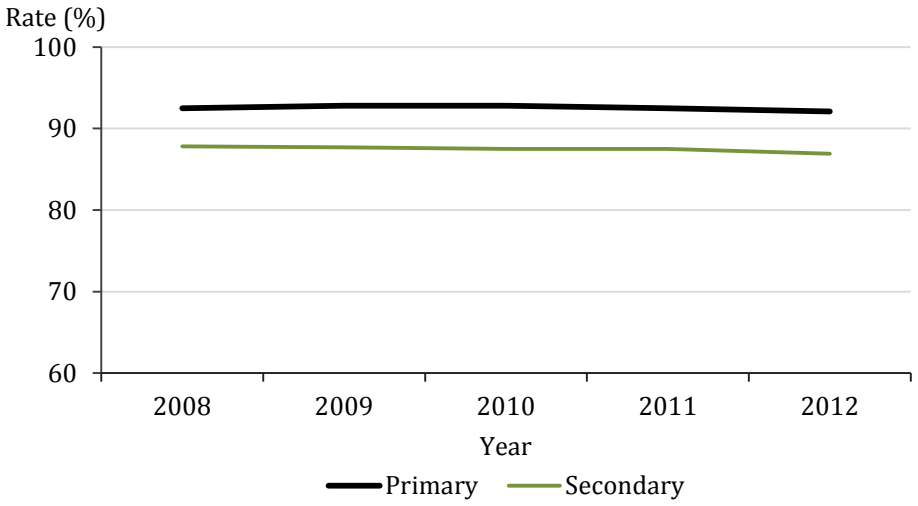


FIGURE 3.6: AVERAGE AUTHORISED AND UNAUTHORISED ABSENCE RATES FROM 2008 TO 2012, PRIMARY AND SECONDARY STUDENTS

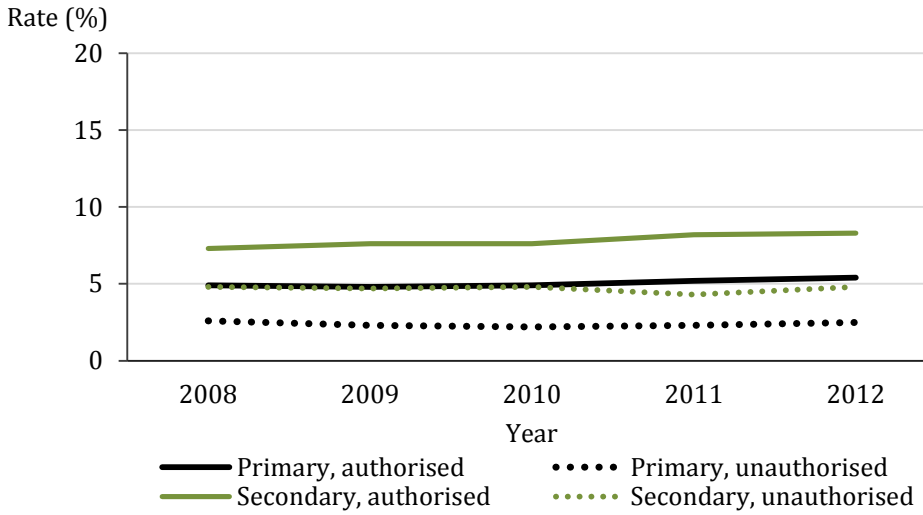


FIGURE 3.7: AVERAGE ATTENDANCE AND ABSENCE RATES, YEAR 1 TO YEAR 10

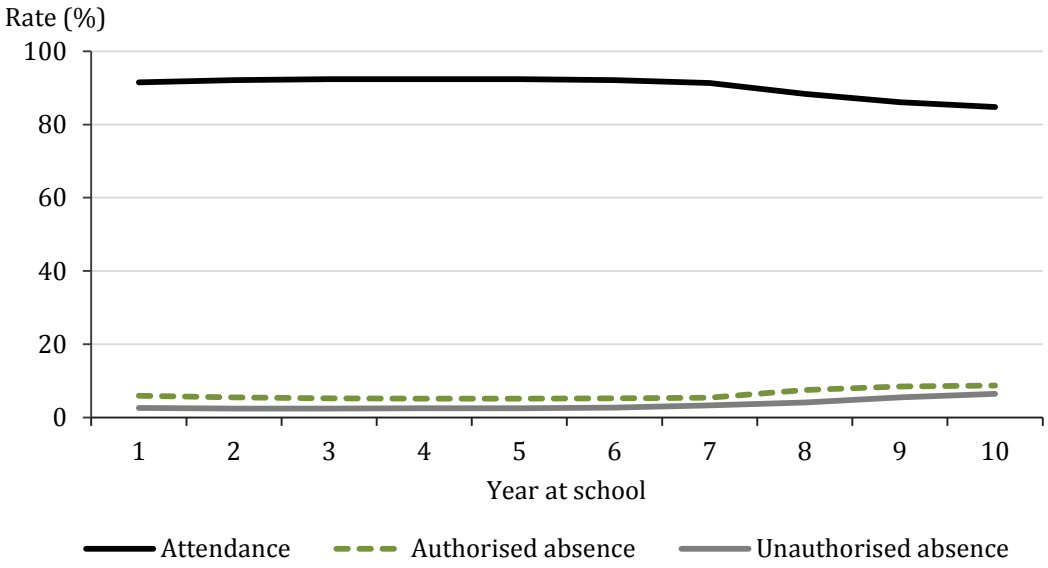
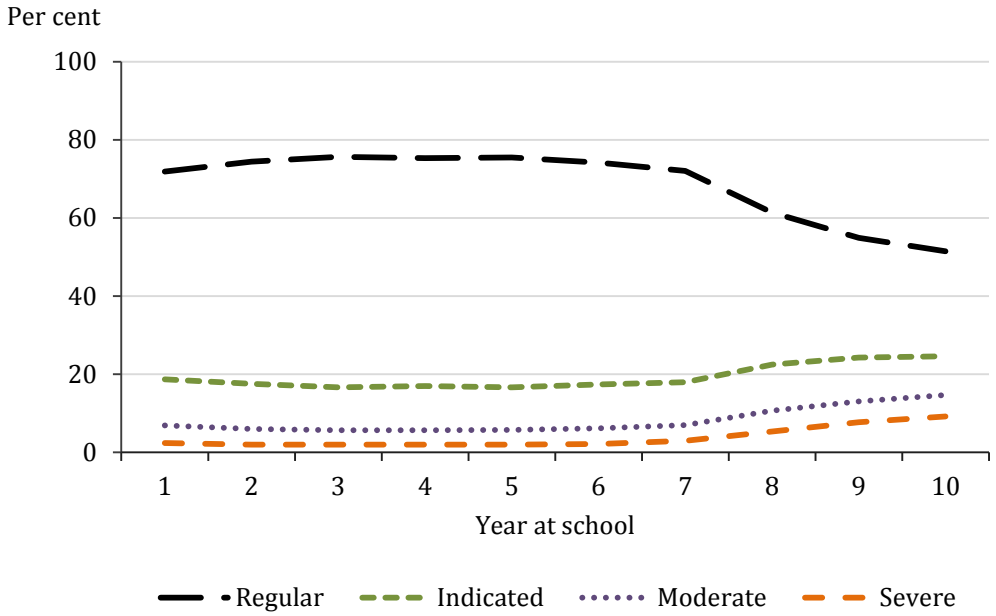


FIGURE 3.8: PROPORTION OF STUDENTS IN EDUCATIONAL RISK CATEGORIES, YEAR 1 TO YEAR 10



Average rates of attendance and absence: by school, student and caregiver characteristics

Relatively unchanging attendance and absence rates in the last five years for the total population of students, as highlighted in the previous section, may mask differences and trends for smaller population sub-groups. As such, it is important to examine attendance rates over time at finer levels of disaggregation. In this section total attendance, and authorised and unauthorised absence rates across 2008–2012 and for different year levels are examined for each of the following school- and student-level characteristics:

School-level characteristics

- School location or remoteness
- School socio-economic disadvantage (SEI)

Student-level characteristics

- Aboriginal status of the student
- Main language spoken in the home by the student
- Student mobility

In addition, attendance rates are presented according to the characteristics of the students' caregivers. In particular, we focus on the education and occupation of mothers, fathers and other caregivers. As discussed above, data quality concerns preclude an analysis of attendance rates by caregiver characteristics over time—hence, data are presented as aggregate estimates for the entire 2008–2012 period.

School-level characteristics

School remoteness

For both primary and secondary students, there are clear and consistent gradients associated with school remoteness (Figure 3.9 to Figure 3.11). Students in schools in more remote locations tended to have lower individual student attendance rates, with the rates for those students in very remote areas being distinctly lower. For example, on average over 2008-12, attendance rates were 72% for secondary students in very remote areas (i.e. these students are absent on average for about 1.5 days a week), compared with attendance rates of 82% in remote areas and rates of 85-88% in regional and metropolitan locations (Figure 3.9). However, it should be noted that the number of secondary students in very remote schools is very small (approximately 1,100 students in any given year, see Appendix A).

For the majority of students, these attendance rates were stable over the 2008 to 2012 period. However, for students in remote and very remote schools, their attendance rates appear to have declined during that time. Among students in remote schools, attendance for primary students decreased from 89.7% to 88.4% (1.3 percentage point difference), and from 84.9% to 81.7% (3.2 percentage points) for secondary students. The declines were more marked in very remote schools, with the attendance rate dropping from 85.1% to 78.7% (6.4 percentage points) for primary students and from 75.3% to 68.4% (6.9 percentage points) for secondary students (Figure 3.9). These decreases in more isolated

settings may partly reflect improvements in attendance reporting processes by the WA Department of Education. For example, the Tri-border Attendance Initiative has enabled students to be tracked across the borders of South Australia, Western Australia and the Northern Territory and provided for a more accurate assessment of attendance patterns of the relatively mobile student population in this isolated region in recent years. Consequently, many students that were previously regarded as having long periods of absence (when moving to a nearby school in another state) are now correctly recorded as having moved schools.

Figure 3.10 show that the differences in attendance rates according to geographic location were in place from Year 1 and maintained throughout the primary years. For example, the gap in attendance rates between students attending school in the Perth metropolitan area and those in very remote schools was the same in Year 1 (12%) as it was in Year 7. Beyond Year 7, the gaps become wider for students in higher year levels. For students in very remote schools, the fall in attendance rates is largely driven by increases in the unauthorised attendance rates in secondary school. Accordingly, Figure 3.11 shows that the proportion of students in very remote schools who were at severe educational risk increased from less than 20% in Year 7 to 35% in Year 10. The proportion of students in other regions who were at severe educational risk also increased, but to a smaller extent.

FIGURE 3.9: AVERAGE ATTENDANCE RATES FROM 2008 TO 2012, BY REMOTENESS, PRIMARY AND SECONDARY STUDENTS

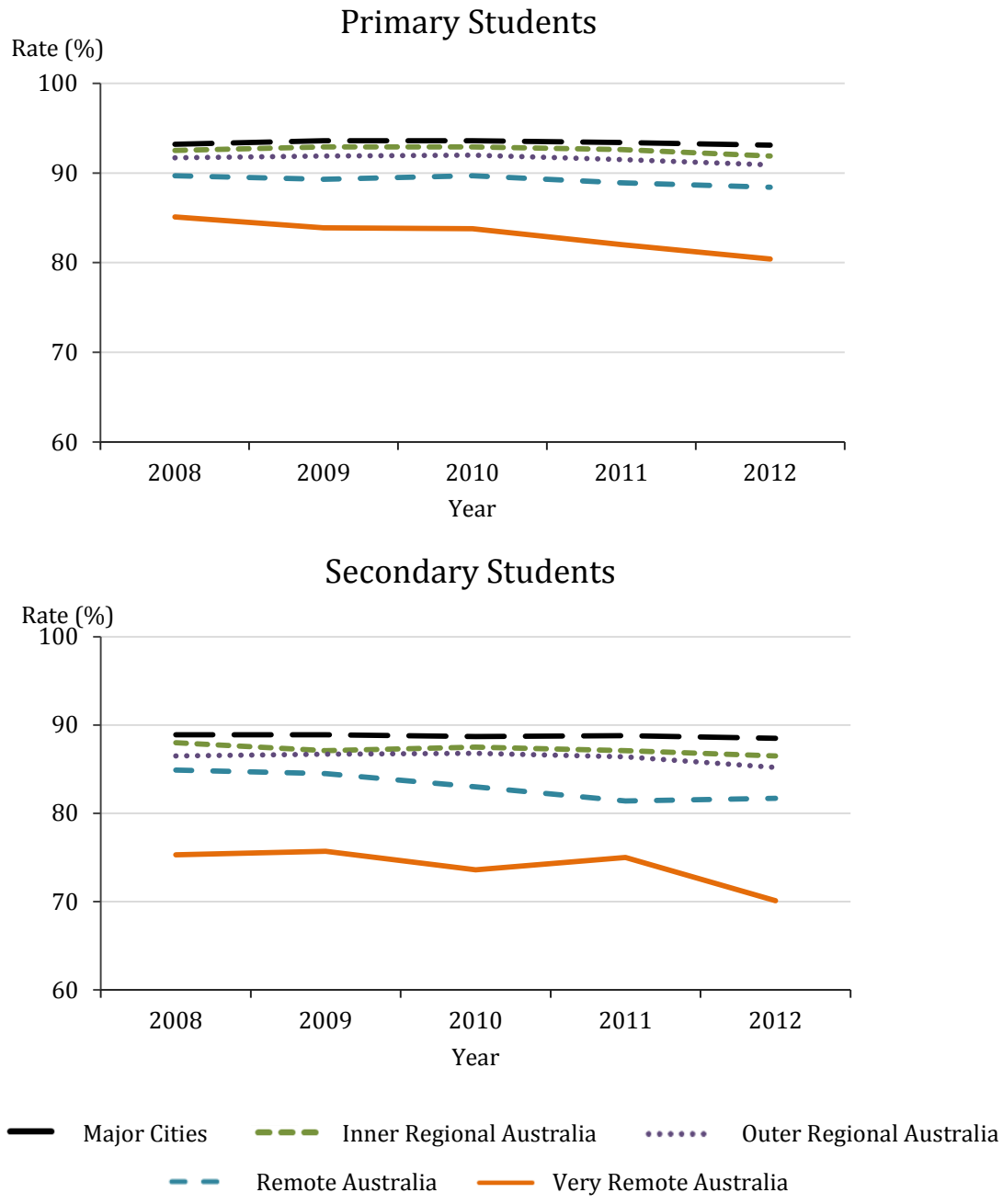


FIGURE 3.10: AVERAGE ATTENDANCE AND AUTHORISED AND UNAUTHORISED ABSENCE RATES, YEAR 1 TO YEAR 10, BY REMOTENESS

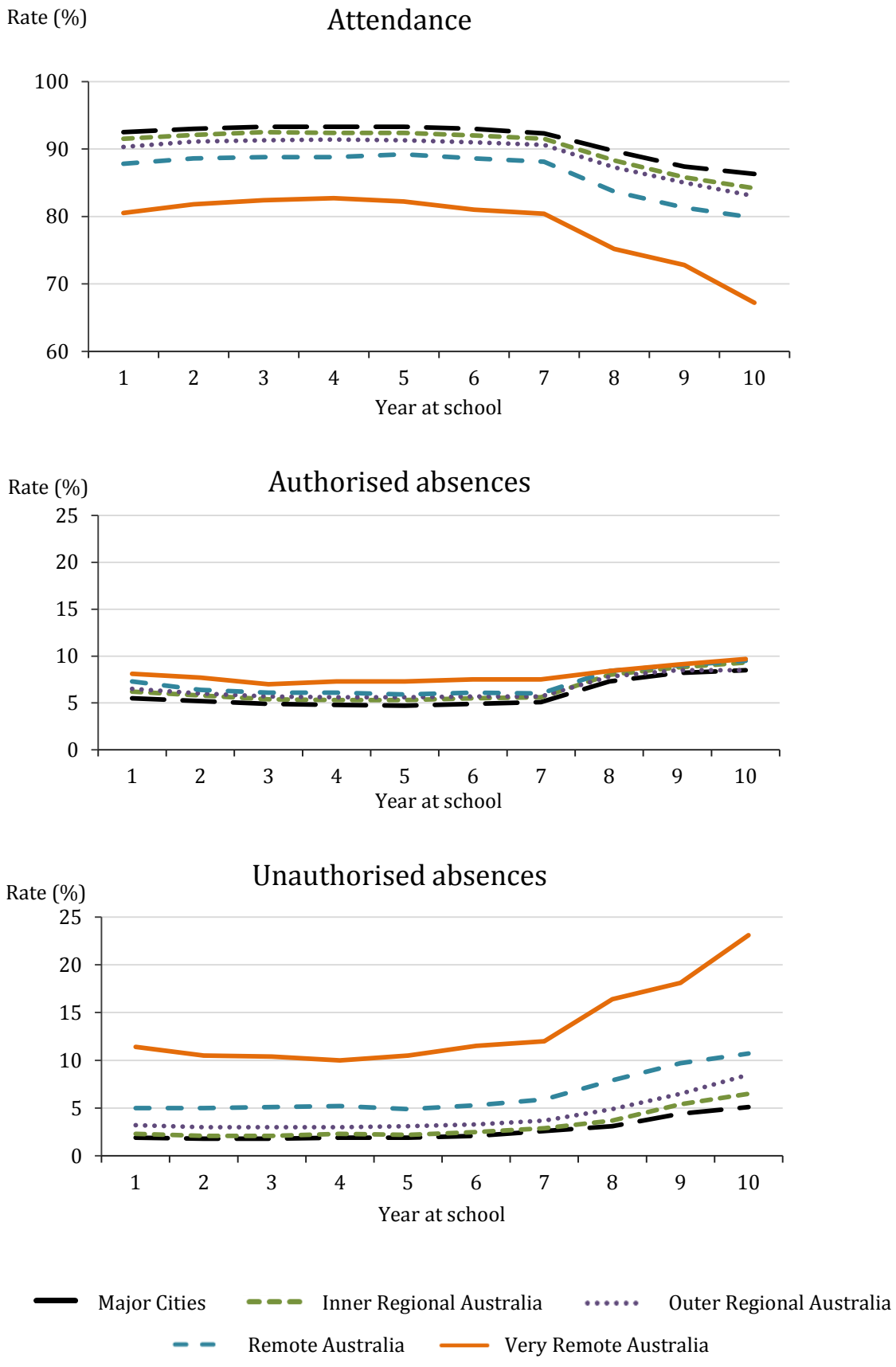
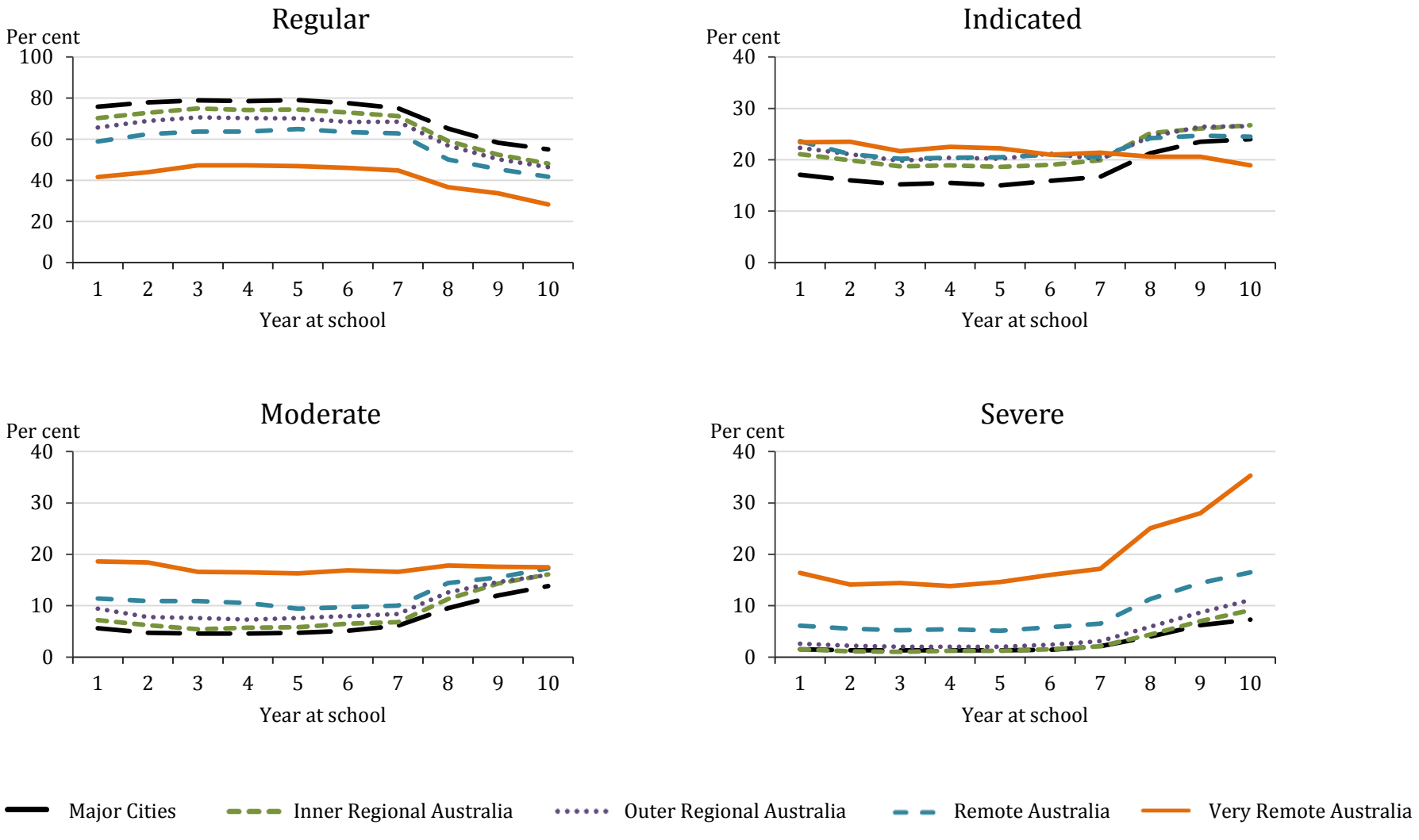


FIGURE 3.11: PROPORTION OF STUDENTS AT REGULAR, INDICATED, MODERATE AND SEVERE EDUCATIONAL RISK, YEAR 1 TO YEAR 10, BY REMOTENESS



School socio-economic disadvantage (SEI)

Figure 3.12 to Figure 3.14 reveal a clear socio-economic gradient in attendance rates, with higher rates of school attendance among students who are attending higher SEI schools. Figure 3.12 shows that while the gradient was evident across the spectrum of school years it is more prominent in the high school years and in the latter part of the study period. For example, the disparity in attendance rates between the highest and lowest SEI quintile is approximately 6 percentage points for primary students and 11 percentage points for secondary students in 2008, increasing to 8 and 15 percentage points in 2012. In other words, the difference between the highest and lowest SEI quintile equates to an additional half day per week of school absence for those in the lowest quintile.

Figure 3.13 shows that the attendance rates for students in all quintiles was relatively constant across the primary years, with the attendance rates of students in the least advantaged quintile consistently lower than students in higher SEI quintiles. Within each SEI quintile, the average attendance rate for students in Year 7 was the same as the average for students in Year 1. In secondary school, however, these gaps become larger for students in the later years. The apparent decrease in attendance amongst secondary students was largely driven by an increase unauthorised absences. For example, the average unauthorised absence rate for students in the least advantaged schools was SEI quintile was 7.6% for Year 7 students and 16% for Year 10 students. For the most advantaged students, these rates were 1.3% and 1.8% respectively. For authorised absence rates, the difference between primary and secondary students was much smaller, and reasonably similar across school SEI quintiles.

Accordingly, Figure 3.14 shows that the proportion of students who attended school on a regular basis (i.e. more than 90% of the time) did not vary a great in primary school. Whilst 80% of the most advantaged students attended school regularly in primary school, only 60% of primary students in the least advantaged SEI quintile attended school regularly. That is, around 40% of students in the least advantaged schools were absent from school at least 1 day each fortnight. For secondary school students, only 40% of the least advantaged students attended school on a regular basis. For Year 10 students, 23% of the least advantaged students were at severe educational risk, or attended school less than 60% of the time. In contrast, only 3% of students in the most advantaged quintile were at severe educational risk in Year 10.

Though these analyses are cross-sectional (that is, different students are contributing to Year 1 attendance rates and Year 7 attendance rates for example), these patterns suggest that socio-economic disparities in attendance rates emerge from Year 1, remain constant throughout primary school, then become wider upon the transition to secondary school.

FIGURE 3.12: AVERAGE ATTENDANCE RATES FROM 2008 TO 2012, BY SCHOOL SOCIO-ECONOMIC INDEX (QUINTILES), PRIMARY AND SECONDARY STUDENTS

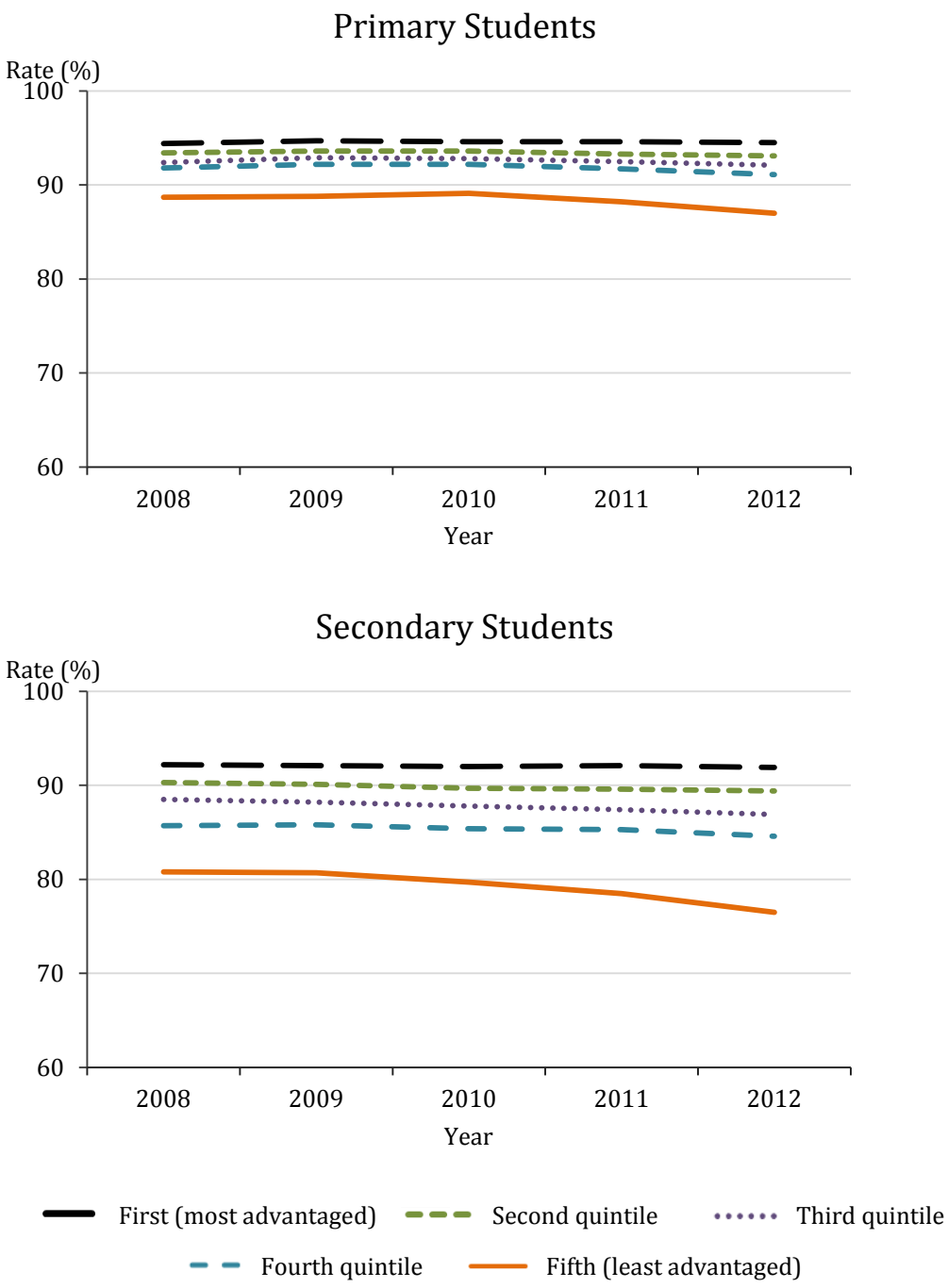


FIGURE 3.13: AVERAGE ATTENDANCE AND AUTHORISED AND UNAUTHORISED ABSENCE RATES, YEAR 1 TO YEAR 10, BY SCHOOL SOCIO-ECONOMIC INDEX (QUINTILE)

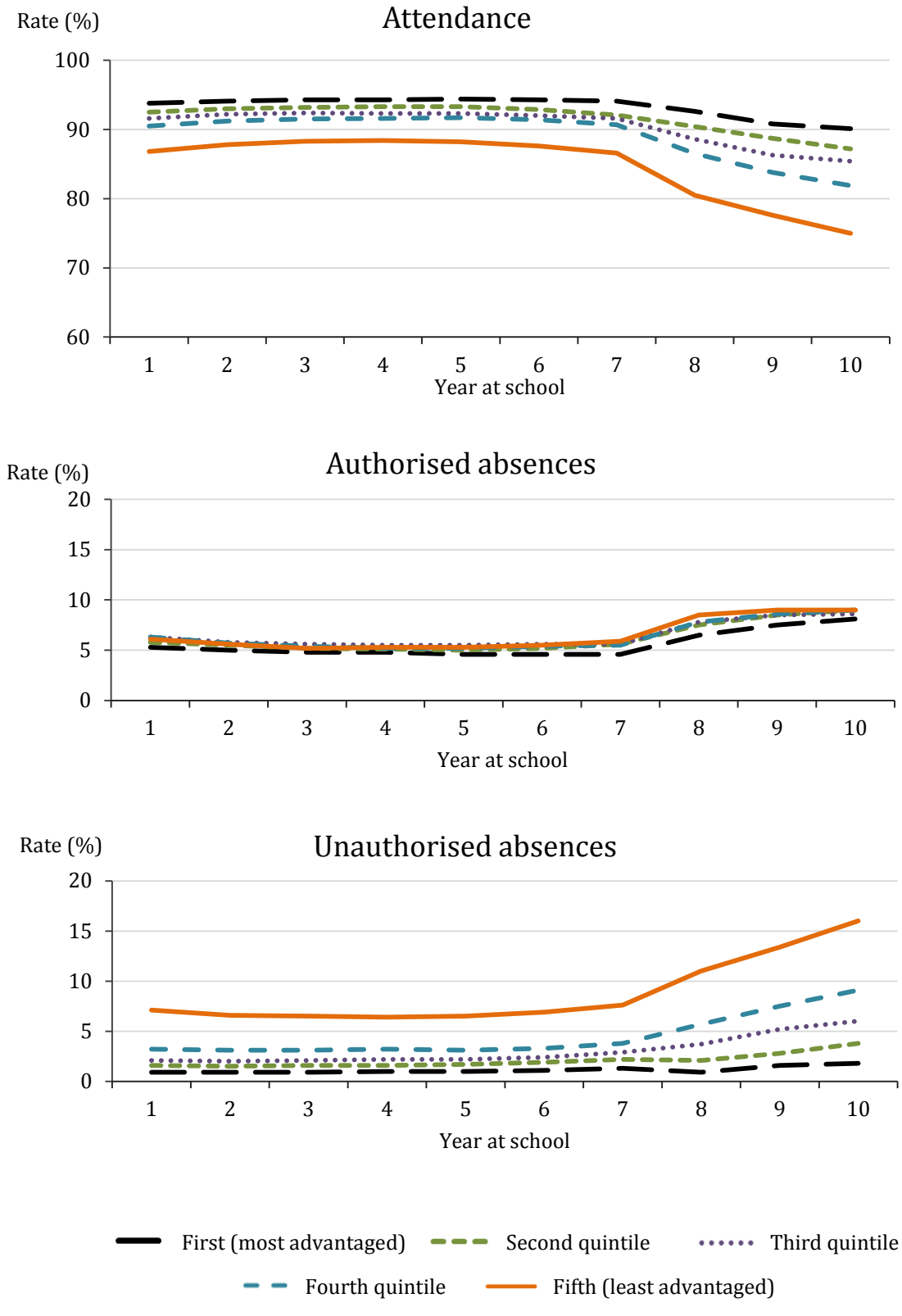
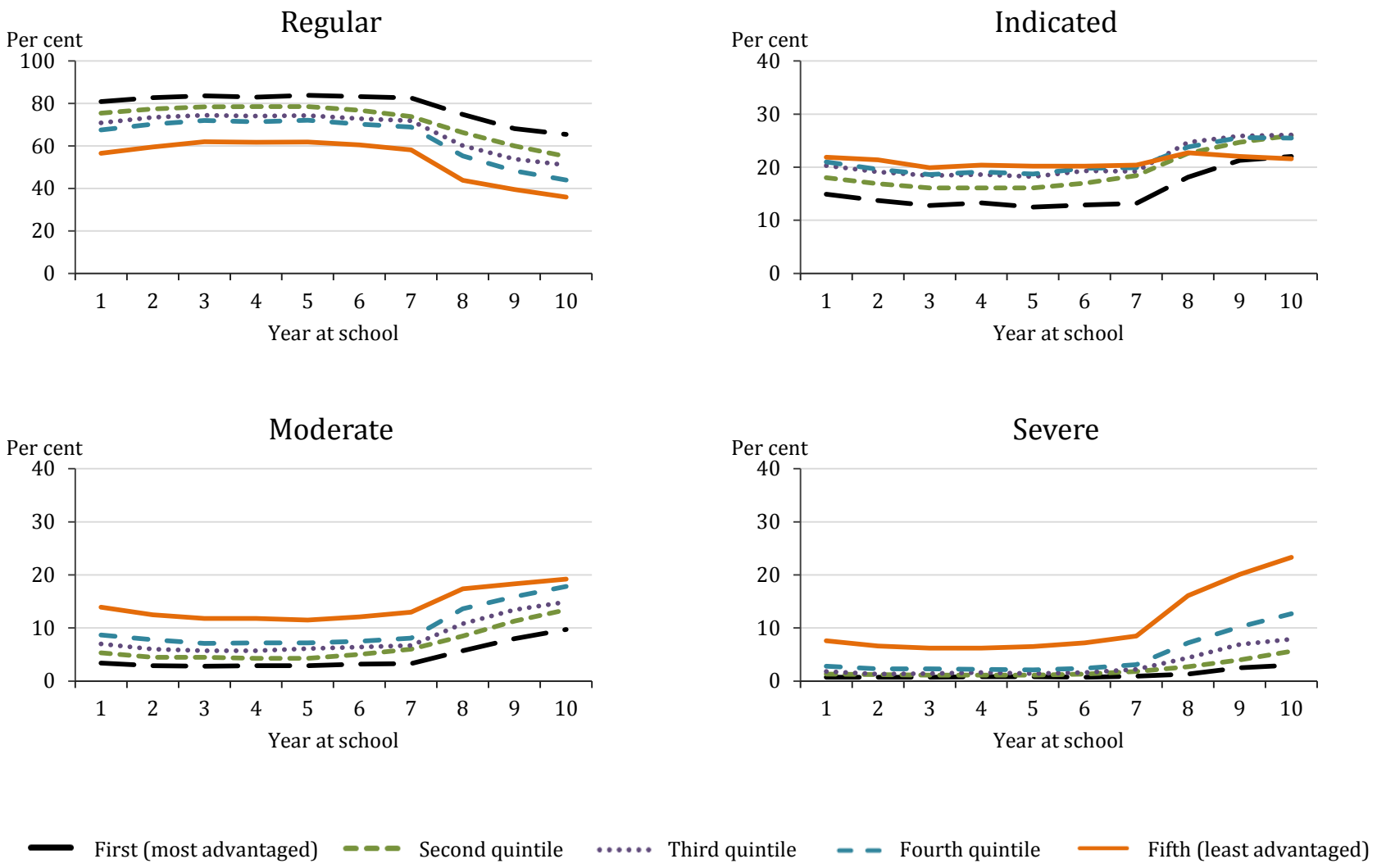


FIGURE 3.14: PROPORTION OF STUDENTS AT REGULAR, INDICATED, MODERATE AND SEVERE EDUCATIONAL RISK, YEAR 1 TO YEAR 10, BY SCHOOL SOCIO-ECONOMIC INDEX (QUINTILE)



Student-level characteristics

Aboriginal status

Figure 3.15 shows that there are marked differences in attendance rates between Aboriginal and non-Aboriginal students over the study period. Aboriginal students attended 79.1% of semester 1 on average compared with 92.3% of semester 1 among non-Aboriginal students. Alternatively put, Aboriginal students miss a day out of every week, whereas non-Aboriginal students miss less than a day per fortnight. These attendance rates did not change between 2008 and 2012.

Figure 3.16 shows that the disparities in attendance between Aboriginal and non-Aboriginal students are evident from the earliest years of school (13 percentage points difference at Year 1), and increase substantially into secondary school (23 percentage points difference by Year 10).

When examining absence rates (Figure 3.16), the differences between Aboriginal and non-Aboriginal students were much larger for unauthorised than for authorised absences. For primary school students, the gap was consistently around 1-2 percentage points for authorised absences but 10-11 percentage points for unauthorised absences. For secondary students, the gap between Aboriginal and non-Aboriginal students was 2-3 percentage points for authorised absences and was 16-19 percentage points for unauthorised absences. Clearly, for secondary-level Aboriginal students, any intervention designed to improve attendance rates needs to focus on reducing unauthorised absences.

With respect to educational risk, only 40% of primary-level and around 20% of secondary-level Aboriginal students were attending school on a regular basis – that is, for at least 4.5 days per week. Approximately 15% of primary and over one-third of secondary Aboriginal students were at severe educational risk for any given year, compared to just 1% and 5% for non-Aboriginal students, respectively.

FIGURE 3.15: AVERAGE ATTENDANCE RATES FROM 2008 TO 2012, BY ABORIGINAL STATUS OF STUDENT, PRIMARY AND SECONDARY STUDENTS

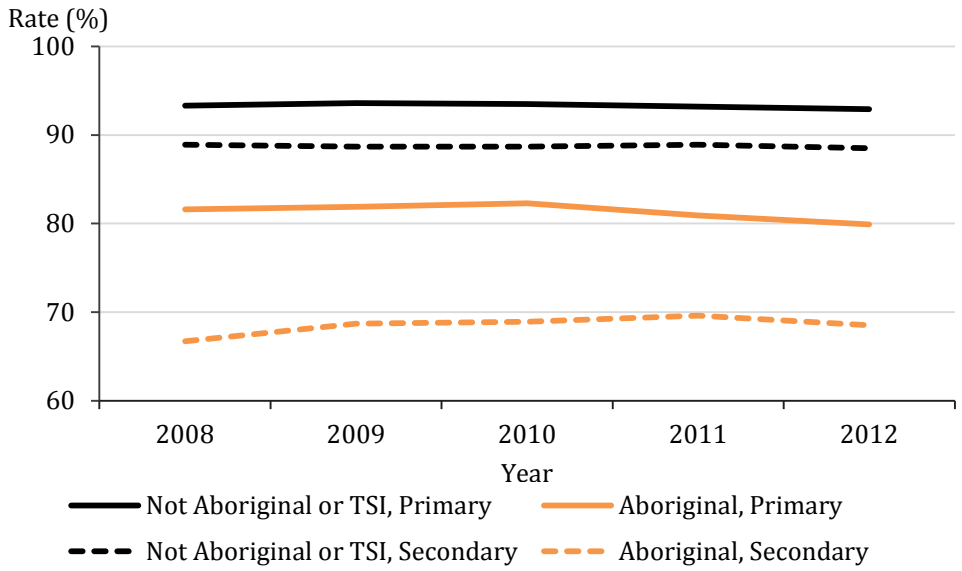


FIGURE 3.16: AVERAGE ATTENDANCE AND AUTHORISED AND UNAUTHORISED ABSENCE RATES, YEAR 1 TO YEAR 10, BY ABORIGINAL STATUS OF STUDENT

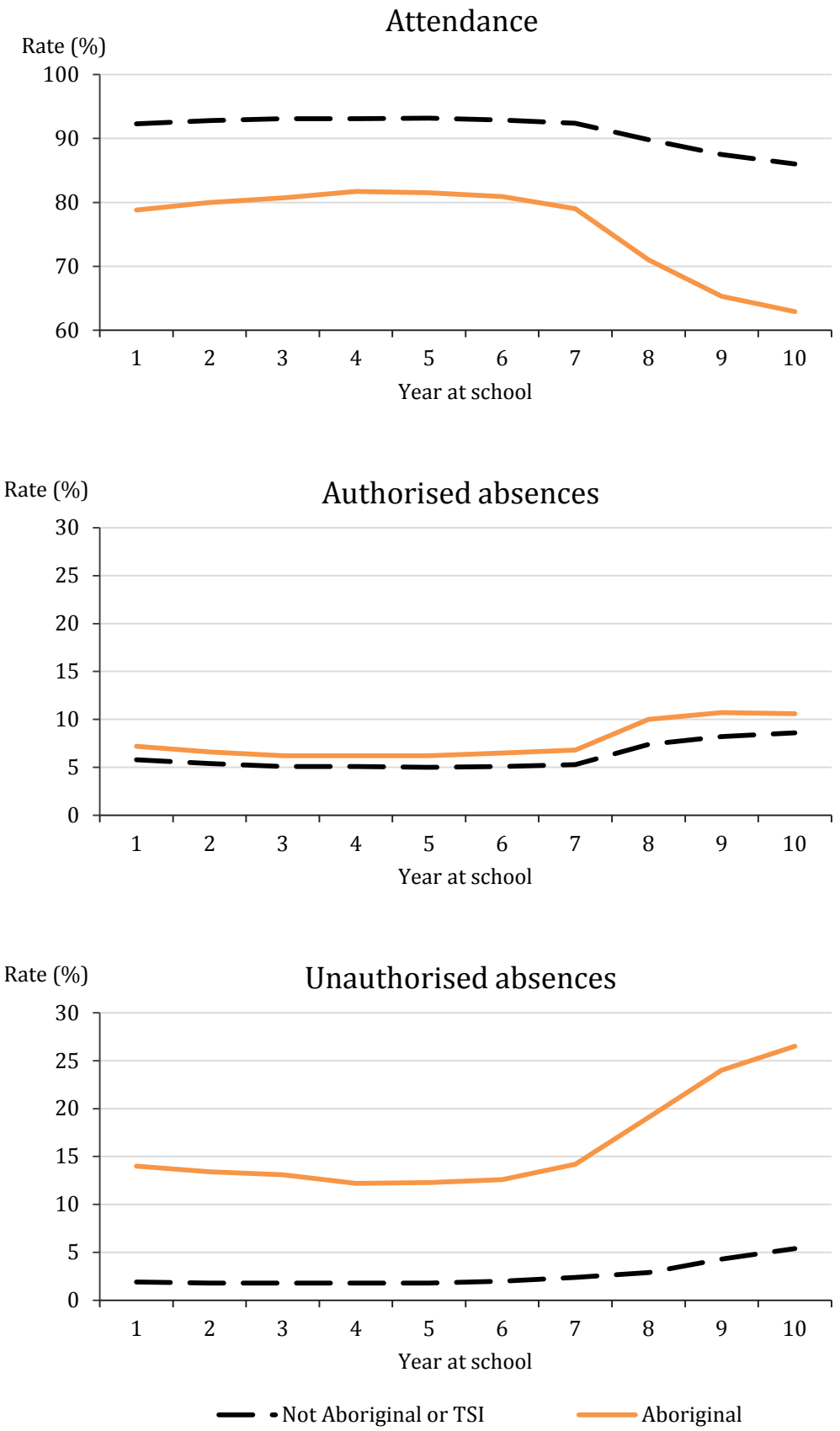
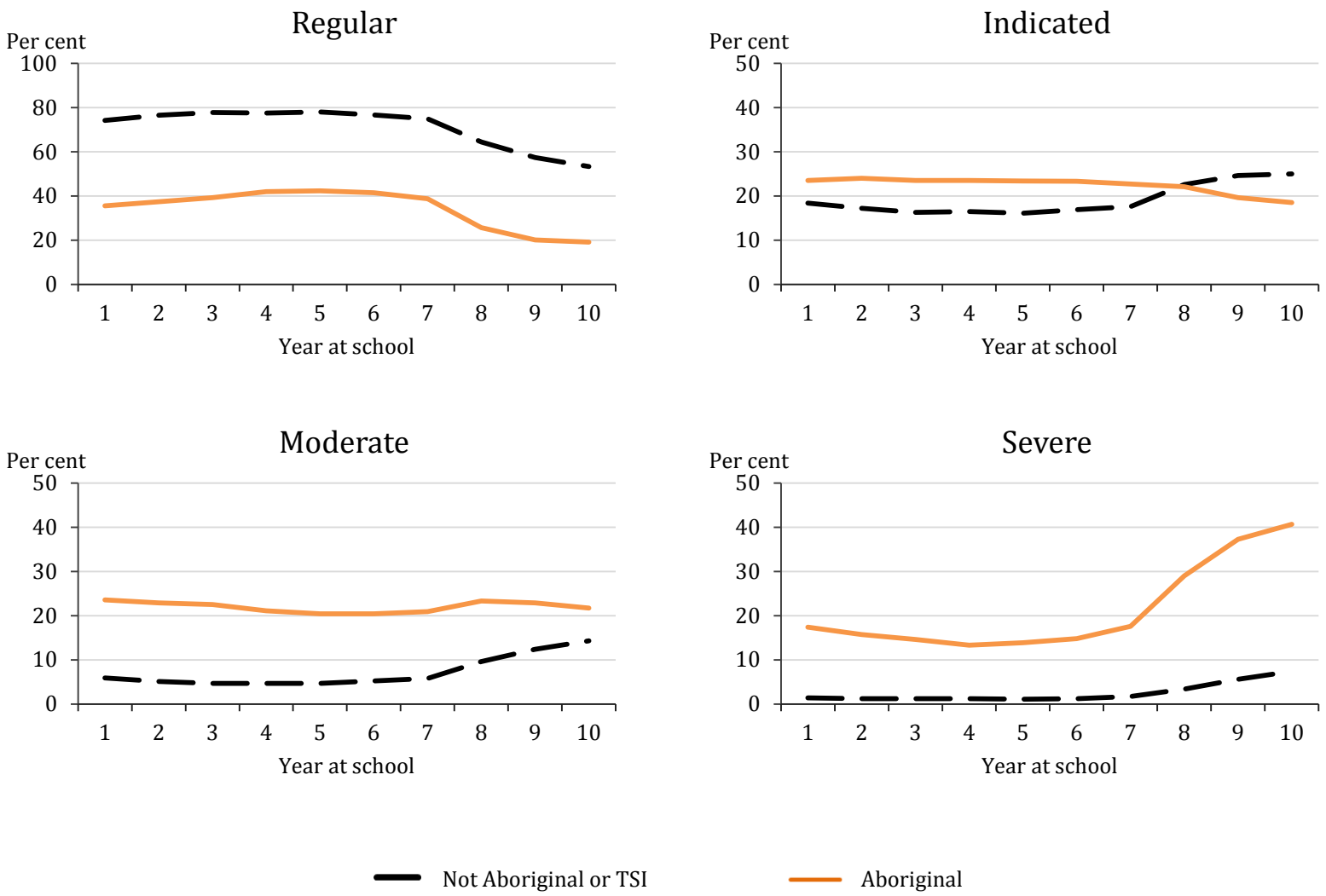


FIGURE 3.17: PROPORTION OF STUDENTS AT REGULAR, INDICATED, MODERATE AND SEVERE EDUCATIONAL RISK,, YEAR 1 TO YEAR 10, BY ABORIGINAL STATUS OF STUDENT



Main language spoken in the home

Figure 3.18 to Figure 3.20 present attendance rates by whether English or another language was the main language spoken in the home. It should be noted that we have presented a separate category for students whose language was not stated, as they form a large proportion of cases (about 17% of the study population). It is likely that the majority of students with no stated language would speak English in the home.

Overall, school attendance rates were higher for students whose main language at home was a language other than English. In other words, larger proportions of students whose main language at home was not English attended school more regularly compared with their English speaking counterparts. This disparity was of a larger magnitude among secondary than primary school students. The same pattern was observed for both authorised and unauthorised absences, with differences in relative rates between English speaking students and students who spoke a non-English language emerging in secondary school years.

With respect to educational risk categories, disparities in the patterns of regular attendance among English and non-English speaking students begin to appear in Year 2, and widen through the high school years. By Year 10, half of students who speak English at home were attending school regularly. In contrast 65% of students who spoke a language other than English at home were attending school regularly. Students who speak English at home are more likely to be categorised as being at moderate or severe educational risk than those students who did not speak English in the home, although this is only applicable to secondary students (Figure 3.20).

FIGURE 3.18: AVERAGE ATTENDANCE RATES FROM 2008 TO 2012, BY MAIN LANGUAGE SPOKEN AT HOME, PRIMARY AND SECONDARY STUDENTS

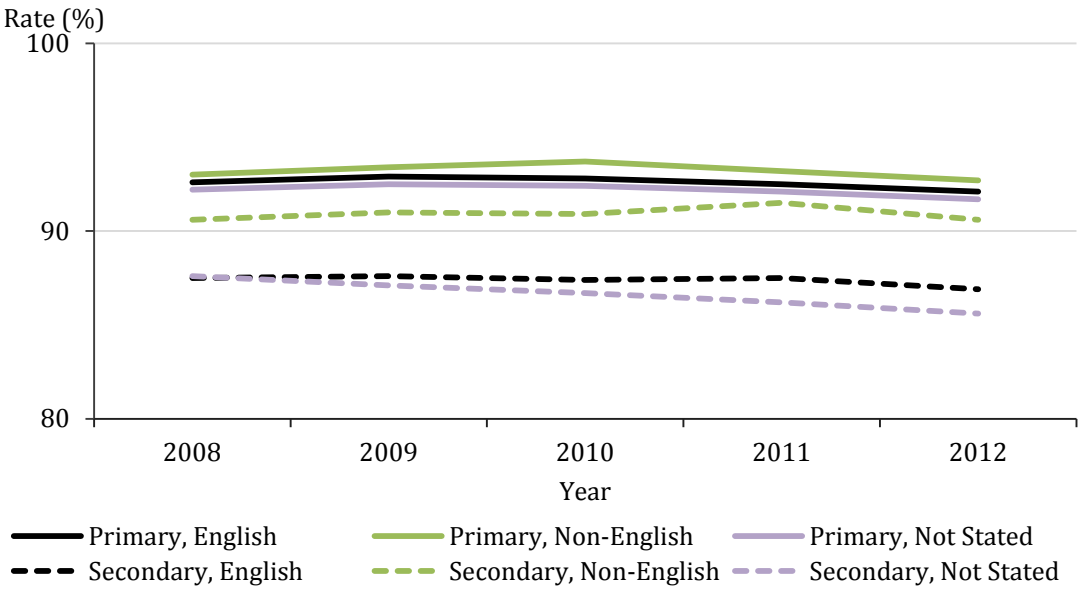


FIGURE 3.19: AVERAGE ATTENDANCE AND AUTHORISED AND UNAUTHORISED ABSENCE RATES, YEAR 1 TO YEAR 10, BY MAIN LANGUAGE SPOKEN AT HOME

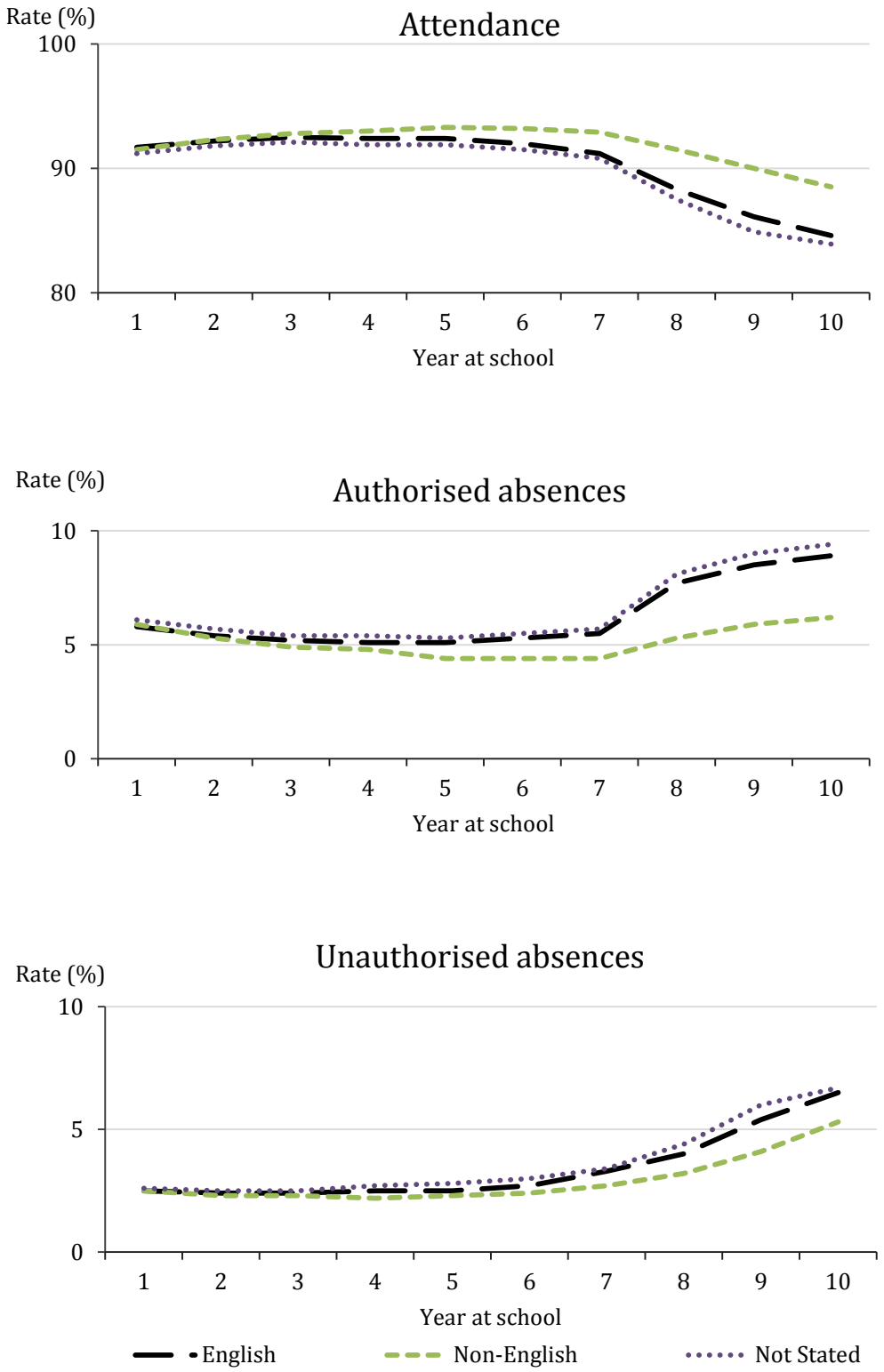
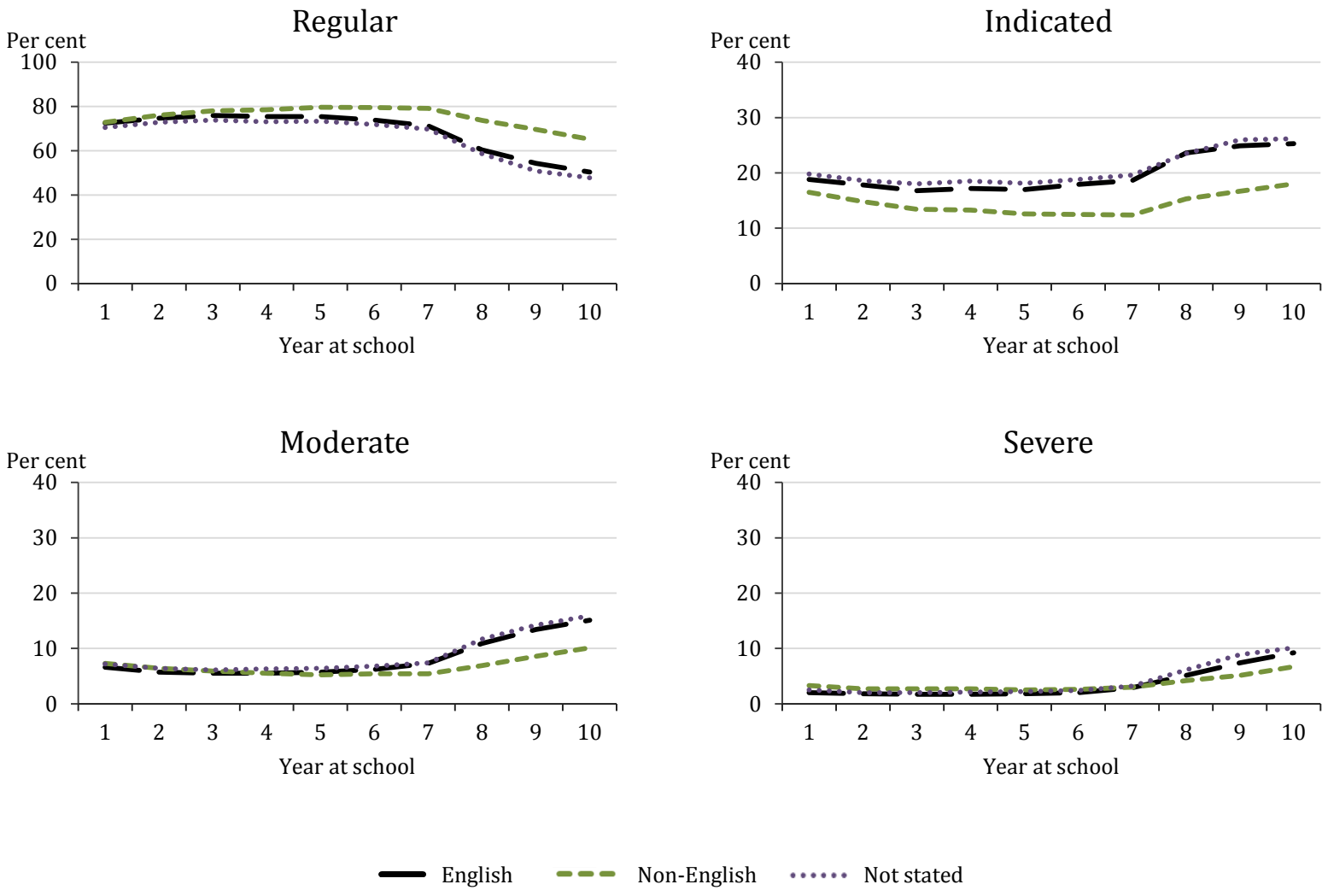


FIGURE 3.20: PROPORTION OF STUDENTS AT REGULAR, INDICATED, MODERATE AND SEVERE EDUCATIONAL RISK, YEAR 1 TO YEAR 10, BY MAIN LANGUAGE SPOKEN AT HOME



Student mobility

The results suggest that each subsequent school move had a proportionally greater adverse association with attendance (Figure 3.21 to Figure 3.25). For primary students, the attendance rate for those students who had been to two schools (one move; excluding the transition from primary school to high school) was 2 percentage points lower than those students with a single enrolment, whereas this disparity was 6 percentage points for those with four enrolments compared to those with five enrolments. Secondary students that had five or more enrolments (4 or more moves) had distinctly poorer attendance, with attendance rates of approximately 68%, on average (Figure 3.21).

Attendance rates remained reasonably stable for each mobility category over the study period, with the exception of the rates between 2008 and 2009. It should be noted, however, that there were only a small number of students with 5 or more enrolments in 2008 and this may explain the variability in the early part of the study period.

The disparities in attendance rates by student mobility were predominantly accompanied by differences in the proportion of unauthorised absences taken (Figure 3.22). Students with a greater number of enrolments had similar rates of authorised absences but they had far higher levels of unauthorised absences when compared with students who have had fewer enrolments. This is true particularly in high school. Students that have had 5 enrolments by Year 10 (in the 5-year study period), for example, tended to miss 25% of school days without a valid reason; the corresponding proportion was 5% among Year 10 students that did not move school.

The data suggest that mobility, as measured by multiple enrolments, poses a particularly acute risk for poorer attendance and onward poorer educational outcomes (Figure 3.23). Substantial proportions of the most mobile students were categorised as being at severe educational risk (attending less than 60% of the school year)—from Year 1 (15%) to Year 7 (19%), increasing dramatically at the start of high school (37% in Year 8), to a peak in Year 10 (45%).

The results also reveal that the timing of school moves is related to attendance rates. Midterm enrolments are particularly associated with poorer attendance. Figure 3.25 shows that students who had changed schools mid-term on at least one occasion had the lowest attendance rates at every level of mobility than other students, while moving at the end of a term *during* the school year was generally associated with worse attendance than moving at the end of the completed school year. The patterns in Figure 3.25 suggest that a mid-term move can have a greater detrimental effect on attendance than an additional move at the end of a term or school year.

FIGURE 3.21: AVERAGE ATTENDANCE RATES FROM 2008 TO 2012, BY STUDENT MOBILITY (NUMBER OF ENROLMENTS), PRIMARY AND SECONDARY STUDENTS

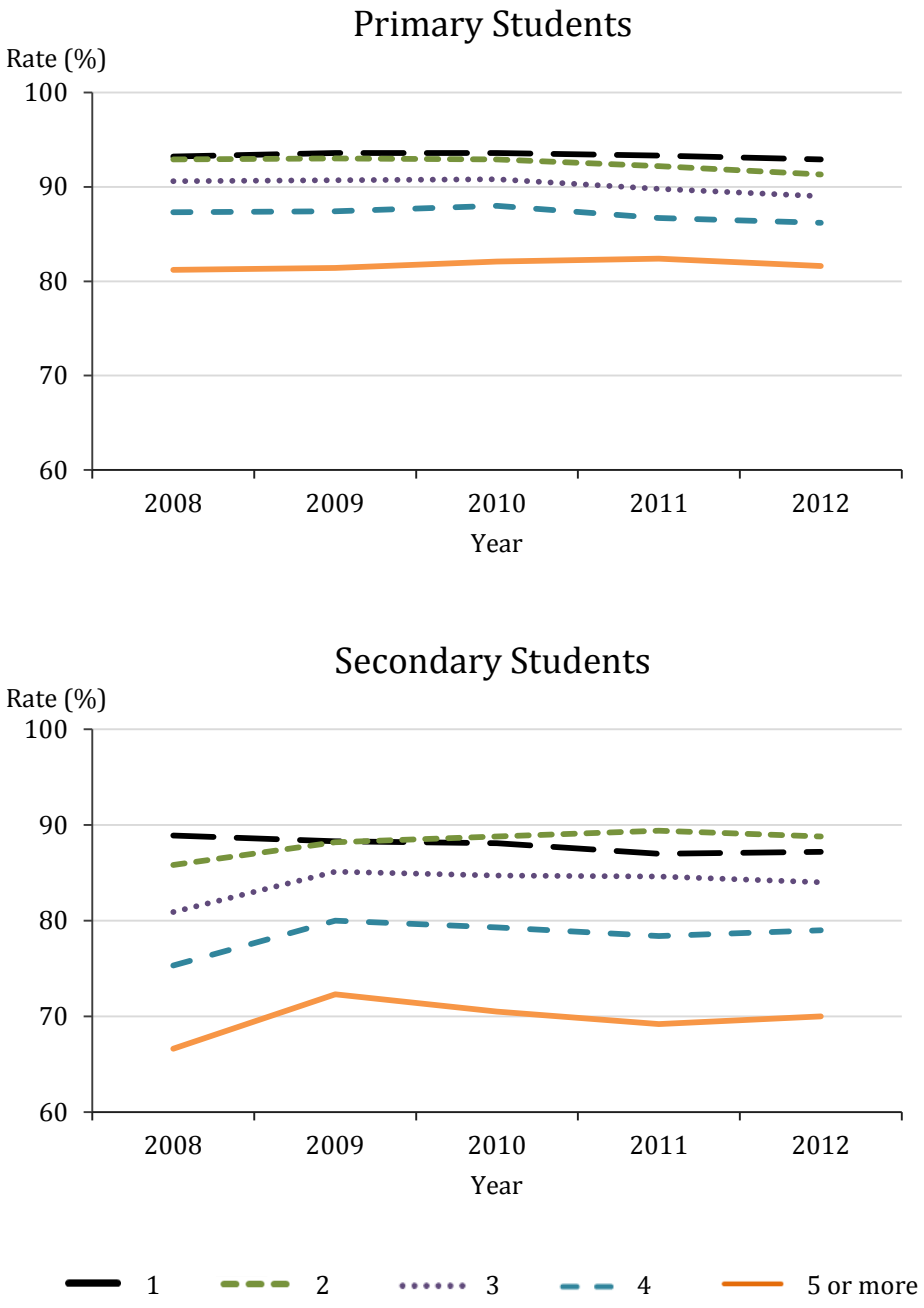


FIGURE 3.22: AVERAGE ATTENDANCE AND AUTHORISED AND UNAUTHORISED ABSENCE RATES YEAR 1 TO YEAR 10, BY STUDENT MOBILITY (NUMBER OF ENROLMENTS)

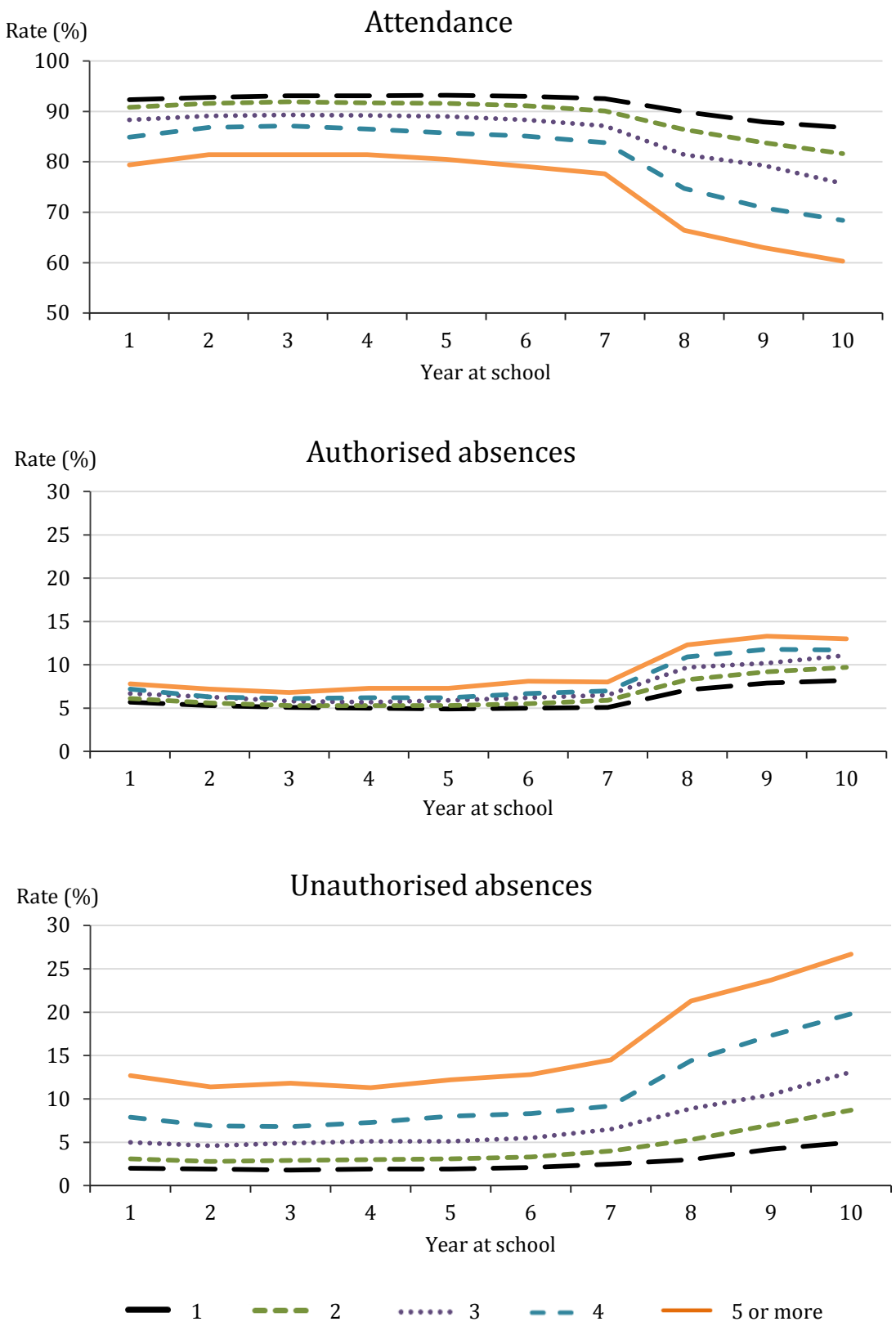


FIGURE 3.23: PROPORTION OT STUDENTS AT REGULAR, INDICATED, MODERATE AND SEVERE EDUCATIONAL RISK, YEAR 1 TO YEAR 10, BY STUDENT MOBILITY (NUMBER OF SCHOOL ENROLMENTS)

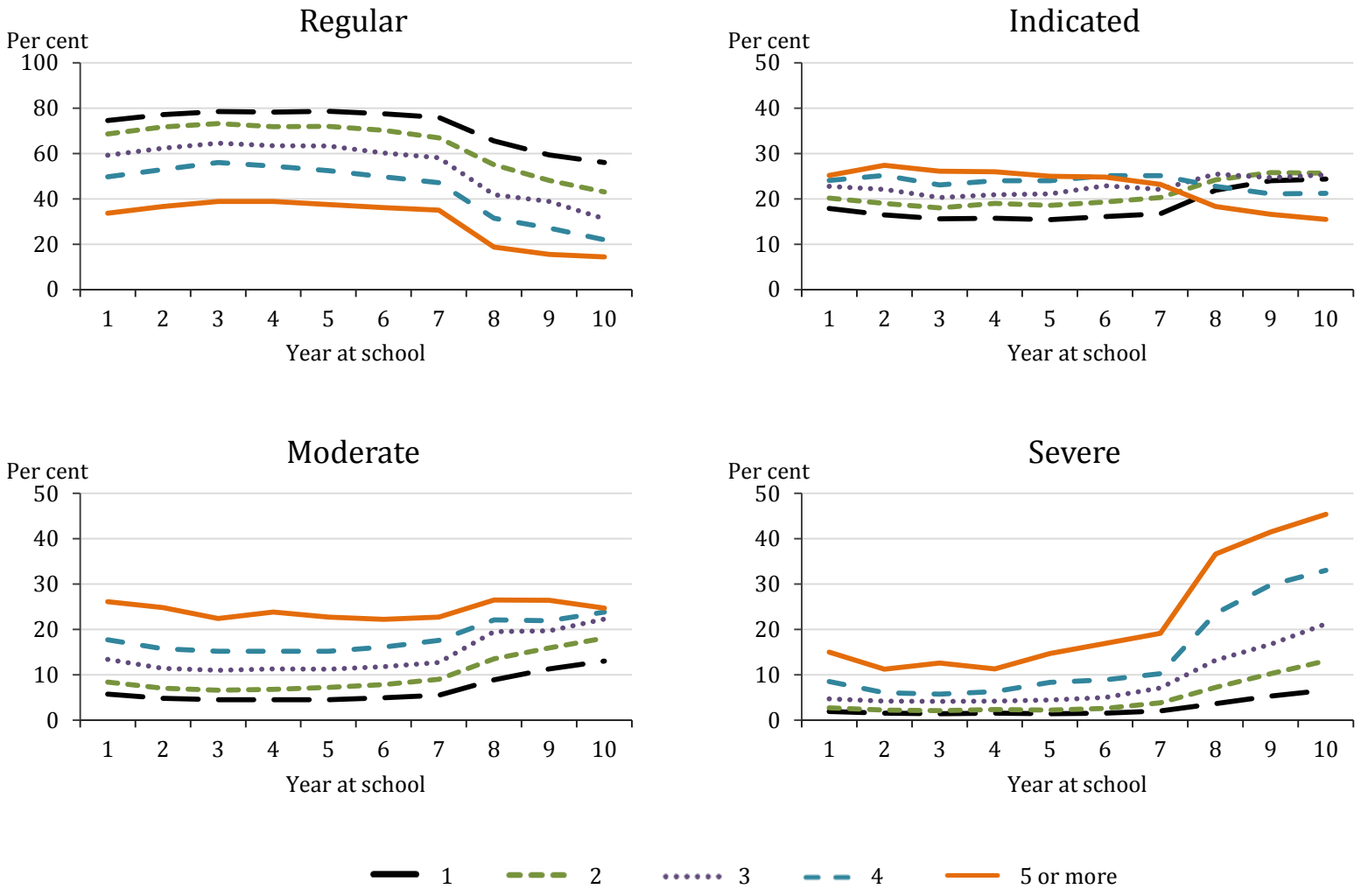


FIGURE 3.24: AVERAGE ATTENDANCE RATES, BY NUMBER OF ENROLMENTS AND THE TIMING OF SCHOOL MOVE, PRIMARY AND SECONDARY STUDENTS

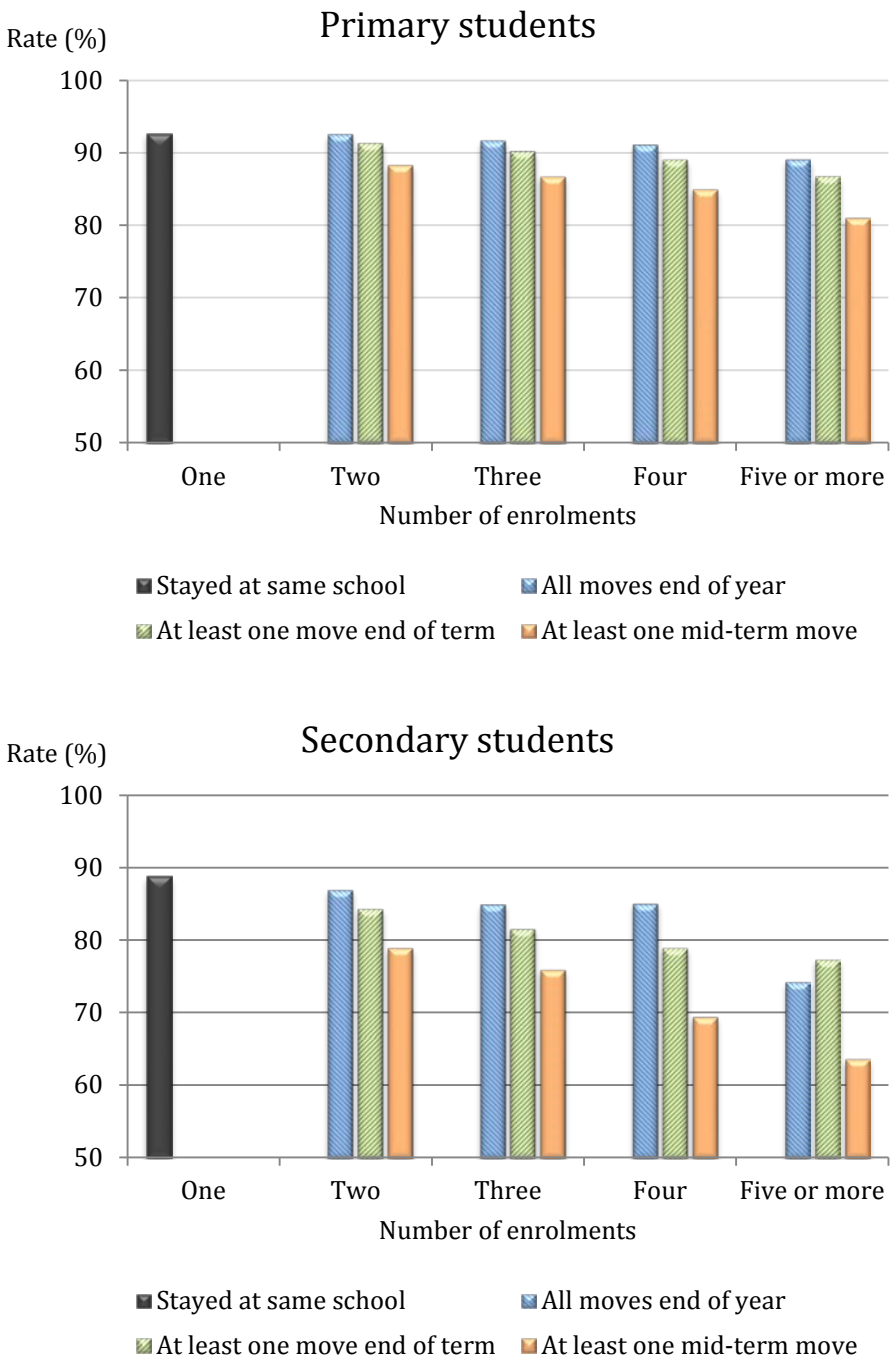
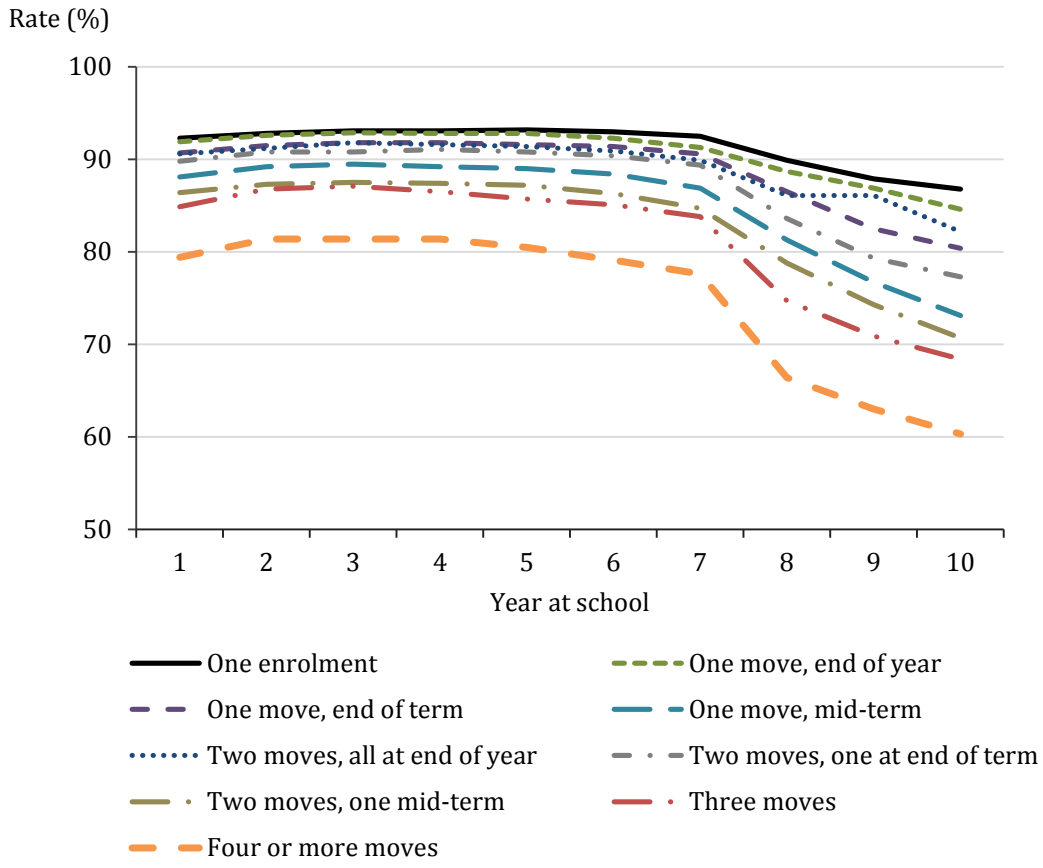


FIGURE 3.25: AVERAGE ATTENDANCE RATES, YEAR 1 TO YEAR 10, BY STUDENT MOBILITY (COMPOSITE MEASURE OF NUMBER OF ENROLMENTS AND TIMING OF SCHOOL MOVE)



Caregiver characteristics

Highest level of education

The attendance rates by the educational attainment of the student's caregivers are provided in Figure 3.26 and Table 3.1 to Table 3.4. These results, in conjunction with the earlier findings on SEI, confirm that a positive socio-economic gradient between attendance and measures of socio-economic position exists at both the family and area-levels. Distinctly higher rates of attendance are observed for students whose caregiver had completed at least Year 12.

Figure 3.26 illustrates that this pattern was evident across the spectrum of school years from early primary to later high school (with respect to the education of the mother), although it is more prominent in the high school years. For example, the average attendance rate for a primary school student with a mother that had a non-school qualification was 4 percentage points higher than that of a student whose mother had completed up to Year 9; the corresponding disparity was 8 percentage points among secondary students.

Caregiver education was also strongly associated with type of absence. Table 3.1 and Table 3.2 show that students with less educated parents were more likely to miss school

and their absences were far more likely to be unexplained. Around half of absences were unexplained among students whose mother had a Year 9 education or less, compared with around a fifth for students whose mother had a non-school qualification. The scale of difference was similar when considering the education of the father.

The educational risk profile also exhibits a socioeconomic gradient, and supports the notion that the mother's education is a stronger predictor of student attendance than the educational level of the father. Table 3.3 and Table 3.4 highlight that approximately 5% of primary students and 14% of secondary students with low maternal education were at severe educational risk, compared with 3% and 10%, respectively, for students with low paternal education. Further, the profile indicates that the proportion attending regularly in secondary school is less than 60% until caregiver education (mother or father) is at Year 12 or above.

FIGURE 3.26: AVERAGE ATTENDANCE RATES, YEAR 1 TO YEAR 10, BY HIGHEST EDUCATIONAL ATTAINMENT OF THE MOTHER

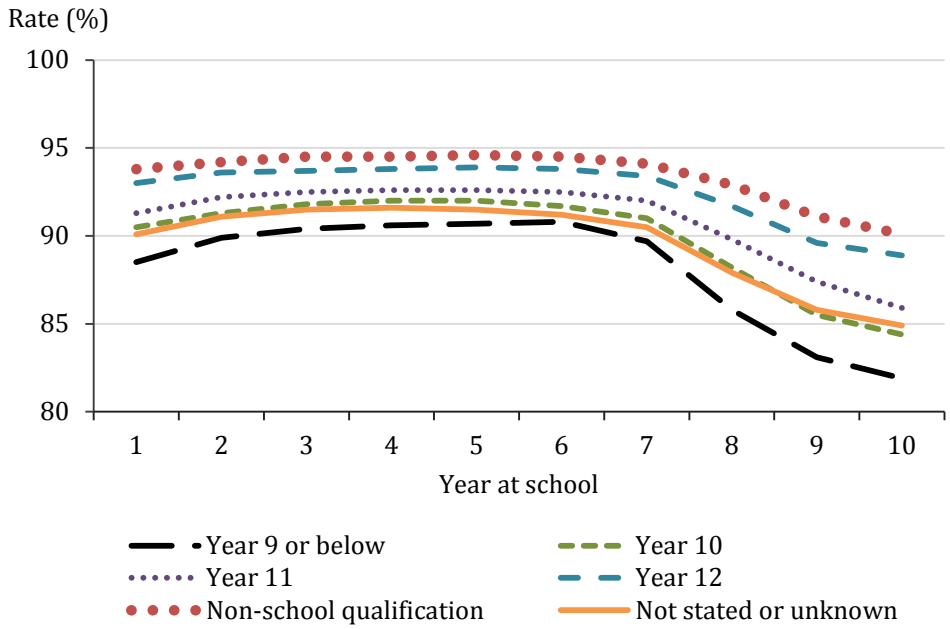


TABLE 3.1: ATTENDANCE, AUTHORISED ABSENCE AND UNAUTHORISED ABSENCE RATES, BY EDUCATIONAL ATTAINMENT OF THE MOTHER

Mother's education	*Attendance Rate*	*Authorised Absence Rate*	*Unauthorised Absence Rate*	*% of absences that are unauthorised*
Primary Students				
Year 9 or below	89.6	5.3	5.2	49.6
Year 10	90.9	5.7	3.3	36.9
Year 11	91.7	5.5	2.7	32.9
Year 12	93.1	5.2	1.6	23.9
Non-school qualification	93.9	5.1	1.0	17.0
Not stated	90.3	5.4	4.3	44.7
Secondary Students				
Year 9 or below	82.6	8.4	9.1	51.9
Year 10	84.9	9.2	5.9	39.2
Year 11	86.6	8.6	4.8	35.7
Year 12	89.1	7.8	3.1	28.2
Non-school qualification	90.6	7.4	2.0	21.6
Not stated	84.4	8.2	7.4	47.5

TABLE 3.2: ATTENDANCE, AUTHORISED ABSENCE AND UNAUTHORISED ABSENCE RATES, BY EDUCATIONAL ATTAINMENT OF THE FATHER

Father's education	*Attendance Rate*	*Authorised Absence Rate*	*Unauthorised Absence Rate*	*% of absences that are unauthorised*
Primary Students				
Year 9 or below	91.3	5.2	3.5	40.5
Year 10	92.4	5.4	2.2	29.1
Year 11	92.7	5.3	2.0	27.4
Year 12	93.2	5.3	1.5	22.2
Non-school qualification	94.1	5.0	0.9	15.6
Not stated	90.5	5.5	4.0	42.0
Secondary Students				
Year 9 or below	85.0	8.4	6.5	43.7
Year 10	87.2	8.5	4.2	33.1
Year 11	88.2	8.1	3.7	31.6
Year 12	89.5	7.7	2.8	26.7
Non-school qualification	91.6	6.8	1.5	18.3
Not stated	83.9	8.6	7.4	46.3

TABLE 3.3: PROPORTION OF STUDENTS AT REGULAR, INDICATED, MODERATE AND SEVERE EDUCATIONAL RISK, BY EDUCATIONAL ATTAINMENT OF THE MOTHER

Mother's education	*Regular*	*Indicated*	*Moderate*	*Severe*
Primary Students				
Year 9 or below	66.4	18.2	10.3	5.1
Year 10	68.7	20.8	8.1	2.4
Year 11	72.0	19.4	6.8	1.8
Year 12	77.6	16.8	4.6	1.0
Non-school qualification	81.4	14.1	3.6	0.9
Not stated	68.8	18.3	8.4	4.4
Secondary Students				
Year 9 or below	49.9	21.3	15.4	13.5
Year 10	49.5	26.6	15.4	8.5
Year 11	54.1	25.9	13.5	6.5
Year 12	61.9	23.7	10.5	3.8
Non-school qualification	67.8	21.0	8.3	2.9
Not stated	51.6	23.5	14.4	10.4

TABLE 3.4: PROPORTION OF STUDENTS AT REGULAR, INDICATED, MODERATE AND SEVERE EDUCATIONAL RISK, BY EDUCATIONAL ATTAINMENT OF THE FATHER

Father's education	*Regular*	*Indicated*	*Moderate*	*Severe*
Primary Students				
Year 9 or below	70.8	18.5	8.1	2.7
Year 10	74.6	18.5	5.6	1.3
Year 11	75.8	17.7	5.3	1.2
Year 12	78.2	16.4	4.4	0.9
Non-school qualification	82.3	13.5	3.3	0.9
Not stated	68.7	19.1	8.4	3.7
Secondary Students				
Year 9 or below	52.8	23.8	13.9	9.6
Year 10	56.0	25.7	12.9	5.4
Year 11	58.6	24.8	11.9	4.7
Year 12	62.7	23.7	10.2	3.4
Non-school qualification	71.5	19.7	6.9	1.9
Not stated	50.0	24.2	15.1	10.8

Occupation

Table 3.5 to Table 3.8 present attendance rates by the occupation of the student's caregivers. While the pattern of the results continue to reflect a socio-economic gradient, the magnitude of these disparities between students whose parents are at the low and high ends of the occupational spectrum is smaller than those observed for SEI and caregiver education. This may, in part, be an artefact of the limited quality of caregiver occupation data although it is generally consistent with findings that have shown stronger links between child development and parental education as opposed to parental occupational status. Nonetheless, occupational status in these data is generally recorded at enrolment and is not systematically updated. It is possible that the data have not captured improvements that can occur in a person's occupational status over time, and this may understate the disparities in attendance rates by caregiver occupation.

Students with a caregiver that was not employed (unemployed or not in the labour force) had the worst attendance outcomes. They also had more days of unexplained absence than other students, in both primary and secondary education. Up to 47% of absence was considered unauthorised for students with an unemployed father.

While it has been suggested that the occupation of the father is a more proximate determinant of child outcomes that that of the mother (e.g. Gregg, Propper & Washbrook, 2007), we found similar associations between attendance and the occupation of mothers and fathers. This is also reflected in the educational risk profile by caregiver occupation, although students with a father that was not employed were the most likely to be at severe educational risk (10%).

TABLE 3.5: ATTENDANCE, AUTHORISED ABSENCE AND UNAUTHORISED ABSENCE RATES, BY MOTHER'S OCCUPATION

Mother's occupation[a]	*Attendance Rate*	*Authorised Absence Rate*	*Unauthorised Absence Rate*	*% of absences that are unauthorised*
Primary Students				
Group 1 (higher skilled)	94.0	5.0	1.0	16.6
Group 2	93.4	5.2	1.4	20.6
Group 3	93.4	5.1	1.4	22.0
Group 4 (lower skilled)	92.6	5.3	2.1	28.7
Not employed[b]	91.7	5.6	2.8	33.1
Not stated	90.6	5.5	3.9	41.9
Secondary Students				
Group 1 (higher skilled)	90.2	7.7	2.1	21.4
Group 2	89.3	8.1	2.7	24.8
Group 3	89.0	8.1	2.9	26.1
Group 4 (lower skilled)	87.5	8.3	4.2	33.5
Not employed[b]	85.8	8.3	5.9	41.7
Not stated	84.4	8.5	7.1	45.6

[a] Group 1 includes senior management in large business organisation, government administration and defence, and qualified professionals. Group 2 includes other business managers, arts/media/sportspersons and associate professionals. Group 3 includes tradespeople, clerks and skilled office, sales and service staff. Group 4 includes machine operators, hospitality staff, assistants, labourers and related workers. See Appendix D for further details.

[b] In the last 12 months.

TABLE 3.6: ATTENDANCE, AUTHORISED ABSENCE AND UNAUTHORISED ABSENCE RATES, BY FATHER'S OCCUPATION

Father's occupation[a]	*Attendance Rate*	*Authorised Absence Rate*	*Unauthorised Absence Rate*	*% of absences that are unauthorised*
Primary Students				
Group 1 (higher skilled)	94.0	5.1	0.9	15.3
Group 2	93.8	5.1	1.1	17.5
Group 3	93.4	5.2	1.4	21.8
Group 4 (lower skilled)	92.5	5.3	2.1	28.7
Not employed[b]	89.9	5.5	4.6	45.2
Not stated	91.4	5.4	3.2	36.9
Secondary Students				
Group 1 (higher skilled)	91.4	7.0	1.6	18.2
Group 2	90.5	7.6	1.9	20.0
Group 3	89.2	7.9	2.9	27.1
Group 4 (lower skilled)	87.5	8.3	4.3	34.0
Not employed[b]	84.6	8.2	7.2	46.6
Not stated	85.8	8.3	5.9	41.6

[a] Group 1 includes senior management in large business organisation, government administration and defence, and qualified professionals. Group 2 includes other business managers, arts/media/sportspersons and associate professionals. Group 3 includes tradespeople, clerks and skilled office, sales and service staff. Group 4 includes machine operators, hospitality staff, assistants, labourers and related workers. See Appendix D for further details.

[b] In the last 12 months.

TABLE 3.7: PROPORTION OF STUDENTS AT REGULAR, INDICATED, MODERATE AND SEVERE EDUCATIONAL RISK, BY MOTHER'S OCCUPATION

Mother's occupation[a]	*Regular*	*Indicated*	*Moderate*	*Severe*
Primary Students				
Group 1 (higher skilled)	82.3	13.6	3.3	0.8
Group 2	78.9	16.3	4.0	0.8
Group 3	79.1	16.1	4.0	0.8
Group 4 (lower skilled)	75.4	17.9	5.5	1.2
Not employed[b]	72.3	18.5	7.0	2.3
Not stated	69.2	19.0	8.3	3.6
Secondary Students				
Group 1 (higher skilled)	66.6	21.6	8.6	3.2
Group 2	62.1	24.1	10.4	3.4
Group 3	61.2	24.5	10.6	3.7
Group 4 (lower skilled)	56.8	25.1	12.7	5.4
Not employed[b]	54.9	23.3	13.4	8.4
Not stated	50.6	24.5	14.9	10.0

[a] Group 1 includes senior management in large business organisation, government administration and defence, and qualified professionals. Group 2 includes other business managers, arts/media/sportspersons and associate professionals. Group 3 includes tradespeople, clerks and skilled office, sales and service staff. Group 4 includes machine operators, hospitality staff, assistants, labourers and related workers. See Appendix D for further details.
[b] In the last 12 months.

TABLE 3.8: PROPORTION OF STUDENTS AT REGULAR, INDICATED, MODERATE AND SEVERE EDUCATIONAL RISK, BY FATHER'S OCCUPATION

Father's occupation[a]	*Regular*	*Indicated*	*Moderate*	*Severe*
Primary Students				
Group 1 (higher skilled)	82.1	13.8	3.3	0.8
Group 2	81.0	15.0	3.4	0.7
Group 3	78.6	16.4	4.2	0.7
Group 4 (lower skilled)	74.7	18.4	5.6	1.2
Not employed[b]	67.0	18.4	10.3	4.3
Not stated	71.7	18.4	7.3	2.6
Secondary Students				
Group 1 (higher skilled)	70.7	19.9	7.4	2.0
Group 2	66.6	22.4	8.6	2.4
Group 3	61.5	24.6	10.5	3.4
Group 4 (lower skilled)	56.5	25.3	12.8	5.3
Not employed[b]	53.6	21.7	14.2	10.5
Not stated	53.5	24.8	13.9	7.9

[a] Group 1 includes senior management in large business organisation, government administration and defence, and qualified professionals. Group 2 includes other business managers, arts/media/sportspersons and associate professionals. Group 3 includes tradespeople, clerks and skilled office, sales and service staff. Group 4 includes machine operators, hospitality staff, assistants, labourers and related workers. See Appendix D for further details.
[b] In the last 12 months.

SUMMARY AND CONCLUSIONS

In this chapter we aimed to provide a profile of attendance and absence among Western Australia students across Years 1 to 10.

We focussed primarily on changes in aggregate attendance rates across time and between students with different school, socio-economic and demographic characteristics. The pattern of results was predominantly consistent with prior knowledge and expectations—and in this respect there were four key overarching features: (1) attendance rates are consistently high in primary school and fall away sharply in the secondary years; (2) there are distinct disparities in attendance. Typically, more mobile students, students in more remote areas, those with worse socio-economic circumstances and those who identified as Aboriginal tended to have poorer attendance records than others; in addition, the results indicate that students whose main language at home is not English have slightly better attendance; (3) these disparities in attendance are evident from Year 1, and are carried into and become wider in secondary school; and (4) unauthorised absences appear to explain the gaps in attendance between different student groups, at all levels of education. Points 3 and 4 strongly suggest that attendance patterns are established early, and are very likely to be influenced by factors and events prior to school entry—such as caregiver attitudes and expectations toward education (Dalziel & Henthorne, 2005; Keating & Hertzman, 1999; Zubrick et al., 2006), family functioning (Gray & Beresford, 2002) and the health of family members, among others.

The attendance disparities documented in this chapter translate into measurable and meaningful differences in the amount of school that some students actually experience relative to others. For example, Year 10 students that had been to 5 or more schools tended to miss an extra 5 weeks of school during Semester 1 when compared with Year 10 students with a single enrolment. Similar scales of difference were observed for those at either end of the spectrum of remoteness and SEI, and between Aboriginal and non-Aboriginal students. Disparities in attendance of this magnitude are likely to have profound impacts on the performance of students in less advantaged groups and their onward development and life circumstances.

The results of this chapter are descriptive in nature and should be seen as the first step in our investigation of the relationships between attendance and its risk factors. The following chapter applies more complex statistical techniques to examine these risk factors simultaneously and assess their independent effects on attendance. Accordingly, the *Summary and Conclusion* section of Chapter 4 (and Chapter 9) provides a more detailed discussion of the implications of our findings on the patterns of primary and secondary school attendance.

CHAPTER 4 EXAMINING CHANGE IN ATTENDANCE RATES OVER TIME

Background

Chapter 4 expands on the findings presented in Chapter 3, and addresses the following research questions:

— What are the independent contributions of key school, socio-economic and demographic factors to attendance rates? How do these factors relate to attendance at the beginning of primary and secondary school, and changes in attendance through the school years? Is there a turning point where attendance starts to decline for disadvantaged students?

We follow two groups of students (a primary school group and a secondary school group) over time, using longitudinal analytic methods to address these questions.

Highlights

- The most disadvantaged students (Aboriginal students in very remote schools in the least advantaged SEI quintile) missed more than a day of school each week. This equates to about 1 term of school each year, resulting in 1.7 years of missed school by the end of the primary years (Year 7).
- In contrast, the most advantaged primary students (non-Aboriginal students in metropolitan schools in the most advantaged SEI quintile) missed less than 4 months of school by the end of Year 7.
- Between Years 8 and 10, the most disadvantaged students were absent from school for around one year out of three.

Summary of findings

- Attendance rates were distinctly lower for more mobile students, those attending schools in remote areas, students with worse socio-economic circumstances, and Aboriginal students.
- The disparities in attendance were wider for students with multiple disadvantages compared with students with fewer disadvantages.
- The attendance disparities are evident from the start of Year 1 and are generally maintained throughout the rest of the primary years. They become wider with each additional year of school for secondary students.

CHAPTER OVERVIEW

In Chapter 3 we provided a cross-sectional, bivariate analysis of the variety of factors and characteristics related to attendance rates at school, using all available data. These analyses provided an introductory and descriptive overview of attendance patterns. These analyses provide a useful overview of school attendance but they obscure more nuanced relationships. For example, are the disparities in attendance rates between schools in metropolitan Perth and Very Remote Areas a function of school remoteness, or are these disparities simply because schools in more remote areas have a higher proportion of

Aboriginal students? Conversely, is the disparity between Aboriginal and non-Aboriginal attendance rates a function of their Aboriginal status, or due to socio-economic differences or because a higher proportion of Aboriginal than non-Aboriginal students simply live in remote areas? Multivariate analytic techniques, adopted for this chapter, allow us to untangle some of these relationships and examine the independent contribution that each of these factors makes towards attendance rates.

In this chapter we adopt a longitudinal methodology to track two groups of students—a primary and a secondary cohort—to assess two different aspects of student attendance. The first aspect is baseline attendance, for example, attendance rates in Year 1. The second aspect is how attendance rates change over time, that is, for any given student does attendance increase, decrease, or stay the same throughout the period of study? We examine the independent effects of the key factors introduced in Chapter 3, Aboriginal status and remoteness for example, on both baseline levels of attendance, and in the rates of change in attendance over time. This allows us to ask questions such as, what is the attendance gap between Aboriginal and non-Aboriginal in Year 1 once other factors have been taken into account, and then does this gap get wider, smaller, or stay the same as these students progress through school? To this end, the patterns we examine in this Chapter are similar to those presented in Chapter 3, but now we can examine these patterns as independent effects.

To this end, the findings presented in this chapter aims to address the following key questions:

- What are the independent contributions of each of the key factors (e.g. remoteness, Aboriginal status) to attendance rates?
- How do these factors influence attendance at the beginning of primary and secondary school (baseline attendance) and changes in attendance through the school years?
- Can we identify a turning point where attendance starts to decline for disadvantaged students?

METHODS

The analysis in this chapter is conducted on the Analysis Long File (see *Overview of Project Data* section in Chapter 2). The sole outcome variable is student attendance at school. The primary explanatory variables include school-level socio-economic and geographic indicators, and the characteristics of students and their caregivers.

Measuring attendance

The primary metric of attendance used in this chapter is the overall attendance rate for a student measured in actual half-days. This is calculated by subtracting the number of authorised and unauthorised half-day absences from the total number of half-days the student was available to attend and then dividing this number by the total number of available half-days (see Chapter 3 for more details on measuring attendance). All calculations are based on Semester 1 attendance information.

Defining the student cohorts

The results from Chapter 3 demonstrated that overall attendance rates were very stable across the primary school years, with more observable declines in this rate commencing upon the transition into high school. Based on those patterns, the analyses in this chapter focussed on two separate cohorts of students, a primary and secondary cohort. The primary cohort was defined as students who were in Years 1, 2 or 3 in 2008. We followed the same students as they progressed to Years 5, 6 or 7 in 2012, allowing an analysis across the full range of the primary school years.

TABLE 4.1: OVERVIEW OF STUDENT PROGRESSION THROUGH SCHOOL, BY CALENDAR YEAR.

Year of Commencement	2008	2009	2010	2011	2012	
	Year at school					
2012					1	
2011				1	2	
2010			1	2	3	
2009		1	2	3	4	
2008	1	2	3	4	5	Primary cohort
2007	2	3	4	5	6	
2006	3	4	5	6	7	
2005	4	5	6	7	8	
2004	5	6	7	8	9	
2003	6	7	8	9	10	Secondary cohort
2002	7	8	9	10		
2001	8	9	10			
2000	9	10				
1999	10					

The secondary student cohort was defined using different parameters, with a more limited number of in-scope secondary years. The baseline for the secondary student cohort was chosen to be Year 7. Though Year 7 still falls within the domain of primary school, this point was chosen as a means of providing a baseline attendance rate *prior* to students entering secondary school. The cohort can be identified in summary Table 4.1, but in brief, secondary students were included in the analytic cohort if they had at least three years of attendance data commencing from Year 7. Students were also included if they commenced Year 8 in 2008 as these students also had three years of secondary school attendance records.

Analytic techniques

This chapter features the use of multivariate multi-level regression modelling to examine the relationships between attendance and a range of potential risk and protective factors.

Multivariate multi-level regression modelling

Multi-level modelling is a particular multivariate statistical technique that was developed to account for correlation among observations within nested data structures. In education research, multi-level models are typically used to account for the similarities observed among students within the same school, or similarities observed among schools within the

same district, and to determine how much variation in the data can be accounted for by student-level factors versus school-level factors. Longitudinal data is simply another form of nested data, with multiple observations for each student. Two-level models (e.g. observations within students, or students within schools) are most commonly adopted, though three-level models or higher may also be developed (e.g. observations within students within schools). In order to present the results as simply and coherently as possible, in this chapter we present only a two-level longitudinal model, separately for our two cohorts. Other limitations of multi-level modelling, discussed below, also guided this decision.

Specification of the models

In longitudinal models, time—or a proxy of time—is used as the key predictor. For these analyses, Year in School is the variable that represents time. For the primary cohort for example, the models provide values that indicate differences in Year 1 attendance rates among different groups of students, and then how these rates change for each additional year of school.

Given the structure of the dataset used here (Analysis Long File)—where each student has multiple records in the data set—it is possible for key covariates (or predictors) to change over time. For example, a student may enrol in an Inner Regional school in Year 1, and move to an Outer Regional school in Year 3, and school location may therefore be time-varying. A fixed factor, in contrast, relates to characteristics that typically don't change, for example, gender or Aboriginal status. In order to simplify the analysis and the interpretation of results, all time-varying factors were modified to become fixed factors, generally by selecting the first listed observation. In the example above, a student would be coded as having attended an Inner Regional school. The first listed observation was selected in order to coincide with the intercepts of the longitudinal models, that is, the factors largely reflect the characteristics of students as of Year 1 in the primary schools model. For the secondary cohort, we selected the school characteristics (SEI quintile and remoteness) of the school that students were attending in Year 8, to adequately reflect their secondary school experiences.

Interpreting regression model results

The model parameters presented in the results section of this chapter are presented as 'estimates of difference', which may be interpreted in the same manner as typical multivariate linear regression models. These estimates (or regression coefficients) are calculated relative to a reference category for each variable. These values can be interpreted as the difference in the outcome variable between one category and the reference category for the characteristic of interest. For instance—and hypothetically—if our outcome of interest was average attendance and the estimate of difference for females was -5.0 then this would suggest that the attendance rate for females was 5 percentage points lower than that for males.

The absolute values for males compared with females will depend on the value of the intercept and the inclusion of other variables in the model. For example, does a 5 percentage point difference equate to 85% vs. 90% or 60% vs. 65%? If the intercept value is 90.0 and there are no other variables in the model, then we can estimate that, on

average, female students have an attendance rate of 85% compared with 90% for males. Extending our hypothetical example, if Aboriginal status was *also* included in the model, and the estimate of difference for Aboriginal students was -10.0 percentage points, then we can say that, holding other factors equal, the attendance rate for Aboriginal students was on average 10 percentage points lower than that for non-Aboriginal students. In terms of absolute value, however, we would also need to consider gender. With an intercept of 90%, we can estimate that the hypothetical attendance rates are as follows:

- Non-Aboriginal male 90%
- Non-Aboriginal female 85%
- Aboriginal male 80%
- Aboriginal female 75%

Here we can see that the effect of gender is 5 percentage points independent of Aboriginal status, and the effect of Aboriginal status is 10 percentage points independent of gender. However, the estimated attendance rate value needs to take into account both gender and Aboriginal status in addition to the intercept.

The multi-level regression coefficients are presented as estimates of difference, and are produced for two key outcomes: attendance rates at baseline (the intercept; Year 1 in the case of primary students, and Year 7 for secondary students); and change in attendance rates over time (slope).

Limitations of multi-level models

Even when using longitudinal data, causation cannot be inferred from the model results presented here. As with other regression techniques, the relationship between predictor X and outcome Y may be explained by presence of a third underlying and unobserved variable. The results presented in this chapter simply describe what these relationships are using the information that is available within the WA student attendance system. It is possible that other unmeasured factors, such as students' or parents' social or emotional wellbeing may impact on attendance at school. This in turn may be correlated with other variables that are available such as measures of school or caregiver socio-economic status.

The ability of the multi-level models to create robust and meaningful results requires a reasonable degree of variation in the attendance rates among the students in our cohorts. If there is not enough variation either within-students or between-students the statistical models struggle to converge. For the analyses presented in this chapter, and particularly for primary students, we faced several difficulties in achieving model convergence—primarily, as a result of very stable attendance trends. That is, while there was some variation among students in overall attendance rates (as shown in differences in the intercept values, described below) for primary students, there was very little difference between students in how attendance changed over time (it was stable for all students). In order for the models to converge, some variables were eliminated from the model, and more information on our approach is provided below. Convergence was less of a problem for secondary students as there was more variation among students.

Modelling Approach

It is a common occurrence when developing statistical models to find one or more variables that do not independently contribute to the outcome. In such cases, variables that are not statistically significantly associated with the outcome of interest can be removed from the model, in order to create the simplest model that describes the outcome. Removal of variables from the model in order to achieve model convergence is consistent with standard statistical practice in developing the most parsimonious model to describe the outcome being investigated.

In this chapter, and in subsequent chapters where multi-level modelling is used, our approach was to include all candidate variables in the initial model. Where there were problems with model convergence, variables that showed no relationship, or those with the weakest relationship to the outcome variable (in this chapter, attendance rates) were removed in a stepwise process until model convergence was achieved.

The estimates produced in this study have been subject to rigorous statistical analysis. The data in the study come from complete censuses of students enrolled in government schools in Western Australia over the study period, so there is no uncertainty in the results due to sampling. However, even where full population data are used it is possible that small variations in attendance rates could occur from year to year by chance alone. All model estimates have been shown with 95% confidence intervals. These confidence intervals indicate the degree of fluctuation that might be expected in the estimates due to random variation alone. These confidence limits indicate that there is a 95% chance that the true value for a data item lies between the upper and lower limits. If the confidence interval includes 0, this typically indicates that the estimate of difference is not significantly different to 0, meaning that there is no significant difference in attendance rates. Typically confidence intervals are wider where fewer students contribute to an estimate, for example, students from non-English speaking backgrounds, or Aboriginal students. For the benefit of the reader, we differentiate non-significant results (grey text) from significant results (black text) in all tables in this chapter.

RESULTS

The longitudinal modelling results for the primary cohort are shown in Table 4.2. and the secondary cohort in Table 4.3. Both tables include five columns of data. The first column simply presents the proportion of students in the cohort falling into each of the listed categories. For example, in Table 4.2, 66% of primary students attended schools in the Perth metropolitan area and 6% were in Remote schools.

The second column provides the estimated difference in baseline attendance rates (i.e. Year 1 attendance) by the different factors in the model. The third column provides the 95% confidence interval for these estimated differences in baseline attendance. The fourth column provides the estimated difference in the rate of change in attendance per year of school (or difference in average slope in attendance for different groups of students). The fifth column provides the 95% confidence interval for this difference. The results are discussed below in relation to each factor presented in the table.

Primary Students

Reference group

The *reference group baseline* estimates the average attendance rate in Year 1 for an advantaged (reference) group of students, or those students who:

- were in the most advantaged Socio-Economic Index for schools (SEI) quintile
- attended a school in metropolitan Perth
- were enrolled in only one school over the 5-year period
- were non-Aboriginal
- spoke English in the home
- were male
- had a mother and a father with a post-school qualification
- had a mother and a father with a Group 1 (professional) occupation.

Therefore the average attendance rate for students with all of these characteristics was estimated to be 95.5% in Year 1.

The *reference group slope* provides the rate of change in attendance rates for this same group of students. On average, attendance declined by 0.1 percentage points for every additional year of school. Therefore, by Year 7 the average attendance rate for this group would be 94.9% (95.5 – [6 years x 0.1]), indicating that students in the reference group tend to have consistently high attendance in school.

School-level characteristics

School socio-economic disadvantage

School SEI was significantly associated with attendance rates both in terms of the amount of school that students attend when they first commence school and then for each year thereafter.

For example, attendance rates for students in Year 1 in the most disadvantaged SEI quintile were, on average, 1.5 percentage points lower than those for students in the most advantaged quintile. For these students, their attendance rates then declined on average by an additional 0.2 percentage points per year when compared with students in the most advantaged quintile.

If we apply these results to the attendance rate of the reference group (defined above), we can calculate attendance rates for students in separate SEI quintiles. For example, students in the most disadvantaged SEI quintile—but otherwise with the same characteristics as those in the reference group—had an attendance rate in Year 1 of 94.0% (95.5 – 1.5). The average decline in their onward attendance rate would be 0.3 percentage points (0.1 + 0.2) for each year of school. By Year 7, the average attendance rate for a student in the most disadvantaged SEI quintile would be 92.2% [95.5 – 1.5 – (6 years x 0.3)]. Therefore, while the difference in attendance rates in Year 1 appeared to be quite minor (1.5 percentage points, or around 1-2 days per semester), by Year 7 the difference was somewhat larger, with students in the most disadvantaged SEI quintile absent for an additional 2.7 days more per semester than students in the most advantage quintile (i.e. around 7.7 days per

semester compared with 5). Alternatively put, 2.7 days per semester represents the independent effect of school SEI on attendance (over and above the effect all of the other factors in the model) when comparing the most disadvantaged SEI with the most advantaged SEI.

The remaining results show similar, though more attenuated patterns for the other SEI quintiles. Students in the second SEI quintile had a slightly higher attendance rate at Year 1 compared with those in the highest quintile (0.3 points higher), although they also had a slightly faster rate of decline (by 0.1 percentage points per year). As such, the difference in attendance rates would be eliminated by Year 3, and reversed by Year 7, on average. Minor declines over time were also observed for the other SEI quintiles, and suggest that students in the second to fifth quintiles miss around 1 day extra of school per semester in Year 7 than they did in Year 1.

In sum, though it appears that attendance rates decline at a faster rate over time for students in less advantaged SEI quintiles, the relative size of these declines is quite small, consistent with the patterns shown in Chapter 3.

School remoteness

The further away from the Perth metropolitan area, the lower the attendance rates were on average. Whilst students in Inner Regional and Outer Regional areas had attendance rates slightly lower on average than students in the Perth area (and these did not change over time), the differences observed for students in Remote and Very Remote areas were more substantial. Compared to students in Perth schools, the average Year 1 attendance rates were 7 percentage points lower for students in Very Remote Areas. The gap in attendance rate also became slightly wider each year, by 0.1 percentage points. Therefore, while the difference between schools in Perth and Very Remote Areas was around 7 percentage points in Year 1 (around 7 days per semester) this gap widened slightly to 7.8 percentage points in Year 7 (or nearly 8 days absence per semester). If the average Year 7 attendance rate of students attending school in the Perth area was 95% (for example), these students would be missing 5 days of school per semester. In contrast, students in Very Remote schools would be missing 13 days per semester by Year 7.

Student-level characteristics

Mobility

The average attendance rate of the students who go on to be the most mobile students (those who changed schools 5 times or more between 2008 and 2012) was 8.3 points lower when they started Year 1 compared with students who ultimately remained at a single school. This difference remained constant for the duration of the study period, that is, student mobility did not seem to change attendance rates over time. As such, student mobility was eliminated from the model describing the slope, or change in attendance per year in school. This result is somewhat surprising, as it might reasonably be expected that student mobility would affect attendance rates in later years of school after school moves had occurred. If the process of moving schools was causally disruptive to attendance then we might expect that attendance rates at Year 1 would be similar irrespective of the subsequent mobility of students, with attendance rates diverging over time as students

became more mobile. However, the relationship between mobility and attendance is consistent through the primary school years. This result suggests that there are one or more underlying factors, not accounted for in this model, that relate both to school attendance and mobility.

These underlying factors could include family circumstances, parental work instability or relate to the broader development of the child (such as their social and emotional development). For example, if one or both parents were employed in a job or industry that required regular relocations, then it is possible that this pattern of moves may be established even before the child starts school, and the disruption resulting from this lifestyle may be consistent and ongoing. Similarly, a child who has significant behavioural problems (prior to starting school) may not enjoy school, which would be reflected in their average attendance rate, even from Year 1. If this same child was disruptive, or had trouble establishing or maintaining friendships, this might cause them to change schools on a regular basis. This child would therefore have a consistently poor attendance record throughout primary school, while also having high school mobility.

Aboriginal status

On average, the Year 1 attendance rate of Aboriginal students was 10 percentage points lower than for non-Aboriginal students. This difference was maintained throughout the primary school years. In other words, Aboriginal students miss an additional 10 days of school per semester when compared with their non-Aboriginal counterparts. This equates to 20 days (4 weeks) per year or 140 days (nearly 8.5 months) over the course of primary school.

It is important to remember that these results are independent of other risk factors for which Aboriginal people are over-represented. For example, a far higher proportion of Aboriginal students attend a school in the least advantaged SEI (50%) or outside of the metropolitan area (62%) compared with non-Aboriginal students (12% and 32%, respectively). Therefore, while it is useful to consider the effects of Aboriginal status independently of these other factors, it is also useful to examine the additive effects.

For example, accounting for all other factors, the average attendance rate in Year 1 for Aboriginal students in Very Remote schools was almost 17 percentage points lower than non-Aboriginal students in the Perth area. That is, in Year 1, Aboriginal students in Very Remote schools were absent from school for an *additional* 3.5 weeks over and above the number of days that non-Aboriginal students in the Perth metropolitan area were absent from school in semester 1. This difference gradually increased for each additional year of school.

Gender

The model results revealed subtle differences in attendance rates between male and female students. Males had slightly higher attendance rates, on average, than females in Year 1 (0.3 percentage points difference). However, this gap was closed within only a few years, with the average rate of change for females being 0.1 percentage points per year higher than for males. By Year 7, the average attendance rate for females was 0.3 percentage points higher than for males. Though these results were statistically

significant, in actual terms these differences were very small, equating to less than one day of absence per semester.

Language spoken at home

The average attendance for students who spoke a language other than English (LOTE) was slightly lower than that of English-speaking students in Year 1 (by 0.4 percentage points). However the rates improved for each subsequent year in school, overtaking English speaking students by Year 7. For example, LOTE students—who otherwise had the same characteristics as those in the reference group—had an attendance rate in Year 1 of 95.14 (95.5 – 0.4). This value increased to 96.3% in Year 7 (95.5 – 0.4 + (6 years x 0.2)).

Caregiver characteristics

The education of the mother and occupation of the father appeared to be the most prominent caregiver characteristics affecting student school attendance, although the these effects were smaller than those observed for student and school-related characteristics. The average Year 1 attendance rate for students whose mother had achieved less than a Year 10 education was 0.9 percentage points lower than for students whose mother had a post-school qualification. The Year 1 attendance rate for students whose father was not in paid work was on average 0.7 points lower compared with students whose father had a Group 1 (or professional) occupation. Again, these small differences observed at Year 1 remained constant over time.

Considering multiple disadvantage

As outlined earlier, the results in this chapter reflect the independent contribution of each factor to student attendance. Accordingly, these effect estimates can also be added together to determine the combined contribution of a set of factors.

Consider the following example of two groups of students with distinctly different characteristics:

Most advantaged group
- Lives in Perth
- Attends a school in highest SEI quintile
- Non-Aboriginal

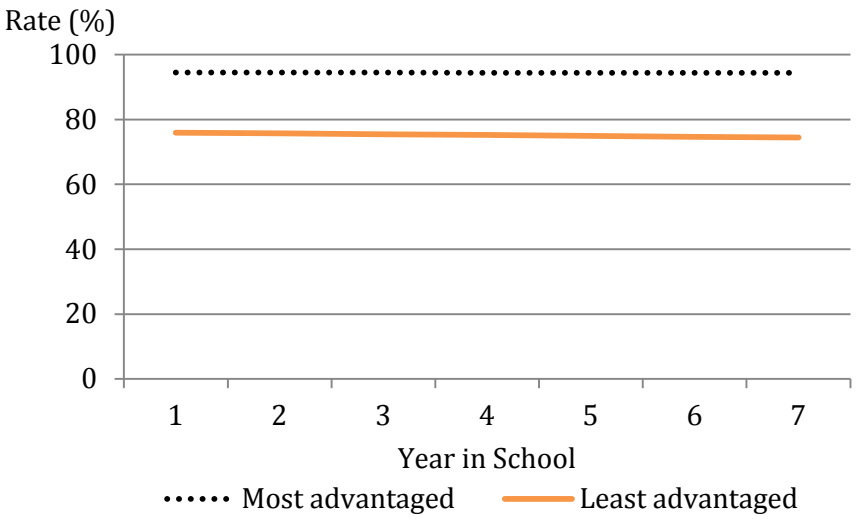
Least advantaged group
- Lives in a Very Remote Area
- Attends a school in lowest SEI quintile
- Aboriginal

Using the model estimates from Table 4.2, and averaging the remaining estimates at the median (thus holding them equal between the most and least advantaged students), the average attendance rate of students in the most advantaged group is 94.5 in Year 1, and this attendance rate remains virtually unchanged for these students through to Year 7. In contrast, the average attendance rate for students in the most disadvantaged group is 76.0, and this value decreases by 0.3 percentage points for each additional year of school—that is, the substantial gap in attendance rates between the two groups remains essentially unchanging over time and, where it did show signs of change, it widened only very slightly (1.5 percentage points) over the primary years (see Figure 4.1).

The scale of absence from school

The scale of difference between students in the most and least advantaged groups is of concern. In terms of the number of days of school missed, an attendance rate of around 76% for students in the most disadvantaged group equates to missing over one day of school each week. Another way of saying this is that they are absent for 26 days or 5 full weeks each semester, or approximately 10 weeks each school year. Carried through each year of primary school, and ignoring the subtle changes in attendance in each year of school, by Year 7 these students were absent for around 360 days or nearly 1.8 years of school[3]. In contrast, an average attendance rate of 94.4% for the most advantaged group equates to missing less than 6 days per semester, or a little over two weeks each year. Across all of the primary years, the most advantaged students missed 78 days school on average (out of a possible 1,400, approximately), or around 4 months by the end of Year 7.

FIGURE 4.1: ESTIMATED ATTENDANCE RATES OF THE MOST ADVANTAGED AND LEAST ADVANTAGED PRIMARY STUDENTS[a]



[a] Approximately 25% of students possess the characteristics that would place them into the most advantaged group, and 1.5% into the least advantaged group.

[3] Calculation based on an available 200 school days per year

TABLE 4.2: PRIMARY STUDENT COHORT—ESTIMATED DIFFERENCES IN ATTENDANCE RATES IN YEAR 1 (BASELINE), AND THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 75,425)	*Year 1 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
Reference Group Baseline		95.5	(95.3, 95.8)		
Reference Group Slope				-0.1	(-0.1, -0.0)
School SEI					
1st(most advantaged)	25.7	Ref		ref	
2nd quintile	22.0	0.3	(0.0, 0.5)	-0.1	(-0.2, -0.1)
3rd quintile	19.1	0.0	(-0.2, 0.3)	-0.1	(-0.2, -0.1)
4th quintile	18.2	-0.4	(-0.7, -0.2)	-0.1	(-0.2, -0.0)
5th quintile (least advantaged)	14.9	-1.5	(-1.8, -1.2)	-0.2	(-0.3, -0.1)
School remoteness					
Major Cities (Perth)	66.4	ref		ref	
Inner Regional Australia	13.0	-0.4	(-0.6, -0.1)	0.1	(-0.0, 0.1)
Outer Regional Australia	10.5	-0.9	(-1.2, -0.6)	0.1	(-0.0, 0.1)
Remote Australia	6.4	-3.0	(-3.3, -2.6)	0.2	(0.1, 0.3)
Very Remote Australia	3.8	-7.0	(-7.5, -6.5)	-0.1	(-0.3, -0.0)
Number of enrolments [a]					
One	71.2	ref			
Two	20.6	-0.8	(-1.0, -0.7)		
Three	5.5	-2.3	(-2.6, -2.1)	(b)	
Four	1.7	-4.1	(-4.6, -3.7)		
5 or more	1.0	-8.3	(-8.9, -7.7)		
Aboriginal status					
Not Aboriginal or TSI	92.4	ref		ref	
Aboriginal	7.6	-10.0	(-10.4, -9.7)	0.1	(-0.0, 0.2)
Gender					
Male	51.5	ref			
Female	48.5	-0.3	(-0.5, -0.1)	0.1	(0.1, 0.2)

TABLE 4.2: PRIMARY STUDENT COHORT—ESTIMATED DIFFERENCES IN ATTENDANCE RATES IN YEAR 1 (BASELINE), AND THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 75,425)	*Year 1 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Mother's education					
Post-school qualification	26.7	ref			
Year 12 or equivalent	18.0	0.0	(-0.2, 0.2)		
Year 11 or equivalent	9.4	-0.7	(-0.9, -0.4)		
Year 10 or equivalent	15.2	-0.9	(-1.1, -0.7)	(b)	
Year 9 or below	3.2	-0.9	(-1.3, -0.6)		
Not stated/unknown[c]	27.4	-0.3	(-0.5, 0.0)		
Father's education					
Post-school qualification	19.7	ref			
Year 12 or equivalent	12.9	0.0	(-0.2, 0.2)		
Year 11 or equivalent	5.9	0.0	(-0.3, 0.3)		
Year 10 or equivalent	13.7	0.1	(-0.2, 0.4)	(b)	
Year 9 or below	2.8	-0.2	(-0.6, 0.2)		
Not stated/unknown[c]	45.0	-0.7	(-1.0, -0.5)		
Mother's occupation					
Group 1	9.6	ref			
Group 2	10.0	-0.2	(-0.4, 0.1)		
Group 3	12.4	0.3	(0.1, 0.6)		
Group 4	11.0	0.2	(-0.1, 0.4)	(b)	
Not in paid work[d]	22.1	-0.6	(-0.9, -0.4)		
Not stated/unknown[c]	34.9	-1.2	(-1.5, -0.9)		

TABLE 4.2: PRIMARY STUDENT COHORT—ESTIMATED DIFFERENCES IN ATTENDANCE RATES IN YEAR 1 (BASELINE), AND THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 75,425)	*Year 1 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Father's occupation					
Group 1	12.2	ref			
Group 2	11.9	0.3	(0.0, 0.5)		
Group 3	13.5	0.3	(-0.0, 0.5)		
Group 4	11.2	0.4	(0.1, 0.6)	(b)	
Not in paid work[d]	2.3	-0.7	(-1.2, -0.3)		
Not stated/unknown[c]	49.0	-0.3	(-0.6, 0.0)		
Main language spoken at home					
English	57.2	ref		ref	
Language other than English	16.9	-0.4	(-0.6, -0.1)	0.2	(0.2, 0.3)
Not stated	25.9	-0.3	(-0.5, -0.1)	-0.1	(-0.1, -0.0)

a. Excluding the transition from primary school to high school
b. Predictor not significantly related with change in attendance rates over time, and eliminated from the final model.
c. Includes cases where caregiver information is missing and should therefore be interpreted with caution
d. In the last 12 months

Secondary students

Reference Group

As described above, the reference group represents the most advantaged group of students. In Year 7, the average attendance rate for this group was 95.3%, similar to the figure for the primary student cohort. However, the rate of change was of a considerably larger magnitude for secondary students, and the attendance rate declined by 0.4 percentage points for each additional year of school beyond Year 7. The average attendance rate for the most advantaged group of students decreased from 95.3% in Year 7 to 94.1% in Year 10.

School-level characteristics

School socio-economic disadvantage

Consistent with the pattern of results for the primary cohort, there were only small differences in Year 7 attendance rates across the SEI quintiles, where more disadvantaged schools had incrementally lower attendance rates. However, in contrast to the primary cohort, there were much steeper declines in these rates throughout the secondary years. The attendance rates of students in the second highest SEI quintile, for example, were just 0.7 percentage points lower, on average, than those of students in the most advantaged quintile. This gap increased by 0.3 percentage points each year relative to students in the most advantaged quintile. The attendance gap therefore increased to 1.5 percentage points by Year 10, meaning that even students in the second most advantaged quintile missed one additional day of school each semester by Year 10 compared to those in the most advantaged quintile.

The attendance disparities with the most advantaged quintile became progressively larger for students in lower SEI schools, both in terms of baseline Year 7 attendance and the rate of decline for each year of school thereafter. For students in the lowest SEI quintile for example, the average attendance rates in Year 7 were 3.1 percentage points lower than students in the most advantaged SEI quintile. The attendance rate gap increased by an additional 1.9 percentage points each additional year. Therefore, the resulting attendance gap was 8.8 percentage points by Year 10, or around 9 days per semester on average, independent of other factors in the model.

School remoteness

School remoteness was associated with attendance for the secondary student cohort, though not in a consistent manner. The Year 7 attendance rate for students attending Inner Regional schools was 0.3 percentage points higher than for students in Perth, and this gap widened slightly over time. The Year 7 attendance rate for students in Outer Regional schools was not significantly different to students in Perth, however, the overall rate of decline in attendance rate was smaller for students in Outer regional schools, resulting in a 2.7 percentage point gap by Year 10.

Once the other student-level factors were accounted for, the attendance patterns for students in Inner Regional and Outer Regional schools were not that dissimilar to the

attendance patterns for students in Perth. Larger differences were observed for students in Remote and Very Remote areas. The Year 7 attendance rate for students who attended Remote schools in secondary school was 1.5 percentage points lower on average than students in the Perth area, however with subsequent years this gap became smaller. By Year 10, the gap between students in Remote and Perth schools was just 0.7 percentage points. There was a more substantial gap for students in Very Remote schools in Year 7 (6.0 percentage points) and this gap did not significantly change over the secondary years. Independent of the other factors, and assuming that semester 1 attendance tracks to semester 2, students in Very Remote schools missed an additional 36 school days (nearly two months) between Year 8 and Year 10 compared to students attending school in Perth.

Student-level characteristics

School mobility

The Year 7 attendance rates were progressively lower for each additional school a student attended during the 2008-2012 period. The attendance rate was 11.0 percentage points lower on average for students who had enrolled in 5 or more schools than students compared with students who ultimately remained in the same school[4]. These gaps in attendance rates by school mobility also became more disparate between Year 7 and 10. The gap between students who attended three schools for example (compared with one school) increased from 3.4 percentage points in Year 7 to 9.1 percentage points in Year 10; for students who attended 4 different schools, the corresponding disparities were 6.2 and 14.7 percentage points, respectively.

As we noted for the primary cohort, these gaps indicate that increased mobility is associated with poorer attendance, and is not necessarily a causal factor. Given that in most cases these gaps in attendance rates were present before the school moves took place, there may well be other unobserved factors that relate to both mobility and attendance rates. Likewise, whilst some of the subsequent decline in attendance rates could be attributed to students moving school, it is also possible that these underlying factors also contributed to these declines.

Aboriginal status

Of all the factors included in the model, the largest disparities in Year 7 attendance and subsequent declines in attendance rates were observed for Aboriginal students. In Year 7, the attendance rate for Aboriginal students was 9.4 percentage points lower than that for non-Aboriginal students. This gap widened by another 3.2 percentage points for each year thereafter. That is, with all other factors being equal, the gap in attendance rates between Aboriginal and non-Aboriginal students doubled to 18.9 percentage points in Year 10. Between Year 8 and Year 10, Aboriginal students were absent, on average, for around 94 days or 19 weeks over and above the number of days non-Aboriginal students were absent. Again, these differences are independent of the other disadvantages that

[4] The mobility indicator used here excludes the transition from primary to secondary school, but it is based on the total number of moves during the 2008-2012 period. For some students this will include moves that occurred prior to Year 7. As the available data only covered the period 2008-2012, student moves in the primary school years prior to 2008 cannot be accounted for.

Aboriginal students may experience, and assumes that semester 2 absences are similar to those in semester 1.

Gender

In contrast to the primary student cohort, where females started out with lower attendance but then caught up, females in the secondary student cohort started out slightly ahead in Year 7 (by 0.9 percentage points), but this gap reduced throughout secondary school by 0.6 percentage points for each year. Accordingly, by Year 10, the average attendance rate of female students was 1.0 percentage points lower than their male counterparts. Over the course of high school therefore, the amount of school missed by male and female students was roughly equal.

Main language spoken at home

On average, the Year 7 attendance rates were 1.5 percentage points higher for LOTE students compared with those who spoke English in the home. This gap increased by an additional 0.9 percentage points for each additional year thereafter.

Caregiver characteristics

Maternal education was the most important caregiver characteristic for attendance rates.

The highest Year 7 attendance rates were recorded for students whose mother attained a post-school qualification, with attendance rates decreasing progressively with each lower level of maternal educational achievement. The gaps in attendance rates increased further over time for students with lower maternal education. For example, the gap between students of mothers with a post-school qualification and those with a Year 11 or equivalent education increased from 0.4 percentage points in Year 7 to 1.5 percentage points in Year 10, relatively small differences. In contrast, the gap between students of mothers with a post-school qualification and those with only a Year 9 education was 1.5 percentage points in Year 7, and this gap widened to 6.0 percentage points in Year 10.

The education level of the father and occupation of the mother had minimal independent effects on attendance rates. There was a somewhat more pronounced association with father's occupation, however the main difference observed was whether or not the father was employed, rather than any occupational level. For example, the average Year 7 attendance rate was 0.8 percentage points lower for students whose father was not in paid work relative to those with a father in a Group 1 (professional) occupation. This difference increased by a further 0.9 percentage points for each additional year to Year 10.

Considering multiple disadvantage

As for the primary cohort analysis, these results represent the independent effects of the factors considered. A comparison of the most advantaged and most disadvantaged student groups (based on school SEI, remoteness and student Aboriginal status) is provided in

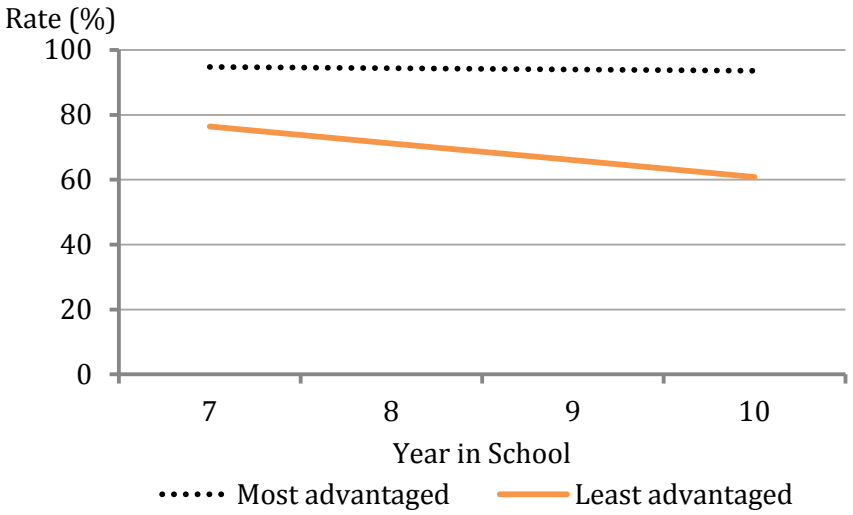
Figure 4.2. The average attendance rate in Year 7 was 94.8% for the most advantaged students and 76.4% for the least advantaged students, or a gap of 18.4 percentage points, a similar difference to that observed for the primary student cohort. By Year 10, the average

attendance rate for the most advantaged students was 93.6% and 60.8% for the most disadvantaged students, or a gap of 32.8 percentage points.

The scale of absence from school

In terms of the number of days of school missed, in Year 7 the most disadvantaged students missed over a day of school each week, or 5 full weeks of school over semester 1. By Year 10 these students were missing over 2 days of school per week, or around 8 weeks of school in semester 1. In total, the most disadvantaged students were absent for around 200 days of their entire secondary schooling, i.e. they were absent from school for a total of one year across Years 8-10.

FIGURE 4.2: ESTIMATED ATTENDANCE RATES OF THE MOST ADVANTAGED AND LEAST ADVANTAGED, SECONDARY STUDENTS[a]



a. Approximately 22% of students possess the characteristics that would place them into the most advantaged group, and 1.0% into the least advantaged group.

TABLE 4.3: SECONDARY STUDENT COHORT—COEFFICIENTS OF DIFFERENCE FOR ATTENDANCE RATES IN YEAR 7, AND THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS

	(n = 48,400)	*Year 7 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
Reference Group Baseline		95.3	(95.0, 95.7)		
Reference Group Slope				-0.4	(-0.6, -0.2)
School SEI (Year 8)					
1st(most advantaged)	21.4	ref		ref	
2nd quintile	19.8	-0.7	(-1.0, -0.4)	-0.3	(-0.4, -0.1)
3rd quintile	26.0	-1.0	(-1.3, -0.7)	-0.8	(-1.0, -0.7)
4th quintile	22.0	-1.5	(-1.8, -1.1)	-1.1	(-1.3, -0.9)
5th quintile (least advantaged)	10.8	-3.1	(-3.4, -2.7)	-1.9	(-2.1, -1.7)
School remoteness (Year 8)					
Major Cities (Perth)	63.3	ref		ref	
Inner Regional Australia	15.8	0.3	(0.0, 0.6)	0.2	(0.1, 0.4)
Outer Regional Australia	12.6	0.3	(-0.1, 0.6)	0.8	(0.6, 1.0)
Remote Australia	5.7	-1.5	(-2.0, -1.1)	0.6	(0.3, 0.8)
Very Remote Australia	2.6	-6.0	(-6.6, -5.4)	0.2	(-0.1, 0.6)
Number of enrolments[a]					
One	74.6	ref		ref	
Two	19.3	-1.1	(-1.4, -0.9)	-0.8	(-0.9, -0.6)
Three	4.4	-3.4	(-3.8, -2.9)	-1.9	(-2.2, -1.7)
Four	1.2	-6.2	(-7.0, -5.4)	-2.8	(-3.3, -2.3)
5 or more	0.6	-11.0	(-12.1, -9.8)	-2.1	(-2.8, -1.4)
Aboriginal status					
Not Aboriginal or TSI	93.4	ref		ref	
Aboriginal	6.6	-9.4	(-9.8, -9.0)	-3.2	(-3.4, -2.9)
Gender					
Male	53.5	ref		ref	
Female	46.6	0.9	(0.8, 1.1)	-0.6	(-0.7, -0.5)

TABLE 4.3: SECONDARY STUDENT COHORT—COEFFICIENTS OF DIFFERENCE FOR ATTENDANCE RATES IN YEAR 7, AND THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS

	(n = 48,400)	*Year 7 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Mother's education					
Post-school qualification	19.2	ref		ref	
Year 12 or equivalent	15.5	-0.1	(-0.4, 0.3)	-0.1	(-0.3, 0.1)
Year 11 or equivalent	100.6	-0.4	(-0.8, -0.0)	-0.4	(-0.6, -0.2)
Year 10 or equivalent	19.4	-0.9	(-1.2, -0.6)	-0.7	(-0.9, -0.5)
Year 9 or below	3.7	-1.5	(-2.1, -1.0)	-1.5	(-1.8, -1.2)
Not stated/unknown[b]	31.6	-0.7	(-1.0., -0.4)	-0.5	(-0.6, -0.3)
Father's education					
Post-school qualification	14.2	ref		ref	
Year 12 or equivalent	11.7	-0.1	(-0.4, 0.3)	0.0	(-0.3, 0.2)
Year 11 or equivalent	6.6	0.0	(-0.4, 0.5)	0.1	(-0.2, 0.4)
Year 10 or equivalent	18.0	-0.1	(-0.4, 0.3)	-0.1	(-0.4, 0.1)
Year 9 or below	3.7	0.1	(-0.5, 0.6)	-0.7	(-1.0, -0.3)
Not stated/unknown[b]	45.9	-0.5	(-0.9, 0.0)	-0.3	(-0.6, -0.0)
Mother's occupation					
Group 1	7.4			(c)	
Group 2	10.2				
Group 3	14.7				
Group 4	15.4				
Not in paid work[d]	15.2				
Not stated/unknown[b]	37.1				

TABLE 4.3: SECONDARY STUDENT COHORT—COEFFICIENTS OF DIFFERENCE FOR ATTENDANCE RATES IN YEAR 7, AND THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS

	(n = 48,400)	*Year 7 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Father's occupation					
Group 1	8.7	ref		ref	
Group 2	11.5	0.3	(-0.1, 0.7)	-0.0	(-0.3, 0.21)
Group 3	15.1	0.3	(-0.2, 0.7)	-0.3	(-0.6, -0.1)
Group 4	13.4	0.3	(-0.2, 0.7)	-0.4	(-0.7, -0.1)
Not in paid work[d]	2.7	-0.8	(-1.5, -0.2)	-0.9	(-1.3, -0.5)
Not stated/unknown[b]	48.7	-1.1	(-1.6, -0.6)	-0.9	(-0.2, -0.6)
Main language spoken at home					
English	53.7	ref		ref	
Language other than English	13.5	1.5	(1.2, 1.8)	0.9	(0.7, 1.1)
Not stated/unknown	32.8	-0.4	(-0.6, -0.2)	0.1	(-0.0, 0.2)

a. Excluding the transition from primary school to high school

b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.

c. Predictor not significantly related with change in attendance rates over time, and eliminated from the final model.

d. In the last 12 months.

Consistency of attendance

In Chapter 3 it was evident that attendance rates were highly consistent across time. However these patterns were at the aggregate level, and do not necessarily mean that each student has consistent attendance rates across years. The methodology in this chapter allowed us to examine the average rates of change over time for individual students. Where these results have shown no change in attendance rates over time, this implies that within-student attendance rates (as opposed to between-groups attendance rates) did not change over the years, particularly for primary students. However, we have not yet examined this assumption in further detail. To assess the consistency of attendance rates over time, we examined the within-student correlation matrix of these attendance rates across all year levels, which are presented in in Table 4.4 below. If there were no consistency in attendance rates (that is, attendance in Year 1 bore no relation to attendance Year 3 for example), the correlation coefficient would be close to 0. If there was perfect consistency over time (where attendance in Year 1 would be equal to that in Year 3), the correlations would be close to 1.0.

The correlation matrix supports the notion that the within-student attendance rates are consistent over time, with moderate to strong correlation coefficients between any given points in time. Though the strength of the relationship does become weaker for points that are further apart (Year 1 attendance rates are more similar to Year 2 attendance rates than they are to Year 5 rates for example), the key finding to note is that even for observations 5 years apart, the attendance rates are still strongly related. These coefficients indicate that students with high attendance rates in Year 1 tended to have high attendance rates in subsequent years. Conversely, students with low attendance rates in Year 1 tended to have low attendance rates in subsequent years.

TABLE 4.4: CORRELATION MATRIX OF ATTENDANCE RATES ACROSS EACH YEAR OF SCHOOL

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Year 1										
Year 2	0.51									
Year 3	0.46	0.49								
Year 4	0.43	0.46	0.48							
Year 5	0.41	0.44	0.46	0.50						
Year 6		0.42	0.44	0.46	0.52					
Year 7			0.41	0.43	0.47	0.54				
Year 8				0.42	0.47	0.52	0.60			
Year 9		(a)			0.42	0.45	0.51	0.67		
Year 10						0.38	0.43	0.55	0.65	

(a) As only 5 years of data are available for any given student, these correlation coefficients are not available.

SUMMARY AND CONCLUSION

The results presented in this chapter closely mirrored the patterns of attendance shown in Chapter 3. As shown in previous research (e.g. Balfanz & Byrnes, 2012), social and economic disadvantages experienced by children can have a substantial impact on school attendance rates. These risk factors appear to be prominent at school entry and through primary school: we observe consistent disparities in attendance between students in the high and low ends of disadvantage from Year 1 to Year 7. These disparities become even larger upon entry into secondary school, and increase progressively with each additional year of schooling.

Our results indicate that student- and school-level factors had the strongest independent relationships with school attendance—in particular, student Aboriginal status, student mobility and school remoteness. Given that many of the attendance policies and programs implemented by schools in Western Australia (e.g. Attendance Improvement Measure, or AIM) already target students in these at-risk population groups this information will support these steps initiated by educators and policy makers. It is possible that without such policies and programs the attendance rates for disadvantaged students in primary schools might be less stable than we have shown here. That is, if these attendance programs were not being implemented, then we may well have observed lower levels of attendance rates in, and declines through, the primary years.

For secondary students, however, the picture is more confronting. Not only are the gaps in attendance rates carried through from primary school, they progressively become wider over time. These different patterns, noting of course the different stage of development and the academic requirements of secondary school, merit a different approach to maximising the attendance of disadvantaged students.

The attendance rates for disadvantaged students are disturbing when considered in terms of the number of days, weeks, months and years of school that disadvantaged children and youth are absent from school. The impacts of such attendance patterns upon learning and educational achievement, in addition to onward life experiences and employment opportunities, are likely to be severely limiting.

The results presented here highlight the significant challenges that schools and policy makers face when designing and implementing initiatives aimed at improving attendance. There are many different approaches that schools have taken to address attendance problems, including making the school environment an inviting and rewarding place for students to be, and improving engagement with both students and parents. However, there are many more factors influencing attendance rates that are determined before children are even enrolled in school.[5] Schools cannot directly change the socio-economic profile of the students they enrol, the educational or occupational characteristics of their parents or where the school is located. If these factors are causally linked to attendance rates, then the ability of schools to make significant improvements to attendance rates may be somewhat limited. For improvements to be made, educators need to better

[5] Indeed, a cursory analysis of attendance rates and patterns in pre-school (not presented) found that preschool attendance rates were identical to attendance patterns in Year 1.

understand the reasons *why* students are absent from school, particularly younger students, in order to address those issues.

The reasons for absences will likely be multi-faceted, and any approach to improving attendance among disadvantaged students will require a multiple approaches with shared responsibility between students, parents, schools and any number of government departments. The data are clear about where greater effort is needed: The results indicate that a child's onward attendance pattern is largely established in the very first year of school. Vigorous efforts spent in considering ways to establish attendance excellence and high expectations about attendance in the commencing years of school, along with monitoring and intervention, are like to yield benefits.

This chapter has highlighted the nature and magnitude of the associations between attendance patterns and a range of risk factors. This has provided an understanding of attendance patterns among public school students in Western Australia. In the following chapters of this report we consider the nexus between these attendance patterns and the achievement of students across the spectrum of primary and secondary education.

SECTION 3
CONNECTING ATTENDANCE WITH STUDENT ACHIEVEMENT

BACKGROUND

The empirical literature demonstrates that attendance at school matters (Keating & Hertzman, 1999; Zubrick et al., 1997; Zubrick et al., 2006). While the causes of non-attendance and truancy are contested, most researchers agree that absenteeism causes harm. Or conversely, that "being in school leads to succeeding in school" (Balfanz & Byrnes, 2012).

Absenteeism is mostly of detriment to the student, although other students, teachers and the learning environment of a class and school, can also be impacted (Reid, 2008). Irregular attenders can be more disruptive which can cause stress and friction in the classroom and consequently impact on the performance of other students. In addition, they tend to take up more of a teacher's time as they require more remedial assistance as well as encouragement to improve their attendance record (Commonwealth of Australia, 2000). This can disrupt the teaching process especially if the progress of irregular attenders is well behind others in the class (Rothman, 2001).

There is a considerable body of literature supporting the general notion that being absent from school affects a student's learning and academic achievement (Finn, 1989; Gottfried, 2009; Malcolm, Thorpe & Lowden, 1996). Absences can predict both current and future academic performance, independent of previous achievement (Gottfried, 2009), which can pose a risk to the successful completion of school (Balfanz & Byrnes, 2012). Achievement in mathematics appears to be particularly sensitive to attendance, while exploratory research has shown a strong positive correlation between attendance and the acquisition of phonological awareness skills and early literacy skills (e.g. letter recognition, word identification processing) (Ehrich et al., 2010).

The pathway between attendance and academic outcomes starts early. Attendance matters even from Kindergarten: US evidence has shown that those who were chronically absent in Kindergarten had lower academic performance in Year 1, although this was far more pronounced for children in low income families (Balfanz & Byrnes, 2012); while Gottfried (2009) has shown a link between missing school days and academic performance in Years 2-4. Further, intervention studies have shown that early levels of attendance can be important predictors of future school success (Epstein & Sheldon, 2002). The implication here is that attendance needs to be monitored and addressed in the earliest years of school.

Much of the quantitative analytic study in this area has focused on the magnitude and pattern of the association between non-attendance and academic outcomes. While the poorest attenders have consistently been shown to do the worst academically (in many studies over time), there does not appear to be a "threshold" effect for absences (Rothman, 2001). This can lead to the establishment of relatively arbitrary cut-points of at-risk attendance, regardless of the central concept of interest, i.e. truancy, poor attenders, marginal participation, and so on. As we outlined earlier in Section 2, Western Australian school students are considered to be at-risk of lower academic competence if they were absent for over half a day a week (Zubrick et al., 1997). While this generally accords with other research in Australian and US contexts (Gray & Beresford, 2002), it may be a relatively conservative indicator of at-risk attendance (Epstein & Sheldon, 2002).

These data are also likely to mask variations in the nature of associations between school absence and outcomes in different ethnic, cultural and disadvantaged population groups and by geographic location (Zubrick et al., 2006). Students from high poverty areas, for example, can miss very large amounts of school across multiple years and this may have an increased effect on other school outcomes, including academic performance. Moreover, analysing the connection between attendance and performance among disadvantaged students is important because students reared in poverty benefit the most from being in school. As Balfanz and Byrnes (2012) point out, "one of the most effective strategies for providing pathways out of poverty is to do what it takes to get these students in school every day. This alone … will drive up achievement…".

Aboriginal populations tend to have the worst attendance records of all population groups in Australia (Steering Committee for the Review of Government Service Provision, 2011). The reasons for this are complex, although a recent Western Australian study highlighted that attendance is one of the three key drivers of school academic performance of Aboriginal students. While this suggests that improving attendance among Aboriginal students will benefit their school outcomes, it will not fix the problems. Schools need to do more to provide learning environments that are appropriate to the specific needs of Aboriginal children (Zubrick et al., 2006).

One of the limitations of the extant empirical literature is that all non-attendance is generally analysed collectively. Gottfried (2009) highlights that, while all absences are bad for academic performance, unexcused absences are far more predictive of lower reading and math achievement (even in early schooling years). This suggests that there are different pathways for these two groups of non-attenders: truant students may struggle because they receive less hours of instruction or feel alienated from classmates, teachers and schools. Those with high levels of excused absences may not necessarily have academic, family or social problems.

CHAPTER 5 FACTORS RELATED TO STUDENT ACHIEVEMENT

Background

This chapter focuses on student achievement as the primary outcome of interest. It provides a basic analysis of how achievement is influenced by a diverse set of factors that characterise students, their caregivers and the schools that they attend.

Highlights

- Average NAPLAN scores were particularly low for students with five or more enrolments. These highly mobile students were around two years behind students with a single enrolment. For example, the average Year 7 numeracy results for the most mobile students (472.4) were on par with the numeracy results that single-enrolment students were achieving in Year 5 (477.5).
- Aboriginal students had the poorest results in writing tests. The average scale score in writing for Aboriginal students in Year 9 (449.2) was below that of non-Aboriginal students in Year 5 (471.5). This result suggests that Aboriginal students were more than 4 years behind in writing than non-Aboriginal students.

Summary of findings

- Students living in less remote areas and in better socio-economic conditions typically do better at school.
- The gaps between the high and low performing students are substantial at each educational level.
- There are groups of students that lag behind by several grades throughout their educational experience.

METHODS

The analysis in this chapter is conducted on the Analysis Long File (see *Overview of Project Data* section in Chapter 1). The outcome variables include the NAPLAN scale score in tests of numeracy, writing and reading. These outcomes are examined by school-level socio-economic and geographic indicators, and the characteristics of students and their caregivers.

The analytic techniques in this chapter are descriptive in nature. We present the average (mean) NAPLAN scores for students in 2008-2012.

Measuring performance

We draw upon NAPLAN scale scores in numeracy, writing and reading for Years 3, 5, 7 and 9 (see Chapter 2 for more details on the NAPLAN). For numeracy and reading, the data for each test was pooled across the years 2008 to 2012, i.e. the results for Year 5 reading include test scores in 2008, 2009, 2010, 2011 and 2012. Due to a change in the writing test in 2011, the NAPLAN writing scale scores were only pooled across 2011 and 2012.

Student characteristics

Student characteristics were measured in this chapter using information from the student enrolments dataset. We have included four key variables here (see *Data and Methods* section of Chapter 3 for definitions and the coding rules that have been applied to the derivation of these items):

- Gender
- Aboriginal status
- Student mobility
- Attendance. Students are coded into categories of educational risk based on their attendance information for Semester 1 of the year of the NAPLAN test.

Caregiver characteristics

Caregiver characteristics were measured in this chapter using two key variables (see *Data and Methods* section of Chapter 3 for more details on the classification of these variables):

- Caregiver educational attainment
- Caregiver occupation.

School-level characteristics

The analyses in this chapter include a small set of school contextual variables (see *Data and Methods* section of Chapter 3 for more details on the derivation and classification of these variables):

- School remoteness
- Socio-Economic Index for schools (SEI).

Students Participating in the NAPLAN

It is possible that any disparities that appear to become larger or smaller between student groups may reflect differences in the underlying composition of the student population and not actual changes in achievement of these groups. For example, if less able students are prone to higher rates of absence, then these students are progressively less likely to be present on the days of the NAPLAN tests. In turn, the NAPLAN results may be higher than would otherwise be observed because the lower-achieving students are not included. Conversely, it is also possible that the highest achieving students are the ones with the resources that enable them to transition out of the public school system into a non-government school when they leave primary school. These scenarios could potentially bias the results to show an increase in overall achievement levels for disadvantaged students, and a decrease in overall achievement levels for advantaged students. To assess the extent to which the results may be biased, it is therefore important to examine the characteristics of the students who sat the NAPLAN tests and those who did not.

Table 5.1 provides the proportion of students who sat at least one of the NAPLAN tests (numeracy, reading or writing) in Years 3, 5, 7 or 9 according to a range of factors. We can also examine the extent to which the population changed over time to assess whether

more advantaged students were no longer represented in the Year 9 tests compared to earlier year groups.

Overall, the NAPLAN participation rates were lower for students with lower attendance and other markers of disadvantage, such as high mobility. The worst participation rates, as expected, were students at Severe educational risk where fewer than 40% participating in the NAPLAN in Year 3, 5 or 7, and 42% participating in Year 9. Generally, the NAPLAN participation rates reflected the average attendance rates for any particular group.

Some compositional change can also be observed in Table 5.1. For mother's education, typically a very good indicator of both socio-economic status and student ability, the number of Year 3 students whose mother had a post-school qualification was 28,448. For Year 9 students, it was 11,498 or just 40% of the number of Year 3 students. The number of students who had a mother with a Year 10 education or equivalent was 16,453 in Year 3 and 12,116 in Year 9, or 74%. These figures lend support to the notion that the higher achieving students become less likely to remain in the public system as they progress through school.

These participation patterns do not suggest that the NAPLAN results of participating students are necessarily biased, but merely flag that the NAPLAN results presented in this chapter should be viewed with some caution. These concepts are revisited in Chapter 7 where strategies are employed to assess the extent to which the results of NAPLAN attenders are representative of the wider student population.

TABLE 5.1: NAPLAN PARTICIPATION RATES – PROPORTION OF YEAR 3, 5, 7 AND STUDENTS SITTING AT LEAST ONE NAPLAN TEST IN THE GIVEN YEAR[a]

	Enrolment Year							
	Year 3		*Year 5*		*Year 7*		*Year 9*	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Attendance (risk category)								
Regular	79,650	93.1	79,249	91.3	64,021	90.4	39,296	90.4
Indicated	15,618	88.5	15,471	85.9	13,961	87.2	15,989	87.6
Moderate	5,072	76.1	5,040	74.0	5,018	75.0	7,938	78.2
Severe	1,847	38.6	1,788	36.3	2,281	36.3	4,505	41.8
School SEI								
1st quintile (most advantaged)	26,397	92.8	25,745	91.5	19,265	89.8	12,257	93.2
2nd quintile	23,530	91.0	22,774	89.4	18,270	87.4	12,971	86.9
3rd quintile	20,169	90.9	20,454	88.8	17,605	88.7	18,691	85.4
4th quintile	18,264	89.3	18,671	87.0	17,308	86.9	16,064	81.7
5th quintile (least advantaged)	13,826	86.7	13,903	84.5	12,830	83.5	7,745	75.1
School remoteness								
Major Cities	68,327	90.8	67,106	89.2	54,331	87.6	41,634	85.8
Inner Regional Australia	13,877	91.9	14,090	90.3	12,772	90.4	11,460	85.9
Outer Regional Australia	10,803	91.1	11,151	87.8	10,013	88.1	8,753	86.2
Remote Australia	6,104	89.1	6,129	87.1	5,581	85.1	4,083	80.6
Very Remote Australia	3,076	80.4	3,072	75.8	2,584	75.7	1,798	67.3
Number of enrolments[b]								
One	70,583	92.4	72,046	90.7	60,248	89.0	47,653	87.9
Two	22,340	87.6	21,068	85.4	17,490	85.8	14,502	82.1
Three	6,315	84.4	5,681	81.0	5,134	82.1	4,081	70.4
Four	1,881	82.9	1,755	78.0	1,601	77.1	1,043	65.9
5 or more	1,068	79.4	998	71.8	808	70.7	449	56.6

TABLE 5.1: NAPLAN PARTICIPATION RATES – PROPORTION OF YEAR 3, 5, 7 AND STUDENTS SITTING AT LEAST ONE NAPLAN TEST IN THE GIVEN YEAR[a]

	Enrolment Year							
	Year 3		*Year 5*		*Year 7*		*Year 9*	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
continued								
Aboriginal status								
Aboriginal	5,904	82.5	7,198	80.2	6,553	78.8	4,175	64.3
Not Aboriginal	96,212	91.1	94,256	89.4	78,636	88.4	63,421	86.6
Mother's education								
Year 9 or equivalent or below	3,031	82.9	3,345	81.9	3,160	80.5	2,378	79.0
Year 10 or equivalent	16,453	91.7	17,724	89.5	16,127	89.3	12,116	86.4
Year 11 or equivalent	10,278	92.3	10,595	90.1	9,218	90.0	6,564	87.9
Year 12 or equivalent	19,792	91.9	18,540	90.5	14,577	90.0	9,569	89.7
Post-school qualification	28,448	91.8	26,203	90.2	19,617	89.4	11,498	91.0
Not stated/unknown	18,708	88.9	19,860	86.9	17,903	85.4	20,912	82.8
Missing	5,477	82.7	5,281	79.7	4,679	74.3	4,691	66.8
Father's education								
Year 9 or equivalent or below	2,878	86.5	3,160	86.1	3,020	13.0	2,328	84.7
Year 10 or equivalent	15,090	92.6	16,492	91.1	15,106	9.2	11,191	88.6
Year 11 or equivalent	6,565	92.9	6,781	90.7	5,816	9.8	4,095	89.0
Year 12 or equivalent	14,312	92.0	13,668	90.3	10,933	10.5	7,160	89.7
Post-school qualification	20,487	91.6	19,144	90.2	14,440	10.9	8,213	92.2
Not stated/unknown	17,712	90.1	19,112	87.8	17,944	13.3	19,848	84.6
Missing	25,143	87.8	23,191	85.2	18,022	17.6	14,893	75.8

TABLE 5.1: NAPLAN PARTICIPATION RATES – PROPORTION OF YEAR 3, 5, 7 AND STUDENTS SITTING AT LEAST ONE NAPLAN TEST IN THE GIVEN YEAR[a]

	Enrolment Year							
	Year 3		*Year 5*		*Year 7*		*Year 9*	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
continued								
Mother's occupation								
Group 1 (highest)	10,288	92.6	9,683	91.2	7,379	89.9	4,434	91.3
Group 2	10,622	92.3	11,306	90.5	9,568	90.8	6,340	89.9
Group 3	13,276	93.2	14,511	91.4	12,606	90.8	9,012	90.7
Group 4	11,360	91.6	13,375	90.0	12,670	90.3	9,618	88.9
Not in paid work[c]	24,449	90.9	21,340	89.1	15,492	87.5	8,976	85.6
Not stated/unknown	26,715	88.6	26,052	86.2	22,887	84.8	24,657	82.5
Missing	5,477	82.7	5,281	79.7	4,679	74.3	4,691	66.8
Father's occupation								
Group 1 (highest)	12,863	92.5	12,160	9.5	8,972	89.5	5,135	91.5
Group 2	12,881	93.1	13,462	8.2	10,931	91.3	6,965	91.3
Group 3	14,842	92.6	15,176	8.8	13,019	90.7	9,085	90.4
Group 4	12,245	91.8	12,922	9.9	11,475	89.6	8,282	88.9
Not in paid work[c]	2,255	84.7	2,394	14.8	2,229	84.4	1,635	82.0
Not stated/unknown	21,958	89.6	22,243	12.8	20,633	86.3	21,733	84.4
Missing	25,143	87.8	23,191	14.8	18,022	82.4	14,893	75.8

a. Student numbers aggregated across 2008–2012 for numeracy, reading and writing. As we are only examining the number of students who sat the test, these figures include those who sat the writing test in 2008, 2009 and 2010 despite the change in test.

b. Excluding the transition to secondary school.

c. In the last 12 months.

RESULTS

The NAPLAN results presented in Table 5.2 to Table 5.3 illustrate that there are disparities in achievement between different sub-groups of students within the Western Australian public school system. The findings are consistent with prior reporting in both the Western Australian and other jurisdictions in Australia where, typically, girls perform better in tests of reading and writing, while boys perform better on tests of numerical skills (Australian Curriculum Assessment and Reporting Authority, 2011). In addition, Aboriginal students and students living in remote areas or in poorer socioeconomic circumstances tend to perform less well on measures of educational achievement.

There are some cautions to note when interpreting the results in this chapter, particularly in assessing changes that may occur in mean scores from Years 3 through to 9. First, the characteristics of students sitting the NAPLAN test may be quite different at each education level and this may obscure comparisons that can be made between test years. Second, and more importantly for the analyses here, whether or not a student sits a NAPLAN test (or indeed be at school) may be associated with the risk factors being analysed (i.e. Aboriginal status or socio-economic status) and this may obscure the differences in achievement scores between student sub-groups from Years 3 to 9 (by removing a relatively larger number of poor performers from the more at-risk groups).

Factors associated with achievement

School-level characteristics

School remoteness

Average NAPLAN scale scores were highest for students living in Major Cities (metropolitan Perth) in all domains. While there was a gradient pattern in NAPLAN achievement across the five categories of remoteness (with lower achievement scores for those in more remote schools), the scores for students in the middle three categories were relatively similar. Accordingly, most of the gap in NAPLAN achievement by remoteness was accounted for by students at the high (metropolitan Perth) versus the low (very remote) ends of the remoteness spectrum. To put the achievement of students in very remote schools into perspective, their average scale score of 492.3 in the Year 9 writing test was lower than that of Year 9 (by 22–61 points) *and* Year 7 (by 12-35 points) students in remote, outer regional, inner regional and metropolitan schools.

School socio-economic disadvantage (SEI)

The relationship between achievement and school SEI is similar to the pattern described above for school remoteness, although the difference in average scale scores between students in the most and least advantaged schools is larger. The disparities are of the magnitude of 81-87 points for numeracy, 80-111 points for writing and 74-99 points for reading.

Average scale scores were markedly higher for students in the most advantaged schools, than those recorded for all other students, and represented some of the highest mean scores among all student sub-groups. For example, students in the top SEI quintile scored

617.6 in Year 9 numeracy, on average—or 44 points higher than the average for students attending schools in the second quintile of advantage.

Student-level characteristics

Gender

Average scale scores were higher for female students than for male students in writing and reading tests at all education levels (Years 3, 5, 7 and 9). The magnitude of the differences was substantial, particularly in writing tests at secondary level. Females on average scored 26 scale points higher than males in writing in Year 3, increasing to 46 scale points by Year 9. For reading, the disparity was between 12 and 17 points across the test years. While the reverse pattern was found for numeracy (males had higher scores than females), the magnitude of the differences was smaller (6-10 scale points).

Aboriginal status

The mean NAPLAN scale scores were substantially lower for Aboriginal than non-Aboriginal students, regardless of the type and level of test. Notwithstanding this universal finding, the difference in achievement was lower in numeracy than writing or reading, at least in Years 3 and 5. In Year 7 and 9 we note that the disparity between Aboriginal and non-Aboriginal students in the mean scale scores for reading decreased, and were of the same magnitude as those seen for numeracy (about 63-68 scale points difference). In contrast to these results for reading, the differences in achievement in numeracy and writing remained relatively static across the education levels, suggesting that Aboriginal and non-Aboriginal students have similar rates of progress through Years 3 to 9 in these learning areas.

Overall, Aboriginal students tended to have the poorest results in writing tests. The average scale score for Aboriginal students in Year 9 (449.2) was below that of non-Aboriginal students in Year 5 (471.5), suggesting that, on average, the development of Aboriginal student achievement in writing is more than 4 years behind that of other students.

Student mobility

Student mobility appeared to be strongly associated with achievement in all domains. Not only were there substantial disparities between students with low and high mobility, but there were differences in achievement at each successive level of mobility, i.e. on average, students who had attended two schools had lower achievement than those who had attended just one, and so on. The average scale score for students with five or more enrolments (four or more changes of school) was particularly low, and indicates that the most mobile students were around two years behind students with a single enrolment. For example, the average Year 7 Numeracy results for the most mobile students (472.4) were on par with the Numeracy results that single-enrolment students were achieving in Year 5 (477.5).

The disparity in achievement between students who had a single enrolment versus those with five or more was highest in Year 3 for reading (81 scale points). This difference was most prominent in Year 5 for writing and reading (78-79 scale points), in Year 7 for

numeracy and writing (71-72 points), and was distinctly higher in Year 9 for writing (105 scale points). It should be noted, however, that there were only a small number of students (n ~140) with five or more enrolments in Year 9 and this may explain the variability in writing scores for this test.

Attendance

The associations with student attendance have been assessed here using WA DoE educational risk categories (see *Definition of Educational Risk* in Chapter 3; Chapters 6-8 examine the patterns of association between attendance and achievement in more detail, using a continuous attendance metric). The data indicate that there is a strong relationship between achievement and these categories of attendance (they exhibit the largest disparities in achievement among all factors considered in this chapter). Those students at severe educational risk had markedly lower mean scale scores than students in all other categories, and the worst achievement scores of all student sub-groups. The difference between regular attenders and students at severe educational risk was as large as 164 scale points (for Year 3 writing). The magnitude of this disparity was greatest in Year 3 in all three domains and decreased considerably at each subsequent test, to Year 9: from 95 to 78 scale points difference in numeracy tests; from 164 to 115 scale points difference in writing tests; and from 117 to 68 scale points difference in reading tests.

There was a gradient of achievement across the educational risk categories (lower achievement for those with poorer attendance records), although the pattern was less distinct in Year 9. While there were considerable differences in achievement between students in the high and low ends of the attendance spectrum at all levels of education, there were negligible differences between students in the middle categories (Indicated and Moderate) by Year 9 across all domains. These relationships will be discussed in more detail in future chapters.

Caregiver characteristics

Caregiver education

Mean NAPLAN scores were higher for students whose parents had attained higher levels of education, with the highest scores evident when the parent had a post-school qualification. While the mean scores for students with parents who had completed Year 12 were consistently above the overall mean, they were generally about 30 points lower than scores for students whose parents had a post-school qualification.

The average scale scores and pattern of student achievement by maternal and paternal educational attainment were strikingly similar in numeracy, writing and reading. Further, the magnitude of disparities between students with high and low parental education was similar at each level of education for each domain—that is, average scores tended to differ by about 60-75 points, with the exception of reading scores in Years 3 and 5 (75-90 points).

Caregiver occupation

The relationship between achievement and parental occupation is similar to that shown for parental education. The mean scale scores were highest for students whose parents

had a Group 1 occupation (senior management and professionals), followed by Group 2 (other business managers and associate professionals), Group 3 (tradespeople, clerks and skilled office, sales and service staff) and Group 4 (labourers and related workers).

For paternal occupation, average scores were lowest when the father was not in paid work. In contrast, having a mother who was not in paid work was generally associated with higher achievement than having a mother employed in a Grade 4 occupation. The result for maternal education here may reflect the competing benefits to child development of material resources and parental engagement with children. While the 'not in paid work' category represents a range of circumstances, it is likely that a reasonable portion of mothers in this category are not engaged in the labour force as a result of undertaking parental responsibilities. If so, then the results suggest that additional time spent with children may bestow greater benefits to student achievement than the additional material benefits of a low grade occupation.

TABLE 5.2: MEAN NAPLAN NUMERACY OUTCOMES FOR YEAR 3, 5, 7 AND 9 STUDENTS, 2008-2012

	Numeracy Scores											
	Year 3			*Year 5*			*Year 7*			*Year 9*		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
Attendance (educational risk)[a]												
Regular (90% or more)	73,737	387.6	74.5	71,998	476.3	70.4	57,589	542.1	72.9	35,198	581.5	71.2
Indicated (80-89%)	13,462	366.3	75.3	12,953	454.0	67.1	11,873	518.9	68.3	13,593	555.3	62.4
Moderate (60-79%)	3,740	338.8	79.7	3,615	428.7	71.0	3,667	493.2	68.5	8,720	561.9	74.8
Severe (less than 60%)	544	292.7	82.8	515	386.7	73.9	643	456.6	66.9	1,435	503.0	57.9
School SEI												
1st quintile (most advantaged)	24,338	418.1	73.6	23,398	508.9	71.1	17,196	577.8	75.5	13,813	617.6	76.0
2nd quintile	21,203	386.3	71.4	20,146	473.5	65.3	15,785	538.0	67.4	11,215	573.5	63.9
3rd quintile	18,102	373.5	69.7	17,979	462.5	63.3	15,432	530.0	66.1	15,502	561.8	62.3
4th quintile	16,170	363.5	71.2	16,068	451.3	63.7	14,932	517.9	65.3	12,871	545.7	59.5
5th quintile (least advantaged)	11,670	336.9	70.1	11,489	427.6	64.5	10,427	492.9	63.6	5,544	530.8	59.4
School remoteness												
Major Cities	61,446	388.9	76.5	59,288	478.4	72.3	47,021	542.6	75.5	37,795	578.1	74.2
Inner Regional Australia	12,626	371.7	70.5	12,610	459.4	63.1	11,496	525.7	64.0	9,523	560.4	62.6
Outer Regional Australia	9,685	368.8	71.1	9,673	456.3	65.1	8,708	525.2	68.0	7,289	559.8	63.6
Remote Australia	5,347	363.9	77.0	5,257	452.7	69.4	4,659	519.6	70.3	3,179	550.9	63.9
Very Remote Australia	2,379	347.8	82.3	2,253	432.7	76.3	1,888	493.3	74.6	1,160	536.1	67.0
Number of enrolments[b]												
One	64,597	389.2	75.6	64,793	477.5	70.9	53,128	543.2	73.8	43,700	577.3	72.3
Two	19,325	370.3	73.8	17,759	458.4	68.6	14,786	520.5	68.9	11,662	555.6	64.7
Three	5,223	355.5	73.9	4,506	441.8	66.9	4,134	505.1	64.4	2,737	542.7	61.7
Four	1,530	339.8	70.6	1,339	428.9	64.2	1,187	491.0	60.8	621	527.9	59.4
5 or more	808	321.9	67.6	684	411.8	64.1	537	472.4	56.7	226	511.7	60.1

TABLE 5.2: MEAN NAPLAN NUMERACY OUTCOMES FOR YEAR 3, 5, 7 AND 9 STUDENTS, 2008-2012

	Numeracy Scores											
	Year 3			*Year 5*			*Year 7*			*Year 9*		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
continued												
Aboriginal status												
Aboriginal	4,628	316.1	65.5	5,524	406.8	61.8	4,890	471.8	57.4	2,460	510.1	55.0
Not Aboriginal	86,855	385.4	75.0	83,557	474.9	69.8	68,882	539.7	72.4	56,486	573.3	70.7
Gender												
Female	44,597	378.9	71.1	43,137	466.1	66.4	35,431	529.9	68.7	27,880	565.8	67.5
Male	46,886	384.7	80.5	45,944	474.9	75.2	38,341	540.0	77.2	31,066	575.0	74.2
Mother's education												
Year 9 or equivalent or below	2,458	341.6	70.8	2,700	434.3	67.1	2,476	502.4	67.6	1,799	541.7	66.3
Year 10 or equivalent	14,849	360.8	68.9	15,613	451.2	62.5	14,182	517.8	64.6	10,231	554.5	62.4
Year 11 or equivalent	9,365	366.8	69.5	9,442	457.0	62.2	8,192	524.1	63.9	5,671	559.7	60.8
Year 12 or equivalent	18,016	384.9	70.5	16,662	474.3	65.2	13,015	541.7	68.4	8,566	576.7	66.0
Post-school qualification	25,965	414.0	75.2	23,539	503.4	71.9	17,466	571.3	76.2	10,713	605.3	75.4
Not stated/unknown[c]	20,830	365.8	76.0	21,125	456.3	71.7	18,441	519.0	72.0	21,966	564.2	71.9
Father's education												
Year 9 or equivalent or below	2,449	351.9	69.2	2,694	444.5	64.0	2,587	513.0	67.5	1,913	550.7	66.1
Year 10 or equivalent	13,819	370.4	69.0	14,880	459.1	62.6	13,575	525.1	64.1	9,712	560.2	62.5
Year 11 or equivalent	6,042	374.4	69.9	6,099	463.6	62.2	5,200	528.8	63.9	3,595	565.8	62.5
Year 12 or equivalent	13,051	387.8	70.4	12,275	476.0	65.1	9,719	544.5	69.1	6,444	578.4	67.6
Post-school qualification	18,666	420.0	75.7	17,191	510.0	73.0	12,820	579.6	77.4	7,846	613.6	76.3
Not stated/unknown[c]	37,456	368.2	75.2	35,942	457.9	70.4	29,871	520.7	71.1	29,436	562.9	70.3

TABLE 5.2: MEAN NAPLAN NUMERACY OUTCOMES FOR YEAR 3, 5, 7 AND 9 STUDENTS, 2008-2012

	Numeracy Scores											
	Year 3			*Year 5*			*Year 7*			*Year 9*		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
continued												
Mother's occupation												
Group 1 (highest)	9,465	420.7	75.3	8,796	508.7	71.8	6,611	577.0	75.6	4,118	608.9	75.4
Group 2	9,749	397.8	72.6	10,156	485.0	67.9	8,645	552.9	71.3	5,708	586.9	69.5
Group 3	12,277	386.5	69.3	13,171	475.0	64.0	11,354	541.8	66.8	8,205	576.8	65.4
Group 4	10,287	371.3	70.2	11,957	461.0	64.0	11,315	527.5	67.1	8,442	562.5	64.8
Not in paid work[d]	21,935	379.6	76.7	18,758	468.0	73.5	13,350	531.5	76.1	7,592	566.3	73.7
Not stated/unknown[c]	27,770	366.7	76.1	26,243	456.4	71.4	22,497	518.8	71.7	24,881	562.7	71.3
Father's occupation												
Group 1 (highest)	11,827	424.2	75.6	10,954	512.6	74.0	8,000	582.1	77.9	4,829	615.3	77.3
Group 2	11,936	403.0	72.1	12,292	490.3	66.7	9,944	559.2	70.8	6,415	592.1	69.6
Group 3	13,608	382.3	68.7	13,749	470.9	62.8	11,718	536.9	65.9	8,225	572.3	64.4
Group 4	11,119	368.4	69.7	11,543	456.7	64.1	10,181	522.4	65.3	7,235	559.0	63.6
Not in paid work[d]	1,864	355.2	76.5	2,006	445.2	72.0	1,844	514.3	73.9	1,312	555.3	73.9
Not stated/unknown[c]	41,129	368.3	75.3	38,537	457.9	70.5	32,085	520.6	71.2	30,930	562.2	70.3
Total	**91,483**	**381.9**	**76.1**	**89,081**	**470.6**	**73.4**	**73,772**	**535.2**	**71.2**	**58,946**	**570.7**	**71.3**

SD = Standard Deviation

a. Students are coded into categories of educational risk based on their attendance information for Semester 1 of the year of the NAPLAN test

b. Excluding the transition to secondary school

c. Includes cases where caregiver information is missing and should therefore be interpreted with caution.

d. In the last 12 months

TABLE 5.3: MEAN NAPLAN READING OUTCOMES FOR YEAR 3, 5, 7 AND 9 STUDENTS, 2008-2012

	Reading Scores											
	Year 3			*Year 5*			*Year 7*			*Year 9*		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
Attendance (educational risk)[a]												
Regular (90% or more)	73,737	400.6	91.4	72,061	480.0	81.5	57,627	536.1	70.5	35,183	569.6	69.0
Indicated (80-89%)	13,527	376.1	94.6	13,059	459.6	84.2	11,935	519.5	71.4	13,566	552.3	67.4
Moderate (60-79%)	3,782	341.4	102.4	3,642	426.6	93.9	3,714	493.5	73.7	8,698	555.3	75.0
Severe (less than 60%)	592	283.7	102.8	553	368.6	104.8	670	454.8	82.1	1,407	501.1	74.0
School SEI												
1st quintile (most advantaged)	24,317	437.0	88.3	23,428	512.3	77.8	17,198	565.1	69.0	13,814	598.4	67.7
2nd quintile	21,242	400.1	88.4	20,221	479.7	77.4	15,836	535.5	67.3	11,205	567.2	66.0
3rd quintile	18,117	385.3	87.9	18,014	468.1	79.6	15,468	528.3	67.2	15,466	555.4	65.4
4th quintile	16,210	370.4	88.6	16,114	454.0	79.7	14,959	515.9	68.0	12,867	541.7	67.2
5th quintile (least advantaged)	11,752	338.3	89.0	11,537	424.6	83.1	10,485	490.4	69.3	5,501	524.1	68.4
School remoteness												
Major Cities	61,522	403.1	93.0	59,437	481.6	82.4	47,099	535.7	71.8	37,716	566.7	70.6
Inner Regional Australia	12,664	381.1	88.1	12,656	465.2	79.3	11,548	526.0	67.2	9,557	555.8	66.4
Outer Regional Australia	9,714	376.6	90.8	9,679	460.3	83.0	8,718	523.5	70.6	7,256	556.7	70.1
Remote Australia	5,363	367.4	101.2	5,272	457.9	89.3	4,688	519.2	76.0	3,172	547.8	74.0
Very Remote Australia	2,375	349.5	101.8	2,271	426.1	103.7	1,893	491.2	83.0	1,153	523.4	79.8
Number of enrolments[b]												
One	64,664	402.5	92.8	64,924	481.6	82.5	53,233	537.5	71.8	43,644	567.5	70.6
Two	19,371	380.3	92.2	17,829	460.9	82.9	14,833	518.0	69.6	11,622	550.0	68.4
Three	5,253	363.0	94.0	4,516	444.2	85.3	4,132	504.6	67.9	2,724	535.9	67.5
Four	1,540	340.2	90.3	1,348	424.7	83.4	1,190	491.0	65.9	627	524.4	68.0
5 or more	810	321.7	81.4	698	403.0	81.9	558	473.3	63.9	237	504.9	62.0

TABLE 5.3: MEAN NAPLAN READING OUTCOMES FOR YEAR 3, 5, 7 AND 9 STUDENTS, 2008-2012

	Reading Scores											
	Year 3			*Year 5*			*Year 7*			*Year 9*		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
continued												
Aboriginal status												
Aboriginal	4,677	309.8	86.3	5,567	394.9	81.9	4,931	466.7	65.8	2,427	498.1	67.0
Not Aboriginal	86,961	398.3	92.2	83,748	479.4	81.4	69,015	535.1	70.3	56,427	564.6	69.6
Gender												
Female	44,766	402.4	91.2	43,298	482.4	81.9	35,558	537.0	70.3	27,876	569.1	69.6
Male	46,872	385.6	95.7	46,017	466.3	85.1	38,388	524.5	73.1	30,978	555.4	71.2
Mother's education												
Year 9 or equivalent or below	2,462	343.7	85.6	2,702	428.7	81.4	2,483	496.3	64.7	1,793	526.2	65.6
Year 10 or equivalent	14,886	366.5	85.2	15,687	453.0	77.4	14,232	514.6	65.6	10,219	548.2	65.2
Year 11 or equivalent	9,387	374.7	86.8	9,467	460.1	76.4	8,228	521.0	64.4	5,654	552.5	63.3
Year 12 or equivalent	18,072	398.1	87.4	16,680	479.2	76.5	13,057	537.2	66.9	8,580	568.3	65.4
Post-school qualification	25,977	434.2	90.2	23,560	511.3	79.5	17,484	564.4	70.8	10,706	593.9	69.8
Not stated/unknown[c]	20,854	373.7	95.6	21,219	456.6	87.3	18,462	514.9	73.5	21,902	555.4	72.5
Father's education												
Year 9 or equivalent or below	2,449	353.3	86.7	2,689	440.9	79.0	2,595	504.7	66.4	1,922	535.9	67.5
Year 10 or equivalent	13,864	378.1	86.0	14,916	463.0	76.8	13,622	521.6	65.4	9,712	553.4	64.0
Year 11 or equivalent	6,054	385.5	86.6	6,109	466.6	75.5	5,207	526.8	64.1	3,610	558.1	65.0
Year 12 or equivalent	13,060	401.7	87.2	12,284	482.1	77.4	9,736	539.6	67.9	6,435	567.5	66.1
Post-school qualification	18,685	441.8	89.4	17,200	516.4	79.0	12,826	569.5	70.5	7,840	599.6	69.8
Not stated/unknown[c]	37,526	376.9	94.0	36,117	459.7	85.6	29,960	517.8	72.2	29,335	555.5	71.5

TABLE 5.3: MEAN NAPLAN READING OUTCOMES FOR YEAR 3, 5, 7 AND 9 STUDENTS, 2008-2012

	Reading Scores											
	Year 3			*Year 5*			*Year 7*			*Year 9*		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
continued												
Mother's occupation												
Group 1 (highest)	9,479	442.9	90.4	8,808	519.3	79.4	6,611	572.3	71.1	4,113	600.6	71.5
Group 2	9,745	412.6	89.4	10,180	492.5	79.4	8,665	548.6	69.0	5,710	578.7	66.5
Group 3	12,296	400.3	85.8	13,178	480.5	75.2	11,380	537.7	64.8	8,214	568.7	64.0
Group 4	10,312	380.8	87.2	11,956	464.1	77.3	11,349	523.1	66.2	8,462	553.9	64.9
Not in paid work[d]	22,013	390.4	94.5	18,833	469.8	84.9	13,410	525.6	72.9	7,565	555.3	72.3
Not stated/unknown[c]	27,793	375.0	94.7	26,360	456.4	86.3	22,531	514.4	72.6	24,790	554.0	72.1
Father's occupation												
Group 1 (highest)	11,843	446.7	89.6	10,957	521.1	80.1	8,006	573.2	70.6	4,838	603.1	70.3
Group 2	11,936	418.5	88.5	12,304	496.8	76.8	9,962	552.8	67.6	6,428	581.8	66.5
Group 3	13,646	394.7	85.7	13,771	475.2	74.8	11,730	532.8	65.3	8,220	562.8	64.1
Group 4	11,149	377.1	86.2	11,562	459.4	76.9	10,201	518.6	65.9	7,252	550.0	64.5
Not in paid work[d]	1,872	359.7	97.2	2,009	443.3	86.3	1,856	507.6	73.1	1,312	543.8	74.3
Not stated/unknown[c]	41,192	377.2	93.8	38,712	459.3	85.4	32,191	517.3	71.9	30,804	554.5	71.4
Total	**91638**	**393.8**	**93.9**	**89315**	**474.1**	**83.9**	**73946**	**530.5**	**72.1**	**58854**	**561.8**	**70.7**

SD = Standard Deviation

a. Students are coded into categories of educational risk based on their attendance information for Semester 1 of the year of the NAPLAN test

b. Excluding the transition to secondary school

c. Includes cases where caregiver information is missing and should therefore be interpreted with caution.

d. In the last 12 months

TABLE 5.4: MEAN NAPLAN WRITING OUTCOMES FOR YEAR 3, 5, 7 AND 9 STUDENTS, 2011-2012.

	Writing Scores											
	Year 3			*Year 5*			*Year 7*			*Year 9*		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
Attendance (educational risk)[a]												
Regular (90% or more)	30,238	410.6	66.2	29,428	474	70.2	24,811	528.1	75.6	13,323	561	90.8
Indicated (80-89%)	5,813	386.5	78.1	5,773	449.1	78.4	5,543	503.5	80.5	5,446	533	95.3
Moderate (60-79%)	1,675	343.8	96.3	1,697	408.3	97.0	1,893	467.4	94.8	2,594	499.2	107.7
Severe (less than 60%)	268	246.4	107.1	278	317.7	116.5	365	393.5	119	720	446.2	127.3
School SEI												
1st quintile (most advantaged)	10,028	433.6	56.2	9,746	499.5	64.9	7,247	557.5	75.0	5,408	593.1	88.0
2nd quintile	9,170	411.7	64.2	8,679	473.8	67.2	7,140	525.7	72.8	4,400	551.6	91.1
3rd quintile	7,434	397.6	67.8	7,452	459.5	69.2	6,832	515.0	73.8	5,512	532.1	89.4
4th quintile	6,489	385.8	75.0	6,476	450.4	74.1	6,504	504.8	78.0	4,742	517.0	98.7
5th quintile (least advantaged)	4,873	353.5	88.5	4,823	415.0	88.8	4,889	476.1	87.1	2,021	481.8	108.4
School remoteness[b]												
Major Cities	25,661	410.9	69.0	24,718	475.0	72.9	20,532	526.8	79.4	14,205	553.6	96.3
Inner Regional Australia	5,287	396.5	67.9	5,249	456.2	69.9	5,204	510.8	72.5	3,528	527.8	98.3
Outer Regional Australia	3,827	388.5	73.3	3,989	451.3	72.5	3,839	509.0	78.5	2,698	529.1	98.4
Remote Australia	2,184	375.2	88.4	2,181	442.9	89.6	2,118	504.4	91.3	1,196	514.8	110.6
Very Remote Australia	1,035	346.2	101.9	1,039	405.8	105.9	919	461.9	106.9	456	492.3	113.8
Number of enrolments												
One	26,069	410.6	68.0	26,091	473.6	72.7	22,731	526.9	78.9	16,149	551.9	96.1
Two	8,456	392.8	76.7	8,015	455.7	76.3	7,141	507.1	80.5	4,315	528.0	99.7
Three	2,424	376.0	83.5	2,102	434.3	87.0	1,857	490.6	82.8	1,157	506.0	106.2
Four	697	362.0	85.9	626	421.3	83.8	591	473.7	89.1	321	478.5	111.5
5 or more	348	334.7	96.0	342	397.5	96.9	292	456.0	90.0	141	446.6	118.6

TABLE 5.4: MEAN NAPLAN WRITING OUTCOMES FOR YEAR 3, 5, 7 AND 9 STUDENTS, 2011-2012.

	Writing Scores											
	Year 3			*Year 5*			*Year 7*			*Year 9*		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
continued												
Aboriginal status												
Aboriginal	1,385	316.3	99.6	2,445	387.0	96.6	2,416	443.9	96.5	1,225	449.2	122.3
Not Aboriginal	36,609	406.1	69.7	34,731	471.5	71.3	30,196	524.9	76.5	20,858	548.6	94.9
Gender												
Female	18,591	416.0	66.6	18,068	481.8	69.5	15,766	537.5	75.3	10,426	567.2	87.5
Male	19,403	390.3	76.5	19,108	450.9	79.0	16,846	501.4	82.2	11,657	521.6	104.1
Mother's education												
Year 9 or equivalent or below	1,060	365.2	85.4	1,142	429.4	80.7	1,166	487.2	83.2	793	506.8	96.0
Year 10 or equivalent	6,031	383.9	75.8	6,023	448.4	73.1	6,167	504.0	76.6	4,318	525.7	94.7
Year 11 or equivalent	3,869	390.1	75.0	3,778	454.6	70.8	3,645	511.7	73.8	2,461	531.0	92.3
Year 12 or equivalent	8,022	408.6	63.9	7,160	472.5	67.4	6,029	525.5	72.0	3,921	551.9	91.6
Post-school qualification	11,558	428.8	58.3	10,049	495.7	65.8	7,870	552.3	76.2	5,202	583.2	91.2
Not stated/unknown[c]	7,454	383.7	82.9	9,024	448.7	84.9	7,735	499.8	86.8	5,388	522.7	106.3
Father's education												
Year 9 or equivalent or below	989	376.8	79.4	1,046	440.8	76.0	1,136	495.7	74.2	873	508.5	104.2
Year 10 or equivalent	654	393.0	72.3	5,602	457.7	69.0	5,715	512.3	72.0	4,268	532.7	91.8
Year 11 or equivalent	2,563	402.8	66.1	2,443	464.7	66.7	2,325	516.6	73.0	1,644	536.7	93.8
Year 12 or equivalent	5,891	411.7	61.8	5,181	473.3	66.5	4,435	529.7	71.7	2,984	552.3	87.0
Post-school qualification	8,277	432.9	57.1	7,294	501.1	65.4	5,758	558.8	75.4	3,819	592.9	89.5
Not stated/unknown[c]	14,620	387.9	80.0	15,610	452.0	81.8	13,243	503.2	85.3	8,495	527.5	103.6

TABLE 5.4: MEAN NAPLAN WRITING OUTCOMES FOR YEAR 3, 5, 7 AND 9 STUDENTS, 2011-2012.

	Writing Scores											
	Year 3			*Year 5*			*Year 7*			*Year 9*		
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
continued												
Mother's occupation												
Group 1 (highest)	4,097	431.6	58.5	3,605	498.5	66.1	2,866	558.4	77.1	1,987	588.9	94.8
Group 2	3,981	418.1	60.8	3,894	481.2	67.6	3,673	536.6	73.7	2,527	562.8	91.2
Group 3	4,971	410.8	63.6	4,926	474.5	66.2	4,842	529.7	72.2	3,577	553.1	88.4
Group 4	3,959	396.9	68.8	4,353	460.2	70.2	4,883	514.5	74.4	3,620	535.5	95.2
Not in paid work[d]	9,639	400.5	74.3	8,835	464.8	76.0	6,600	513.8	82.0	3,731	539.2	99.6
Not stated/unknown[c]	11,347	387.6	80.9	11,563	450.0	83.0	9,748	500.9	85.1	6,641	522.8	104.5
Father's occupation												
Group 1 (highest)	5,093	435.2	55.7	4,481	502.4	65.4	3,474	562.8	76.3	2,347	595.0	91.3
Group 2	4,784	421.1	60.6	4,805	486.6	65.3	4,207	542.7	70.9	2,850	568.9	88.2
Group 3	5,800	408.6	62.2	5,592	470.7	65.6	5,133	525.4	69.9	3,713	546.7	87.9
Group 4	4,740	396.0	70.2	4,572	457.6	69.5	4,636	510.1	73.3	3,322	530.2	92.7
Not in paid work[d]	800	378.2	85.8	818	440.7	85.5	844	493.0	85.4	634	516.7	111.6
Not stated/unknown[c]	16,777	389.0	79.6	16,908	452.3	81.2	14,318	503.3	84.7	9,217	526.9	103.7
Total	**37994**	**402.8**	**73.0**	**37176**	**466.0**	**76.1**	**32612**	**518.9**	**81.0**	**22083**	**543.1**	**99.3**

SD = Standard Deviation

a. Students are coded into categories of educational risk based on their attendance information for Semester 1 of the year of the NAPLAN test

b. Excluding the transition to secondary school

c. Includes cases where caregiver information is missing and should therefore be interpreted with caution.

d. In the last 12 months

SUMMARY AND CONCLUSION

This chapter provides an initial analysis of the factors that are related to student achievement, and highlights clear and consistent relationships between achievement and a range of student, caregiver and school-level factors. The patterns are consistent with the existing literature in this field and support the notion that students living in less remote areas and in better socio-economic conditions typically do better at school. The gaps between the high and low performing students at each education level are, at times, vast and suggest that there are groups of students that lag behind by several grades throughout their educational experience.

The next chapter extends on this one by providing a more robust examination of the nature and shape of the associations between achievement, attendance and a range of risk factors (or determinants).

CHAPTER 6 THE RELATIONSHIP BETWEEN STUDENT ATTENDANCE AND ACHIEVEMENT

Background

This chapter provides a visual examination of the nature and shape of the relationship between achievement and attendance, and how this relationship differs for a range of population sub-groups.

Highlights

- Substantial achievement gaps were observed for all learning domains across Years 3, 5 7 and 9, and at all levels of absence. For example, among students with a perfect attendance record (0 absences) students from advantaged backgrounds still achieved at significantly higher levels than disadvantaged students.

Summary of findings

- The findings support the notion that every day of attendance in school contributes towards a child's learning.
- Overall, absence appears to have a greater impact on achievement in writing than it does in numeracy and reading.
- Some students are more adversely affected by absence than others. As absence rates increase, the declines in student achievement are more rapid for students from less advantaged backgrounds.
- The effects of unauthorised absences on student achievement are far greater than authorised absences.

METHODS

The analysis in this chapter is conducted on the Analysis Long File (see *Overview of Project Data* section in Chapter 2). The outcome variables include the NAPLAN scale score in tests of numeracy, reading and writing (student achievement). The primary explanatory variable is student attendance at school. The relationship between outcomes in student achievement and attendance are examined by school-level socio-economic and geographic indicators, and the characteristics of students and their caregivers. We introduce the use of Generalised Additive Models, or regression splines, to provide a visual illustration of the relationships with student achievement.

Measuring performance

We draw upon NAPLAN scale scores in numeracy, writing and reading for Years 3, 5, 7 and 9 (see Chapter 2 for more details on the NAPLAN). The data for each test is pooled across multiple years of the study period. We have used the full study period (years 2008 to 2012) for numeracy and reading, e.g. the results for Year 3 reading include test scores in 2008, 2009, 2010, 2011 and 2012. Our analysis of writing results is restricted to 2011 and

2012 only, on the basis that there was a substantial change in this test in 2011 (from a narrative to persuasive writing test).

Measuring attendance

The primary metric of attendance used in this chapter is the overall absence rate. The number of authorised and unauthorised half-day absences was summed to create the total number of half-day absences. The rate is then calculated as a percentage of the total number of half-days the student was available to attend (see Chapter 3 for more details on measuring attendance).

Calculations are based on the Semester 1 attendance information for the student in the year of the NAPLAN test.

It should be noted that there are, on average, about 100 days of school available for students to attend each semester. An absence rate of 10% therefore equates to a student being away from school for 10 full days (or 20 half-days) out of 100. Accordingly, a 10% absence rate can be interpreted as 10 days of school being missed per semester, two full weeks for the semester, or four weeks of the school year. Similarly, a student with an absence rate of 40% would be away from school around two months of a semester, or four months of the year.

Student characteristics

Student characteristics were measured in this Chapter using information from the Student Enrolments database. We have included five key variables here (see *Data and Methods* section of Chapter 3 for definitions and the coding rules that have been applied to the derivation of these items):

- Gender
- Aboriginal status
- Student mobility
- Main language spoken at home by the student

Caregiver characteristics

In the interest of brevity, only the educational attainment of the student's mother is included in the following analyses (see *Data and Methods* section of Chapter 3 for more details). Based on the results from Chapter 4, maternal education was chosen as the best indicator of student-level advantage or disadvantage.

School-level characteristics

The analyses in this Chapter include a small set of school contextual variables (see *Data and Methods* section of Chapter 3 for more details on the derivation and classification of these variables):

- School remoteness
- Socio-Economic Index for schools (SEI).

Analytic techniques

Generalised Additive Models are the primary analytic technique used in this chapter (see below for details).

Generalised Additive Models (splines)

The empirical literature and results presented thus far confirm that there is a strong relationship between school attendance and academic performance. The educational achievement of students in the indicated, moderate or severe categories of educational risk is progressively worse compared with students with regular attendance. Understanding the shape and nature of the relationship between attendance and performance at school may help in defining risk categories and in determining the types of supports that may be beneficial for students, and the points at which these supports may have the greatest impact.

One theory that has been proposed is the existence of a threshold amount of school that can be missed beyond which it is difficult to catch up (Zubrick et al., 1997). A student who misses an occasional day of school may be able to catch up on the missed school work within a relatively small space of time, for instance by catching up on missed readings in school or at home, or by doing additional school or homework following the absence, or be provided a small amount of additional help by a parent or teacher. A student who misses a large block of time from school may not have the opportunity or resources to catch up on the missed work.

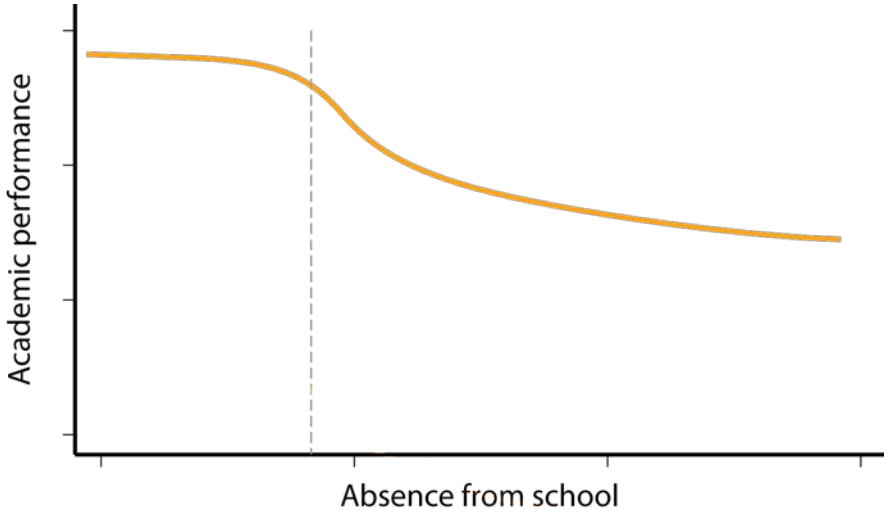
One way to test this hypothesis is to examine the relationship between attendance at school and academic performance using methods that allow the data to better describe the shape of the relationship.

If this type of relationship is observed in the data, it would then be reasonable to use the points at which the shape of the curve changes to define risk categories for attendance in school.

Figure 6.1 illustrates what might be observed if the hypothesised threshold effect occurs. A small amount of absence from school may have minimal effect on academic performance, but beyond some threshold attendance level there is a noticeable drop in measured academic performance. This is to be contrasted with what is sometimes called a "dose response effect" where, in this example, there is a progressive decline in academic performance with increasing absence from school. That is, for every "dose" of absence, be it defined as one day or one week of absence, there is a corresponding effect of a decline in academic performance.

If this type of relationship is observed in the data, it would then be reasonable to use the points at which the shape of the curve changes to define risk categories for attendance in school.

FIGURE 6.1: HYPOTHESISED THRESHOLD RELATIONSHIP BETWEEN ACADEMIC PERFORMANCE AND ATTENDANCE AT SCHOOL



It is also possible that the nature of the relationship between attendance and academic performance may be different at different ages or for students in different circumstances. For instance, students may be able to catch-up on a certain amount of missed schooling by receiving support from school or home on return to school. This could depend on the resources the school or the parents have available. For instance, more highly educated parents or parents more invested in their children's schooling may be better placed to help their children if they miss days from school. It may also depend on year level in school and the intensity of the curriculum.

Generalised Additive Models (GAMs) were used to fit a non-linear spline curve to the relationship between attendance rate and NAPLAN test results. This method uses the data to determine the best shape of the relationship between two variables, rather than impose a linear relationship or pre-defined categories (Hastie & Tibshirani, 1990).

The GAM modelling framework estimates a smooth trend relationship between attendance and performance of arbitrary shape. So the effect on academic performance of a difference in attendance rate from 98% to 96% may be quite different than a difference in attendance rate from 88% to 86%.

GAMs were fitted examining the relationship between NAPLAN scores and attendance rates for all students in a year level, and for specific sub-sets of students—by remoteness, school SEI, maternal education, gender, Aboriginal status, student mobility, disability and main language spoken at home. The aim was to determine if there were any specific levels of attendance where the shape of the relationship between attendance and performance changed to help define categories of educational risk.

All spline curves are reported with 95% confidence intervals. The intervals are denoted in all figures by use of grey shaded regions around the spline. When no grey shading is visible it indicates that the upper and lower confidence boundaries are very close to the estimated effect (or that there is a high level of confidence about the estimate). Confidence intervals tend to be wider for very high levels of absence from school because of the small number of students with such high absence rates.

RESULTS

All figures presented below include two reference lines (in grey). The lower line represents the cut point below which a student would be regarded as performing *below* the National Minimum Standard for the outcome being examined. Students between the upper and lower lines are *at* the National Minimum Standard, while those above the upper line are *above* the National Minimum Standard.

The nature and shape of the attendance–achievement relationship

Numeracy Achievement

Overall, there appears to be a relatively linear association between attendance at school and numeracy achievement in Years 3, 5, 7 and 9 (Figure 6.2). In other words, as absences increase there is a steady linear decline in numeracy achievement. The spline curve appears to flatten at the more extreme ends of absence (above 60% absence) in Years 3 and 7, suggesting that numeracy achievement is similar for students at very high levels of absence in these grades. Students can be absent for quite a significant proportion of school before their NAPLAN achievement falls below the National Minimum Standards. Figure 6.2 shows that, on average, students are not at risk of falling below the National Minimum Standards of numeracy achievement until they miss more than 70% of the semester. Even students with less than 30-35% absence tend to be above the National Minimum Standards in this domain.

We can also observe that the slope of the line between 0-10% of absence from school increases in Years 7 and 9. This pattern suggests that it becomes more difficult to catch up on a few missed days in later years.

School SEI

Figure 6.3 indicates the gaps in the achievement of students in low and high SEI areas are independent of level of attendance. We see this clearly in the SEI differences in students who miss virtually no school. Figure 6.3 also highlights that the relationship between achievement and attendance is also different among students in schools in the most advantaged areas. The spline curve for students in the highest SEI is almost flat at absence ratios greater than 10% in Years 3 and 5, suggesting that even large amounts of absence do not affect numeracy results in the early- to mid-years of primary school in high SEI schools. In contrast, from Year 7 onward, there appears to be a slightly steeper slope in the early part of the curve (<10% absence), whereby small improvements in attendance appear to have larger benefits for achievement, but only for students in the most advantaged areas . This finding suggests that while children from less advantaged areas benefit from higher attendance across all years of school, children in advantaged schools benefit the most from higher attendance in later years. Children attending more advantaged schools may have alternative resources to achieve learning objectives, and be exposed to qualitatively better learning environments and opportunities, both at school and in the home, during the early years of school.

School remoteness

Figure 6.4 reveals that there are subtle differences in the pattern of achievement along the continuum of absence for students in different remoteness areas. Students in metropolitan Perth appear to perform better than other students when absence ratios are around the 0-30% range, after which the distinction between students in Perth and Regional areas is less clear. Our findings in Chapter 5 suggested that students in Remote and Very remote areas of Western Australia have lower achievement than students in other areas. The patterns in Figure 6.4 suggest that these achievement gaps become larger at higher levels of absence (greater than 20–30%). That is, higher levels of absence appear to have a greater impact for students in more remote areas.

Gender

The relationship between absence and achievement on numeracy tests did not differ substantially between male and female students Figure 6.5.

Aboriginal status

The disparities in achievement in numeracy between Aboriginal and non-Aboriginal students (outlined in Chapter 5) were consistently maintained at every level of attendance in all grades—with the exception of Year 9, where the gaps in achievement narrowed at higher levels of absence (Figure 6.6). Figure 6.6 also highlights that, on average, only Aboriginal students attending school regularly (i.e. with less than 10% absence) were likely to be performing above the National Minimum Standards in numeracy. In contrast, non-Aboriginal students with up to 30–40% absence were still likely to achieve this standard.

Mobility

The patterns of achievement were generally similar by level of student mobility, although the spline curves suggest there is some convergence at the high end of the absence spectrum. Figure 6.7 shows that, among highly mobile students, only those with small amounts of absence tend to achieve above the National Minimum Standard in numeracy.

Main language spoken at home

There were generally similar patterns of achievement between students who speak English at home and those who speak another language at home (Figure 6.8). That said, while there were no differences for regular attenders, non-English speakers with 10–30% absence appear more tolerant of absences doing slightly better in numeracy than their English-speaking counterparts in Years 3 and 5. These small disparities are also evident in Year 7, although it is evident for the range of absence from 0% through to about 30%.

Maternal education

Figure 6.9 confirms that maternal education level had a strong association with student achievement, independent of the level of attendance of the student, although the effects appeared to reduce progressively from Year 3 to Year 9. In particular, average numeracy scores were distinctly higher for students whose mother had completed Year 12 or a non-school qualification.

The relationship between achievement and attendance was noticeably different for students whose mother had a non-school qualification than other students, at least in the primary school years. The spline curve for these students was relatively flat in Years 3 and 5 and suggests that falling attendance does not pose a risk to numeracy achievement of students if their mother had a non-school qualification. By Year 9, the attendance-achievement relationship begins to look similar for all students, and is characterised by a linear pattern. Further, we note that the majority of students performed at or above the National Minimum Standards by Year 9 regardless of their mother's education and level of absence (Figure 6.9).

The patterns observed here for maternal education are similar to those seen by level of school SEI. That is, for higher levels of SEI or maternal education, student performance is more resistant to absence when it does occur. There is likely to be a reasonably high degree of correlation between individual and school level indicators of socio-economic status (SES). Taken together, these data suggest that among less advantaged students, fewer absences bring a benefit to achievement across all the years of school. For the most advantaged students, attendance brings the most benefit in the later years of school.

How to interpret the figures in this chapter

Grey reference lines:

- The lower line represents the cut point below which a student would be regarded as performing *below* the National Minimum Standard (NMS). Students between the upper and lower lines are *at* the NMS, while those above the upper line are *above* the NMS.

Grey shaded regions:

- All figures include 95% confidence intervals (denoted by grey shaded regions around the curves). When no grey shading is visible it indicates that there is a high level of confidence about the estimate. Wider confidence intervals tend to indicate that the estimate is based on a small numbers of students and, accordingly, that there is less confidence about the shape of the curve at that point.

Scale of absence:

- Each percentage point of absence equates to around 1 day of absence from school in a semester. Therefore, an absence rate of 10% is equivalent to 10 full days away per semester (or 20 days per year).

FIGURE 6.2: PATTERN OF ASSOCIATION BETWEEN NAPLAN NUMERACY SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), 2008-2012

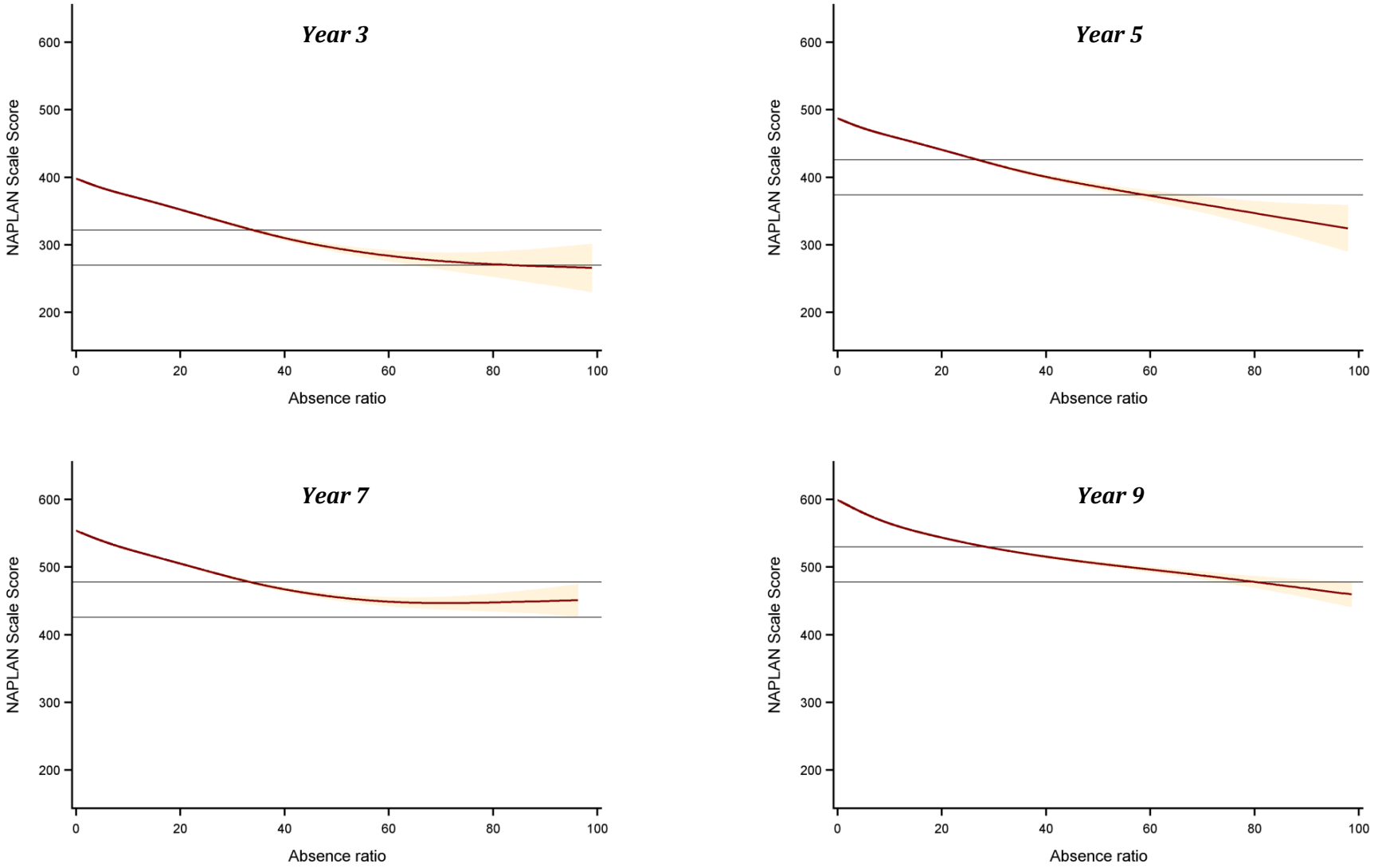


FIGURE 6.3: PATTERN OF ASSOCIATION BETWEEN NAPLAN NUMERACY SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY SCHOOL SOCIO-ECONOMIC INDEX (SEI), 2008-2012

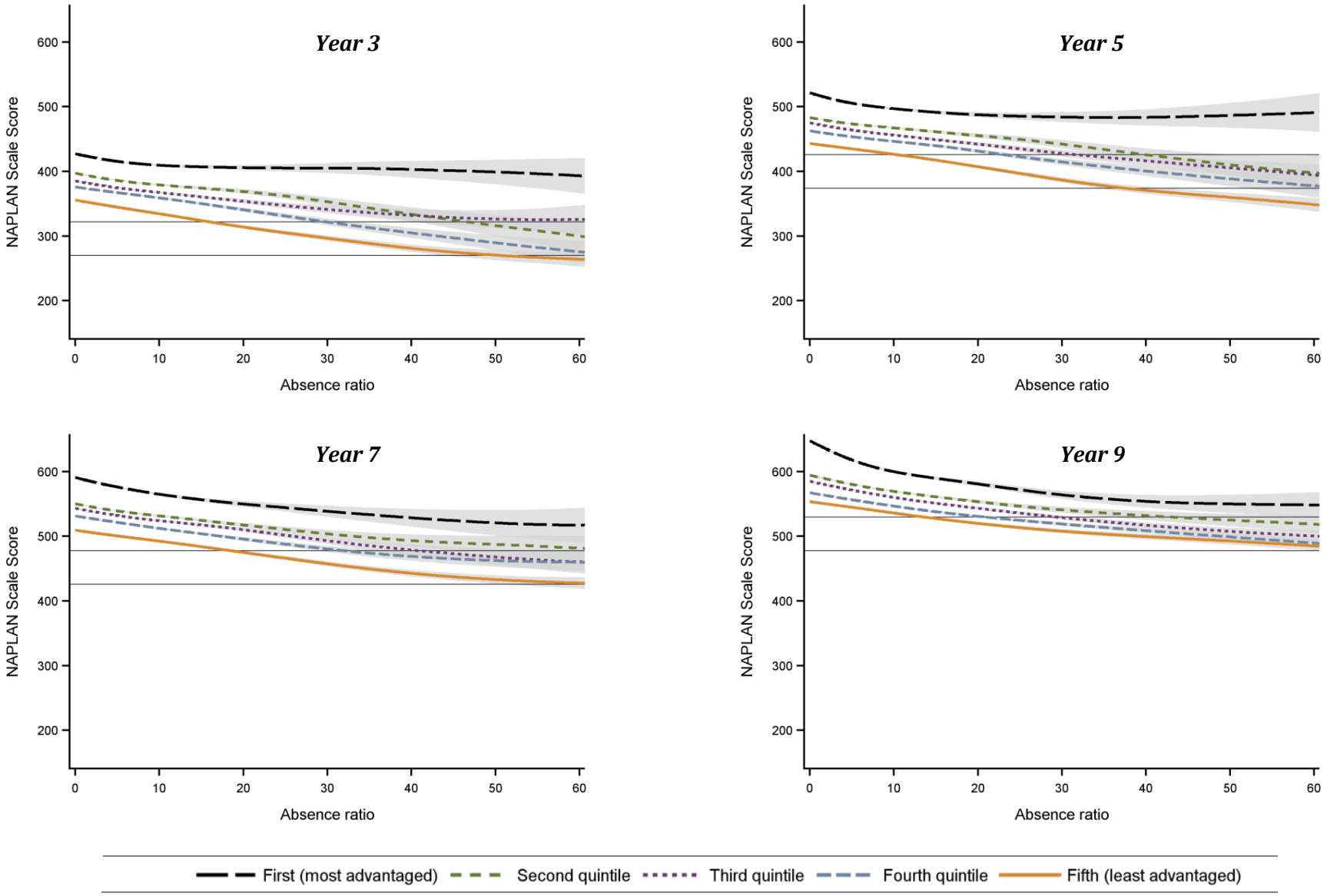


FIGURE 6.4: PATTERN OF ASSOCIATION BETWEEN NAPLAN NUMERACY SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY REMOTENESS

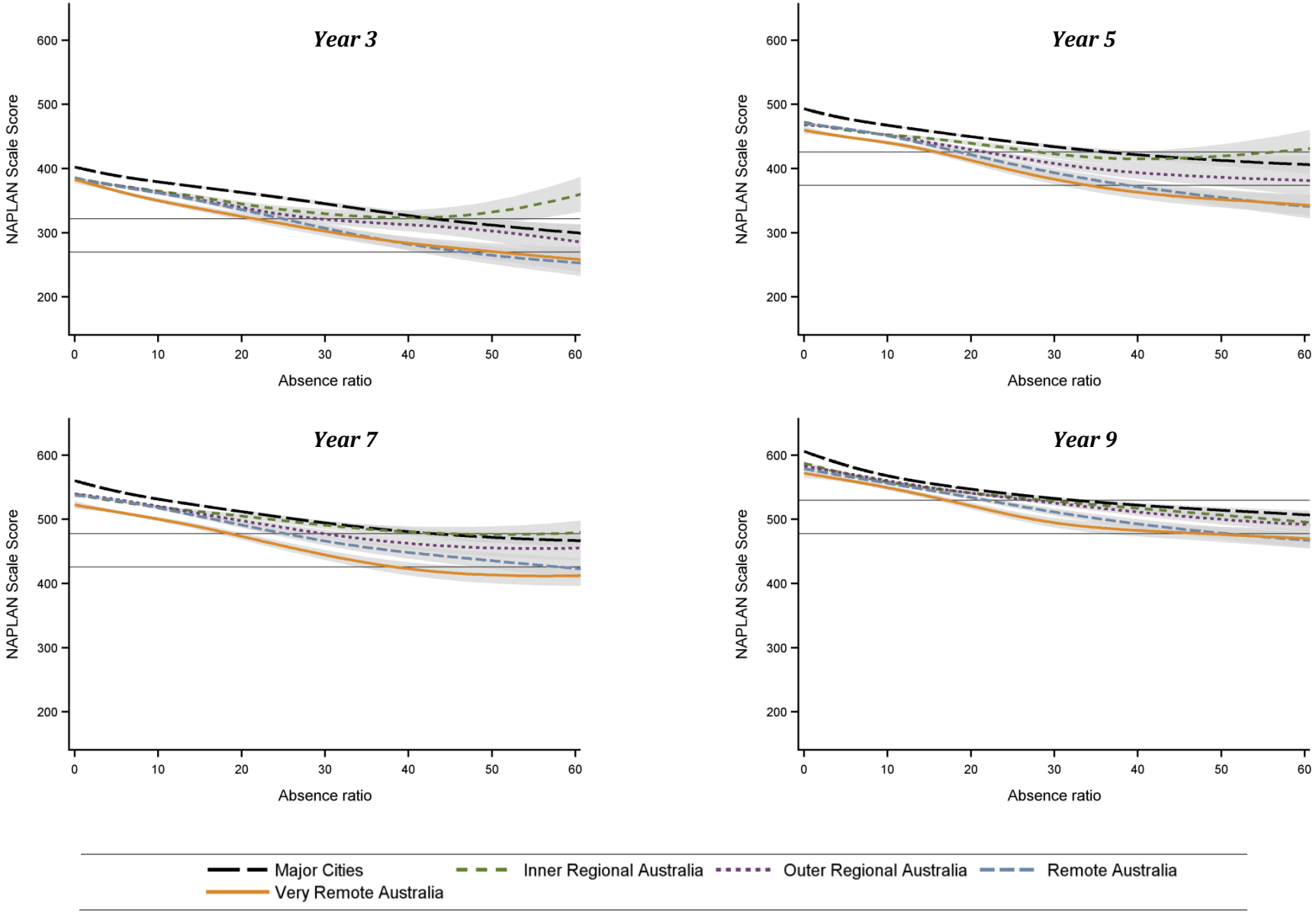


FIGURE 6.5: PATTERN OF ASSOCIATION BETWEEN NAPLAN NUMERACY SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY GENDER, 2008-2012

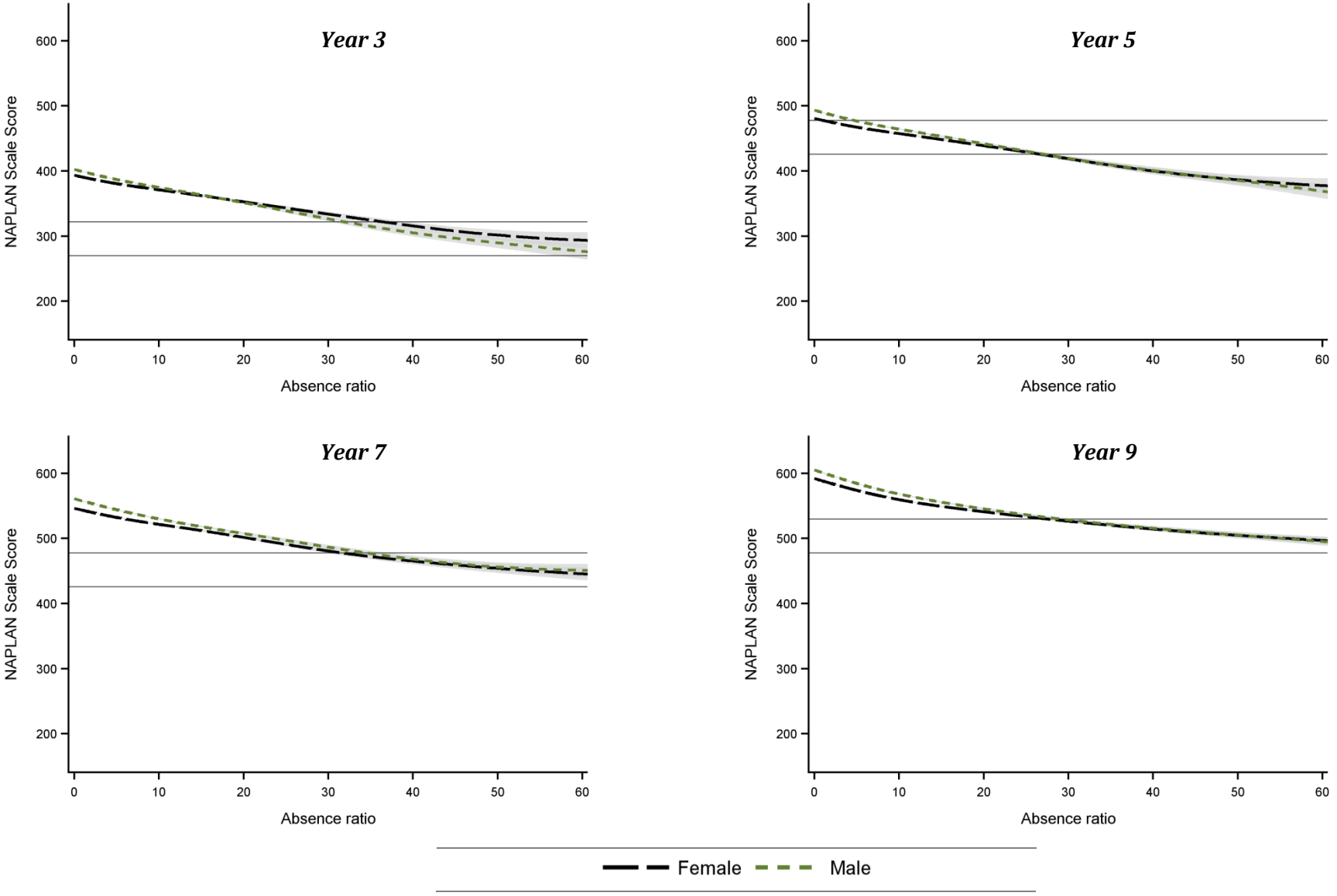


FIGURE 6.6: PATTERN OF ASSOCIATION BETWEEN NAPLAN NUMERACY SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY ABORIGINAL STATUS OF THE STUDENT, 2008-2012

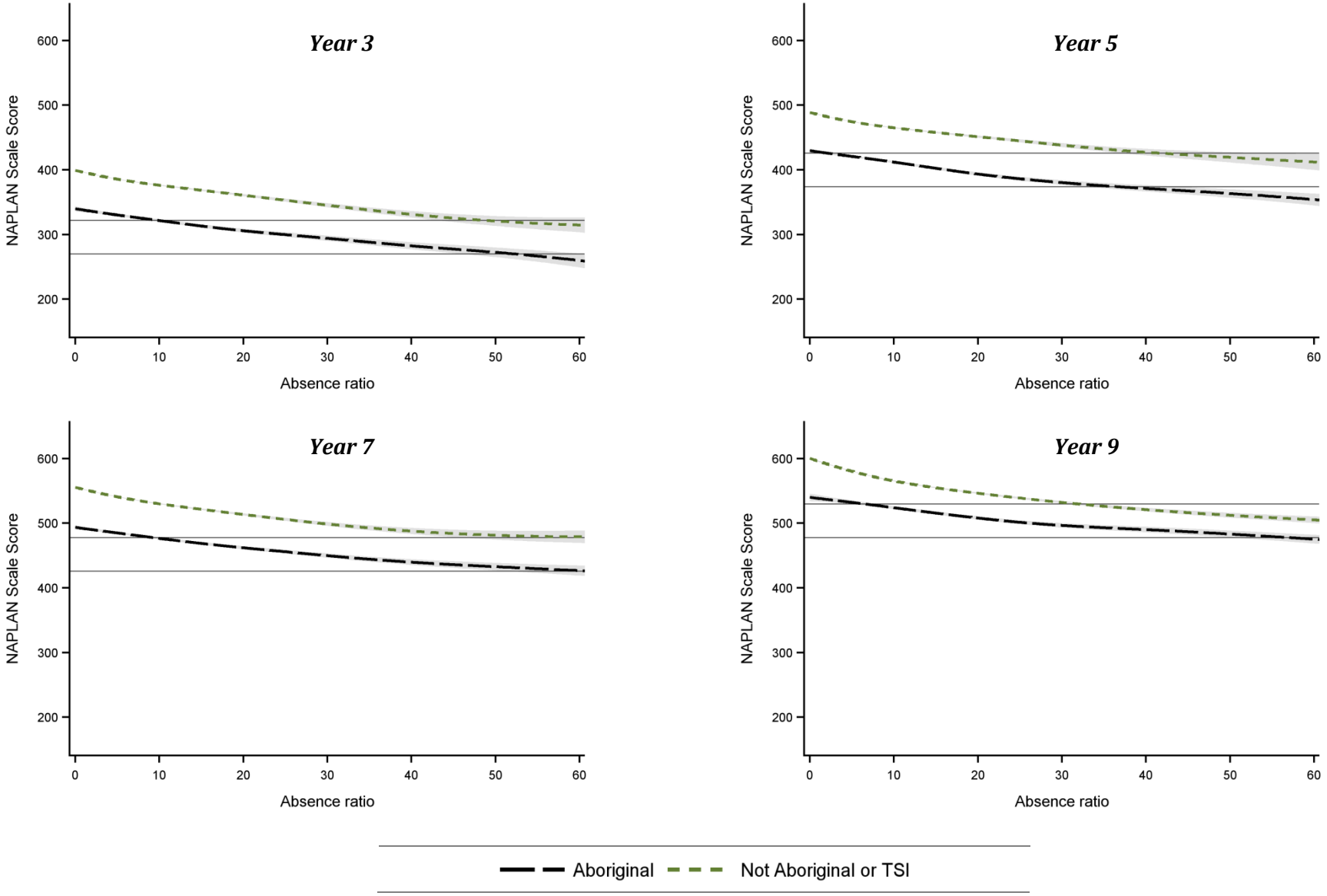


FIGURE 6.7: PATTERN OF ASSOCIATION BETWEEN NAPLAN NUMERACY SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY NUMBER OF STUDENT ENROLMENTS, 2008-2012

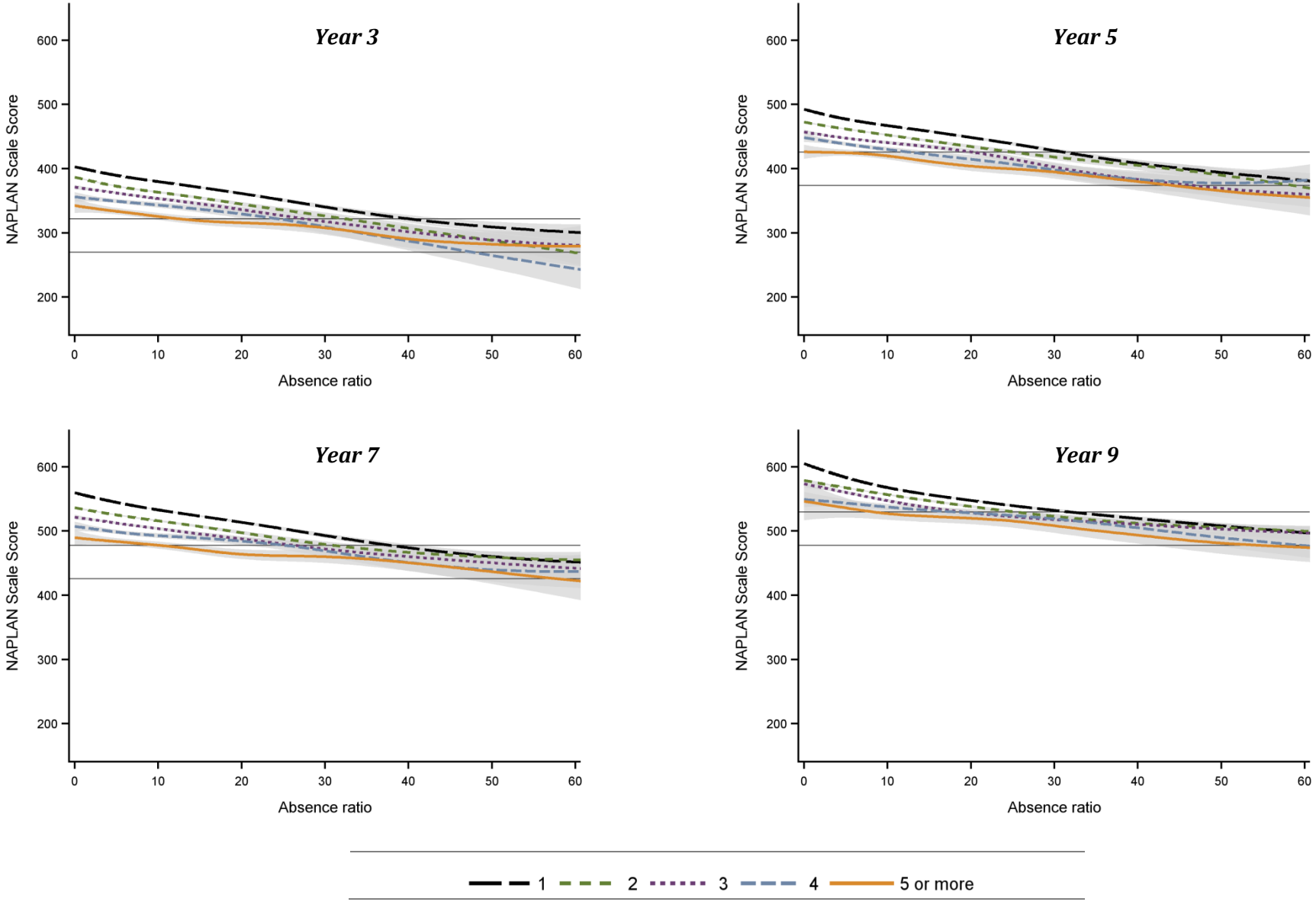


FIGURE 6.8: PATTERN OF ASSOCIATION BETWEEN NAPLAN NUMERACY SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY MAIN LANGUAGE SPOKEN AT HOME, 2008-2012

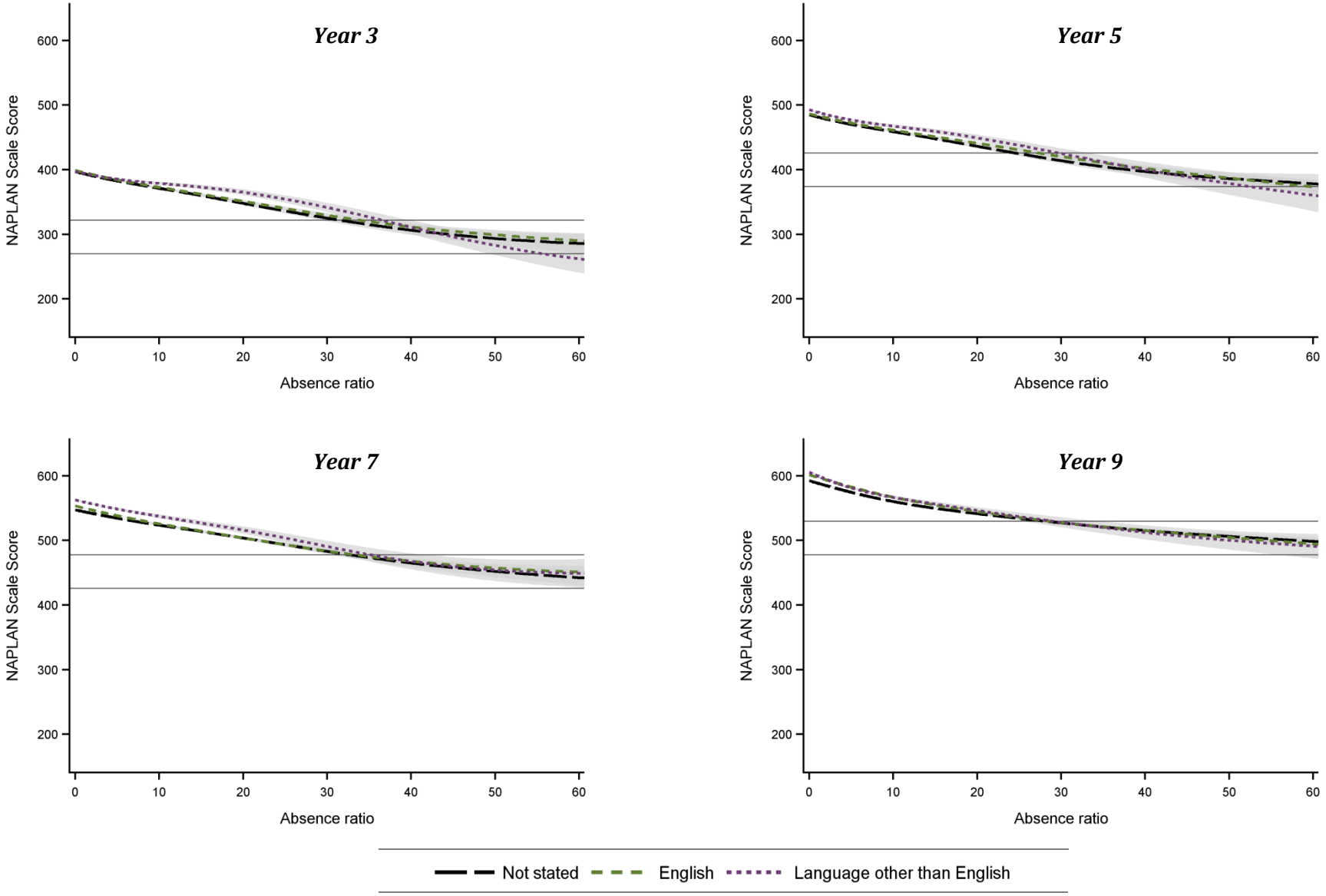
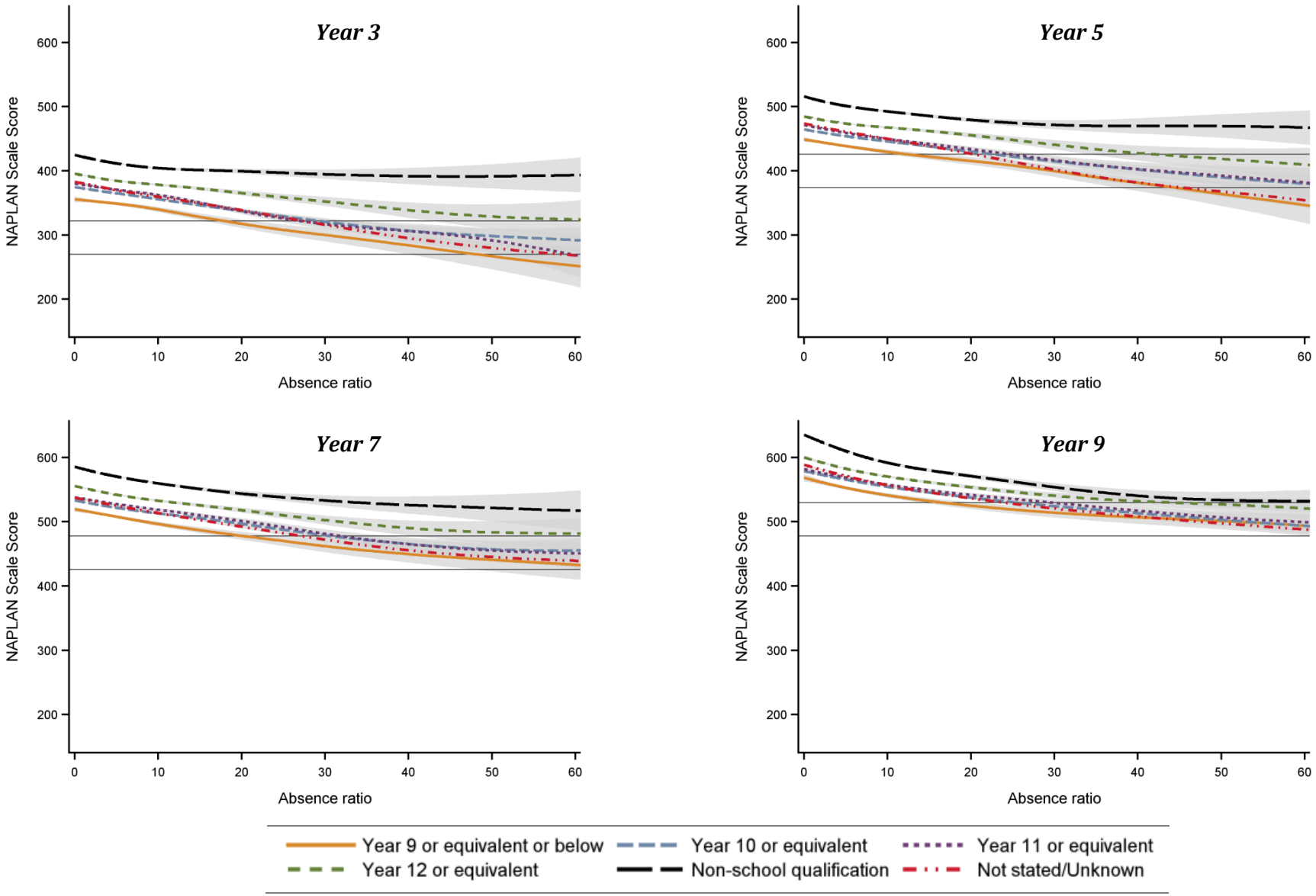


FIGURE 6.9: PATTERN OF ASSOCIATION BETWEEN NAPLAN NUMERACY SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY MATERNAL EDUCATIONAL ATTAINMENT, 2008-2012



Reading achievement

There appears to be a slightly curvilinear association between attendance at school and achievement in reading in all grades (Figure 6.10). This pattern becomes more pronounced in secondary education—as the slopes of the splines become progressively flatter at higher levels of absence—and suggests that attendance generally has a greater influence on reading achievement in Year 3 than Year 9. As a general rule, students were not at risk of falling below the National Minimum Standards for reading until they missed a large portion of the school year (about 50-60% absence in primary school and 80% in secondary school). Further, students with less than about 30% absence tend to be above the National Minimum Standards in this domain.

School SEI

The socioeconomic gradient in reading (and numeracy and writing) achievement that is evident again at every level of attendance (Figure 6.11). This also highlights that the relationship between attendance and reading achievement is different among students in schools in the most advantaged areas, being also more pronounced in primary school years. The spline curve for students in the highest SEI is almost flat in all grades, indicating that students in the top quintile of SEI performed above the National Minimum Standards in reading even when being absent for the majority of the school year.

In primary school, the slope of the spline curve appears to be steepest for students in the lowest levels of SEI. The suggestion here is that attendance had a greater influence on the primary school reading achievement of lower SEI students compared with other primary students.

School remoteness

Figure 6.12 reveals the average achievement scores were relatively similar among students with regular attendance regardless of school remoteness. While this equity in achievement is broadly maintained along the spectrum of attendance for students in Perth and Inner and Outer regional areas (particularly in Years 7 and 9), there is a divergence in the achievement of students in Remote and Very remote areas at higher levels of absence (from about 10% absence in Very remote areas and about 20% in Remote areas). This suggests that variations in attendance at school is more strongly associated with reading achievement for students in remote areas.

Gender

Female students performed slightly better in NAPLAN reading tests than male students, across all grades (Figure 6.13). These gender gaps in reading achievement were evident along the continuum of attendance.

Aboriginal status

The relationship between falling reading achievement and falling attendance is similar for both Aboriginal and non-Aboriginal students, in all grades (Figure 6.14). The splines demonstrate that only Aboriginal students who attended almost all of the school year were likely to be performing above the National Minimum Standards in Years 5 and 7 reading tests. By Year 9 though, even Aboriginal students with a perfect attendance record did not tend to achieve this standard on average.

Mobility

More mobile students tended to have lower test scores in reading (Figure 6.15). We observed that students that had been to 5 or more schools did not tend to be above the National Minimum Standards in reading in Years 5 and 9 (regardless of their attendance record), and only those with small amounts of absence achieved this level in Years 3 and 7. They also support the notion that the relationship between reading achievement and attendance is similar for students with different levels of mobility (with the possible exception of the most mobile students), although the splines curves suggest there is some convergence at the high end of the absence spectrum.

Main language spoken at home

Figure 6.16 highlights that the achievements in reading in Years 3, 5 and 7 are similar between students who speak English at home and those who speak another language, although there are some subtle variations. Non-English speakers who have missed 10-35% of the school year appear to do slightly better in Year 3 reading tests than their English speaking students—this is consistent with the pattern shown earlier for numeracy and writing tests.

Maternal education

The relationship between student achievements in reading, attendance and the education of the mother appeared to differ by student grade (Figure 6.17). In primary school, there was a similar association between increasing achievement and increasing attendance for maternal education levels up to Year 11, above which this relationship became progressively weaker (and essentially flat for students whose mother had a non-school qualification). In secondary school, the shape of the spline curve for students with low maternal education flattened, and revealed that there was a similar pattern at all levels of maternal education. This may suggest that higher maternal education provides a greater buffer in primary school to the detrimental effects of absence on achievement, than it does in secondary school (Figure 6.17).

The splines in Figure 6.17 also illustrate that students tended to be at or above the National Minimum Standards in reading in Years 7 and 9 regardless of their attendance record or the level of maternal educational attainment.

FIGURE 6.10: PATTERN OF ASSOCIATION BETWEEN NAPLAN READING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), 2008-2012

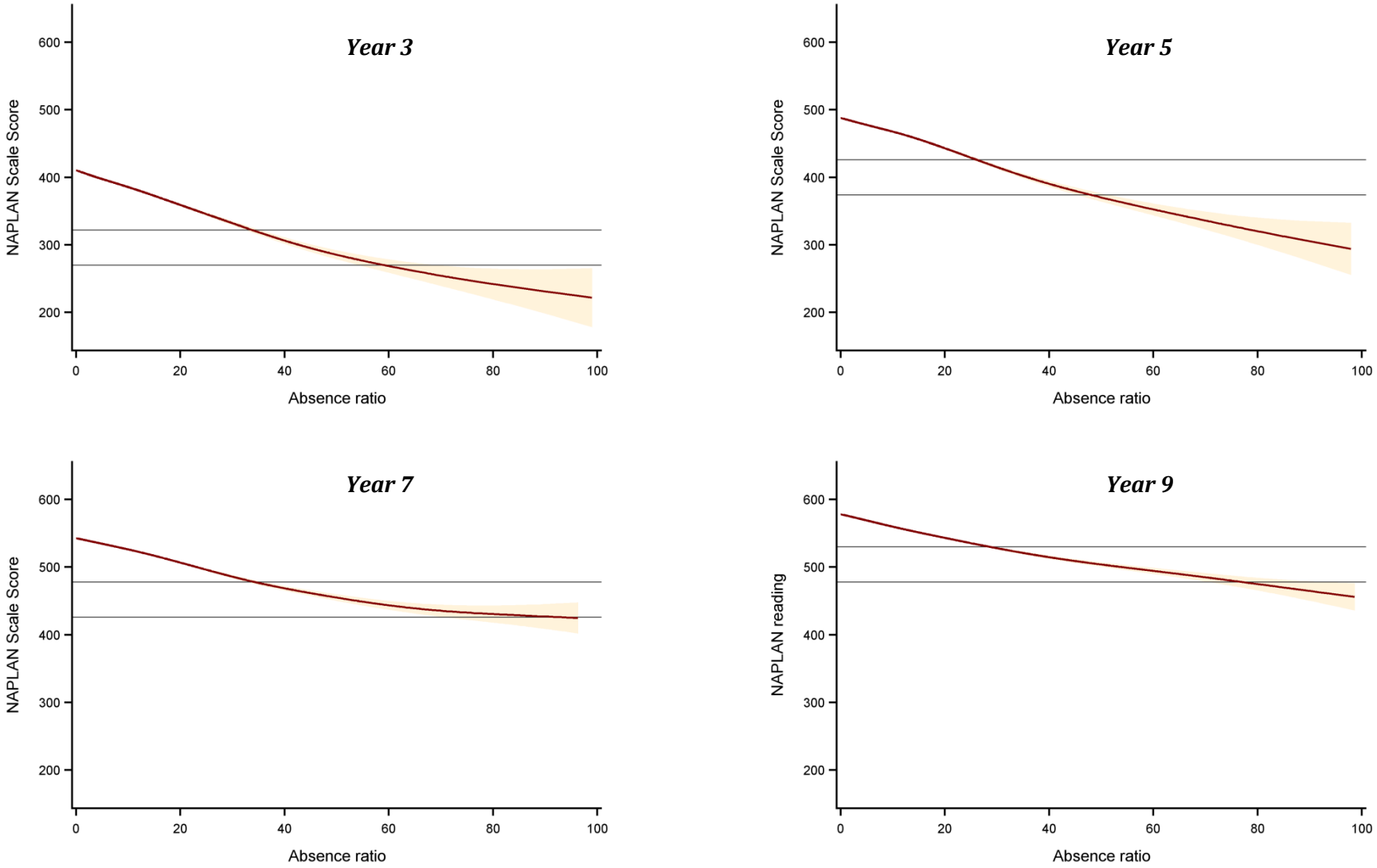


FIGURE 6.11: PATTERN OF ASSOCIATION BETWEEN NAPLAN READING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY SCHOOL SOCIO-ECONOMIC INDEX (SEI), 2008-2012

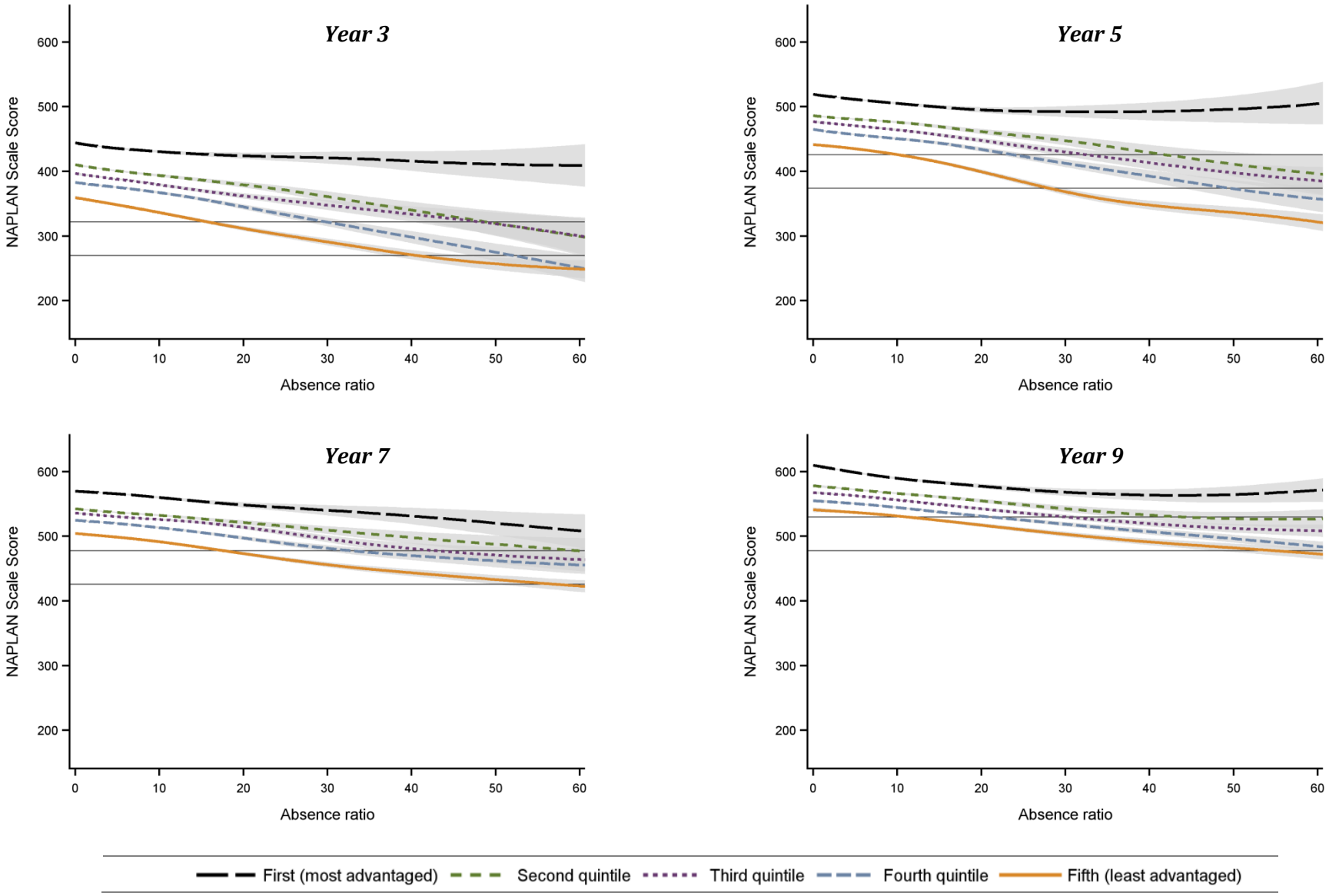


FIGURE 6.12: PATTERN OF ASSOCIATION BETWEEN NAPLAN READING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY REMOTENESS

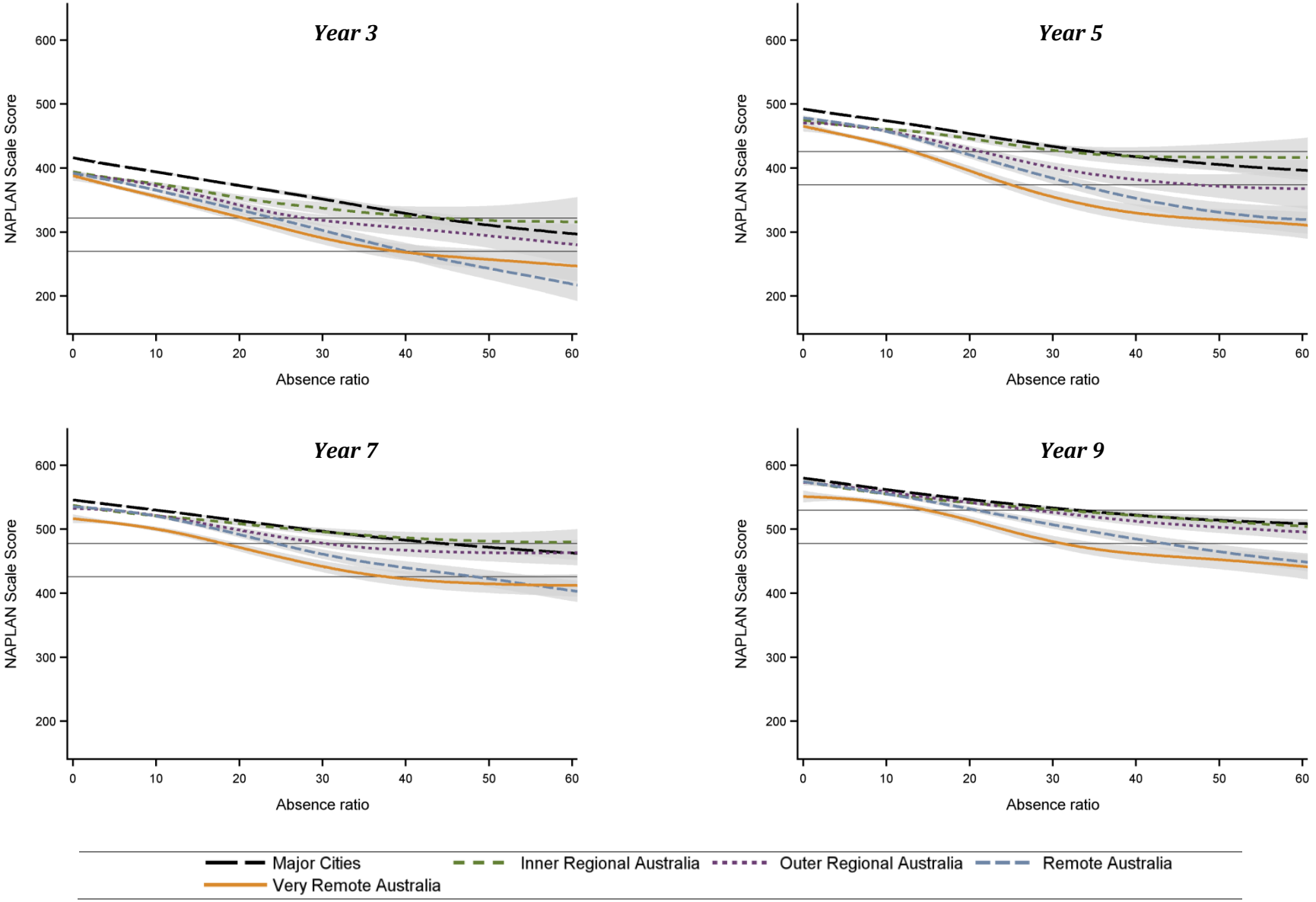


FIGURE 6.13: PATTERN OF ASSOCIATION BETWEEN NAPLAN READING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY GENDER, 2008-2012

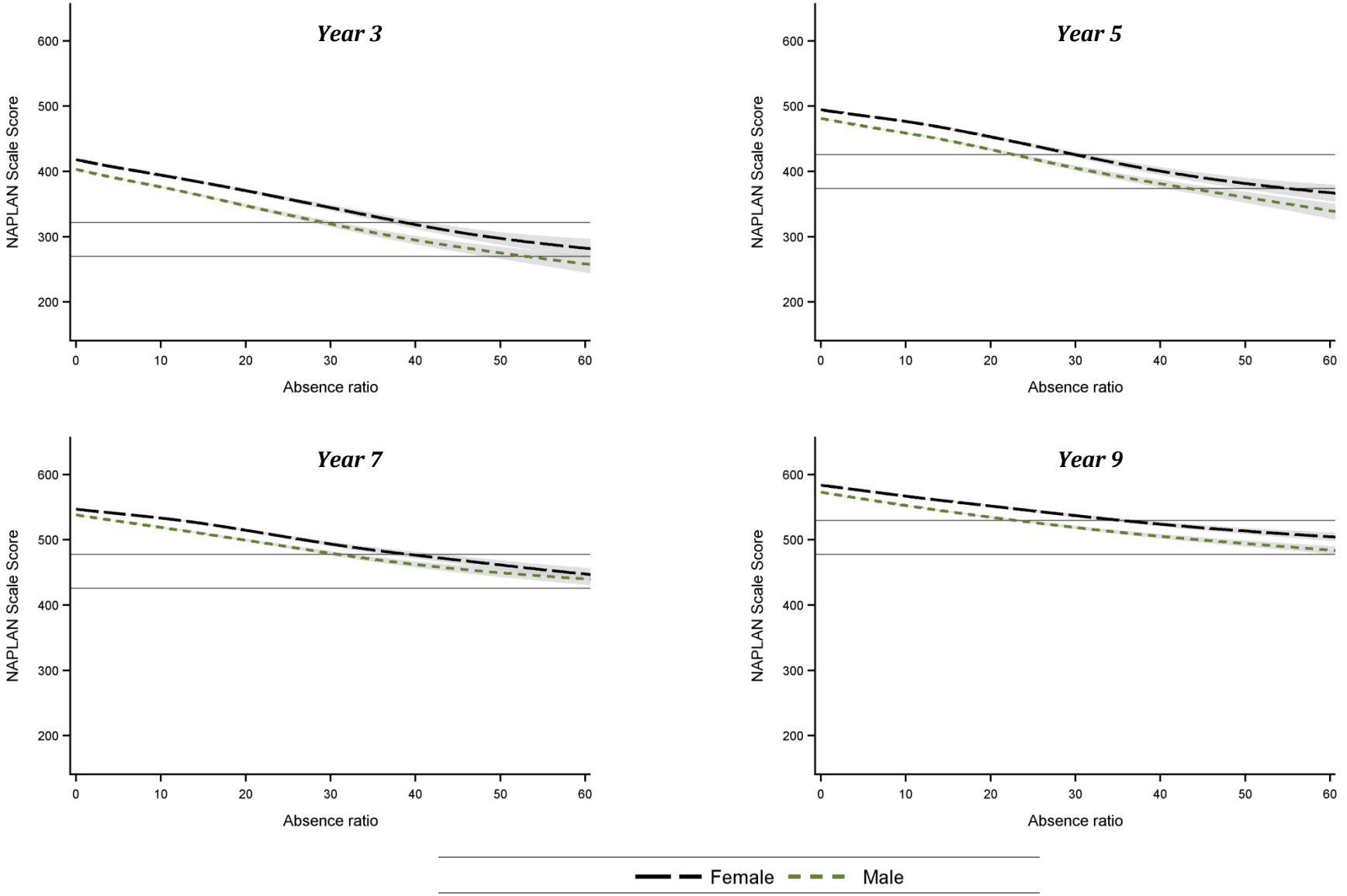


FIGURE 6.14: PATTERN OF ASSOCIATION BETWEEN NAPLAN READING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY ABORIGINAL STATUS OF THE STUDENT, 2008-2012

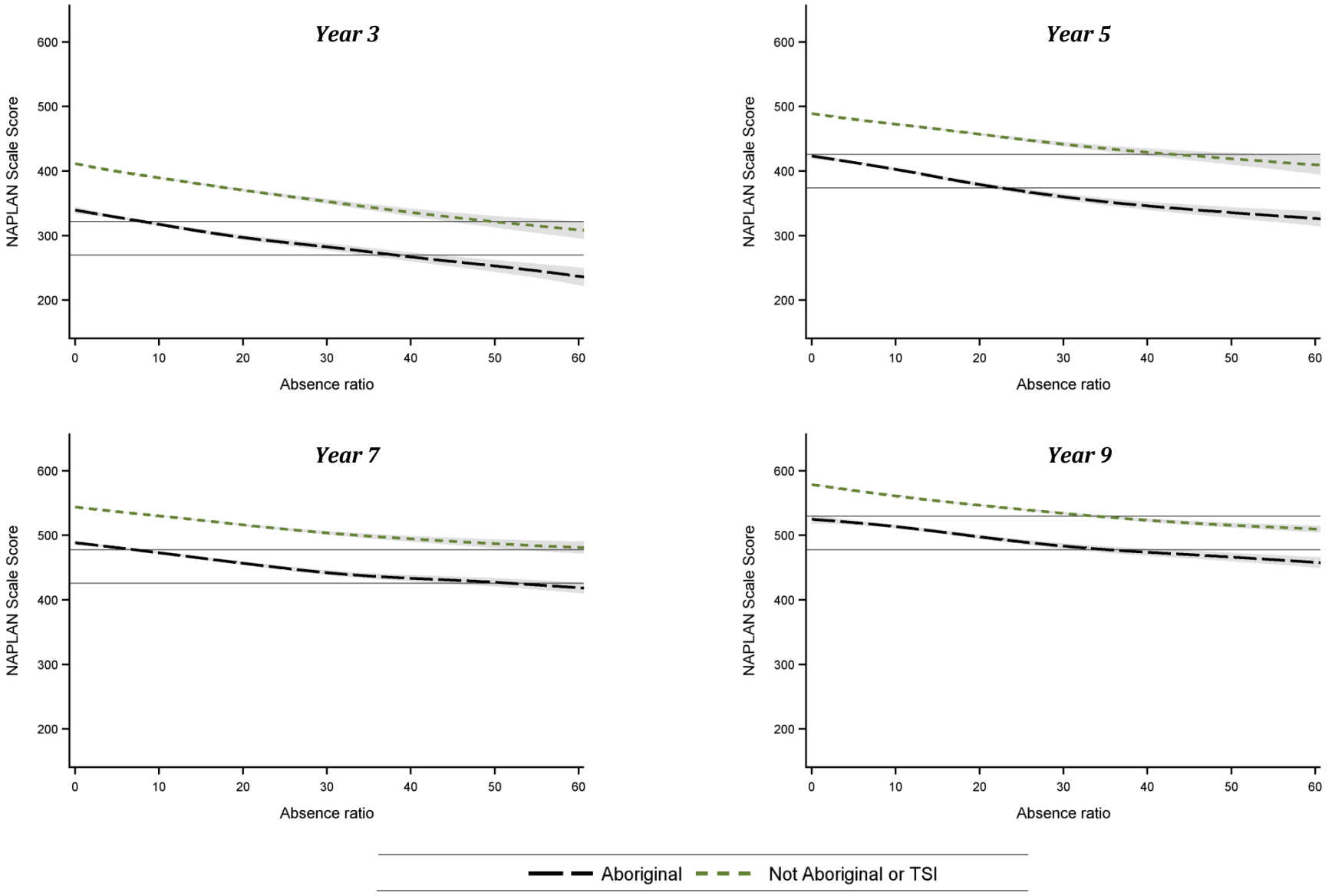


FIGURE 6.15: PATTERN OF ASSOCIATION BETWEEN NAPLAN READING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY NUMBER OF STUDENT ENROLMENTS, 2008-2012

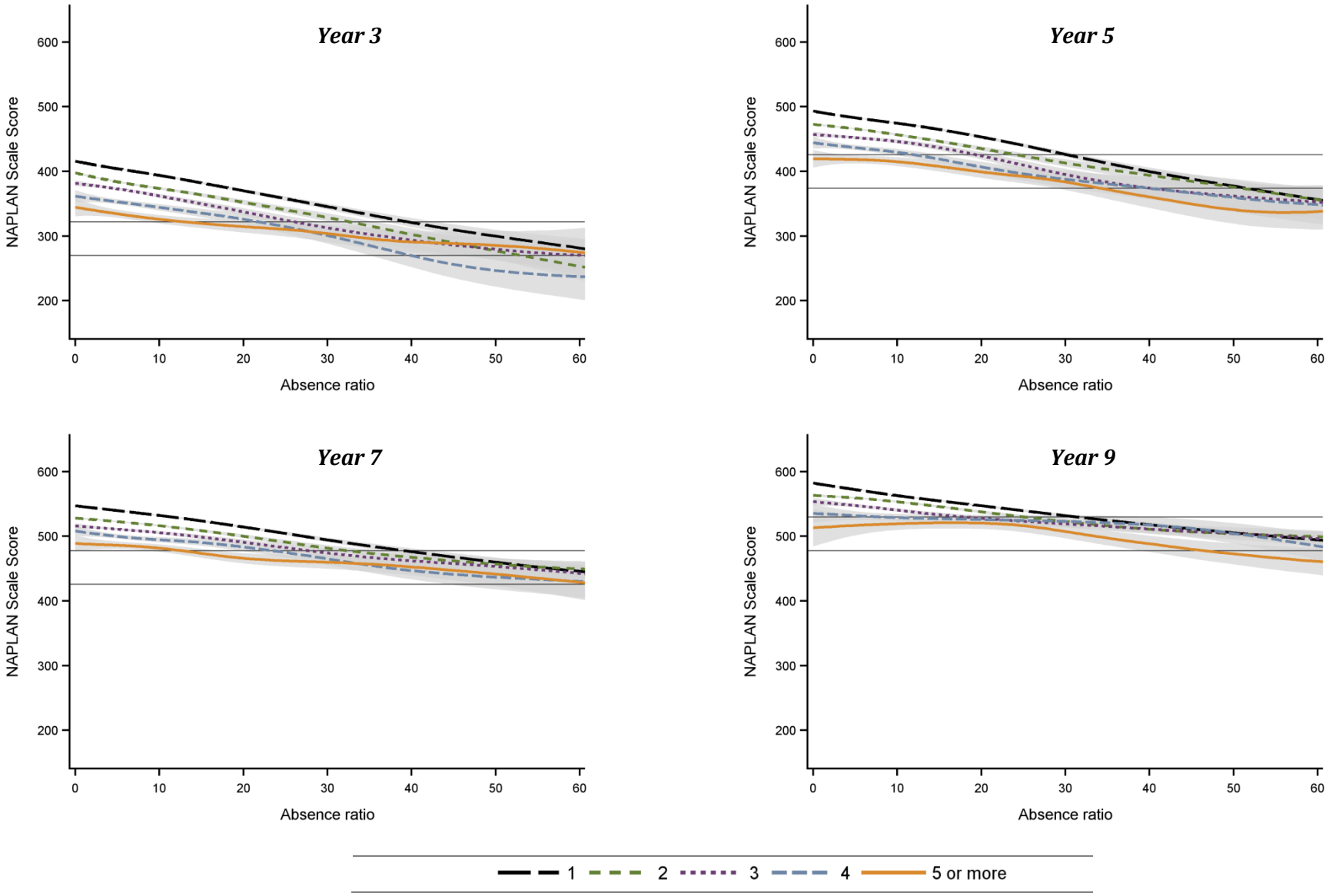


FIGURE 6.16: PATTERN OF ASSOCIATION BETWEEN NAPLAN READING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY MAIN LANGUAGE SPOKEN AT HOME, 2008-2012

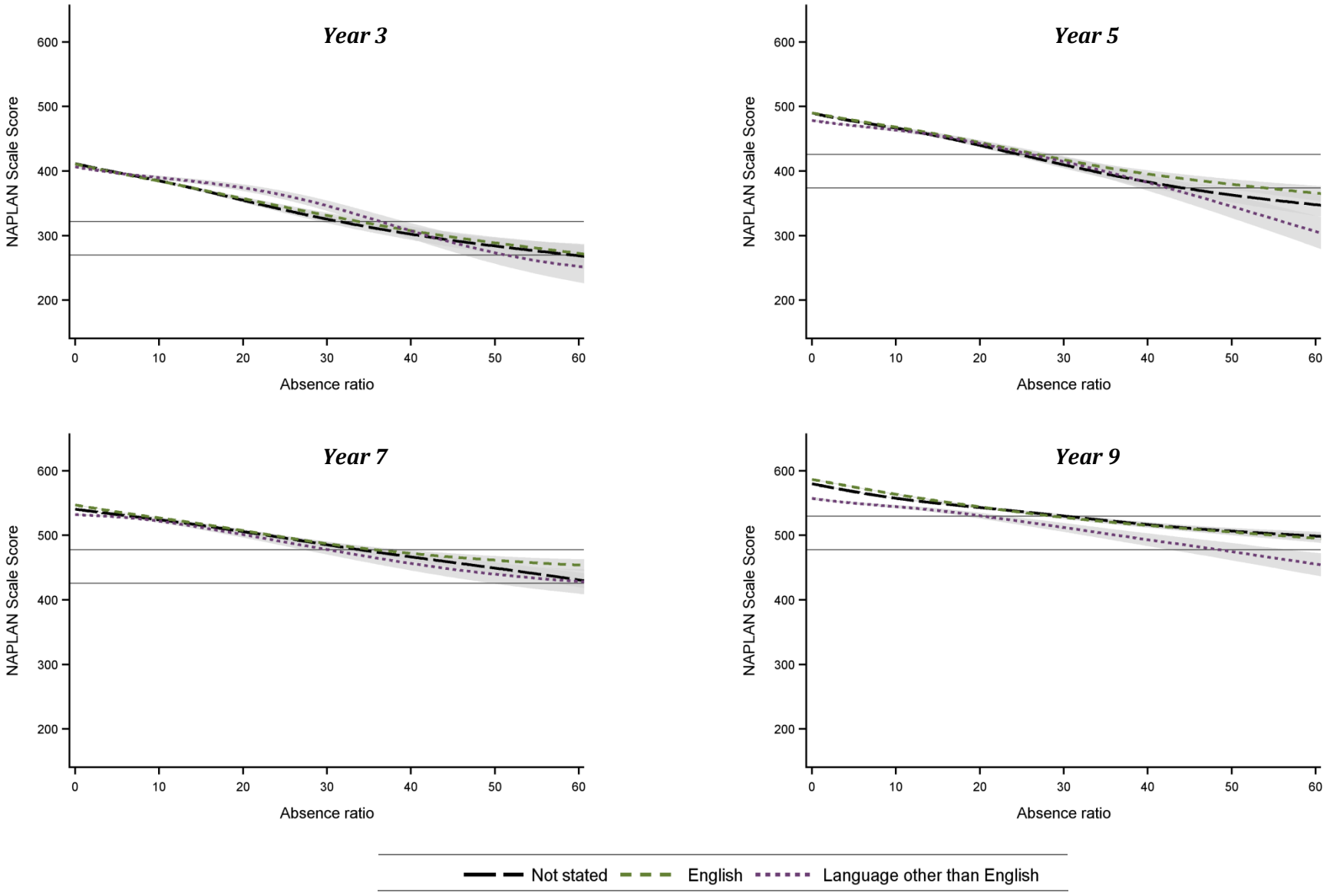
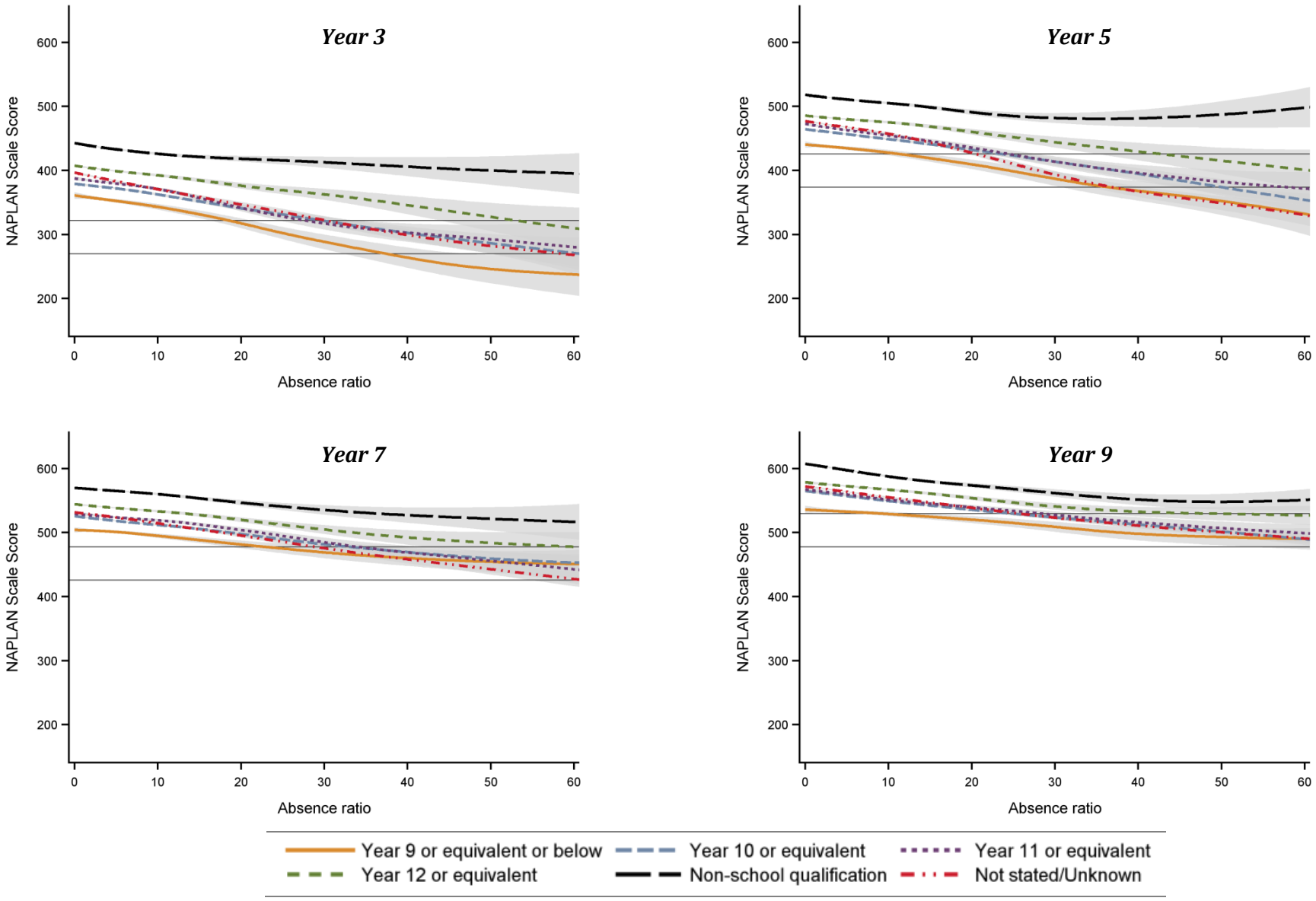


FIGURE 6.17: PATTERN OF ASSOCIATION BETWEEN NAPLAN READING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY MATERNAL EDUCATIONAL ATTAINMENT, 2008-2012



Writing Achievement

The spline curves in Figure 6.18, below, suggest that there was a slightly curvilinear association between attendance at school and writing achievement in all grades except Year 9. The curve tends to exhibit a steeper slope beyond 20% absence until the more extreme ends of absence (above 50-60% absence). On average, students were not at risk of falling below the National Minimum Standards for writing achievement until they missed about 40% of the school year, or 2 days of school each week. Further, students with less than about 30% absence tend to be above the National Minimum Standards in this domain in Year 3 but this threshold reduces in successive grades, to about 20% in Year 9.

School SEI

Figure 6.19 shows there were gaps in the achievement of students in low and high SEI areas regardless of their attendance record, and that the relationship between writing achievement and attendance was different among students in schools in the most advantaged areas. The spline curve for students in the highest SEI is linear and almost flat, at all levels of attendance and in all grades. This suggests that students in the top quintile of SEI performed above the National Minimum Standards in writing even if they were absent for the majority of the school year.

The slope of the spline curve gets progressively steeper at lower levels of SEI, an observation that was particularly evident for Year 3 students. This pattern means that higher absence levels were more detrimental for students in lower SEI schools. Attendance has a much greater influence on the achievement of students in lower SEI schools.

School remoteness

Figure 6.20 reveals that average achievement scores were relatively similar among regular attending students regardless of the level of remoteness of their school. While this equity in achievement was maintained along the spectrum of absence for students in Perth and Inner and Outer Regional areas, the achievement of students in Remote and Very Remote areas fell away considerably once absence ratios rose above 20% (or 1 day per week of absence). This suggests that attendance at school is more strongly associated with achievement in writing for students in remote areas.

Gender

Figure 6.21 highlights clearly that female students have better levels of achievement in writing when compared with their male counterparts, at all levels of education. This gender gap is evident along the continuum of absence. For Year 9 students, the achievement gap between male and female students became wider at higher levels of absence, where the achievement of male students declines at a faster rate than female students as the absence rate increases.

Aboriginal status

The relationship between declines in writing achievement with declines in attendance is almost linear for both Aboriginal and non-Aboriginal students, although the slope of the splines is slightly flatter for Aboriginal students (Figure 6.22). As a result, we found that the disparities in achievement between Aboriginal and non-Aboriginal students (see Chapter 5) were larger among students with greater levels of absence—with the exception of Year 9 where the gaps in

achievement are static at each level of attendance. The splines also demonstrate that only Aboriginal students who attended almost all of the school year were likely to be performing above the National Minimum Standards in Years 5 and 7 writing tests. By Year 9, on average, even Aboriginal students with a perfect attendance record do not achieve this standard.

Mobility

More mobile students tend to have lower writing test scores (Figure 6.23). This gradient suggests that the relationship between achievement and attendance is similar for students with different levels of mobility, with the possible exception of the most mobile students. These patterns tended to be curvilinear, featuring a progressively steeper slope at higher levels of absence in Years 3, 5 and 7. The curve for students that had been to five or more schools was more volatile, perhaps reflecting the small number of students in this category at each education level. What we can infer with more certainty is that students that have been to at least 4 schools did not tend to be above the National Minimum Standards for writing in secondary schooling, regardless of their attendance record.

Main language spoken at home

Figure 6.24 highlights that there were generally similar patterns of writing achievement between students who speak English at home and those who speak another language. Notwithstanding, as noted above with Numeracy achievement, non-English speakers who missed 10-40% of the school year appeared more tolerant of absence doing slightly better in Year 3 writing than their English-speaking counterparts. There were also small disparities in Years 5, 7 and 9, whereby non-English speakers with high levels of absence (generally above 40%) tended to have poorer writing achievement than English speaking students—although not all of these findings were statistically significant.

Maternal education

There appeared to be a dynamic relationship between a student's achievements in writing (and the year level of the test), their attendance record and the educational attainment of their mother. The association between achievement and attendance was similar for maternal education levels up to Year 11, above which this relationship became progressively weaker—at least in Years 3, 5 and 7. The spline curves in these years suggest that poorer attendance did not pose a risk to achievements in writing for students whose mother had a non-school qualification.

For students with lower parental education, the results indicate that attendance matters more to achievement in primary than secondary school. They also highlight that the combination of low maternal education and poor attendance is not as detrimental to writing achievement in Year 9 than it is in earlier grades, i.e. average scores are closer to (but still below) the National Minimum Standards in Year 9 than in Years 3, 5 or 7.

Overall, while there are differences in patterns of attendance by the education of the mother in Years 3, 5 and 7, the spline curves look relatively similar (and linear) for all students by Year 9 (Figure 6.25).

FIGURE 6.18: PATTERN OF ASSOCIATION BETWEEN NAPLAN WRITING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), 2011-2012

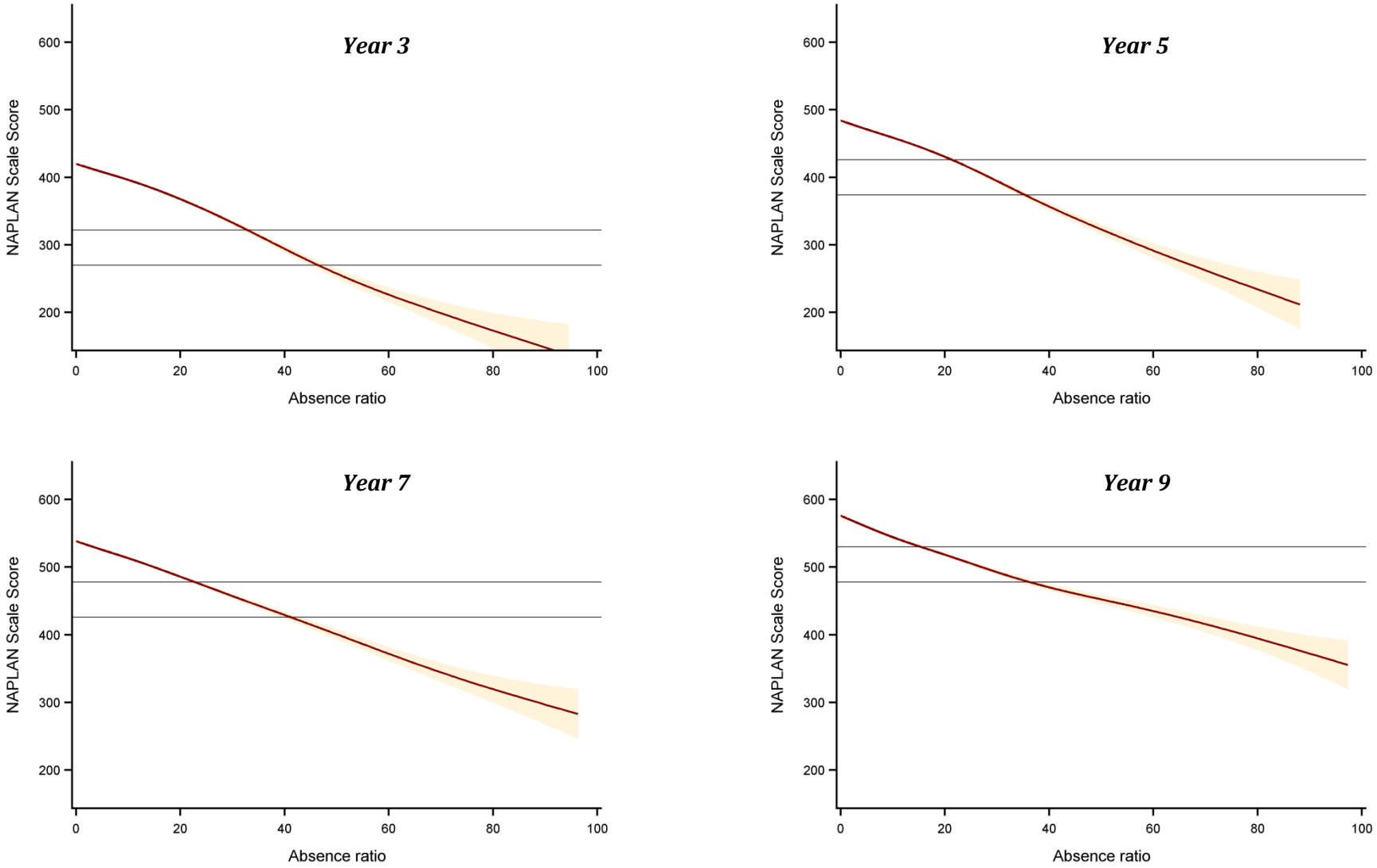


FIGURE 6.19: PATTERN OF ASSOCIATION BETWEEN NAPLAN WRITING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY SCHOOL SOCIO-ECONOMIC INDEX (SEI), 2011-2012

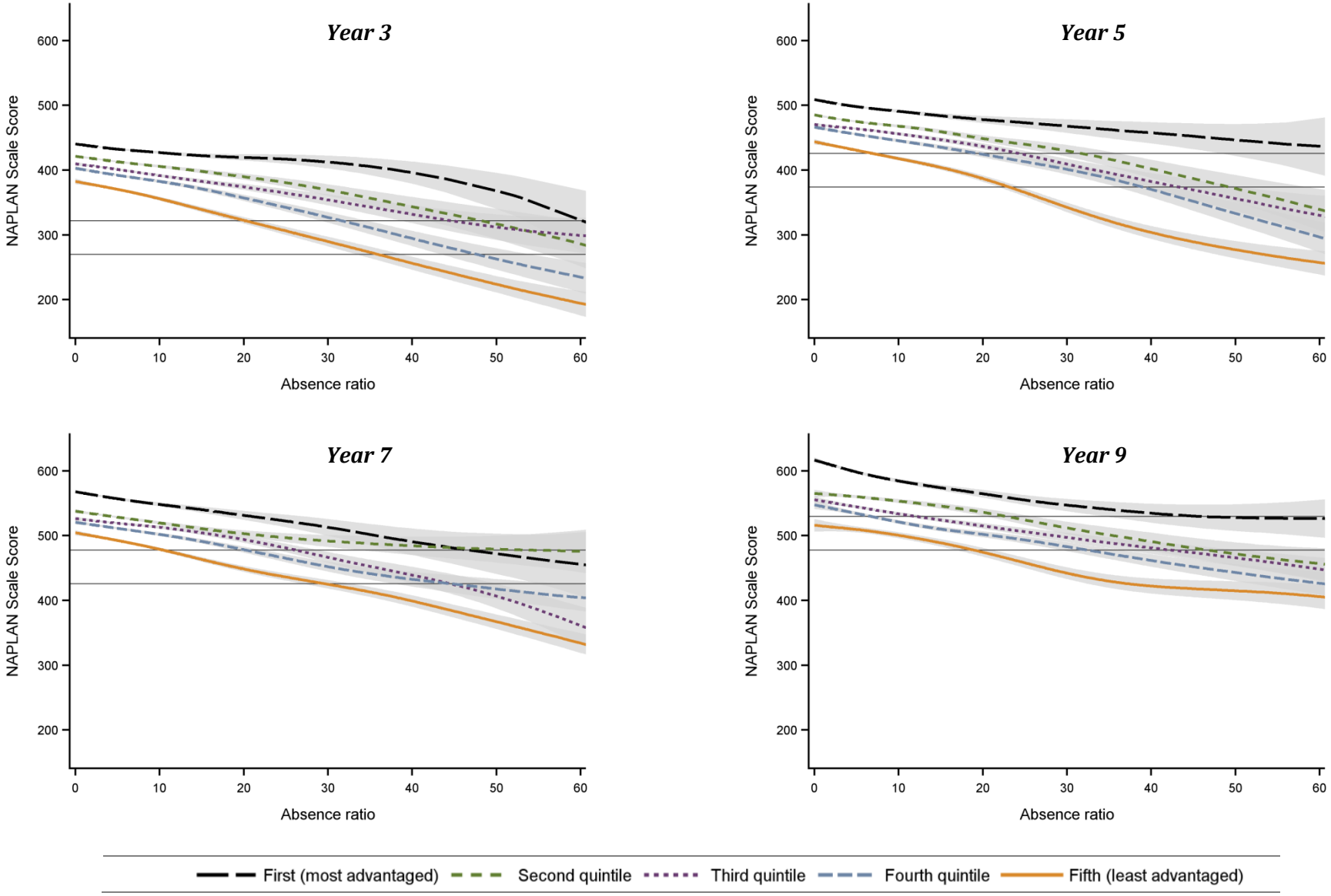


FIGURE 6.20: PATTERN OF ASSOCIATION BETWEEN NAPLAN WRITING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY REMOTENESS, 2011-2012

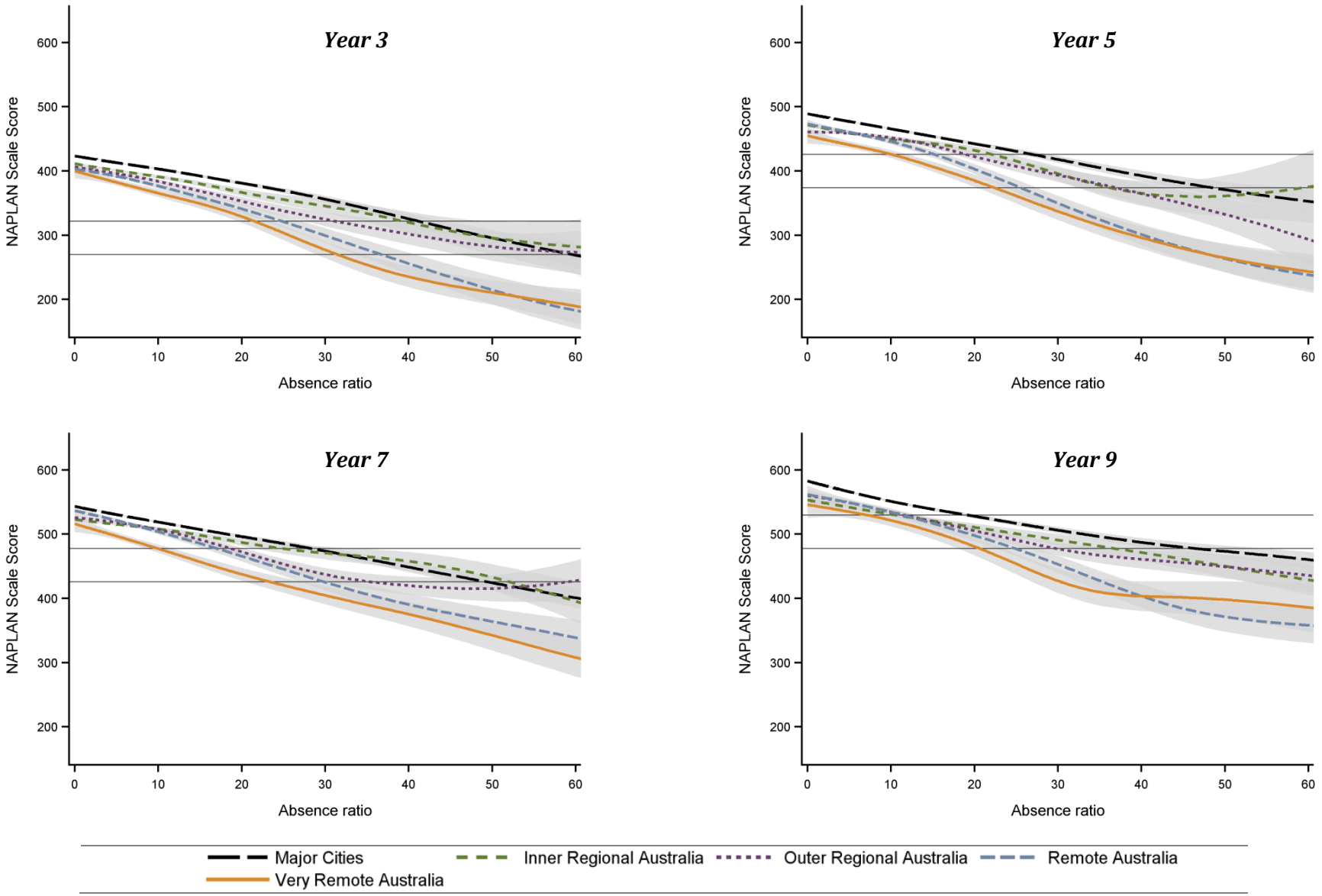


FIGURE 6.21: PATTERN OF ASSOCIATION BETWEEN NAPLAN WRITING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY GENDER, 2011-2012

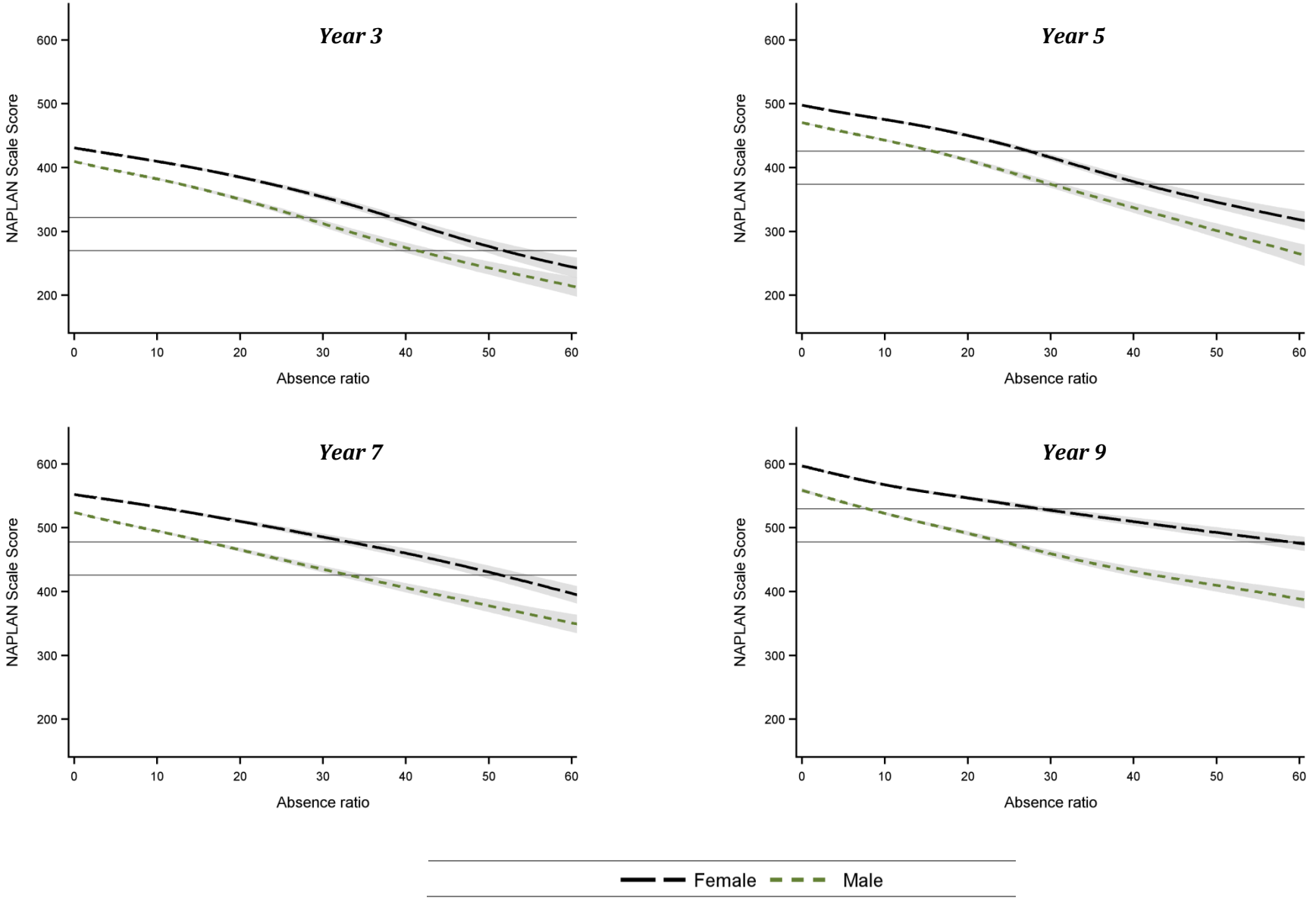


FIGURE 6.22: PATTERN OF ASSOCIATION BETWEEN NAPLAN WRITING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY ABORIGINAL STATUS OF THE STUDENT, 2011-2012

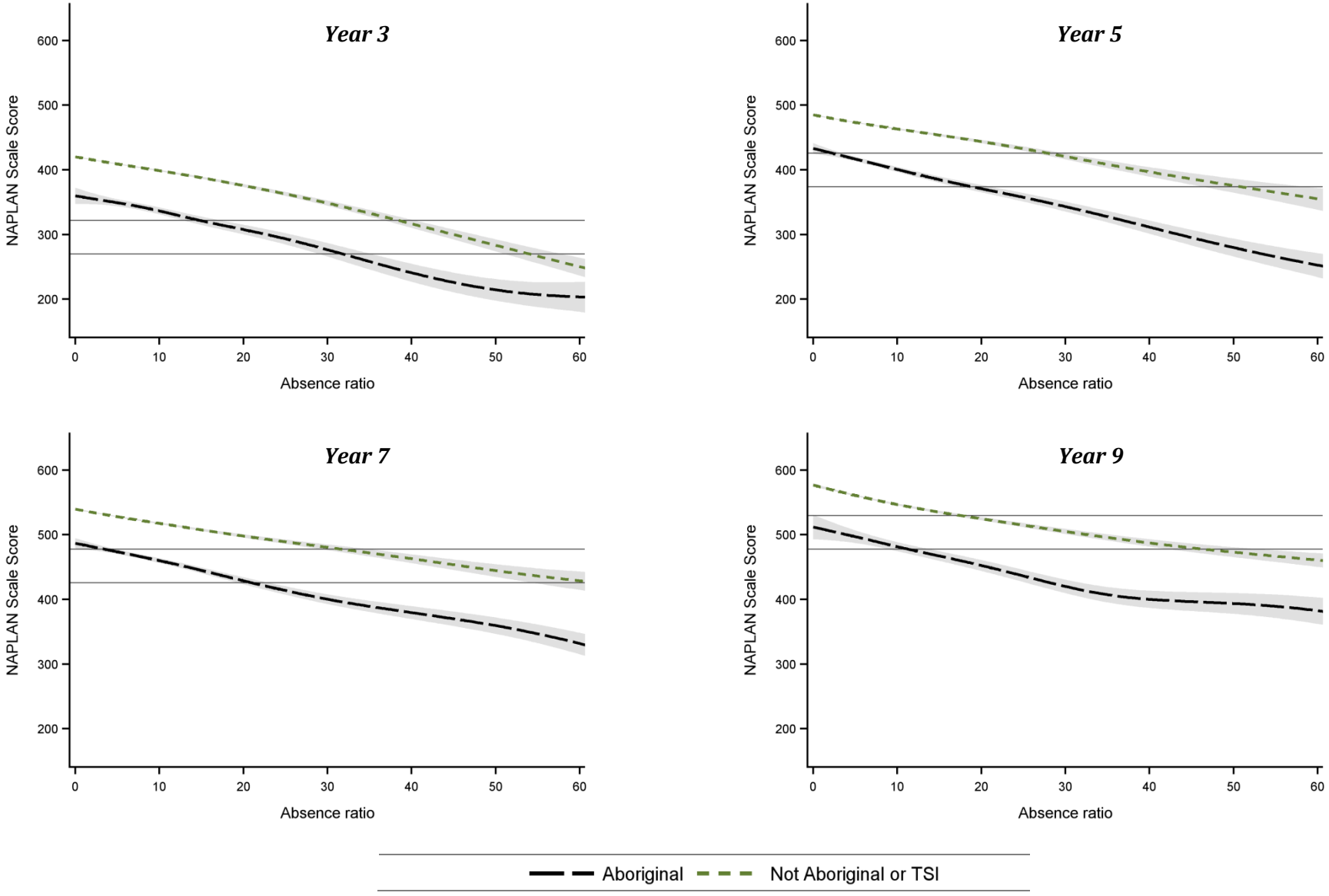


FIGURE 6.23: PATTERN OF ASSOCIATION BETWEEN NAPLAN WRITING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY NUMBER OF ENROLMENTS, 2011-2012

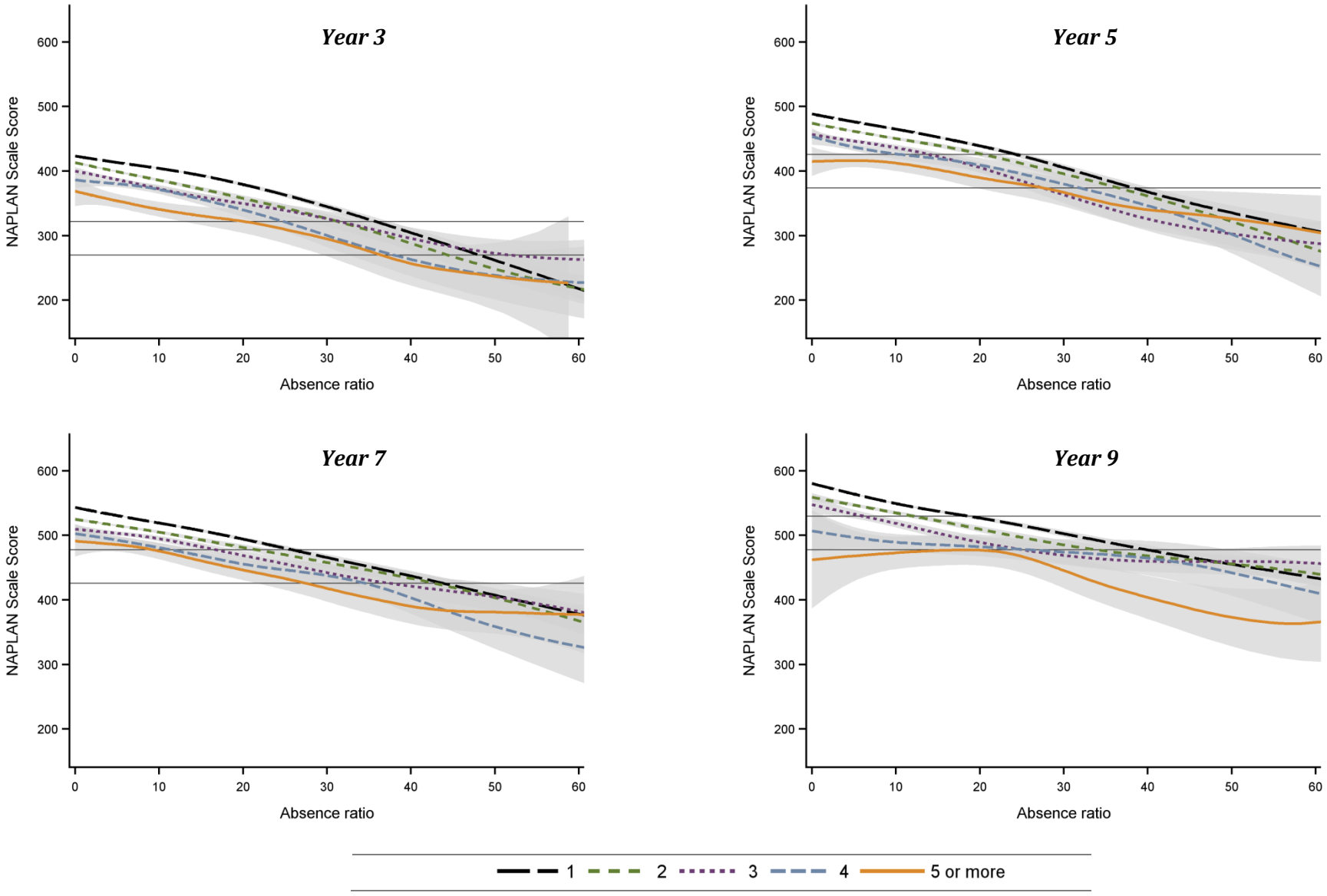


FIGURE 6.24: PATTERN OF ASSOCIATION BETWEEN NAPLAN WRITING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY MAIN LANGUAGE SPOKEN AT HOME, 2011-2012

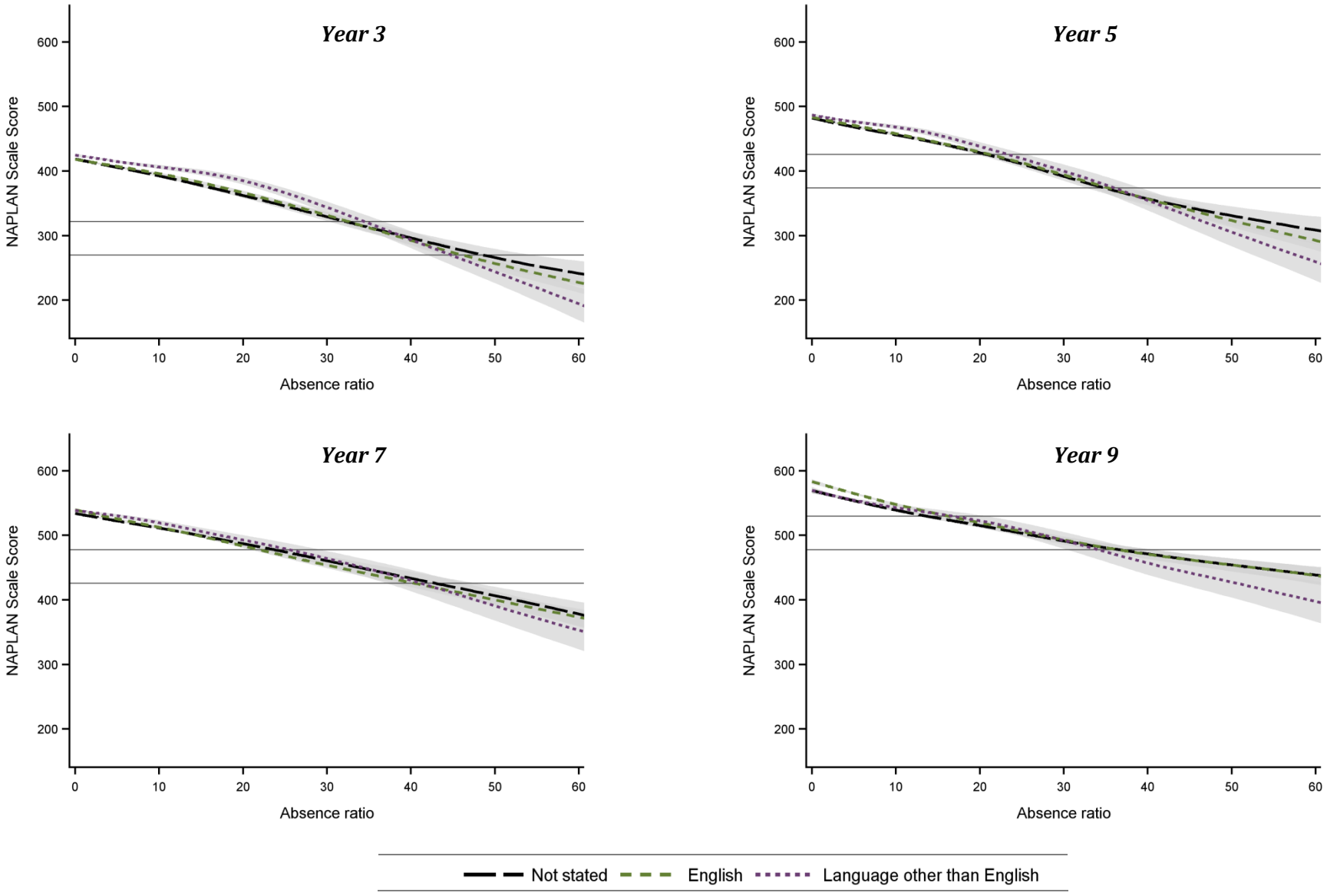
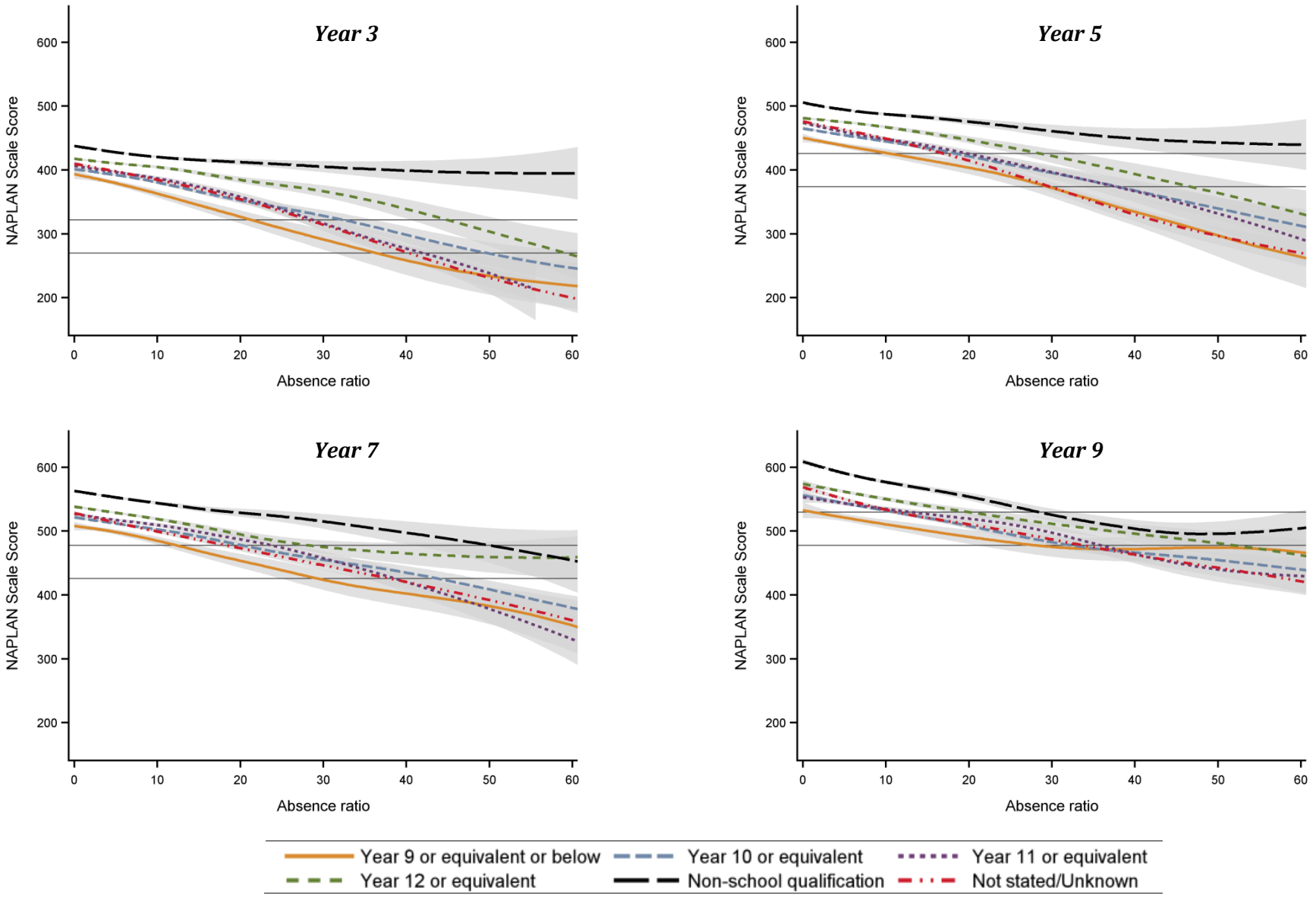


FIGURE 6.25: PATTERN OF ASSOCIATION BETWEEN NAPLAN WRITING SCORE AND SCHOOL ABSENCE (YEAR 3, 5, 7 & 9), BY MATERNAL EDUCATIONAL ATTAINMENT, 2011-2012



Achievement by type of absence

The results so far have focussed on variations in achievement by total absences. In this section we now differentiate between two broad types of absence from school—authorised and unauthorised absences—and examine their joint associations with achievement in numeracy, writing and reading in Years 3, 5 7 and 9.

Figure 6.26 to Figure 6.41 show results for spline models that jointly model the association between authorised absence rate, unauthorised absence rate and NAPLAN achievement scores. Effectively this model shows the relationship between authorised absence and achievement while controlling for level of unauthorised absence and vice versa. Each model is illustrated via two figures. In the first figure, the relationship between authorised absence and achievement is shown for four specific values of unauthorised absence rate—0%, 5%, 10% and 20%. The second figure shows the relationship between unauthorised absence and achievement for four separate values of authorised absence rate—0%, 5%, 10% and 20%.

For example Figure 6.26 shows four curves. The highest curve on the graph shows the modelled relationship between authorised absence rate and numeracy achievement for Year 3 children who have no unauthorised absence from school. It can be seen that while achievement decreases as authorised absence from school increases, these declines are relatively modest. In comparison however, the highest curve on the graph in Figure 6.30 shows the modelled relationship between unauthorised absence rates and numeracy achievement for Year 3 children who have no authorised absences from school. There is a much sharper decline in numeracy achievement scores with increasing unauthorised absences from school. The difference between the effect of authorised and unauthorised absences on achievement can also be inferred by the gaps between each of the curves on each graph. In Figure 6.29 it can be seen that children with 20% or more authorised absences from school but no unauthorised absences still perform better on average than children with 5% unauthorised absence and no authorised absences. However, it should be kept in mind that far fewer students have unauthorised absences than authorised absences from school.

Figure 6.26 to Figure 6.41 highlight a remarkable degree of consistency across the different domains in the pattern of achievement by type of absence. This has enabled us to make two overarching points about the relationships being examined here: (1) there are distinct differences in the nature of the associations between achievement and authorised and unauthorised absences; (2) unauthorised absences are associated with larger declines in achievement than are authorised absences.

The relationship between achievement and authorised absences was essentially linear for all achievement test types in all years. In contrast, the associations with unauthorised absences were curvilinear, characterised by a steeper curve at lower levels of absence (0-10%). These results suggest that there are greater returns to improving achievement through the early resolution of problems with unauthorised absences, i.e. before this type of absence becomes an ongoing or consistent problem.

The figures also illustrate that the splines for unauthorised absences are steeper than those for authorised absences. Accordingly, each additional day of unauthorised absence is associated with a larger reduction in achievement when compared with authorised absence. These differences could partly be explained by the characteristics and life circumstances of students

and their level of engagement with the education system. Alternatively, they may also reflect the attitudes of parents or the efficacy of schools in managing issues of attendance. If parents are unaware or do not care that unauthorised absences have taken place, or if schools do not follow-up the absence with parents, then there is unlikely to be any intervention to support the student to catch up on missed school work.

While we have noted that the slopes of the splines for authorised absence are relatively flat, they are steeper in Year 9. This may reflect that it is more difficult to arrest the declines in achievement (that may be prompted by poor attendance) in later school years, i.e. it is harder to catch up in secondary school than primary school.

FIGURE 6.26: YEAR 3 NAPLAN NUMERACY SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2008-2012

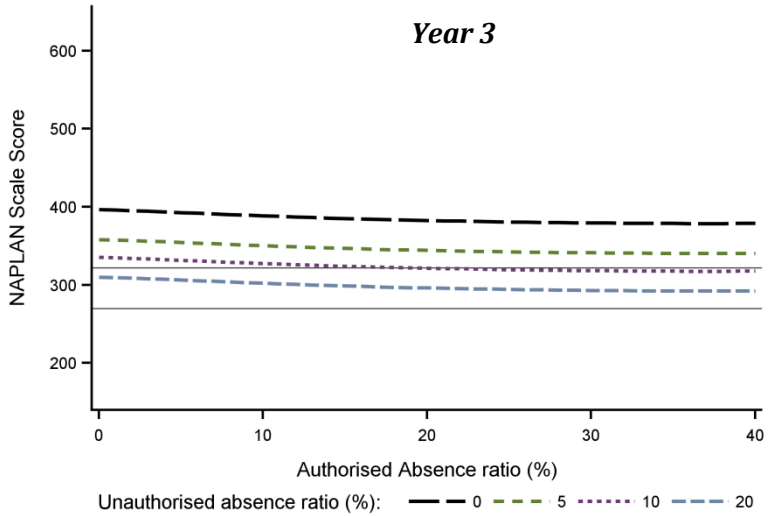


FIGURE 6.27: YEAR 3 NAPLAN NUMERACY SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2008-2012

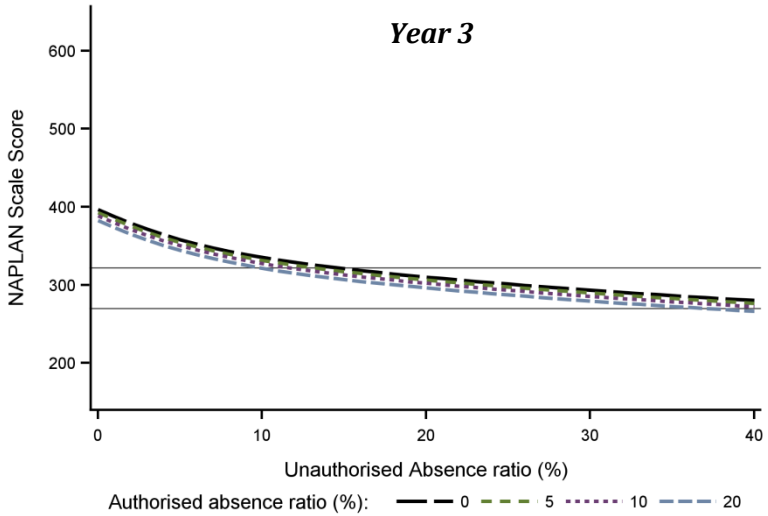


FIGURE 6.28: YEAR 5 NAPLAN NUMERACY SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2008-2012

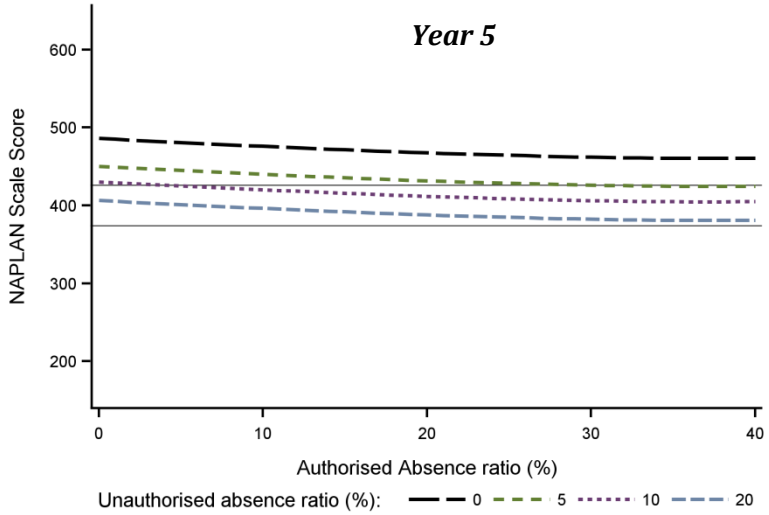


FIGURE 6.29: YEAR 5 NAPLAN NUMERACY SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2008-2012

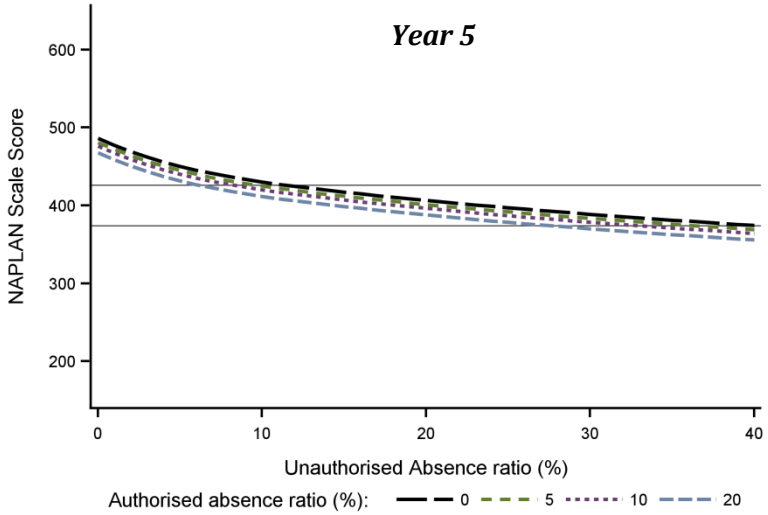


FIGURE 6.30: YEAR 7 NAPLAN NUMERACY SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2008-2012

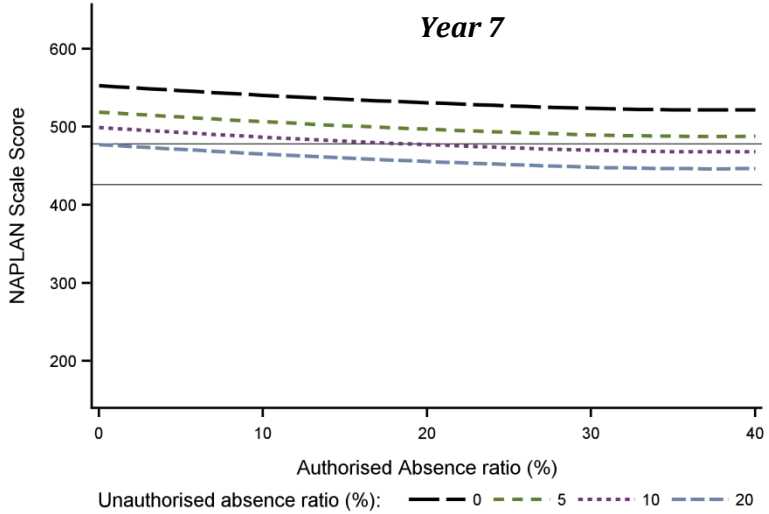


FIGURE 6.31: YEAR 7 NAPLAN NUMERACY SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2008-2012

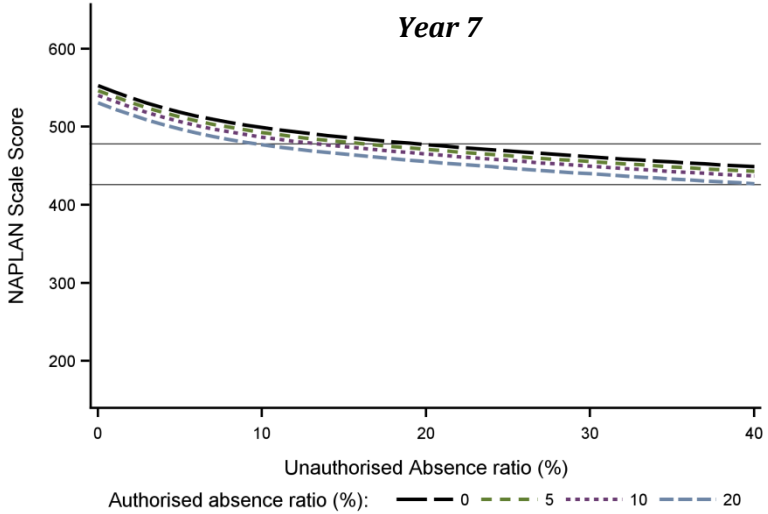


FIGURE 6.32: YEAR 9 NAPLAN NUMERACY SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2008-2012

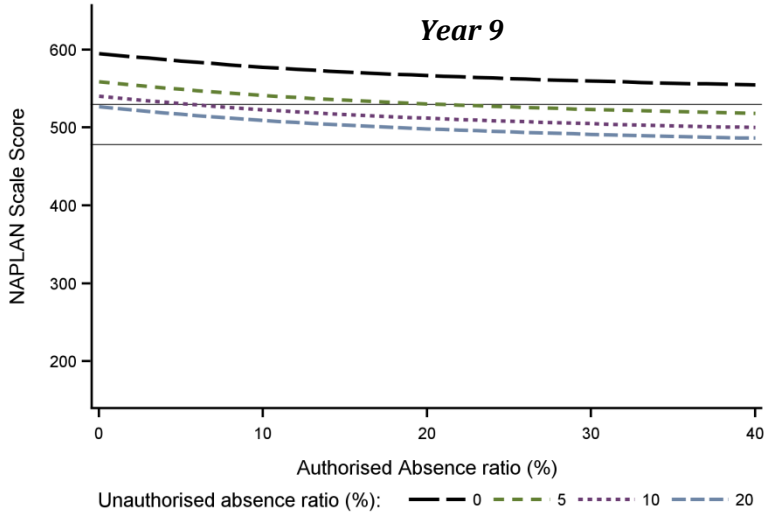


FIGURE 6.33: YEAR 9 NAPLAN NUMERACY SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2008-2012

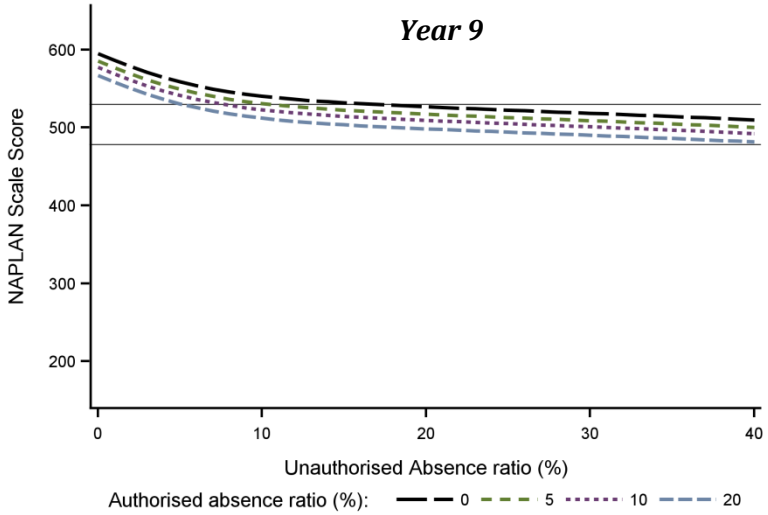


FIGURE 6.34: YEAR 3 NAPLAN READING SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2008-2012

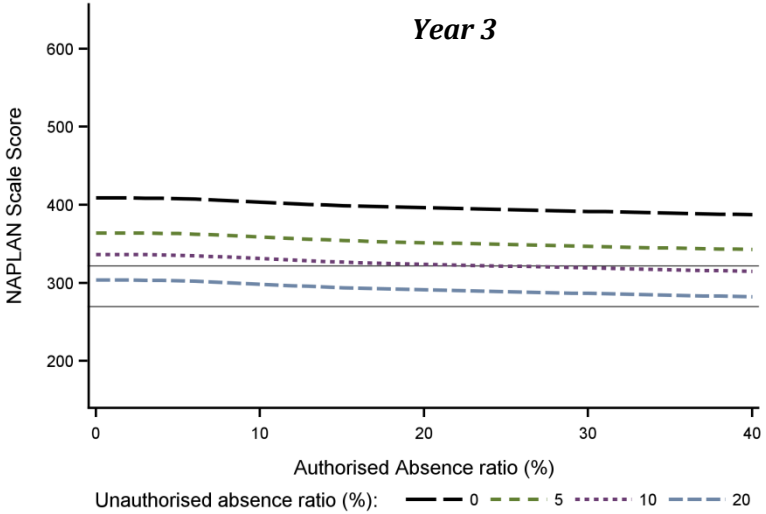


FIGURE 6.35: YEAR 3 NAPLAN READING SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2008-2012

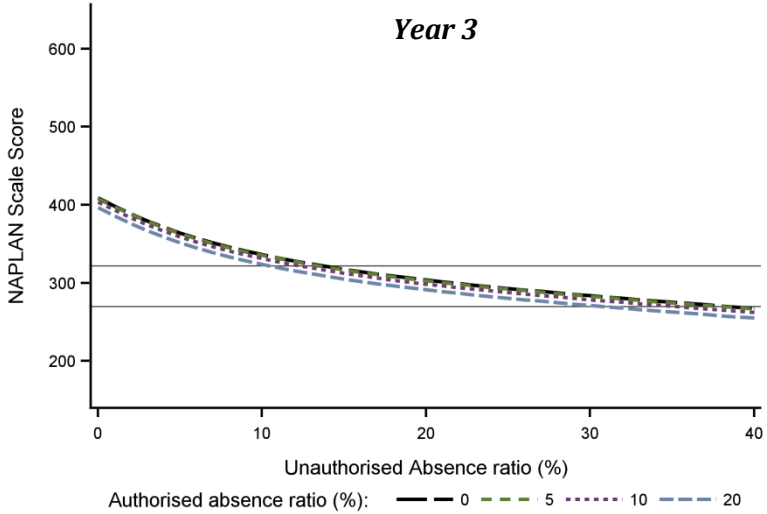


FIGURE 6.36: YEAR 5 NAPLAN READING SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2008-2012

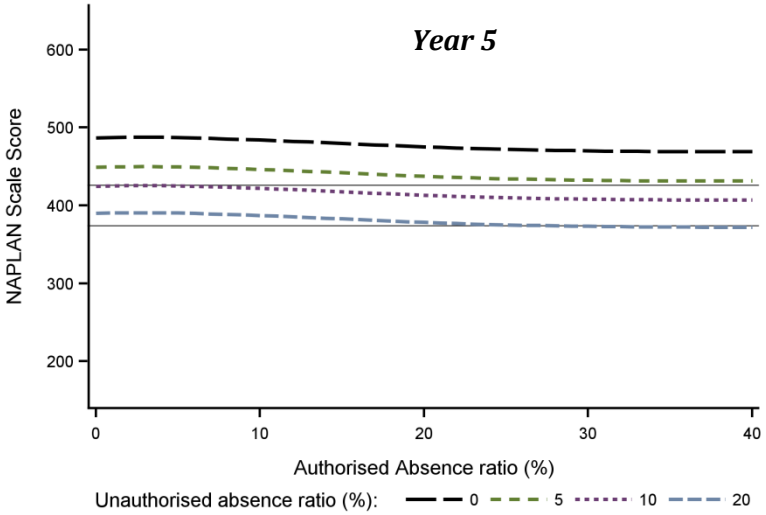


FIGURE 6.37: YEAR 5 NAPLAN READING SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2008-2012

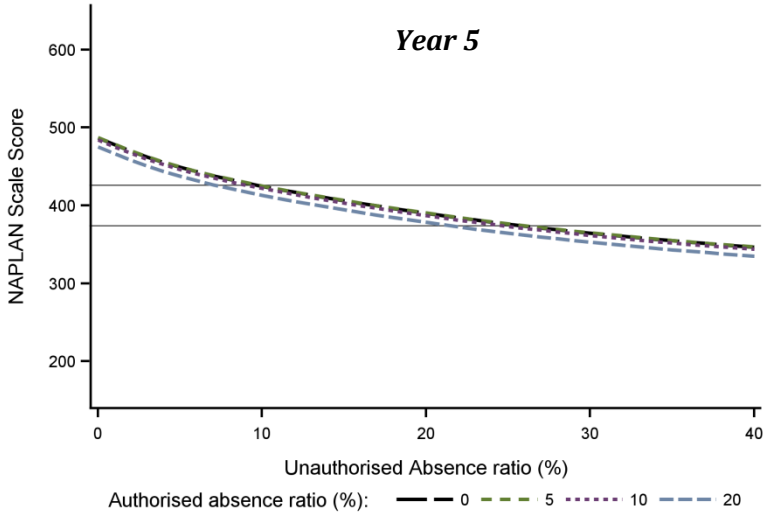


FIGURE 6.38: YEAR 7 NAPLAN READING SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2008-2012

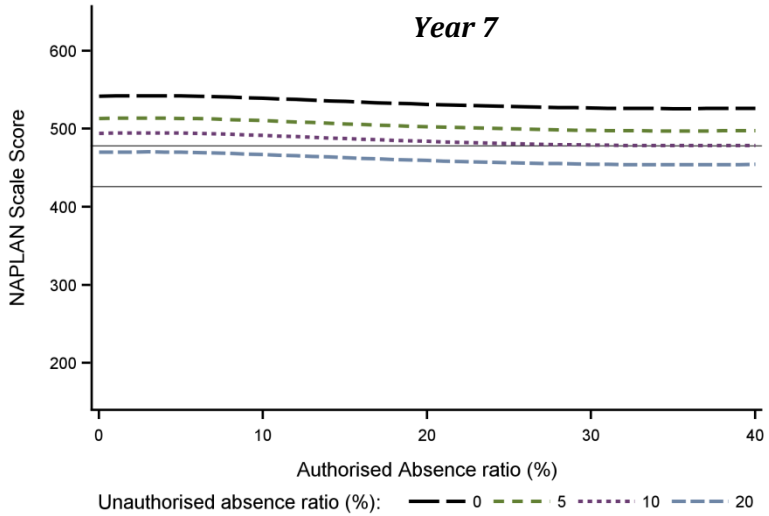


FIGURE 6.39: YEAR 7 NAPLAN READING SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2008-2012

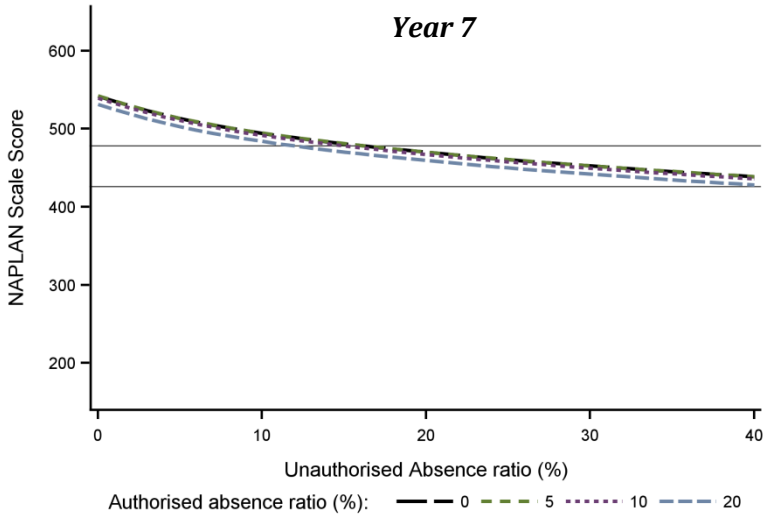


FIGURE 6.40: YEAR 9 NAPLAN READING SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2008-2012

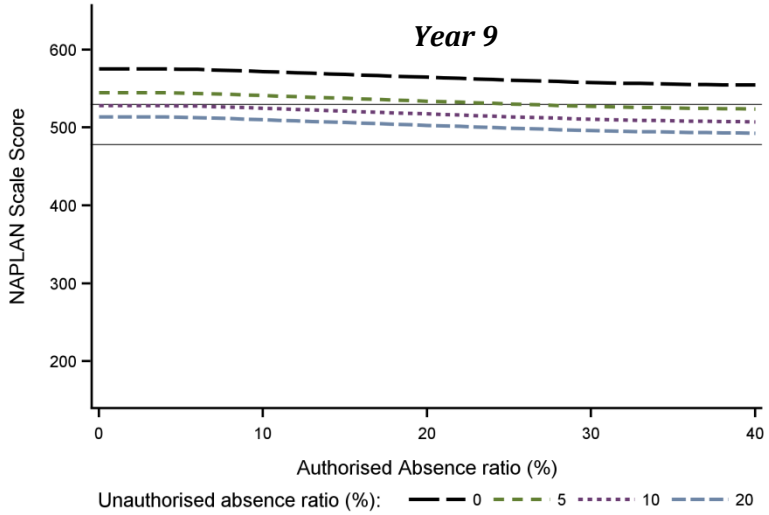


FIGURE 6.41: YEAR 9 NAPLAN READING SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2008-2012

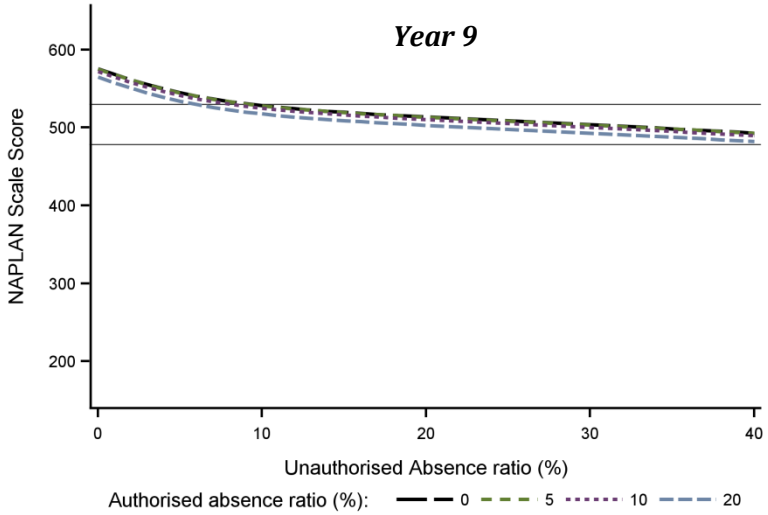


FIGURE 6.42: YEAR 3 NAPLAN WRITING SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2011-2012

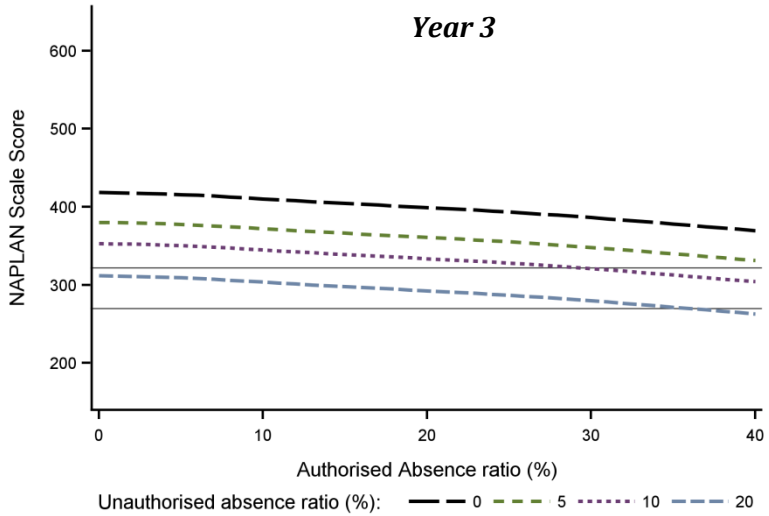


FIGURE 6.43: YEAR 3 NAPLAN WRITING SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2011-2012

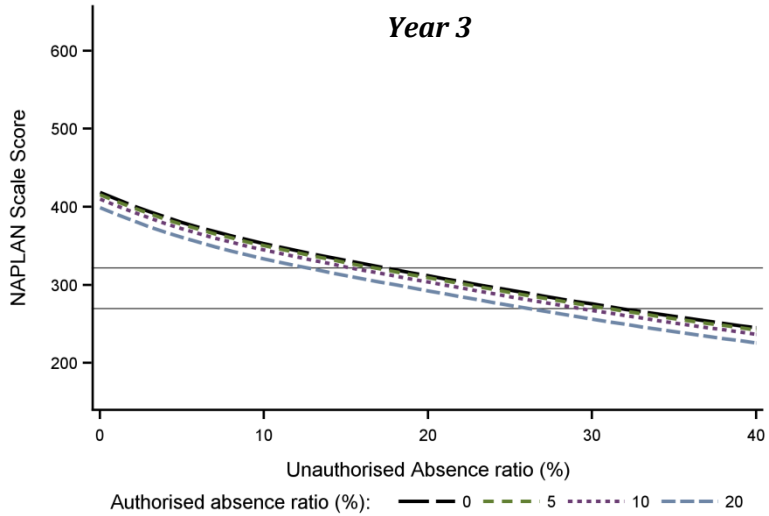


FIGURE 6.44: YEAR 5 NAPLAN WRITING SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2011-2012

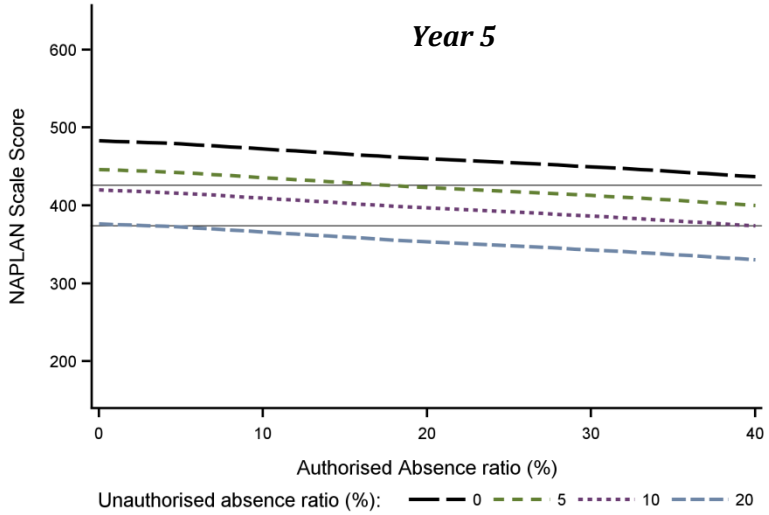


FIGURE 6.45: YEAR 5 NAPLAN WRITING SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2011-2012

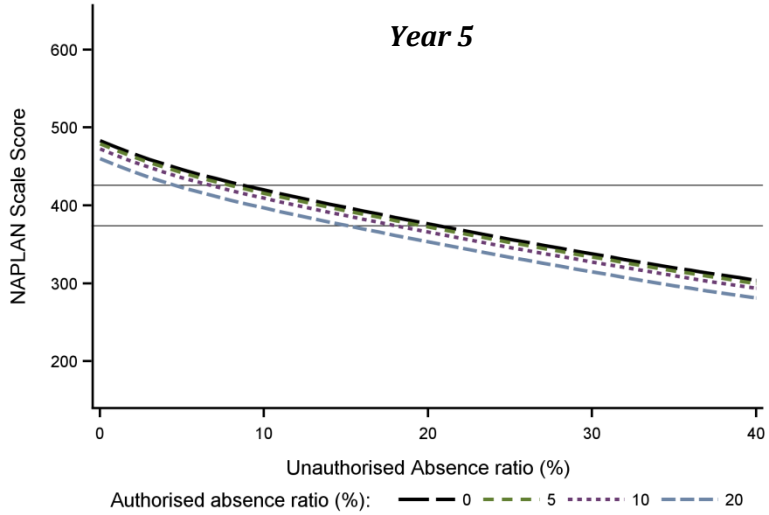


FIGURE 6.46: YEAR 7 NAPLAN WRITING SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2011-2012

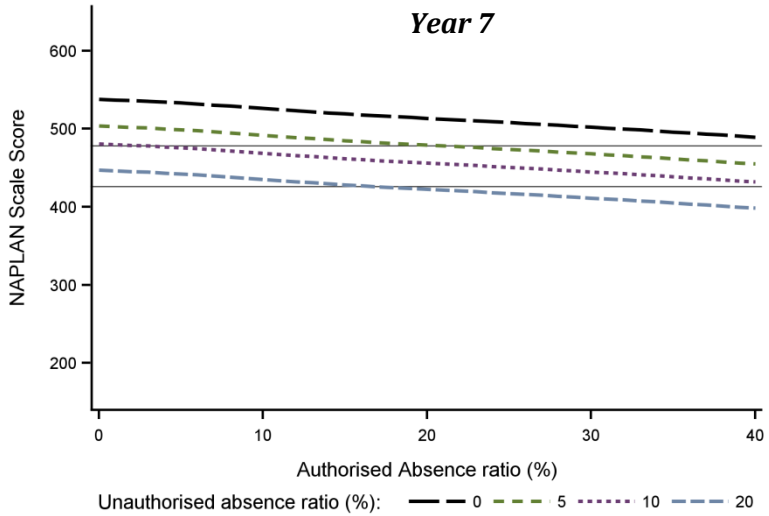


FIGURE 6.47: YEAR 7 NAPLAN WRITING SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2011-2012

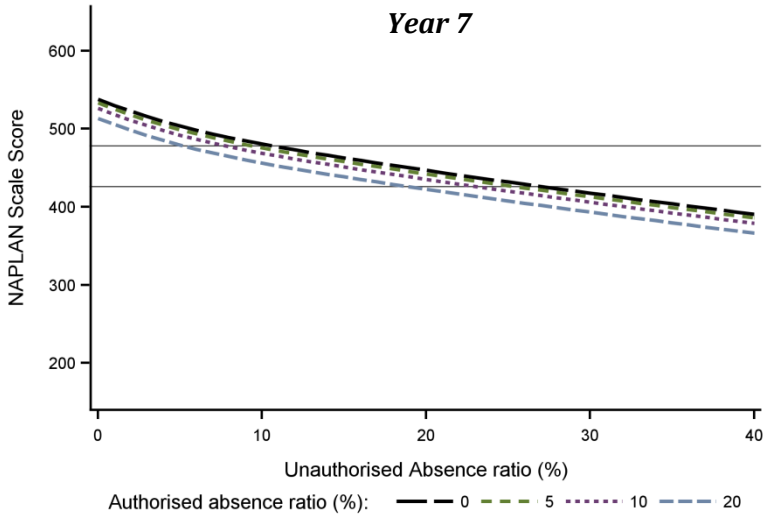


FIGURE 6.48: YEAR 9 NAPLAN WRITING SCORE BY RATE OF AUTHORISED ABSENCE FROM SCHOOL, BY RATE OF UNAUTHORISED ABSENCE, 2011-2012

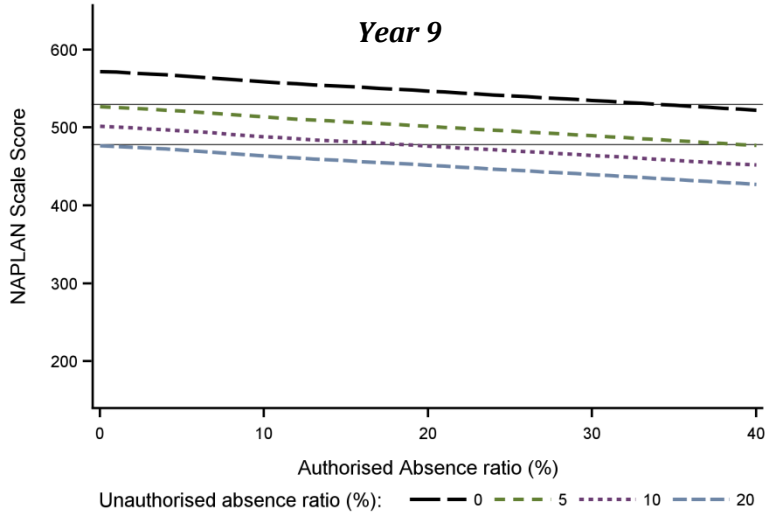
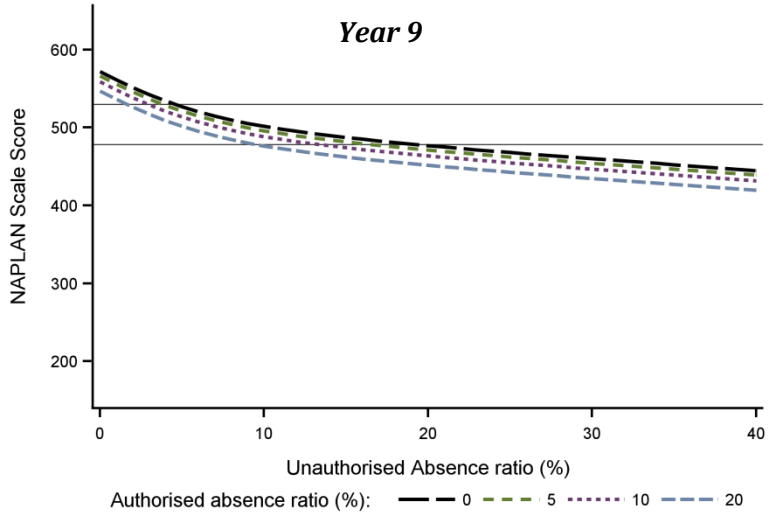


FIGURE 6.49: YEAR 9 NAPLAN WRITING SCORE BY RATE OF UNAUTHORISED ABSENCE FROM SCHOOL, BY RATE OF AUTHORISED ABSENCE, 2011-2012



SUMMARY AND CONCLUSIONS

This chapter has provided a visual examination of the nature and shape of the relationship between achievement and attendance, according to a range of student, school and caregiver characteristics. A number of important themes emerge from the results. Overall, the findings generally support the notion that "every day counts"—that is, every day of absence from school is associated with progressively lower achievement in numeracy, writing and reading. Typically, absence is associated with greater declines in writing than in numeracy and reading, as indicated by steeper spline curves for writing.

The results here also reinforce the conclusions of Chapter 5—that there are distinct gaps in achievement depending on where students live, on their socio-economic status, and on their Aboriginal status. These factors tended to predict important differences in the nature of the relationship between attendance and achievement. We observed that more advantaged children have relatively high achievement levels irrespective of their level of attendance at school. This pattern is particularly evident in the primary school years. It suggests that more advantaged children have alternative resources that help them achieve learning objectives, both at school and in the home, during the early years of school. In later years however, absence from school appears to have a greater impact, where it becomes more difficult to catch up on even a small number of missed days. Conversely, the findings suggest that less advantaged students (lower maternal education and school SEI) would benefit from attending school across all the years of school, and in particular, the early years of school.

The chapter also illustrates that the nature of the associations between achievement and absence differs markedly depending on the type of absence. The overarching observation is that unauthorised absences are associated with greater declines in achievement than are authorised absences. This suggests that there are greater returns to improving achievement through the early resolution of problems with unauthorised absences—that is, addressing this type of absence before it becomes an ongoing or consistent problem.

The findings of this chapter have provided some key initial observations concerning the relationship between attendance and achievement, and how they vary for different sub-groups of students. This has helped us in identifying potential risk factors but as yet we have not uncovered the set of factors that collectively make the greatest contribution to achievement, or how the timing and duration of exposure to these factors affects student outcomes. That is the focus of the next chapter.

CHAPTER 7 ADVANCED MODELLING OF THE RELATIONSHIP BETWEEN ATTENDANCE AND ACHIEVEMENT

Background

This chapter is an extension of Chapters 5 and 6 and provides a more advanced examination of the relationship between attendance and school achievement. Specifically, it addresses the following questions:

- What are the independent contributions of authorised and unauthorised absences and other key factors to student achievement?
- Do these contributions vary by education level?
- To what extent are prior educational experiences associated with current achievement?

To address these questions, we examined the numeracy, reading and writing results for Year 3, 5, 7 and 9 students who sat the NAPLAN tests in 2012, using multivariate analytic methods.

Highlights

- Year 3 numeracy achievement in 2012 declined by 1.6 NAPLAN points for every unauthorised day of absence in semester 1 of that year.
- Every day of unauthorised absence in semester 1 of 2011 and 2010 reduced the Year 3 numeracy score by 0.8 points and 1.2 points, respectively. A student who had two weeks of unauthorised absences in semester 1 of each year, for example, scored around 36 points lower in Year 3 than a student with no unauthorised absences over the first three years of school.
- The largest gaps in achievement were observed between students in the most and least advantaged schools. Year 3 students in the least advantaged school SEI quintile scored 49 points lower in numeracy, 55 points lower in reading, and 39 points lower in persuasive writing when compared with their counterparts in the highest SEI quintile. These gaps were larger by Year 9 (65, 52 and 66 points, respectively).

Summary of findings

- Attendance matters to achievement. The pattern of results is remarkably consistent across education levels and the different domains of achievement, and reflects that higher rates of absence are uniformly associated with progressively worse achievement.
- The effect of attendance on achievement is also cumulative. That is, the achievement of students reflects not only their absences in that year, but also absences in the preceding 2-3 years as well, particularly when those absences are unauthorised.
- Attendance has a generally modest effect on achievement. School SEI, student mobility, Aboriginal status, and caregiver education all appear to have a more pronounced relationship with achievement and account for substantial gaps in achievement between students (at all levels of education).

CHAPTER OVERVIEW

In Chapters 5 and 6 we showed that the student background and school factors associated with attendance were also associated with school achievement. We also examined how the relationship between attendance and achievement might vary for students with different characteristics and backgrounds. The aim of this chapter is to extend these findings and examine the extent to which attendance predicts achievement once the other factors that are also associated with attendance are accounted for. For example, is lower achievement amongst students in the least advantaged schools due to these students having lower attendance rates on average, or a function of the socio-economic backgrounds of these students, or a combination of both factors? Multivariate analysis, as outlined in Chapter 4, can help to determine the relative contributions of attendance and student factors towards student achievement.

NAPLAN achievement in any given year can be influenced by the number of absences of a student in that year. However in this chapter we also extend our focus to examine how absences in *previous* years predict later achievement. We might expect that the academic achievement of a student would reflect not only their experiences in the current academic year, but the accumulation of all of their prior school experiences, particularly as attendance rates, or more importantly absence rates, are so stable across the primary school years. We also begin to examine the effects of upward and downward mobility and the extent to which moving to a school in a higher or lower Socio-Economic Index for schools (SEI) quintile is associated with differences in achievement.

In this chapter we extend on our earlier findings and address the following key questions:

- What are the independent contributions of authorised and unauthorised absence rates and other key factors to student achievement?
- Are these contributions different for students in Years 3, 5, 7 and 9?
- To what extent are prior educational experiences associated with current achievement?

METHODS

The analysis in this chapter was conducted on the Analysis Wide File (see *Overview of Project Data* in Chapter 2). In this chapter the key outcomes we examined were the numeracy, reading and writing NAPLAN results. Data were restricted to 2012 NAPLAN results in order to use attendance information from previous years of enrolment to predict current achievement.

Defining the student cohorts

The analyses in this chapter were based around four cohorts of students. Simply, the cohorts corresponded to year level in 2012, that is, students who were in Years 3, 5, 7 or 9 in 2012 and sat the NAPLAN tests. For Year 3 students, absence rates were examined for the previous 3 years to Year 1 (or 2010). For Years 5, 7 and 9 students, absence rates were examined for the previous 5 years since 2008. The results presented here consist of

students who were in the public system for the duration of the study period, that is 2010-2012 for the Year 3 cohort and 2008-2012 for the Year 5, 7 and 9 cohorts. In order to be able to assess the cumulative effect of attendance patterns over several years, students who moved into or out of the private system or moved interstate or overseas during the period were excluded from analyses. Table 7.1 provides an overview of the students with 2012 NAPLAN test scores who were included and excluded from the model. Overall, the achievement test scores of students with incomplete attendance data were lower than those with complete attendance data from the preceding years.

TABLE 7.1: STUDENTS WITH NAPLAN DATA FOR 2012 – MEAN AND STANDARD DEVIATION NAPLAN SCORES FOR STUDENTS WITH PARTIAL AND FULL ATTENDANCE DATA, BY YEAR LEVEL AND LEARNING DOMAIN.

	Partial Attendance Data (excluded)			**Full Attendance Data (included)**		
	n	*Mean*	*SD*	*n*	*Mean*	*SD*
Year 3						
Numeracy	7,113	365.7	80.4	12,293	389.5	77.2
Reading	7,158	385.1	97.9	12,358	411.7	95.2
Writing	7,168	388.8	82.5	12,350	413.0	65.4
Year 5						
Numeracy	8,450	461.1	75.7	10,291	482.3	71.6
Reading	8,518	463.2	89.3	10,320	485.6	81.7
Writing	8,521	454.0	81.0	10,324	474.7	68.4
Year 7						
Numeracy	7,707	519.7	74.5	8,431	538.3	75.0
Reading	7,746	519.1	73.1	8,478	537.8	70.9
Writing	7,741	505.1	83.8	8,476	525.3	75.9
Year 9						
Numeracy	5,918	564.5	73.7	7,794	580.2	75.6
Reading	5,931	551.8	75.6	8,065	569.4	72.0
Writing	5,985	529.8	99.5	8,093	552.1	93.4

Analytic techniques

This chapter features the use of multivariate multi-level regression modelling to examine the relationship between attendance and other risk and protective factors on performance on the NAPLAN numeracy, reading and writing tests.

Though we have provided a historical context to 2012 achievement, we did not assess progress or change in NAPLAN performance over time (this is presented in the next chapter). As such, longitudinal analytic techniques were not used here. However, it is likely that any student's NAPLAN scores will be more similar to other students in their own school relative to students from other schools. To account for this nested structure of the data — students within schools — two-level cross-sectional multi-level models are still the most appropriate technique for these analyses.

Interpreting regression model results

As in Chapter 4, the model parameters presented in the results section of this chapter are presented as 'estimates of difference'. A detailed explanation on interpreting model coefficients is provided in Chapter 4. In brief, and using Table 7.4 (Year 3 Numeracy) as an example, the reference intercept estimates the average Year 3 numeracy score in 2012 for the reference group of students, which includes those:

- With no authorised or unauthorised absences in 2010, 2011 or 2012 (that is, they have a perfect attendance record)
- Who were enrolled only in one school between 2010 and 2012, and that school was in the most advantaged quintile
- Who were in a Perth metropolitan school in 2012
- Who were not Aboriginal or Torres Strait Islander
- Who were male
- Whose mother and father had a non-school qualification and a Group 1 occupation
- Who spoke English in the home.

The average numeracy score for students that met all of these characteristics would be 458.2.

Categorical factors such as school SEI can be interpreted in the same manner as detailed in Chapter 4. For example, independent of the authorised and unauthorised absence rate and other key factors, the average numeracy score for students in the least advantaged SEI quintile was 48.9 points lower than students in the most advantaged SEI quintile (see Table 7.4).

Based on the (mostly) linear patterns observed in the spline models in Chapter 6, the authorised and unauthorised absence rates were included as continuous variables and therefore require a different interpretation to the other (categorical) variables. Referring to Table 7.4, for each additional 1-percentage point of authorised absence in 2012, the numeracy achievement would decrease by 0.4 points.

For example, compared to a student with an absence rate of 0% in 2012, a student with an authorised absence rate of 10% in semester 1 of 2012 scored 4 points (10 x 0.4) lower on average on the numeracy test, after controlling for the other variables in the model.

Measuring a change in SEI

In this chapter we also extended our focus to examine how a change in circumstance is related to performance at school. Though we could examine a range of socio-economic factors that change over time, such as parent education or occupation, for simplicity and parsimony in our models we restricted our focus to one of the strongest predictors of achievement, school SEI quintile. This had the additional advantage that school SEI is known for all students in all years, while there is considerable missing data for caregiver data items such as education or occupation.

To examine the effect of moving to a school in a different quintile, we derived a variable that summarises that change that occurred from the first year of the period in question, to 2012.

The *Change in School SEI* variable should be interpreted in conjunction with the 2012 school SEI variable. Again referring to Table 7.4, a student in the second highest SEI quintile in 2012 and who attended the same school in 2010 scored, on average, 20 points lower than a student who was in the same highest quintile school at each time point. An upwardly mobile student who moved from a school in the lowest quintile in 2010 to the second highest quintile between 2008 and 2012 scored 34 points (19.9 + 14.2) lower on average than a student in the highest quintile at each point. A downwardly mobile student who moved from the second highest quintile in 2010 to the second lowest quintile in 2012 scored, on average, 36 points (32.0 + 4.3) lower than a student in the highest quintile at each point.

Effect sizes

To place estimates derived from the models into context, it is useful to know not just whether the differences are statistically significant, but the magnitude of the effect, or effect size. This helps us to interpret the practical or substantive importance of an observed difference. An effect size can be measured in several ways, such as in comparison to the overall distribution of NAPLAN scores in a particular year level, or in comparison to the average growth in NAPLAN achievement scores from one testing period to the next. For example, the average difference between boys and girls on Year 3 numeracy was 8 points, but what does this difference mean in real terms? The overall mean and standard deviation for numeracy scores for Year 3 students was 389.5 and 77.2 respectively (see Table 7.2). A difference of 8 points equates to 0.1 (8 ÷ 77.2) of a standard deviation, this is a small effect. With reference to the underlying distribution of scores (see Coe, 2002), this would mean that approximately 54% of girls would score below the average boy. If there were no effect, this figure would be 50%. In contrast, a difference of 50 points of achievement, the difference between students in the highest and lowest SEI quintiles, is 0.6 of a standard deviation. This is a moderate to large effect size, and indicates that 74% of students in the least advantaged quintile would score below the average student in the most advantaged quintile. A table of effect sizes and how they can be interpreted is provided in Table 7.3. Alternatively, student's NAPLAN numeracy test scores typically increase by around 100 points from Year 3 to Year 5. The difference of 50 points of achievement between students in the highest and lowest SEI quintiles is thus equivalent to the average gain in achievement in one year of school.

TABLE 7.2: YEAR 3, 5, 7 AND 9 STUDENTS IN 2012—MEAN AND STANDARD DEVIATION FOR NUMERACY, READING AND WRITING RESULTS

	n	*Mean*	*SD*
Year 3			
Numeracy	12,293	389.5	77.2
Reading	12,358	411.7	95.2
Writing	12,350	413.0	65.4
Year 5			
Numeracy	10,291	485.6	81.7
Reading	10,320	485.6	81.7
Writing	10,324	474.7	68.4
Year 7			
Numeracy	8,431	538.3	75.0
Reading	8,478	537.8	70.9
Writing	8,476	525.3	75.9
Year 9			
Numeracy	7,994	580.2	75.6
Reading	8,065	569.4	71.2
Writing	8,093	552.1	93.4

TABLE 7.3: INTERPRETATION OF EFFECT SIZES[a]

Effect Size	*Percentage of students in 'lower' group who would be below the average student in the 'higher' group*	*Broad interpretation of size*
0	50	none
0.1	54	small
0.2	58	
0.3	62	
0.4	66	
0.5	69	medium
0.6	73	
0.7	76	
0.8	79	large
0.9	82	
1.0	84	
1.2	88	
1.4	92	
1.6	95	

a. Adapted from Coe (2002).

Students absent for testing and participation bias

As discussed in Chapter 5, students from disadvantaged backgrounds and those with higher absence rates were less likely to sit the NAPLAN tests in any given year. As these are the same students who are likely to perform poorly on the tests, the average NAPLAN results may be biased towards the better performing students. For example, 93% of students in the most advantaged quintiles sat the Year 3 NAPLAN compared with 87% of students in the least advantaged quintile (see Table 5.1, Chapter 5). If it were the case that

low-achieving students were more likely to be away the day of testing, then the test scores may be biased to look more favourable than is really the case.

Inverse probability weighting is one technique that can be used to address bias. This technique is commonly used for survey data when a sample does not adequately represent the population from which it was drawn. By giving more weight to individuals who are not well represented, and less weight to individuals who are well represented, the sample data can become more representative of the total population. Though we are not using survey data here, we still have a 'sample' of students —those who sat the test — who do not wholly represent the defined population of students. We therefore developed a weighting approach to determine the extent to which the data may be biased towards higher achieving students.

To calculate inverse probability weights, we fitted logistic regression models to estimate the probability of a student having NAPLAN data given their personal characteristics, such as school SEI[6]. The inverse of this probability was calculated to create a weight that could be used to adjust model estimates. For example, if the probability of a student sitting the NAPLAN was 0.90, they would receive a weight of 1.11 (or 1 ÷ 0.9). If the probability of a student sitting the NAPLAN was only 0.5, they would receive a weight of 2. The application of these weights adjusts the results so that the test scores of students from demographic groups who were less likely to participate are given greater weight, and the scores of students who were more likely to participate are given lower weights. In effect, the data of the student with a probability of 0.5 is used to represent themselves plus one other student with similar characteristics who did not sit the test. Thus, any bias in the results should be corrected as the less advantaged students are better represented by the students who were in attendance on the NAPLAN testing days.

Our approach here was deliberately cautious and we discovered that the application of these weights to the models presented in this chapter had almost no impact on either the estimates presented, or the standard errors used to calculate the confidence intervals. As such, the same interpretations and conclusions were derived irrespective of whether the weights were applied. That the results were almost identical before and after weighting may suggest that the students within each strata were quite similar to each other, and therefore the missing students were already adequately represented by the ones who were present on the day of testing. Another explanation may be that the population of disadvantaged students was too small for the weights to make any difference to overall estimates. As a result, any adjustments made for these small populations would have no substantial impact upon overall estimates. Finally, it could be that though there was some bias in terms of the characteristics of the students who did not sit the NAPLAN tests, a sufficient number of these students were still in attendance for any given test. For example, though only 87% of students in the least advantaged quintile were in attendance for the Year 3 numeracy test, compared to 93% of students in most advantaged quintile, a participation rate of 87% still represents the vast majority of students in that group. Many researchers would consider a response rate of 87% to be very good in other research contexts.

[6] All of the variables used in the models were included as predictors in the logistic regression models.

As there was no appreciable difference between weighted and unweighted results, we have presented unweighted, unadjusted estimates in this chapter. All key variables were included in analyses. For the benefit of the reader, we differentiate non-significant results (grey text) from significant results (black text) in all tables in this chapter.

RESULTS

Numeracy Achievement

The model results for 2012 Numeracy performance for Year 3, 5, 7 and 9 students are provided in Table 7.4 to Table 7.7.

Authorised and unauthorised absences

Year 3

For every day of unauthorised absence in semester 1 2012, numeracy achievement declined by 1.6 points. For example, students with five unauthorised absences in 2012 would score 8 points less on average than students with no unauthorised absences, after controlling for the other key factors.

Unauthorised absences in 2010 and 2011 were also associated with achievement in 2012. For every day of unauthorised absence in 2011, Year 3 numeracy achievement declined by 0.8 points, and by 1.2 points for every unauthorised absence in 2010.

For authorised absence rates, only the current year of information was relevant to numeracy achievement. Every day of authorised absence resulted in a decrease in numeracy achievement of 0.4 points. In terms of effect size this value is small. A student who was absent from school for 20 days or 4 weeks due to illness, for example, scored 8 points less on average compared with a student with no authorised absences. Authorised absences in previous years appeared to have no bearing on 2012 achievement.

Though these values for authorised and unauthorised absences suggest that "every day counts", an important question is, what does each day count for? Clearly, unauthorised absences count for more than those which are authorised[7]. If a Year 3 student missed 5 days of school in 2012 through illness, they lost 2 points of achievement on average. If they missed 5 days of school due to truancy, they lost 8 points of achievement on average. In terms of effect size, the effect of 5 days of authorised absence is very small (effect size = 0.03). The effect of 5 days of unauthorised absence is larger, but still small (effect size = 0.1). Students would need to be absent from school for long periods of time before there were any substantial impacts on their NAPLAN results, when controlling for the other observed variables.

Though the effect sizes of the absence rates in any given year were small, because attendance rates were very stable across the primary years (see Chapters 3 and 4), the effects become larger if the accumulation of absences over time are considered. The achievement of Year 3 students with an unauthorised absence rate of 10 per cent each

[7] Possible reasons for these differences are provided in the discussion at the end of the chapter.

year would be 36 points lower on average than students with no unauthorised absences over the first three years of school, an effect size of 0.46. Thus, over time the small effects of absence accumulate to become an important indicator of achievement.

Years 5, 7 and 9

The relationship between authorised and unauthorised absences and 2012 numeracy achievement for Years 5, 7 and 9 students was highly consistent with those described for the Year 3 students. Unauthorised absences in 2012 had larger effects on current achievement than unauthorised absences in the prior years, but unauthorised absences in previous years still made a contribution. Tellingly, the number of unauthorised absences a student had in Year 1 was associated with numeracy achievement in Year 5 (0.4 point decline in achievement per day of unauthorised absence). Similarly, the number of unauthorised absences a student had in Year 6 was associated with achievement in Year 9 (0.7 point decline). As for the Year 3 students, the stand-alone effect size of these values was very small, but the accumulation of absences over time needs to be considered to understand the real effect.

Given that unauthorised absences are significantly associated with Year 3 performance, and that unauthorised absence rates within students are highly correlated across the primary years, the relationship between unauthorised absences in the early years and Year 3 outcomes would carry through to later test results. Thus, attendance and learning in the early years of school can have a substantial influence upon later performance, particularly for those students with consistently low attendance rates in the primary years.

School SEI

For all year levels, there was a clear and consistent gradient between school SEI and achievement, with every downward step in school SEI quintile resulting in a substantial decline in achievement. Considering the Year 9 students for example, the difference between students in the highest and second highest quintiles was 31.4 points, an effect size of 0.4. The difference between those in the most advantaged and least advantaged quintiles was 65.2, or an effect size of 0.86. An effect size this large suggests that 80% of students in the least advantaged quintile would have a score lower than the average student in the most advantaged quintile.

For students in Years 3 and 5 who had attended more than one school, the SEI quintile of their previous school also had a bearing on their achievement in 2012. If a Year 5 student had moved from the third quintile to the highest quintile between Year 1 and Year 5 for example, that student scored 12.8 points lower on average than a student who had always been in the highest quintile, with all other factors being equal. If a student moved from the lowest to the third quintile, they would score 31.6 points lower for being in the third quintile in 2012, but also an additional 12.8 points lower for being in less advantaged school in Year 1. These results suggest that a student's achievement would likely improve if they moved to a higher SEI school, but they would also still carry some part of their earlier disadvantage with them.

School remoteness

Across all of the year groups, there was no independent effect of school remoteness on numeracy achievement. The achievement of students in very remote schools was no better or worse on average than students in major cities after accounting for the differences in the characteristics of students. These results indicate that the clear achievement disparities for schools in more remote regions, as shown in Chapter 5, are explained by the other factors included in the model.

Number of enrolments

The independent effects of student mobility were variable across the year groups, though most of this variation could be attributed to small sample size for students with multiple enrolments. There were no independent effects of mobility for Year 5 students, for example, but quite strong relationships of mobility on achievement for Year 7 students. Overall, the average achievement of students was lower if they had been to more than one school, and the achievement deficits were generally larger for students with a larger number of enrolments.

Aboriginal status

Across all year groups in 2012, Aboriginal students scored 15-20 points lower on numeracy tests than non-Aboriginal students after controlling for the other key factors. This difference equates to an effect size of 0.19 to 0.25, a small effect. However, this result represents the *independent effect* of Aboriginal status, and would be the difference in scores between a group of Aboriginal and non-Aboriginal students who were otherwise identical. As Aboriginal students face a number of disadvantages, the other factors should also be considered when estimating the full effect of the difference between Aboriginal and non-Aboriginal students.

Gender

Across all year groups, girls scored 7–9 points lower than boys on the numeracy scale. Generally, this is a small effect, with a consistent effect size of 0.1 for each year group.

Caregiver characteristics

Parental educational attainment was independently associated with student achievement, and the attainments of mothers and fathers appeared to carry equal weight. Considering the Year 7 students for example, compared to students whose mother possessed a non-school qualification, students scored 13 points lower on average if their mother had a Year 12 education, and 25 points lower if their mother had less than a Year 10 education. Similar results were found for father's educational attainment, where the differences were 12 and 20 points respectively. Overall, the average score of students was higher for every additional year of high school education attained by either their mother or father. These patterns were very consistent for each of the year groups, though the estimates were somewhat attenuated for Year 9 students.

With respect to parent occupation status, mother's occupation generally had only small independent effects on student achievement, a finding that was consistent across the year groups. For students in Years 5 and 9, having a mother without a Group 1 occupation drew a 5- to 10 point penalty on achievement, but no such effect was found for students in Years 3 or 7. The occupational status of fathers had larger and more consistent effects, with the exception of Year 5 students. Fathers in lower occupational groups had larger differences in achievement relative to students whose father had a Group 1 occupation, with largest differences observed for students whose fathers who were not in paid work.

Main language spoken at home

In Year 3, there was no difference in achievement between English and non-English speaking students. However, there was a 7 point difference in favour of non-English speaking students in Year 5, and by Year 9 this difference had increased to 11 points. Again, these differences are small in terms of effect size.

TABLE 7.4: YEAR 3 STUDENTS, 2012–ESTIMATED DIFFERENCES IN NUMERACY ACHIEVEMENT, BY KEY FACTORS.

		Numeracy, Year 3 (n = 12,293)	
Predictor	*%*	*Coefficient*	*95% CI*
Reference Intercept		458.2	(452.6, 463.8)
Authorised Absence Rate			
2012		-0.4	(-0.7, -0.2)
2011		-0.2	(-0.4, 0.1)
2010		-0.1	(-0.3, 0.1)
Unauthorised Absence Rate			
2012		-1.6	(-2.1, -1.2)
2011		-0.8	(-1.2, -0.3)
2010		-1.2	(-1.6, -0.8)
School SEI			
1st(most advantaged) quintile	29.8	ref	
2nd quintile	26.2	-19.9	(-25.9, -13.9)
3rd quintile	19.9	-31.5	(-37.9, -25.0)
4th quintile	14.7	-32.0	(-38.9, -25.0)
5th (least advantaged) quintile	9.5	-48.9	(-56.5, -41.3)
Change in school SEI from 2010			
Same school as 2010	85.0	ref	
New school with improved SEI	5.8	-14.2	(-20.3, -8.1)
New school, same SEI	5.3	-8.7	(-15.1, -2.3)
New school with worse SEI	4.0	-4.3	(-11.4, 2.7)
School remoteness			
Major Cities	70.1	ref	
Inner Regional Australia	14.0	4.8	(-1.6, 11.1)
Outer Regional Australia	8.8	1.6	(-5.4, 8.6)
Remote Australia	5.2	-4.2	(-12.2, 3.8)
Very Remote Australia	1.9	-5.1	(-17.2, 7.0)
Number of enrolments[a]			
One	69.4	ref	
Two	22.2	-3.5	(-7.1, 0.1)
Three	6.2	-8.7	(-14.6, -2.8)
Four	1.6	-3.0	(-13.4, 7.3)
5 or more	0.6	-10.1	(-26.4, 6.2)
Aboriginal status			
Not Aboriginal or TSI	98.0	ref	
Aboriginal	2.0	-15.1	(-24.4, -5.7)
Gender			
Male	52.2	ref	
Female	47.8	-8.0	(-10.4, -5.6)

TABLE 7.4: YEAR 3 STUDENTS, 2012–ESTIMATED DIFFERENCES IN NUMERACY ACHIEVEMENT, BY KEY FACTORS.

Predictor	*%*	*Numeracy, Year 3 (n = 12,293) Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	35.5	ref	
Year 12 or equivalent	23.8	-10.9	(-14.5, -7.3)
Year 11 or equivalent	10.9	-17.9	(-22.6, -13.3)
Year 10 or equivalent	15.2	-21.5	(-25.8, -17.1)
Year 9 or below	2.6	-25.0	(-33.4, -16.6)
Not stated/unknown[b]	12.0	-14.8	(-20.3, -9.2)
Father's education			
Non-school qualification	28.4	ref	
Year 12 or equivalent	21.4	-7.5	(-11.6, -3.5)
Year 11 or equivalent	9.1	-13.6	(-18.8, -8.3)
Year 10 or equivalent	20.1	-15.5	(-19.9, -11.0)
Year 9 or below	3.1	-21.3	(-29.2, -13.4)
Not stated/unknown[b]	17.9	-7.6	(-12.8, -2.3)
Mother's occupation			
Group 1	12.8	ref	
Group 2	11.7	-5.6	(-10.7, -0.5)
Group 3	14.4	-5.9	(-11.1, -0.8)
Group 4	11.0	-3.1	(-8.7, 2.5)
Not in paid work[c]	28.1	-2.6	(-7.2, 2.0)
Not stated/unknown[b]	22.0	-7.7	(-13.4, -2.0)
Father's occupation			
Group 1	17.9	ref	
Group 2	17.3	-6.5	(-10.9, -2.0)
Group 3	20.2	-12.3	(-17.1, -7.5)
Group 4	16.9	-16.5	(-21.6, -11.5)
Not in paid work[c]	2.5	-21.7	(-30.5, -12.9)
Not stated/unknown[b]	25.4	-14.9	(-20.3, -9.5)
Main language spoken at home			
English	54.3	ref	
Language other than English	14.4	2.5	(-1.4, 6.4)
Not stated	31.4	-1.8	(-4.7, 1.2)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

TABLE 7.5: YEAR 5 STUDENTS, 2012–ESTIMATED DIFFERENCES IN NUMERACY ACHIEVEMENT, BY KEY FACTORS.

Predictor	*%*	*Numeracy, Year 5 (n = 10,291) Coefficient*	*95% CI*
Reference Intercept		551.3	(545.7, 556.9)
Authorised absence rate			
2012		-0.8	(-1.0, -0.5)
2011		-0.2	(-0.5, 0.0)
2010		0.0	(-0.2, 0.3)
2009		0.0	(-0.3, 0.2)
2008		0.1	(-0.2, 0.3)
Unauthorised absence rate			
2012		-1.2	(-1.6, -0.8)
2011		-1.3	(-1.8, -0.8)
2010		-0.4	(-0.8, 0.1)
2009		-0.5	(-0.9, -0.1)
2008		-0.4	(-0.7, -0.1)
School SEI			
1st (most advantaged) quintile	29.6	ref	
2nd quintile	25.6	-22.0	(-27.6, -16.5)
3rd quintile	20.4	-31.6	(-37.6, -25.7)
4th quintile	14.9	-35.0	(-41.4, -28.6)
5th (least advantaged) quintile	9.6	-47.1	(-54.2, -40.0)
Change in School SEI from 2008			
Same school as 2008	75.9	ref	
New school with improved SEI	9.7	-12.8	(-20.8, -4.8)
New school, same SEI	8.6	-7.7	(-15.9, 0.4)
New school with worse SEI	5.8	-7.3	(-15.9, 1.4)
School remoteness			
Major Cities	68.4	ref	
Inner Regional Australia	14.8	2.0	(-3.8, 7.8)
Outer Regional Australia	10.0	3.7	(-2.6, 10.0)
Remote Australia	5.1	2.2	(-5.5, 9.8)
Very Remote Australia	1.7	-1.5	(-13.1, 10.1)
Number of enrolments[a]			
One	72.8	ref	
Two	20.5	-2.6	(-9.7, 4.5)
Three	5.1	-7.3	(-16.1, 1.6)
Four	1.2	-5.4	(-18.9, 8.0)
5 or more	0.5	0.8	(-18.6, 20.2)
Aboriginal status			
Not Aboriginal or TSI	95.8	ref	
Aboriginal	4.2	-15.7	(-22.6, -8.7)
Gender			
Male	51.4	ref	
Female	48.6	-7.4	(-9.8, -5.0)

TABLE 7.5: YEAR 5 STUDENTS, 2012–ESTIMATED DIFFERENCES IN NUMERACY ACHIEVEMENT, BY KEY FACTORS.

		Numeracy, Year 5 (n = 10,291)	
Predictor	*%*	*Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	30.2	ref	
Year 12 or equivalent	21.6	-10.3	(-14.2, -6.4)
Year 11 or equivalent	11.0	-19.1	(-24.0, -14.3)
Year 10 or equivalent	17.3	-19.8	(-24.1, -15.4)
Year 9 or below	2.5	-17.9	(-26.5, -9.3)
Not stated/unknown[b]	17.4	-9.7	(-16.0, -3.3)
Father's education			
Non-school qualification	24.5	ref	
Year 12 or equivalent	18.7	-10.5	(-14.9, -6.1)
Year 11 or equivalent	9.2	-16.2	(-21.6, -10.7)
Year 10 or equivalent	21.5	-19.1	(-23.7, -14.5)
Year 9 or below	3.9	-24.1	(-31.4, -16.7)
Not stated/unknown[b]	22.3	-12.3	(-18.6, -6.0)
Mother's occupation			
Group 1	11.1	ref	
Group 2	11.9	-8.6	(-13.9, -3.3)
Group 3	15.0	-6.3	(-11.7, -0.9)
Group 4	12.1	-9.4	(-15.1, -3.6)
Not in paid work[c]	27.0	-6.2	(-11.1, -1.3)
Not stated/unknown[b]	22.9	-10.3	(-17.0, -3.5)
Father's occupation			
Group 1	15.9	ref	
Group 2	18.5	0.9	(-3.6, 5.5)
Group 3	20.5	-4.0	(-9.0, 1.0)
Group 4	17.0	-5.7	(-10.9, -0.4)
Not in paid work[c]	2.4	-7.1	(-16.1, 1.8)
Not stated/unknown[b]	25.7	-5.3	(-11.9, 1.3)
Main language spoken at home			
English	63.1	ref	
Language other than English	12.1	6.7	(2.6, 10.8)
Not stated	24.8	-1.7	(-4.9, 1.4)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

TABLE 7.6: YEAR 7 STUDENTS, 2012–ESTIMATED DIFFERENCES IN NUMERACY ACHIEVEMENT, BY KEY FACTORS.

		Numeracy, Year 7 (n = 8,431)	
Predictor	*%*	*Coefficient*	*95% CI*
Reference Intercept		624.3	(617.4, 631.2)
Authorised absence rate			
2012		-0.6	(-0.9, -0.3)
2011		-0.4	(-0.7, -0.2)
2010		-0.2	(-0.5, 0.1)
2009		0.2	(-0.1, 0.5)
2008		-0.1	(-0.4, 0.2)
Unauthorised absence rate			
2012		-1.0	(-1.5, -0.6)
2011		-0.6	(-1.1, -0.2)
2010		-0.2	(-0.7, 0.3)
2009		-0.4	(-0.9, 0.0)
2008		-0.5	(-0.9, -0.1)
School SEI			
1st(most advantaged) quintile	24.0	ref	
2nd quintile	24.3	-24.5	(-31.4, -17.5)
3rd quintile	22.1	-31.8	(-38.9, -24.6)
4th quintile	17.8	-36.4	(-43.9, -29.0)
5th (least advantaged) quintile	11.7	-51.6	(-59.9, -43.3)
Change in school SEI from 2008			
Same school as 2008	72.3	ref	
New school with improved SEI	10.0	-5.0	(-15.0, 5.0)
New school, same SEI	10.4	-2.7	(-12.8, 7.4)
New school with worse SEI	7.4	1.1	(-9.3, 11.5)
School remoteness			
Major Cities	63.7	ref	
Inner Regional Australia	17.0	0.3	(-6.5, 7.2)
Outer Regional Australia	11.3	3.7	(-3.5, 11.0)
Remote Australia	5.7	3.3	(-5.6, 12.3)
Very Remote Australia	2.3	-2.3	(-14.9, 10.4)
Number of enrolments[a]			
One	69.8	ref	
Two	22.5	-10.8	(-19.8, -1.8)
Three	5.7	-10.5	(-21.4, 0.4)
Four	1.5	-16.5	(-31.1, -1.9)
5 or more	0.6	-25.5	(-46.5, -4.6)
Aboriginal status			
Not Aboriginal or TSI	95.5	ref	
Aboriginal	4.5	-20.4	(-27.9, -12.8)
Gender			
Male	51.1	ref	
Female	48.9	-9.0	(-11.8, -6.3)

TABLE 7.6: YEAR 7 STUDENTS, 2012–ESTIMATED DIFFERENCES IN NUMERACY ACHIEVEMENT, BY KEY FACTORS.

		Numeracy, Year 7 (n = 8,431)	
Predictor	*%*	*Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	24.8	ref	
Year 12 or equivalent	19.9	-13.1	(-17.8, -8.4)
Year 11 or equivalent	11.8	-18.7	(-24.2, -13.1)
Year 10 or equivalent	19.0	-19.2	(-24.2, -14.2)
Year 9 or below	2.5	-25.0	(-34.8, -15.1)
Not stated/unknown[b]	22.1	-14.5	(-21.9, -7.1)
Father's education			
Non-school qualification	19.9	ref	
Year 12 or equivalent	17.0	-11.8	(-17.1, -6.5)
Year 11 or equivalent	8.9	-19.3	(-25.7, -12.9)
Year 10 or equivalent	23.1	-20.5	(-25.9, -15.1)
Year 9 or below	3.9	-20.4	(-29.0, -11.9)
Not stated/unknown[b]	27.2	-15.4	(-22.9, -8.0)
Mother's occupation			
Group 1	9.4	ref	
Group 2	11.5	-5.0	(-11.4, 1.4)
Group 3	15.6	-0.5	(-6.9, 5.9)
Group 4	14.2	-3.1	(-9.7, 3.6)
Not in paid work[c]	22.9	-3.2	(-9.3, 2.8)
Not stated/unknown[b]	26.5	-3.3	(-11.4, 4.8)
Father's occupation			
Group 1	12.1	ref	
Group 2	16.8	-6.3	(-12.0, -0.6)
Group 3	20.1	-12.7	(-18.7, -6.7)
Group 4	18.5	-19.0	(-25.3, -12.8)
Not in paid work[c]	2.5	-22.2	(-32.4, -11.9)
Not stated/unknown[b]	30.0	-18.5	(-26.4, -10.6)
Main language spoken at home			
English	65.7	ref	
Language other than English	11.8	10.1	(5.4, 14.9)
Not stated	22.5	-0.4	(-4.1, 3.2)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

TABLE 7.7: YEAR 9 STUDENTS, 2012–ESTIMATED DIFFERENCES IN NUMERACY ACHIEVEMENT, BY KEY FACTORS.

		Numeracy, Year 9 (n = 7,794)	
Predictor	*%*	*Coefficient*	*95% CI*
Reference Intercept		674.3	(659.9, 688.7)
Authorised absence rate			
2012		-0.9	(-1.1, -0.6)
2011		-0.5	(-0.7, -0.2)
2010		-0.2	(-0.5, 0.1)
2009		0.2	(0.0, 0.5)
2008		0.0	(-0.3, 0.3)
Unauthorised absence rate			
2012		-1.3	(-1.6, -1.0)
2011		-0.3	(-0.7, 0.1)
2010		-0.5	(-0.9, -0.1)
2009		-0.7	(-1.2, -0.3)
2008		-0.1	(-0.6, 0.3)
School SEI			
1st (most advantaged) quintile	26.4	ref	
2nd quintile	20.8	-31.4	(-44.9, -17.9)
3rd quintile	26.1	-41.9	(-55.0, -28.7)
4th quintile	20.4	-54.7	(-67.9, -41.5)
5th (least advantaged) quintile	6.2	-65.2	(-81.1, -49.2)
Change in school SEI from 2008			
Same school as 2008	4.6	ref	
New school with improved SEI	28.5	-6.7	(-16.1, 2.7)
New school, same SEI	48.0	-6.5	(-15.7, 2.7)
New school with worse SEI	18.9	-1.3	(-10.8, 8.3)
School remoteness			
Major Cities	65.5	ref	
Inner Regional Australia	15.7	6.7	(-4.0, 17.4)
Outer Regional Australia	12.1	6.7	(-4.5, 17.9)
Remote Australia	4.7	13.7	(-0.7, 28.1)
Very Remote Australia	1.9	4.1	(-13.0, 21.2)
Number of enrolments[a]			
One	75.2	ref	
Two	19.1	-6.6	(-10.5, -2.8)
Three	4.1	-11.7	(-18.8, -4.5)
Four	1.1	0.1	(-13.2, 13.5)
5 or more	0.5	-18.3	(-38.6, 2.1)
Aboriginal status			
Not Aboriginal or TSI	95.8	ref	
Aboriginal	4.2	-15.3	(-22.7, -7.8)
Gender			
Male	53.3	ref	
Female	46.7	-9.5	(-12.3, -6.7)

TABLE 7.7: YEAR 9 STUDENTS, 2012–ESTIMATED DIFFERENCES IN NUMERACY ACHIEVEMENT, BY KEY FACTORS.

		Numeracy, Year 9 (n = 7,794)	
Predictor	*%*	*Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	25.0	ref	
Year 12 or equivalent	20.2	-6.3	(-10.9, -1.7)
Year 11 or equivalent	13.1	-14.7	(-20.0, -9.5)
Year 10 or equivalent	22.3	-15.0	(-19.8, -10.3)
Year 9 or below	3.3	-18.6	(-27.3, -10.0)
Not stated/unknown[b]	16.1	-12.3	(-19.8, -4.9)
Father's education			
Non-school qualification	20.3	ref	
Year 12 or equivalent	17.3	-9.5	(-14.7, -4.4)
Year 11 or equivalent	9.3	-14.4	(-20.7, -8.2)
Year 10 or equivalent	26.6	-17.5	(-22.7, -12.3)
Year 9 or below	4.7	-19.7	(-27.5, -11.8)
Not stated/unknown[b]	21.8	-11.3	(-18.6, -4.0)
Mother's occupation			
Group 1	9.3	ref	
Group 2	13.1	-9.2	(-15.3, -3.1)
Group 3	19.0	-10.4	(-16.4, -4.3)
Group 4	19.3	-9.9	(-16.2, -3.7)
Not in paid work[c]	19.2	-9.1	(-15.1, -3.0)
Not stated/unknown[b]	20.1	-9.5	(-17.4, -1.5)
Father's occupation			
Group 1	12.9	ref	
Group 2	17.3	-0.9	(-6.4, 4.6)
Group 3	21.7	-12.8	(-18.5, -7.1)
Group 4	20.3	-13.4	(-19.4, -7.4)
Not in paid work[c]	3.3	-13.8	(-22.9, -4.7)
Not stated/unknown[b]	24.5	-16.6	(-24.2, -9.1)
Main language spoken at home			
English	62.5	ref	
Language other than English	12.4	11.3	(6.6, 16.0)
Not stated	25.2	1.4	(-2.0, 4.7)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

Reading Achievement

The results of the multi-level models for reading achievement are provided in Table 7.8 to Table 7.11. For most of the factors, the direction and magnitude of the relationships between attendance and each of the key factors to reading achievement closely matched those for numeracy achievement.

Authorised and unauthorised absences

The relationship between authorised and unauthorised absences and reading outcomes were similar to those reported for numeracy. For authorised absences, only those recorded in 2012 were associated with reading outcomes for any given year group, and again the magnitude of the effect was quite small.

Unauthorised absences had a stronger association with reading achievement than authorised absences. The largest effects were found for unauthorised absences in 2012, but unauthorised absences in previous years were also important. For Year 3 students, unauthorised absences in the previous 3 years contributed to reading achievement. For students in Years 5, 7 and 9 only the previous 2 years of unauthorised absences contributed. The magnitude of effect for reading was similar to the effect for numeracy.

School SEI

As for numeracy, in all year groups there was a clear, strong and consistent gradient across for SEI and reading scores. Considering Year 9 students, the difference between students in the highest and second highest quintiles was 31.4 points, an effect size of 0.4. The difference between those in the most advantaged and least advantaged quintiles was 65.2, or an effect size of 0.86. To translate this effect, 80% of students in the most disadvantaged quintile had a score lower than the average student in the most advantaged quintile. Or alternatively, the difference in reading scores between students in the most advantaged and most disadvantaged quintiles was larger than the typical gain in reading scores for an average student over a full academic year.

A change in school SEI appeared to have an effect on reading achievement for Year 3 students only. Upwardly mobile students who moved to a school in a more advantaged SEI quintile still scored almost 13 points lower on reading achievement than students who did not change schools. No significant effects were found for the change in SEI variable for the other year groups.

School remoteness

Unlike the results for numeracy, where there was no association between remoteness and achievement, there were independent effects of remoteness on reading achievement for students in Year 3 and 5. For Year 3 students, those in remote or very remote schools scored 14– to 15–points lower on average in reading achievement than students in major cities, after controlling for the other key factors. For Year 5 students, this difference was observed only for students in very remote schools.

Mobility

As for the numeracy results, the independent effects of student mobility were somewhat variable. Overall, there were some independent effects for student mobility where the average achievement of students was lower for those with multiple enrolments.

Aboriginal status

Relative to numeracy, the effects of Aboriginal status appear to be slightly larger for reading achievement. While the differences for Aboriginal students relative to non-Aboriginal students ranged from 15–20 points (effect sizes 0.19–0.27) lower for numeracy, their differences were 20–27 points lower for reading (effect sizes 0.20–0.37).

Gender

In contrast to numeracy, where boys outperformed girls, the results for reading were in favour of girls, and with larger effects. Also, while the difference between boys and girls remained steady across the year groups for numeracy, the disparities of gender became more apparent for the older students on the reading tests. In Year 3, the average score for girls was 12.5 points higher than that for boys. For students in Years 5, 7 and 9 the difference was 14–17 points. While the effect size was approximately 0.1 for numeracy, it was closer to 0.2 for reading achievement. These are small effect sizes.

Caregiver characteristics

Generally, the average reading score for students improved for every additional year of high school education that their parent received, and the attainments of mothers and fathers appeared to carry equal weight. These patterns were robust across all year groups.

Mother's occupation had small and somewhat inconsistent effects on reading, whereas the effects for father's occupation were larger and more robust. For students in Years 5, 7 and 9, students whose mother did not have a Group 1 occupation scored 5 to 10 points lower on average on reading achievement. No effect of maternal occupation was found for students in Year 3. For father's occupation, lower occupational groups had larger differences in achievement relative to students whose father had a Group 1 occupation. Again, the largest differences within any given year group were observed for fathers who were not in paid work. Students whose fathers were not in paid work scored as much as 23 points lower on average than students whose father with a Group 1 occupation.

Main language spoken at home

As for the numeracy results, there was no difference in achievement between English and non-English speaking students in Year 3, and for reading this result extended to Year 5 students. However in contrast to numeracy, students who only spoke English in the home performed better on average than students who spoke a language other than English in the home in Years 7 and 9. Non-English speakers scored 5.5 points lower on average in Year 7, and 10.7 points lower in Year 9 compared with students who spoke English in the home.

TABLE 7.8: YEAR 3 STUDENTS, 2012–ESTIMATED DIFFERENCES IN READING ACHIEVEMENT, BY KEY FACTORS.

		Reading, Year 3 (n = 12,358)	
Predictor	*%*	*Coefficient*	*95% CI*
Reference Intercept		480.7	(474.2, 487.2)
Authorised absence rate			
2012		-0.3	(-0.6, 0.0)
2011		0.0	(-0.3, 0.3)
2010		0.2	(-0.1, 0.4)
Unauthorised absence rate			
2012		-1.4	(-1.9, -0.9)
2011		-0.8	(-1.3, -0.3)
2010		-1.1	(-1.6, -0.6)
School SEI			
1st (most advantaged) quintile	29.7	ref	
2nd quintile	26.2	-20.0	(-26.7, -13.4)
3rd quintile	19.9	-29.0	(-36.3, -21.7)
4th quintile	14.8	-38.0	(-45.8, -30.1)
5th (least advantaged) quintile	9.6	-54.8	(-63.4, -46.2)
Change in school SEI from 2010			
Same school as 2010	84.8	ref	
New school with improved SEI	5.9	-12.9	(-20.4, -5.3)
New school, same SEI	5.3	-5.9	(-13.8, 2.0)
New school with worse SEI	4.0	1.3	(-7.4, 10.1)
School remoteness			
Major Cities	70.0	ref	
Inner Regional Australia	14.0	1.4	(-5.7, 8.6)
Outer Regional Australia	8.9	-5.2	(-13.1, 2.7)
Remote Australia	5.2	-14.1	(-23.4, -4.9)
Very Remote Australia	1.9	-15.2	(-29.3, -1.2)
Number of enrolments[a]			
One	69.2	ref	
Two	22.3	-7.2	(-11.7, -2.8)
Three	6.3	-12.0	(-19.3, -4.7)
Four	1.7	-12.7	(-25.4, 0.1)
5 or more	0.6	-14.5	(-34.8, 5.9)
Aboriginal status			
Not Aboriginal or TSI	97.9	ref	
Aboriginal	2.1	-19.5	(-31.0, -8.1)
Gender			
Male	52.2	ref	
Female	47.8	12.5	(9.5, 15.5)

TABLE 7.8: YEAR 3 STUDENTS, 2012–ESTIMATED DIFFERENCES IN READING ACHIEVEMENT, BY KEY FACTORS.

		Reading, Year 3 (n = 12,358)	
Predictor	*%*	*Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	35.4	ref	
Year 12 or equivalent	23.8	-11.7	(-16.2, -7.2)
Year 11 or equivalent	10.8	-22.6	(-28.4, -16.8)
Year 10 or equivalent	15.4	-29.6	(-34.9, -24.2)
Year 9 or below	2.5	-33.4	(-43.9, -22.9)
Not stated/unknown[b]	12.0	-13.1	(-20.0, -6.2)
Father's education			
Non-school qualification	28.3	ref	
Year 12 or equivalent	21.4	-10.4	(-15.5, -5.3)
Year 11 or equivalent	9.1	-18.7	(-25.3, -12.1)
Year 10 or equivalent	20.2	-22.8	(-28.3, -17.3)
Year 9 or below	3.1	-36.0	(-45.8, -26.1)
Not stated/unknown[b]	18.0	-12.5	(-19.0, -6.0)
Mother's occupation			
Group 1	12.8	ref	
Group 2	11.6	-6.1	(-12.5, 0.3)
Group 3	14.4	-5.3	(-11.7, 1.1)
Group 4	11.0	-2.3	(-9.3, 4.7)
Not in paid work[c]	28.2	-3.3	(-9.0, 2.4)
Not stated/unknown[b]	22.1	-9.5	(-16.5, -2.4)
Father's occupation			
Group 1	17.8	ref	
Group 2	17.2	-9.2	(-14.7, -3.6)
Group 3	20.3	-16.0	(-21.9, -10.0)
Group 4	16.8	-21.6	(-27.9, -15.2)
Not in paid work[c]	2.5	-23.4	(-34.4, -12.5)
Not stated/unknown[b]	25.4	-20.2	(-26.9, -13.4)
Main language spoken at home			
English	54.3	ref	
Language other than English	14.4	-0.9	(-5.8, 3.9)
Not stated	31.3	2.5	(-1.2, 6.1)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

TABLE 7.9: YEAR 5 STUDENTS, 2012–ESTIMATED DIFFERENCES IN READING ACHIEVEMENT, BY KEY FACTORS.

		Reading, Year 5 (n = 10,320)	
Predictor	*%*	*Coefficient*	*95% CI*
Reference Intercept		545.3	(539.2, 551.5)
Authorised absence rate			
2012		-0.6	(-0.9, -0.3)
2011		-0.2	(-0.5, 0.1)
2010		0.4	(0.1, 0.7)
2009		0.1	(-0.2, 0.4)
2008		0.3	(0.0, 0.5)
Unauthorised absence rate			
2012		-1.1	(-1.6, -0.6)
2011		-1.5	(-2.1, -1.0)
2010		-0.5	(-1.1, 0.1)
2009		-0.3	(-0.8, 0.2)
2008		-0.2	(-0.6, 0.1)
School SEI			
1st (most advantaged) quintile	29.6	ref	
2nd quintile	25.5	-18.4	(-24.0, -12.8)
3rd quintile	20.3	-29.1	(-35.3, -23.0)
4th quintile	15.0	-34.3	(-41.0, -27.7)
5th (least advantaged) quintile	9.6	-44.3	(-51.8, -36.9)
Change in school SEI from 2008			
Same school as 2008	76.0	ref	
New school with improved SEI	9.7	-7.1	(-16.4, 2.3)
New school, same SEI	8.5	-1.5	(-11.0, 8.1)
New school with worse SEI	5.9	0.9	(-9.3, 11.0)
School remoteness			
Major Cities	68.5	ref	
Inner Regional Australia	14.8	3.5	(-2.4, 9.4)
Outer Regional Australia	9.9	4.4	(-2.2, 11.0)
Remote Australia	5.1	4.7	(-3.4, 12.9)
Very Remote Australia	1.7	-13.5	(-26.1, -0.8)
Number of enrolments[a]			
One	72.9	ref	
Two	20.4	-7.7	(-16.0, 0.7)
Three	5.1	-13.8	(-24.2, -3.4)
Four	1.2	-9.7	(-25.6, 6.1)
5 or more	0.5	-19.5	(-42.0, 2.9)
Aboriginal status			
Not Aboriginal or TSI	95.8	ref	
Aboriginal	4.2	-26.8	(-35.0, -18.7)
Gender			
Male	51.4	ref	
Female	48.6	14.0	(11.2, 16.9)

TABLE 7.9: YEAR 5 STUDENTS, 2012–ESTIMATED DIFFERENCES IN READING ACHIEVEMENT, BY KEY FACTORS.

		Reading, Year 5 (n = 10,320)	
Predictor	*%*	*Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	30.1	ref	
Year 12 or equivalent	21.7	-12.8	(-17.4, -8.2)
Year 11 or equivalent	11.0	-22.7	(-28.3, -17.0)
Year 10 or equivalent	17.4	-21.9	(-27.0, -16.8)
Year 9 or below	2.4	-27.6	(-37.8, -17.5)
Not stated/unknown[b]	17.4	-16.1	(-23.5, -8.7)
Father's education			
Non-school qualification	24.5	ref	
Year 12 or equivalent	18.6	-11.5	(-16.7, -6.4)
Year 11 or equivalent	9.2	-18.0	(-24.4, -11.6)
Year 10 or equivalent	21.5	-20.8	(-26.2, -15.4)
Year 9 or below	3.8	-25.2	(-33.8, -16.5)
Not stated/unknown[b]	22.3	-10.5	(-17.9, -3.1)
Mother's occupation			
Group 1	11.0	ref	
Group 2	11.9	-9.1	(-15. , -2.9)
Group 3	15.0	-5.1	(-11.4, 1.3)
Group 4	12.0	-9.9	(-16.7, -3.2)
Not in paid work[c]	27.0	-5.8	(-11.6, -0.1)
Not stated/unknown[b]	23.0	-8.3	(-16.2, -0.3)
Father's occupation			
Group 1	15.9	ref	
Group 2	18.5	-3.0	(-8.3, 2.3)
Group 3	20.5	-8.4	(-14.3, -2.5)
Group 4	16.9	-9.5	(-15.7, -3.3)
Not in paid work[c]	2.5	-14.0	(-24.5, -3.5)
Not stated/unknown[b]	25.7	-10.7	(-18.5, -3.0)
Main language spoken at home			
English	63.2	ref	
Language other than English	12.1	-2.7	(-7.5, 2.0)
Not stated	24.7	-0.3	(-3.9, 3.3)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

TABLE 7.10: YEAR 7 STUDENTS, 2012–ESTIMATED DIFFERENCES IN READING ACHIEVEMENT, BY KEY FACTORS.

		Reading, Year 7 (n = 8,478)	
Predictor	*%*	*Coefficient*	*95% CI*
Reference Intercept		601.8	(595.4, 608.1)
Authorised absence Rate			
2012		-0.1	(-0.4, 0.2)
2011		-0.2	(-0.5, 0.0)
2010		-0.1	(-0.4, 0.2)
2009		0.3	(0.1, 0.6)
2008		0.2	(-0.1, 0.5)
Unauthorised absence Rate			
2012		-1.0	(-1.5, -0.6)
2011		-0.7	(-1.1, -0.2)
2010		-0.3	(-0.8, 0.2)
2009		-0.3	(-0.7, 0.2)
2008		-0.2	(-0.6, 0.2)
School SEI			
1st (most advantaged) quintile	24.0	ref	
2nd quintile	24.4	-19.1	(-24.9, -13.3)
3rd quintile	22.1	-24.6	(-30.7, -18.6)
4th quintile	17.9	-29.3	(-35.6, -22.9)
5th (least advantaged) quintile	11.7	-42.0	(-49.1, -34.9)
Change in school SEI from 2008			
Same school as 2008	72.2	ref	
New school with improved SEI	10.0	-7.6	(-17.3, 2.0)
New school, same SEI	10.4	-3.3	(-13.1, 6.4)
New school with worse SEI	7.4	-3.5	(-13.6, 6.5)
School remoteness			
Major Cities	63.7	ref	
Inner Regional Australia	17.1	1.9	(-3.7, 7.5)
Outer Regional Australia	11.3	3.0	(-3.2, 9.1)
Remote Australia	5.7	2.5	(-5.3, 10.2)
Very Remote Australia	2.2	1.7	(-9.5, 13.0)
Number of enrolments[a]			
One	69.8	ref	
Two	22.5	-6.4	(-15.2, 2.3)
Three	5.7	-7.3	(-17.9, 3.3)
Four	1.5	-18.8	(-32.9, -4.6)
5 or more	0.6	-8.4	(-28.3, 11.5)
Aboriginal status			
Not Aboriginal or TSI	95.4	ref	
Aboriginal	4.6	-24.6	(-31.9, -17.4)
Gender			
Male	51.0	ref	
Female	49.0	16.6	(13.9, 19.3)

TABLE 7.10: YEAR 7 STUDENTS, 2012–ESTIMATED DIFFERENCES IN READING ACHIEVEMENT, BY KEY FACTORS.

Predictor	*%*	*Reading, Year 7 (n = 8,478) Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	24.6	ref	
Year 12 or equivalent	20.0	-13.4	(-18.0, -8.8)
Year 11 or equivalent	11.8	-21.3	(-26.7, -15.9)
Year 10 or equivalent	19.1	-20.1	(-25.0, -15.2)
Year 9 or below	2.5	-25.7	(-35.3, -16.1)
Not stated/unknown[b]	22.0	-13.3	(-20.5, -6.1)
Father's education			
Non-school qualification	19.8	ref	
Year 12 or equivalent	16.9	-8.5	(-13.7, -3.3)
Year 11 or equivalent	8.9	-14.9	(-21.2, -8.6)
Year 10 or equivalent	23.2	-19.4	(-24.7, -14.1)
Year 9 or below	3.9	-22.6	(-30.9, -14.3)
Not stated/unknown[b]	27.3	-13.7	(-21.0, -6.4)
Mother's occupation			
Group 1	9.3	ref	
Group 2	11.5	-7.2	(-13.4, -0.9)
Group 3	15.7	-1.7	(-8.0, 4.6)
Group 4	14.2	-6.2	(-12.7, 0.3)
Not in paid work[c]	22.9	-7.9	(-13.8, -2.0)
Not stated/unknown[b]	26.5	-8.1	(-16.0, -0.2)
Father's occupation			
Group 1	12.0	ref	
Group 2	16.8	-8.1	(-13.6, -2.5)
Group 3	20.1	-13.1	(-19.0, -7.2)
Group 4	18.5	-17.0	(-23.1, -10.9)
Not in paid work[c]	2.6	-18.0	(-27.9, -8.0)
Not stated/unknown[b]	30.1	-16.8	(-24.5, -9.0)
Main language spoken at home			
English	65.7	ref	
Language other than English	11.7	-5.5	(-10.1, -0.9)
Not stated	22.6	0.5	(-3.0, 4.0)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

TABLE 7.11: YEAR 9 STUDENTS, 2012–ESTIMATED DIFFERENCES IN READING ACHIEVEMENT, BY KEY FACTORS.

		Reading, Year 9 (n = 8,065)	
Predictor	*%*	*Coefficient*	*95% CI*
Reference Intercept		635.8	(622.5, 649.0)
Authorised absence rate			
2012		-0.5	(-0.7, -0.3)
2011		-0.2	(-0.5, 0.0)
2010		0.3	(0.0, 0.6)
2009		0.2	(0.0, 0.5)
2008		0.2	(0.0, 0.5)
Unauthorised absence rate			
2012		-1.2	(-1.5, -0.9)
2011		-0.6	(-1.1, -0.2)
2010		0.1	(-0.3, 0.5)
2009		-0.1	(-0.5, 0.3)
2008		-0.4	(-0.8, 0.0)
School SEI			
1st (most advantaged) quintile	26.3	ref	
2nd quintile	20.8	-19.9	(-31.6, -8.2)
3rd quintile	26.1	-32.0	(-43.5, -20.6)
4th quintile	20.5	-40.6	(-52.1, -29.0)
5th (least advantaged) quintile	6.4	-52.4	(-66.5, -38.3)
Change in school SEI from 2008			
Same school as 2008	4.6	ref	
New school with improved SEI	28.3	-2.1	(-11.1, 6.9)
New school, same SEI	48.4	-2.4	(-11.3, 6.4)
New school with worse SEI	18.7	3.4	(-5.8, 12.5)
School remoteness			
Major Cities	65.2	ref	
Inner Regional Australia	16.0	8.2	(-1.2, 17.5)
Outer Regional Australia	12.1	5.1	(-4.8, 15.0)
Remote Australia	4.7	10.2	(-2.8, 23.2)
Very Remote Australia	1.9	1.6	(-14.1, 17.4)
Number of enrolments[a]			
One	75.2	ref	
Two	19.2	-5.7	(-9.5, -1.9)
Three	4.1	-13.8	(-20.9, -6.6)
Four	1.1	-7.6	(-20.9, 5.7)
5 or more	0.5	-19.6	(-40.2, 0.9)
Aboriginal status			
Not Aboriginal or TSI	95.7	ref	
Aboriginal	4.3	-25.6	(-33.0, -18.2)
Gender			
Male	53.0	ref	
Female	47.0	14.6	(11.9, 17.4)

TABLE 7.11: YEAR 9 STUDENTS, 2012–ESTIMATED DIFFERENCES IN READING ACHIEVEMENT, BY KEY FACTORS.

Predictor	*%*	*Reading, Year 9 (n = 8,065) Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	24.7	ref	
Year 12 or equivalent	20.3	-7.2	(-11.8, -2.6)
Year 11 or equivalent	13.0	-17.2	(-22.5, -12.0)
Year 10 or equivalent	22.5	-18.5	(-23.3, -13.8)
Year 9 or below	3.2	-23.8	(-32.5, -15.1)
Not stated/unknown[b]	16.3	-16.2	(-23.6, -8.8)
Father's education			
Non-school qualification	20.1	ref	
Year 12 or equivalent	17.2	-8.3	(-13.5, -3.1)
Year 11 or equivalent	9.4	-13.8	(-20.0, -7.6)
Year 10 or equivalent	26.6	-16.8	(-22.0, -11.6)
Year 9 or below	4.7	-19.7	(-27.5, -11.8)
Not stated/unknown[b]	22.1	-5.8	(-13.1, 1.4)
Mother's occupation			
Group 1	9.4	ref	
Group 2	3.1	-7.6	(-13.7, -1.4)
Group 3	18.9	-9.2	(-15.3, -3.1)
Group 4	19.4	-10.9	(-17.1, -4.7)
Not in paid work[c]	19.1	-8.5	(-14.6, -2.4)
Not stated/unknown[b]	20.2	-8.7	(-16.6, -0.7)
Father's occupation			
Group 1	12.9	ref	
Group 2	17.3	-4.9	(-10.4, 0.6)
Group 3	21.4	-14.2	(-19.9, -8.4)
Group 4	20.3	-13.8	(-19.8, -7.9)
Not in paid work[c]	3.3	-11.2	(-20.3, -2.2)
Not stated/unknown[b]	24.7	-18.2	(-25.7, -10.7)
Main language spoken at home			
English	62.6	ref	
Language other than English	12.3	-10.7	(-15.4, -6.1)
Not stated	25.1	1.0	(-2.3, 4.3)

a. Excludes transition to secondary school.

b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.

c. In the last 12 months

Persuasive Writing Achievement

The results of the multilevel models for NAPLAN writing achievement are shown in Table 7.12 to Table 7.15. The overall patterns of results were again similar to those found for numeracy and reading, with some notable exceptions discussed below.

Authorised and unauthorised absences

The relationship between authorised and unauthorised absences and writing outcomes were similar to those reported for numeracy and reading achievement. For authorised absences, those recorded in both 2011 and 2012 were associated with writing outcomes, with the exception of Year 5 students, where this relationship was observed for 2012 only. For every day of authorised absence, writing scores would decrease by 0.4 to 0.5 points. Again, this is a reasonably modest effect that would require large amounts of absence before a substantial change in student performance was evident.

Again, unauthorised absences had a stronger association with writing achievement than authorised absences. The extent to which unauthorised absences in previous years contributed to writing achievement in 2012 varied across the year groups. For Year 3 students, unauthorised absences across Years 1 to 3 contributed to poorer writing achievement. For Year 5 and 7 students, unauthorised absences in the previous 4 years had a similar effect in contributing to poorer writing achievement. For Year 9 student, unauthorised absences in 2012 and 2011 contributed to poorer achievement, in addition to those in 2008 when students were in Year 5.

The magnitude of the effect of unauthorised absences on poorer writing achievement appeared to be larger than the effects observed on numeracy and reading achievement. For numeracy, the decrease in achievement ranged from 1.2 to 1.6 points per day of unauthorised absence, and likewise 1.0 to 1.4 for reading. For writing achievement the decrease in achievement ranged from 1.3 to 2.1 points per day of unauthorised absence. To examine the relative effects of these values, consider the example of a Year 3 student with an unauthorised absence rate of 20% in 2012, and compare them to a student with no unauthorised absences. With all other model predictors held constant, the difference between these students would be 32 points for numeracy (effect size 0.41), 28 points for reading (effect size 0.29) and 36 points for writing (effect size 0.55).

School SEI

As shown for numeracy and reading, in all year groups there were clear, strong and consistent relationships between school SEI and reading scores, with the largest gradient observed for Year 9 students. The difference between the most and least advantaged quintiles for Year 3, 5 and 7 students was 37 to 39 points (effect size 0.50–0.58). For Year 9 students, the difference was 66 points, or an effect size of 0.71, meaning that in Year 9, over three-quarters of students in the least advantaged SEI quintile scored below the average or middle student in the most advantaged SEI quintile for writing achievement. We should note an important distinction: This result is not necessarily due to disadvantaged students performing particularly poorly, instead it is possible that the students in the most advantaged schools performed very well. The difference in writing

achievement between students in the most advantaged and middle SEI quintiles in Years 3, 5 and 7 ranged from 20 to 24 points; for Year 9 students the difference was 40 points.

Upwardly mobile students who moved to a school in a higher SEI quintile in Year 9 still scored around 7 points lower on writing achievement than students who did not change schools. No significant effects were found for this variable for the other year groups.

School remoteness

There were independent effects of remoteness for writing achievement for students in Year 3 and 5. For Year 3 students, those in remote or very remote schools scored 10–16 points lower on average than students in major cities. For Year 5 students, this difference was observed only for students in very remote schools. No effects were observed for students in Year 7 or Year 9.

Mobility

As for the numeracy and reading results, the independent effects of student mobility for writing achievement were variable and unreliable, and the results should therefore be interpreted with some caution. Generally speaking, there were some independent effects for student mobility where the average achievement of students was lower if they had multiple enrolments, with a larger number of enrolments corresponding to poorer achievement. For Year 9 students, those with 5 or more enrolments scored 43 points lower on average relative to students with a single enrolment.

Aboriginal status

Across all year groups in 2012, Aboriginal students scored 13-20 points lower on writing tests than non-Aboriginal students after controlling for the other key factors. This difference equates to an effect size of 0.2 to 0.3, a relatively small effect on par with the results for numeracy and reading.

Gender

Similar to the results for reading achievement, the results for writing achievement were in favour of girls. Whilst the gender disparities appeared to increase for each successive year group, the relative effect sizes were reasonably stable across the cohorts. In Year 3, girls scored 25 points higher on average than boys. This disparity increased to 28 points for Year 5 students, 37 points for Year 7 students and to 48 points for students in Year 9. However, the respective effect sizes to these increases were 0.39, 0.56, 0.49 and 0.51, which is a more stable pattern of gender differences over the years. Notably, these effect sizes were much larger than those observed for gender on numeracy and reading scores, which were in the range of 0.1 to 0.2.

Caregiver characteristics

The pattern of results for caregiver characteristics for writing achievement closely resembled those shown for numeracy and reading. The educational attainments of students' parents were independently associated with student achievement, and the

attainments of mothers and fathers appeared to carry equal weight. The average writing score for students improved for every additional year of high school education that their parent received. These patterns were robust across all year groups.

Again, mother's occupation had no association with achievement, and father's occupation had a stronger, more robust relationship. For father's occupation, lower occupational groups had larger differences in achievement relative to students whose father had a Group 1 occupation. As for the numeracy and reading results, the largest differences in writing achievement were observed for fathers who were not in paid work. Students whose fathers were not in paid work scored up to 21 points lower on average than students whose father had a Group 1 occupation.

Main language spoken at home

Finally, the relationship between language spoken in the home and writing achievement were similar to those shown for reading, but in contrast to those found for numeracy. Students who did not speak English at home scored 6 to12 points lower on average than students who spoke English at home.

TABLE 7.12: YEAR 3 STUDENTS, 2012–ESTIMATED DIFFERENCES IN WRITING ACHIEVEMENT, BY KEY FACTORS.

Predictor	*%*	*Writing, Year 3 (n = 12,350) Coefficient*	*95% CI*
Reference Intercept		440.8	(435.5, 446.2)
Authorised absence rate			
2012		-0.5	(-0.7, -0.3)
2011		-0.4	(-0.5, -0.2)
2010		0.1	(-0.1, 0.3)
Unauthorised absence rate			
2012		-1.8	(-2.2, -1.5)
2011		-1.0	(-1.3, -0.6)
2010		-1.0	(-1.3, -0.7)
School SEI			
1st (most advantaged) quintile	29.7	ref	
2nd quintile	26.1	-10.0	(-16.4, -3.6)
3rd quintile	19.9	-19.7	(-26.4, -12.9)
4th quintile	14.7	-26.1	(-33.3, -18.9)
5th (least advantaged) quintile	9.6	-39.0	(-46.7, -31.4)
Change in school SEI from 2010			
Same school as 2010	84.9	ref	
New school with improved SEI	5.9	-6.6	(-11.5, -1.7)
New school, same SEI	5.3	-3.0	(-8.3, 2.2)
New school with worse SEI	4.0	-1.4	(-7.1, 4.3)
School remoteness			
Major Cities	70.1	ref	
Inner Regional Australia	14.0	3.4	(-3.4, 10.1)
Outer Regional Australia	8.8	-3.8	(-11.0, 3.3)
Remote Australia	5.2	-9.7	(-17.6, -1.8)
Very Remote Australia	1.9	-15.7	(-27.3, -4.1)
Number of enrolments[a]			
One	69.3	ref	
Two	22.2	-4.9	(-7.8, -2.0)
Three	6.3	-7.3	(-12.1, -2.5)
Four	1.7	-4.0	(-12.4, 4.3)
5 or more	0.6	-19.2	(-32.5, -5.8)
Aboriginal status			
Not Aboriginal or TSI	97.8	ref	
Aboriginal	2.2	-20.0	(-27.4, -12.6)
Gender			
Male	52.2	ref	
Female	47.8	25.3	(23.3, 27.2)

TABLE 7.12: YEAR 3 STUDENTS, 2012–ESTIMATED DIFFERENCES IN WRITING ACHIEVEMENT, BY KEY FACTORS.

		Writing, Year 3 (n = 12,350)	
Predictor	*%*	*Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	35.4	ref	
Year 12 or equivalent	23.8	-6.3	(-9.3, -3.4)
Year 11 or equivalent	10.9	-13.1	(-16.9, -9.4)
Year 10 or equivalent	15.3	-11.9	(-15.4, -8.4)
Year 9 or below	2.6	-21.0	(-27.8, -14.2)
Not stated/unknown[b]	12.0	-9.3	(-13.8, -4.8)
Father's education			
Non-school qualification	28.3	ref	
Year 12 or equivalent	21.5	-4.1	(-7.4, -0.8)
Year 11 or equivalent	9.1	-6.7	(-11.0, -2.4)
Year 10 or equivalent	20.2	-11.2	(-14.8, -7.6)
Year 9 or below	3.1	-16.0	(-22.4, -9.6)
Not stated/unknown[b]	17.9	-5.4	(-9.6, -1.2)
Mother's occupation			
Group 1	12.7	ref	
Group 2	11.6	1.3	(-2.8, 5.5)
Group 3	14.4	1.1	(-3.0, 5.3)
Group 4	11.0	3.1	(-1.5, 7.6)
Not in paid work[c]	28.1	1.0	(-2.7, 4.8)
Not stated/unknown[b]	22.1	-1.7	(-6.3, 3.0)
Father's occupation			
Group 1	17.8	ref	
Group 2	17.2	-1.9	(-5.5, 1.7)
Group 3	20.4	-5.5	(-9.4, -1.6)
Group 4	16.8	-7.2	(-11.3, -3.1)
Not in paid work[c]	2.4	-12.9	(-20.1, -5.7)
Not stated/unknown[b]	25.4	-7.8	(-12.3, -3.4)
Main language spoken at home			
English	54.2	ref	
Language other than English	14.4	5.8	(2.6, 9.0)
Not stated	31.4	-1.9	(-4.4, 0.5)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

TABLE 7.13: YEAR 5 STUDENTS, 2012–ESTIMATED DIFFERENCES IN WRITING ACHIEVEMENT, BY KEY FACTORS.

		Writing, Year 5 (n = 10,324)	
Predictor	*%*	*Coefficient*	*95% CI*
Reference Intercept		508.0	(502.4, 513.7)
Authorised absence rate			
2012		-0.7	(-0.9, -0.5)
2011		0.0	(-0.2, 0.2)
2010		0.0	(-0.2, 0.2)
2009		0.0	(-0.2, 0.2)
2008		0.2	(0.0, 0.4)
Unauthorised absence rate			
2012		-2.1	(-2.5, -1.6)
2011		-1.0	(-1.5, -0.6)
2010		-0.5	(-1.0, -0.1)
2009		-0.4	(-0.8, -0.1)
2008		-0.3	(-0.5, 0.0)
School SEI			
1st (most advantaged) quintile	29.6	ref	
2nd quintile	25.5	-11.5	(-17.6, -5.4)
3rd quintile	20.4	-23.4	(-29.9, -16.9)
4th quintile	14.9	-24.3	(-31.2, -17.3)
5th (least advantaged) quintile	9.6	-37.0	(-44.5, -29.4)
Change in school SEI from 2008			
Same school as 2008	75.9	ref	
New school with improved SEI	9.7	-7.0	(-14.5, 0.6)
New school, same SEI	8.5	-4.3	(-12.0, 3.5)
New school with worse SEI	5.8	-2.9	(-11.1, 5.2)
School remoteness			
Major Cities	68.5	ref	
Inner Regional Australia	14.8	0.7	(-5.6, 7.1)
Outer Regional Australia	9.9	0.1	(-6.7, 6.9)
Remote Australia	5.1	-1.0	(-9.1, 7.1)
Very Remote Australia	1.7	-15.2	(-27.2, -3.2)
Number of enrolments[a]			
One	72.9	ref	
Two	20.4	-3.6	(-10.3, 3.1)
Three	5.1	-12.4	(-20.8, -4.1)
Four	1.2	-13.3	(-26.0, -0.5)
5 or more	0.5	-19.1	(-37.4, -0.7)
Aboriginal status			
Not Aboriginal or TSI	95.8	ref	
Aboriginal	4.2	-13.7	(-20.3, -7.1)
Gender			
Male	51.4	ref	
Female	48.6	28.3	(26.0, 30.6)

TABLE 7.13: YEAR 5 STUDENTS, 2012–ESTIMATED DIFFERENCES IN WRITING ACHIEVEMENT, BY KEY FACTORS.

Predictor	*%*	*Writing, Year 5 (n = 10,324) Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	30.1	ref	
Year 12 or equivalent	21.6	-7.9	(-11.6, -4.2)
Year 11 or equivalent	11.0	-14.2	(-18.8, -9.7)
Year 10 or equivalent	17.4	-12.7	(-16.8, -8.7)
Year 9 or below	2.4	-16.4	(-24.6, -8.3)
Not stated/unknown[b]	17.4	-5.8	(-11.7, 0.2)
Father's education			
Non-school qualification	24.5	ref	
Year 12 or equivalent	18.6	-8.6	(-12.7, -4.4)
Year 11 or equivalent	9.3	-11.3	(-16.5, -6.2)
Year 10 or equivalent	21.6	-16.3	(-20.6, -12.0)
Year 9 or below	3.8	-21.0	(-28.0, -14.0)
Not stated/unknown[b]	22.3	-10.1	(-16.0, -4.2)
Mother's occupation			
Group 1	11.0	ref	
Group 2	12.0	-2.8	(-7.8, 2.1)
Group 3	15.0	0.1	(-4.9, 5.2)
Group 4	12.0	-2.5	(-7.9, 2.9)
Not in paid work[c]	27.0	0.8	(-3.8, 5.4)
Not stated/unknown[b]	23.0	-3.3	(-9.7, 3.1)
Father's occupation			
Group 1	15.9	ref	
Group 2	18.5	-1.1	(-5.4, 3.1)
Group 3	20.5	-3.1	(-7.8, 1.6)
Group 4	16.9	-7.4	(-12.4, -2.5)
Not in paid work[c]	2.4	-13.5	(-21.9, -5.1)
Not stated/unknown[b]	25.7	-7.0	(-13.1, -0.8)
Main language spoken at home			
English	63.2	ref	
Language other than English	12.1	9.1	(5.2, 13.0)
Not stated	24.8	-2.3	(-5.3, 0.7)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

TABLE 7.14: YEAR 7 STUDENTS, 2012–ESTIMATED DIFFERENCES IN WRITING ACHIEVEMENT, BY KEY FACTORS.

Predictor	*%*	*Writing, Year 7 (n = 8,476) Coefficient*	*95% CI*
Reference Intercept		576.0	(569.1 , 582.8)
Authorised absence rate			
2012		-0.4	(-0.7, -0.2)
2011		-0.5	(-0.8, -0.2)
2010		-0.1	(-0.4, 0.2)
2009		0.2	(-0.1, 0.4)
2008		0.0	(-0.3, 0.3)
Unauthorised absence rate			
2012		-1.8	(-2.2, -1.3)
2011		-0.7	(-1.2, -0.2)
2010		-0.3	(-0.7, 0.2)
2009		-0.6	(-1.1, -0.2)
2008		-0.5	(-0.9, -0.0)
School SEI			
1st (most advantaged) quintile	24.0	ref	
2nd quintile	24.3	-16.1	(-22.8, -9.4)
3rd quintile	22.1	-23.9	(-30.9, -17.0)
4th quintile	17.8	-30.6	(-37.8, -23.4)
5th (least advantaged) quintile	11.7	-39.1	(-47.2, -31.0)
Change in school SEI from 2008			
Same school as 2008	72.3	ref	
New school with improved SEI	10.0	-6.3	(-16.3, 3.7)
New school, same SEI	10.4	0.0	(-10.1, 10.1)
New school with worse SEI	7.4	0.3	(-10.1, 10.6)
School remoteness			
Major Cities	63.7	ref	
Inner Regional Australia	17.0	-5.2	(-11.7, 1.4)
Outer Regional Australia	11.3	1.8	(-5.2, 8.9)
Remote Australia	5.7	1.8	(-6.9, 10.5)
Very Remote Australia	2.3	0.0	(-12.3, 12.4)
Number of enrolments[a]			
One	69.8	ref	
Two	22.5	-10.4	(-19.4, -1.4)
Three	5.7	-11.8	(-22.8, -0.9)
Four	1.5	-16.3	(-31.1, -1.6)
5 or more	0.6	-8.8	(-29.3, 11.6)
Aboriginal status			
Not Aboriginal or TSI	95.5	ref	
Aboriginal	4.5	-17.2	(-24.8, -9.7)
Gender			
Male	51.1	ref	
Female	48.9	37.0	(34.2, 39.7)

TABLE 7.14: YEAR 7 STUDENTS, 2012–ESTIMATED DIFFERENCES IN WRITING ACHIEVEMENT, BY KEY FACTORS.

		Writing, Year 7 (n = 8,476)	
Predictor	*%*	*Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	24.8	ref	
Year 12 or equivalent	19.9	-7.5	(-12.2, -2.7)
Year 11 or equivalent	11.8	-16.0	(-21.6, -10.5)
Year 10 or equivalent	19.0	-13.4	(-18.4, -8.4)
Year 9 or below	2.5	-25.3	(-35.1, -15.4)
Not stated/unknown[b]	22.1	-13.7	(-21.2, -6.3)
Father's education			
Non-school qualification	19.9	ref	
Year 12 or equivalent	17.0	-10.7	(-16.0, -5.3)
Year 11 or equivalent	8.9	-12.3	(-18.8, -5.9)
Year 10 or equivalent	23.1	-17.3	(-22.7, -11.9)
Year 9 or below	3.9	-20.2	(-28.8, -11.6)
Not stated/unknown[b]	27.2	-10.9	(-18.4, -3.4)
Mother's occupation			
Group 1	9.4	ref	
Group 2	11.5	-4.8	(-11.2, 1.7)
Group 3	15.6	0.4	(-6.1, 6.8)
Group 4	14.2	-3.1	(-9.8, 3.6)
Not in paid work[c]	22.9	-3.4	(-9.5, 2.7)
Not stated/unknown[b]	26.5	-3.9	(-12.1, 4.2)
Father's occupation			
Group 1	12.1	ref	
Group 2	16.8	-8.2	(-13.9, -2.4)
Group 3	20.1	-11.0	(-17.0, -4.9)
Group 4	18.5	-14.0	(-20.3, -7.7)
Not in paid work[c]	2.5	-20.7	(-30.9, -10.4)
Not stated/unknown[b]	30.0	-15.9	(-23.9, -7.9)
Main language spoken at home			
English	65.7	ref	
Language other than English	11.8	11.3	(6.5, 16.1)
Not stated	22.5	2.0	(-1.7, 5.7)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

TABLE 7.15: YEAR 9 STUDENTS, 2012–ESTIMATED DIFFERENCES IN WRITING ACHIEVEMENT, BY KEY FACTORS.

Predictor	*%*	*Writing, Year 9 (n = 8,093) Coefficient*	*95% CI*
Reference Intercept		606.7	(589.9 , 623.6)
Authorised absence rate			
2012		-0.9	(-1.2, -0.7)
2011		-0.4	(-0.7, -0.1)
2010		0.3	(-0.0, 0.7)
2009		0.3	(-0.1, 0.6)
2008		0.1	(-0.3, 0.4)
Unauthorised absence rate			
2012		-1.3	(-1.6, -0.9)
2011		-0.8	(-1.4, -0.3)
2010		-0.3	(-0.8, 0.2)
2009		0.0	(-0.5, 0.5)
2008		-0.9	(-1.4, -0.4)
School SEI			
1st (most advantaged) quintile	26.3	ref	
2nd quintile	21.1	-22.5	(-37.2, -7.7)
3rd quintile	25.8	-40.4	(-54.8, -26.0)
4th quintile	20.6	-47.7	(-62.2, -33.2)
5th (least advantaged) quintile	6.3	-65.7	(-83.5, -47.8)
Change in school SEI from 2008			
Same school as 2008	4.6	ref	
New school with improved SEI	28.4	-4.7	(-16.2, 6.8)
New school, same SEI	48.3	-2.7	(-14.0, 8.6)
New school with worse SEI	18.7	-3.7	(-15.4, 8.0)
School remoteness			
Major Cities	65.3	ref	
Inner Regional Australia	15.9	2.0	(-9.8, 13.8)
Outer Regional Australia	12.2	10.2	(-2.4, 22.7)
Remote Australia	4.7	16.9	(0.4, 33.4)
Very Remote Australia	1.9	12.0	(-8.1, 32.1)
Number of enrolments[a]			
One	75.1	ref	
Two	19.2	-4.9	(-9.8, -0.0)
Three	4.1	-17.8	(-26.9, -8.7)
Four	1.2	-10.1	(-26.8, 6.5)
5 or more	0.4	-43.1	(-69.7, -16.5)
Aboriginal status			
Not Aboriginal or TSI	95.7	ref	
Aboriginal	4.3	-22.4	(-31.9, -13.0)
Gender			
Male	53.1	ref	
Female	46.9	47.8	(44.3, 51.3)

TABLE 7.15: YEAR 9 STUDENTS, 2012–ESTIMATED DIFFERENCES IN WRITING ACHIEVEMENT, BY KEY FACTORS.

Predictor	*%*	*Writing, Year 9 (n = 8,093) Coefficient*	*95% CI*
continued			
Mother's education			
Non-school qualification	24.8	ref	
Year 12 or equivalent	20.3	-6.2	(-12.1, -0.3)
Year 11 or equivalent	13.0	-14.8	(-21. , -8.1)
Year 10 or equivalent	22.6	-17.8	(-23.8, -11.8)
Year 9 or below	3.2	-20.3	(-31.3, -9.2)
Not stated/unknown[b]	16.2	-16.0	(-25.5, -6.5)
Father's education			
Non-school qualification	20.1	ref	
Year 12 or equivalent	17.2	-5.1	(-11.7, 1.5)
Year 11 or equivalent	9.4	-14.0	(-21.9, -6.0)
Year 10 or equivalent	26.6	-13.3	(-19.9, -6.7)
Year 9 or below	4.7	-20.8	(-30.8, -10.8)
Not stated/unknown[b]	21.9	-2.6	(-11.9, 6.6)
Mother's occupation			
Group 1	9.4	ref	
Group 2	13.1	-3.6	(-11.3, 4.2)
Group 3	18.9	-5.2	(-12.9, 2.6)
Group 4	19.4	-8.5	(-16.5, -0.6)
Not in paid work[c]	19.1	-7.3	(-15.0, 0.5)
Not stated/unknown[b]	20.1	-6.8	(-17.0, 3.3)
Father's occupation			
Group 1	12.9	ref	
Group 2	17.2	-1.2	(-8.2, 5.9)
Group 3	21.6	-8.5	(-15.8, -1.2)
Group 4	20.4	-10.9	(-18.5, -3.3)
Not in paid work[c]	3.4	-4.8	(-16.3, 6.7)
Not stated/unknown[b]	24.5	-14.1	(-23.7, -4.5)
Main language spoken at home			
English	62.6	ref	
Language other than English	12.3	6.1	(0.1, 12.0)
Not stated	25.1	-0.1	(-4.4, 4.1)

a. Excludes transition to secondary school.
b. Includes cases where caregiver information is missing and should therefore be interpreted with caution.
c. In the last 12 months.

SUMMARY AND CONCLUSION

The aim of this chapter was to examine the relationship between authorised and unauthorised absences and school achievement, independent of other key variables. We examined these patterns for students who were in Years 3, 5, 7 and 9 in 2012, for numeracy, reading and writing achievement as measured by the NAPLAN scales. Overall, the patterns of results were remarkably consistent across the year groups and across the different domains of achievement. Some subtle differences were noted, and these are discussed in more detail below.

The key message from these results is that the achievement of students reflects not only their current experiences of school, but their experiences in the preceding years as well. The results for unauthorised absences demonstrated this most clearly. For all year groups, unauthorised absences in the preceding two to three years were significantly associated with achievement on numeracy, reading and writing tests.

Though the results were supportive of the notion that "every day counts" an examination of the effect sizes for authorised and unauthorised absences showed these stand-alone effects were quite modest in magnitude. It is unrealistic to expect large numbers of students to be able to complete the school career without missing any days of school. On face value, small amounts of absences would make only a small difference to achievement, and students who miss a small amount of school over their school career are unlikely to suffer academically in the longer term. However, noticeable effects are likely to be observed where students are absent for substantial periods of time, or accumulate absences regularly over a sustained period of time. These patterns were particularly evident for Year 9 students, consistent with the results from Chapter 6.

It is difficult to discern from these results, and the results of Chapter 6, the points at which absence rates place students at educational risk. In this regard, there is no "safe threshold" for absences. Instead the relationship between absences and achievement conforms to a "dose response" model and the broad message, as we have already noted, is "every day counts".

What the results do suggest is that the effects of absence, particularly those which are unauthorised, need to be considered in the context of other key factors. As the average NAPLAN scores were substantially lower for disadvantaged students, the effects of absence were greater for disadvantaged students than advantaged students, simply because there are smaller differences between the average NAPLAN scores of the disadvantaged students and the point at which the scale drops below the national minimum standard. That is, missing one month of school each year would sooner put a student attending a school in a disadvantaged area below the minimum standard than a student from a more advantaged school, simply because the students at the more disadvantaged school start from a lower base of performance and therefore have less room for decline. The impacts of unauthorised absences are therefore greater for disadvantaged students, because it would take a smaller amount of absence to fall below the critical points of achievement.

The results also indicate that the type of absence matters, with stronger and more persistent effects demonstrated for unauthorised absences. However, it is unlikely that the type of absence, and whether it is approved or not, really contributes to the difference in achievement between students with authorised and students with unauthorised absences. Authorised absences, (e.g. illness) could be assumed to affect most children equally and therefore this type of absence would not distinguish between those who achieve and those who struggle. Unauthorised absences, however, may reflect any number of unobserved factors that relate to both poor attendance and to lower achievement that affects a particularly vulnerable group of students. We demonstrated in Chapter 3 that socio-economic gradients in unauthorised absences emerge from Year 1. In the majority of cases, caregivers would be aware if their 6 year-old was not at school and as such, any unauthorised absences in Year 1 would be endorsed by a caregiver. This may reflect underlying caregiver attitudes towards education that students adopt for themselves and carry with them throughout the rest of their schooling. Indeed, entangled in this observation there may also be school effects with regard to how attendance policies and expectations are implemented and monitored.

Taken together, these results have several implications for the development of policy relating to attendance. Policies or programs addressing school attendance as a means to improving student achievement are likely to make the greatest impact by focussing on unauthorised absences rather than overall attendance. Furthermore, the development of policies and programs should be targeted at students from Year 1 onwards, as the accumulation of absences over the years will impact upon later achievement and the benefits, assuming the improvement can be sustained, will carry through to subsequent years. Thus taking action to prevent the establishment of a poor pattern of attendance as soon as a student starts having unauthorised absences from school is likely to have greater impact than addressing chronic unauthorised absences in the later years of school. Finally, there are unobserved factors that underlie unauthorised absences that need to be considered, such as parental attitudes, engagement with school, and the school's approach to helping parents and children understand attendance expectations as well as how the school implements its policies and monitoring. Further research is needed to understand *why* 6 year-old students have unauthorised absences from school before schools can attempt to reverse the trend of absences and improve the achievement for at-risk students. This is likely to require some level of engagement with parents, either to help students and their parents feel more engaged with school, or to help parents recognise the importance of sending their child to school.

The findings in this chapter focussed on absences throughout school and how these relate to achievement at a given point in time. In the next chapter, we extend these findings to examine the relationship between absence from school and gains in achievement over time, in addition to the other key factors.

CHAPTER 8 HOW DOES ABSENCE FROM SCHOOL IMPACT ON PROGRESS OVER TIME?

Background

In this final chapter we longitudinally follow the same group of students—those who were eligible to sit NAPLAN tests in 2008, 2010 and 2012—to examine how their achievement scores in numeracy and reading tests change over time, and the factors that influence these changes.

Highlights

- As seen in previous chapters, most of the achievement disparities were in place by Year 3, and the variation in later years was only small. For example, the average gap in numeracy achievement between students in the most advantaged and least advantaged schools was 34 points in Year 3 and 42 points by Year 7. For reading, the gap was 46 points in Year 3 and 33 points by Year 7.
- In the numeracy domain:
  - Students who improved their unauthorised absence rate did not necessarily catch up on numeracy achievement, but they did do better in later years than students whose absence rates worsened or remained high.
  - Students whose unauthorised absence rates increased between Year 5 and Year 9 fell further behind students whose rates stayed low, with the gap in numeracy achievement increasing from 16 points in Year 5 to 29 points in Year 9.
- In the reading domain:
  - Students with higher levels of unauthorised absence start out substantially behind at Year 3, and catch up only slightly by Year 5. Beyond Year 5, the gaps remain more or less constant, with the exception of students whose absence rates improve between Year 5 and Year 9.

Summary of findings

- Disadvantaged students, irrespective of the indicators used to assess socio-economic status, were significantly behind at the start of Year 3 and remained so throughout school.
- The results for students whose absences improved over time were mixed. Students who improved their unauthorised absence rate did not necessarily catch up on numeracy achievement, but they tended to do better in later years than students whose absence rates worsened or remained high.
- Achievement disparities were well established at Year 3, and the magnitude of these disparities generally didn't change in later years.

CHAPTER OVERVIEW

In Chapter 7 we examined the independent effects of authorised and unauthorised absences, both current and prior, upon the 2012 academic achievement of students in Years 3, 5, 7 and 9.

In this chapter we take these analyses one step further and use a longitudinal methodology, tracking the same groups of students over time to examine the effects of absences on both students' baseline NAPLAN scores and the rate at which NAPLAN scores increase over time. We focus on the two cohorts of students with 3 points of achievement data: the Year 3 cohort included students who sat the Year 3 NAPLAN test in 2008, and subsequently the Year 5 test in 2010, and Year 7 test in 2012; the Year 5 cohort sat the Year 5 NAPLAN test in 2008, and then the Year 7 and Year 9 tests in 2010 and 2012, respectively.

The analyses in this chapter examine differences in 'baseline' achievement (i.e. either in Year 3 or Year 5) and subsequent progress over time. As a result, many of the findings relating to initial performance will be very similar to those described in Chapter 7, but will relate to NAPLAN scores in 2008 rather than 2012, and only for students in Year 3 and 5. However, this chapter offers additional information assessing how absences and other key factors are independently associated with the rate at which students gain NAPLAN points from year to year. This allows us to ask important questions about progress: for example, do students who start off behind catch up at all, are they always one step behind other students, or do they get further and further behind with each year?

By following the same students over time, we can also examine the students whose attendance rates improve or worsen over the study period. For instance, do students whose attendance worsens over time progress at a slower rate compared with students with consistently good attendance? Asking these questions allows us to focus on the extent to which worsening absence contributes to poorer performance at school. Ultimately, this chapter assesses what gains could be made if the attendance rates of at-risk students improved over time.

METHODS

The analysis in this chapter was conducted on the Analysis Long File (see *Overview of Project Data* in Chapter 2). The results presented here are confined to the learning domains of numeracy and reading. While we examined the outcomes of the NAPLAN writing test, our results are not provided in the body of this report. The writing test was substantially changed (from a narrative to persuasive writing test) in 2011 and, accordingly, it is not appropriate to make comparisons across time in this domain. The findings for writing have been provided for information in Appendix E and should be treated with caution.

Analytic techniques

As NAPLAN testing only commenced in 2008, results from 2012 are the first time that 3 points of data have been available to assess student progress.

Having three points of data rather than two confers a significant advantage for understanding how students really progress between the testing years. Given that any measure of achievement has a degree of measurement error associated with it[8], additional points of information provides a more accurate assessment of achievement levels. For example, let's say Michelle performed slightly below average in Year 3, and slightly above average in Year 5. Though it would appear that she has improved on her performance between tests, errors of measurement could mean that her performance in Year 3 was slightly underestimated and her Year 5 performance slightly overestimated. In effect, there was no real change, and at both times she was really just at the average level. However if Michelle's performance in Year 7 (or time 3) suggested she was again below average, then this provides a better indication that she was typically performing below average, and that perhaps her performance in Year 5 was higher than was actually the case.

Having three points of performance data for each student in the cohort also allows us to use the longitudinal multi-level regression modelling described in detail in Chapter 4. Multi-level modelling of longitudinal data also carries a distinct advantage in that three points of data are not needed from *all* students in order to examine longitudinal trends. That is, some students may only have one or two NAPLAN scores instead of all three, but their results will still statistically contribute to the model. This can help to address concerns about response bias – students with only one point of data will have different characteristics to those with all three, and if their data are discarded then the results will be less representative of the cohort in question. Though this situation is not as ideal as having complete data from all students, including cases with just one point of information, be it in Year 3 or Year 7, helps us to obtain a more accurate picture of how different groups of students are doing at school.

Change in absence rates over time

In longitudinal analyses such as these, not only can we examine student progress over time, but we can also examine the effect of how changing absence rates—within students—relate to changes in subsequent performance. For example, does an improvement in absence rates confer improvements in NAPLAN scores relative to students whose absence rates remained the same? Similarly, does a decline in attendance relate to smaller gains in achievement over time? Absence rates may be included in longitudinal models as a factor that varies over time, however the interpretation of the coefficients for these predictors can be difficult to describe simply. Therefore to examine the effect of improving or declining absence rates on achievement, we derived two

[8] Error on test scores can be introduced in any number of ways. Students may feel sick or anxious on a given day, which may impact on their scores, or there may also be errors in the marking or assessment process. Students can also make random errors on tests, correctly guessing answers to questions they don't know, or make mistakes on something they do know. Thus test scores should be viewed as being the "true score" plus or minus some error.

variables that simply, though broadly, summarise absence patterns over the 5-year period: One relating to authorised absences and one for unauthorised absences.

For each variable, students were defined as having a high or low absence rate in 2008 and 2012. Students were then classed into one of four categories that summarised combinations of their 2008 and 2012 absence rates: 1) consistently low; 2) consistently high; 3) low then high (worsening absence to Year 2012); and 4) high then low (improving absence to 2012). We defined absence rates of less than 4% as being low, and rates of 4% or more as being high. In practical terms a student with a 4% absence rate is absent for 4 full days of school for each school semester – students with rates of 4% or more are defined here as having a "high" absence rate.

Four per cent was chosen as the cut-off point for several reasons. First, even the best students will have some level of absence during a semester, particularly authorised absences, and some allowance needed to be made for this[9]. However, if the cut point is set too high (e.g. at 10%) then the proportion of students with a 'high' absence rate becomes too small for any meaningful analysis. A cut point of 4% provided the best balance between these factors[10]. For simplicity, absence rates in the intervening years (Years 4, 5 and 6) were not included in the summary variables. The variables therefore provide a broad indicator of change based on absences in 2008 and 2012, or the start and end points. As a result of this approach, the analyses are limited to students who were enrolled in a Western Australian public school in both 2008 and 2012.

The nature of gains in achievement over time

The longitudinal models presented in this chapter assume that the gain in NAPLAN scores over time increases at a constant rate each year. In Figure 8.1 we provide the mean numeracy scores at each year and for each cohort to demonstrate the rate of growth across years. The pattern for reading scores is shown in Figure 8.2.

Both Figures show that growth is not strictly linear, with faster growth occurring between Years 3 and 5 than between Years 5 and 7 for the Year 3 cohort, and similarly faster growth occurring between Years 5 and 7 than between Years 7 and 9 for the Year 5 cohort. This means that the actual gain in NAPLAN over time is curvilinear rather than just a straight (e.g. linear) line. Addressing the curvilinear nature of progress over time requires a slightly different statistical approach to the longitudinal models, however doing so hinders our ability to simply and succinctly describe how students progress through school. As the actual difference between the curvilinear and linear fits of the models that describe NAPLAN growth in achievement is not substantially different, we have chosen to present the results of the relationship between Year level and achievement based on the linear model.

[9] In 2008, for example, 82% of primary and 88% of secondary students had at least one day of authorised absence, and 45% of primary and 52% of secondary students had at least one day of unauthorised absence.
[10] We examined using cut points of 0%, 4%, 5% and 10%.

FIGURE 8.1: PATTERN OF AVERAGE NUMERACY RESULTS BY YEAR AND STUDENT COHORT

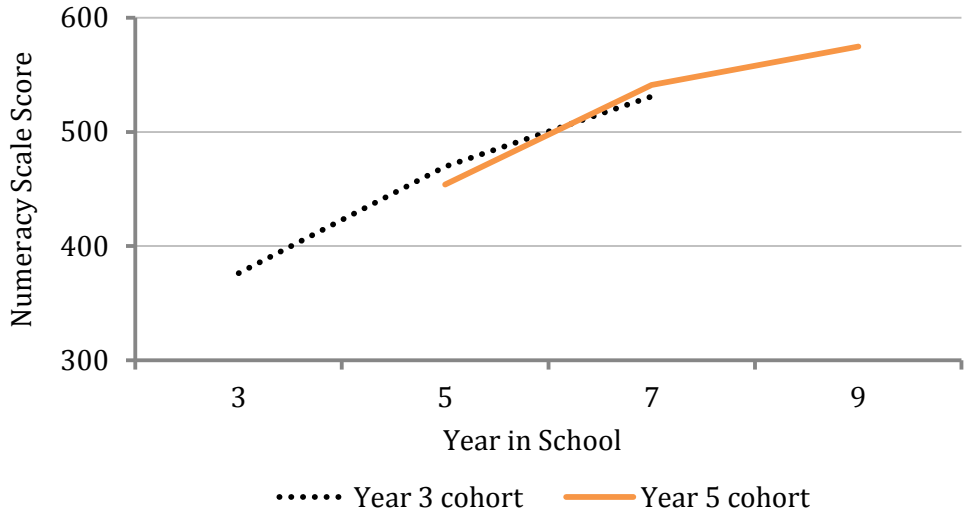
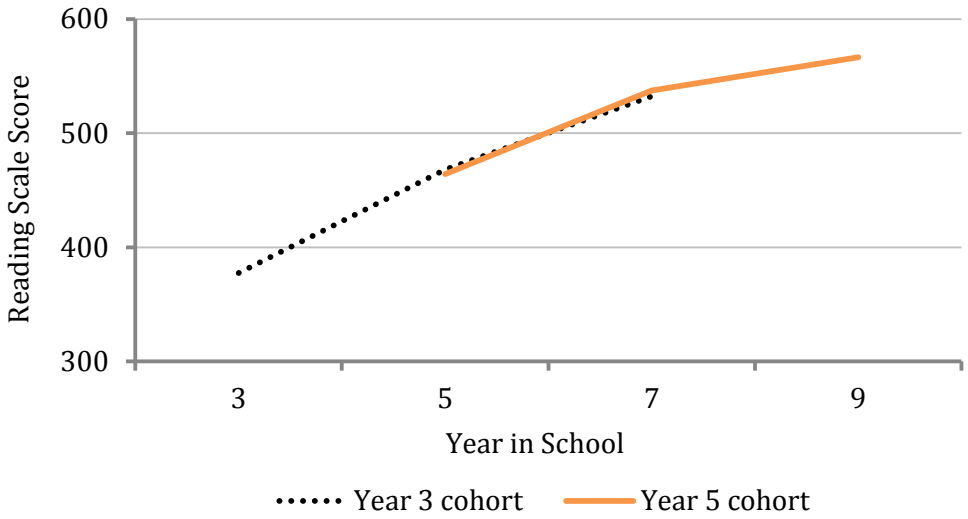


FIGURE 8.2: PATTERN OF AVERAGE READING RESULTS BY YEAR AND STUDENT COHORT



Interpreting regression model results

The model parameters presented in this chapter can be interpreted in a similar manner as the longitudinal models discussed in Chapter 4. As before, we provide estimates of difference with respect to baseline NAPLAN achievement (i.e. Year 3 and Year 5 for each cohort) in addition to differences in gains in NAPLAN achievement per year of school. The reference intercept provides the average baseline NAPLAN score for the most advantaged group of students, in this case those students who:

- had consistently low authorised and unauthorised rates
- were in the most advantaged Socio-Economic Index for schools (SEI) quintile
- attended a school in metropolitan Perth
- were enrolled in only one school over the 5-year study period
- were non-Aboriginal
- spoke English in the home
- were male
- had a mother and a father with a post-school qualification
- had a mother and a father with a Group 1 (professional) occupation.

The reference slope provides the average rate of gain per year for this group of students. The remaining variables estimate the difference in achievement between two groups of students, independently of the other factors included in the model.

Using the numeracy results for the Year 3 cohort as an example (see Table 8.1), the average Year 3 numeracy score for students with all of the advantaged characteristics listed above would be 460.7 (very similar to the result shown in Chapter 7) and their average gain in NAPLAN score for each year of school is 41.9 points. In contrast, students with all of the same characteristics above but who were in the second highest SEI quintile, for example, started 17 points lower on average in Year 3 (or 443.4) and their average gain in numeracy per year of school was 1.6 points lower on average (or 40.3 points per year) than students in the highest SEI quintile. In other words, the achievement gap between students in the highest and second highest SEI quintile became slightly wider with each additional year of school after Year 3, due to the slower rate of gain for the second highest SEI students.

We adopted a similar approach to modelling in this chapter to the approach employed in Chapter 4. We attempted to include all key variables where possible, however, due to issues with model convergence some variables needed to be eliminated from the model. All of the key variables assessed in earlier chapters were included in the initial model. Where there were problems with model convergence, variables that showed no relationship, or those with the weakest relationship to the outcome variable (in this chapter, attendance rates) were removed in a stepwise process until model convergence was achieved. For variables remaining in the model, we differentiate non-significant results (grey text) from significant results (black text) in all tables.

Limitations

As with the previous chapters, because the data are observational and not experimental, causal inferences cannot be made from the results presented in this chapter. Even though we examine the changing outcomes of students whose absence rates change over time, it is highly plausible that there are underlying factors that influence which students improve and which students worsen over time with respect to their attendance (for example, student motivation). These underlying factors are also likely to influence changes in student achievement. The variables assessing change in absence rates are also very broad, and do not take into account absence rates 2009, 2010 and 2011. These variables are

broad indicators of change only, and therefore we stress the need for caution when interpreting these results.

As seen in Figures 8.1 and 8.2, growth in reading scores is not strictly linear over time, with average rate of increase slowing in later years. A more complex non-linear model would be required to fully describe the shape of this relationship. However, as only three time points are available for students included in this analysis, a linear model should adequately describe change between the initial and final levels of achievement, although may not accurately match the true situation at the mid-point of the timeline. So the Year 3 cohort linear model should give accurately describe changes from Year 3 to Year 7 at the expense of accurately describing the Year 5 results.

Another limitation that may effect analysis of change in achievement scores over time is the way the NAPLAN tests are designed, scored, scaled and equated over time. The theoretical maximum range of NAPLAN scale scores is divided into 10 bands, but at each year level, the NAPLAN test is really only designed to measure performance across 6 bands. It is possible, therefore, that the highest bands may not be thoroughly assessed in the Year 3 test, and the lowest bands may not be thoroughly assessed in the Year 9 test. As a result the test does not strongly discriminate between being one, two or more than two bands below the national minimum standard at later year levels. While this does not impact on reporting against national minimum standards, it may have some impact on modelling of changes in NAPLAN scores over time. For instance, a higher proportion of Year 9 students than Year 3 students were below the National Minimum Standard in 2012, particularly for reading, with more students potentially falling more than one band below the National Minimim Standard in Year 9. The standard deviation of NAPLAN scores also decreases in later years at school. This may reflect the range of scores that tests at each year level are designed to cover (Australian Curriculum Assessment and Reporting Authority, 2012a).

RESULTS

Numeracy achievement and progress

The results for the numeracy progress scores are provided in Table 8.1 for the Year 3 cohort and Table 8.2 for the Year 5 cohort.

Unauthorised absences

Year 3 Cohort

The majority of students in the Year 3 cohort (72%) had fewer than 4% unauthorised absences in both Year 3 and Year 7, and only 8% of students in the cohort had a consistently high unauthorised absence rate of 4% or more. There were clear achievement disparities for students with unauthorised absence rates above and below this threshold. Students with a high unauthorised absence rate in both years started 24 NAPLAN points lower on average in Year 3 numeracy than students with a consistently low unauthorised absence rate. The gap between these groups widened very slightly each year, increasing from 23 points in Year 3 to 28 points in Year 7.

The beginning gap in Year 3 achievement was smaller for students who improved their unauthorised absence rates over time, with a difference of just 14 numeracy points on average compared to students with consistently low absence. The increase in numeracy scores for this group (0.5 points per year) matched the average yearly increase for the students with consistently low absence rates, meaning that the gap between these groups of students stayed the same across time. Therefore the students who improved their absence rate did not catch up to students with consistently low absence rates, but neither did they fall further behind.

In contrast to the students who improved their unauthorised absences rates, students whose rates worsened over time had progressively poorer NAPLAN performance. Students whose unauthorised absence rate was initially low in Year 3 but then increased to more than 4% in Year 7 scored 11 points lower on average than students with consistently low absence rates, and this estimated difference increased by 2.0 points with each additional year, to an overall difference of 19 points by Year 7.

To summarise, students who improved their attendance maintained their relative position to students with consistently low absence rates, and students whose attendance declined had worse performance over time.

Based on the differences observed in achievement at Year 3, it is also apparent that the students who ultimately change their unauthorised absence rate (whether it improves or worsens) are substantively different to the students whose absence rates remain the same. There are clear differences in the students who have the propensity for change, with lower achieving students appearing at greater risk of higher rates of unauthorised absence in Year 7 and subsequent declines in achievement. For example, among the students with low absence rates in Year 3, those students who later had higher absence rates already had significantly lower NAPLAN scores at Year 3, before this change in absence rate had even occurred.

There are at least two explanations for these patterns. One is that there is an underlying propensity for lower achieving students to have a higher number of absences in later years, and this is reflected in their earlier achievement. A second explanation is that students who perform poorly – despite their good attendance rates – perhaps become dejected and disengage with school, which results in poorer attendance at school in later years, contributing even further to the gap in achievement. Either way, at-risk students can be readily identified and targeted for intervention by schools using the attendance and achievement data they collect. By identifying the students in Year 1 who have already begun to accumulate unauthorised absences, and/or the students who are already lagging behind their peers in learning and performance, schools should be able to identify the students who are most at risk of poor attendance and performance in later years.

Year 5 cohort

Unauthorised absences appeared to have a similar effect on the achievement of the Year 3 and Year 5 cohorts. There were, however, some subtle variations. For example, the achievement gap increased at a rate of 3.2 points per year for Year 5 cohort students whose unauthorised absences worsened between Year 5 and Year 9; this compares with a rate of 2.0 for equivalent students in the Year 3 cohort. Accordingly, for the Year 5 cohort

the achievement gap between students with worsening attendance and those with consistently low absence doubled from 16 points in Year 5 to 29 points in Year 9. Students in the Year 5 cohort who had consistently high unauthorised absence rates performed progressively worse over time, with the achievement gap widening from 26 points in Year 5 to 37 points in Year 9. These results would suggest that while it is important to target students early (i.e. prior to Year 3) to have the maximum impact on achievement, the results for the Year 5 cohort indicates that significant impacts can still be made by addressing unauthorised absences beyond Year 5.

Authorised Absences

Year 3 cohort

Consistent with our findings in previous chapters, the effects of authorised absences are smaller than those for unauthorised absences. Compared with students with consistently good authorised absence rates, those who started out with a rate less than 4% in Year 3 but had a rate more than 4% in Year 7 (i.e. they worsened) achieved at similar levels in Year 3 and but then performed more poorly over time. For example, students with worsening authorised absence rates scored 3.5 points lower on average than those with consistently low rates in Year 3, and by Year 7 this gap was 7.1 points. Students with a consistently poor authorised absence rate were 6.6 points lower on average at Year 3 than students with consistently low absence rates. The gap widened by 1.5 points each year resulting in an achievement gap of 13 points by Year 7. These are generally small effects.

Year 5 cohort

The effects of authorised absence patterns were more substantial for the Year 5 cohort than the Year 3 cohort. Students with consistently high authorised absence rates scored 9.0 points lower on average in Year 5 compared to students with consistently low rates. This difference increased by a further 2.3 points each year, where the estimated difference by Year 9 was 18 points, on average.

Students whose authorised absence rate worsened from a low rate to a high rate achieved at a slightly lower level (5.5 points lower) in Year 5 as students with consistently low authorised absence rates. However, over time their performance became progressively worse, with a difference of 14 points on average by Year 9. Students who improved their absence rate maintained the gap between themselves and students with consistently low absence rates, achieving 5 to 6 points lower on average. Though these differences are not very large, these data reflect the patterns shown for changes in unauthorised absences rates. Students whose absence rates worsen or stay consistently high over time fall further behind their peers as they progress through school. Though the students who improve their absence rates do not catch up to the students with good attendance patterns, they do not fall further behind like their other peers. Therefore improving attendance may help prevent students from falling further behind.

School SEI

The results shown in Table 8.1 and Table 8.2 are consistent with our findings in earlier chapters, and affirm that lower school SEI is associated with poorer numeracy

achievement at Year 3. Beyond Year 3, these achievement gaps became slightly wider over time. For example, the average gap for Year 3 students in the most advantaged and least advantaged SEI quintiles was 34 points. This gap increased by 2.0 points for each additional year, with a resulting gap of 42 points by Year 7. For the Year 5 cohort, though large gaps were present at Year 5, with the exception of students in the second highest SEI quintile, the achievement gaps did not become significantly wider over time.

Though these results suggest that the achievement disparities widen somewhat between the more advantaged and less advantaged students as they progress through school, they clearly show that the vast majority of the disparity is already in place by Year 3.

Remoteness

For the Year 3 cohort, there was no significant effect of school remoteness on numeracy scores in Year 3, and there was no evidence to suggest that this changed over time. For the Year 5 cohort, students in Very Remote schools scored 13 points lower in Year 5. This difference did not change significantly in subsequent years.

Student mobility

Students who went on to have multiple enrolments had lower average achievement in Year 3 than students who stayed enrolled at one school, and there was no evidence to suggest the achievement gaps changed over time. For the Year 5 cohort, the achievement gaps between students who remained at one school and those who had multiple enrolments became slightly wider over time. For example, students who went on to have 3 or more enrolments scored 12 points lower on average in Year 5; this gap widened to 19 points by Year 9.

The results indicate that the majority of the achievement gap for more mobile students was in place by Year 3. As discussed in Chapter 4, the gaps associated with student mobility, whether those gaps are in attendance rates or achievement, were evident before the school moves had even occurred. Such patterns indicate that it is not necessarily mobility per se that impacts upon ongoing achievement, but rather there are other factors that influence initial attendance rates, student performance and the propensity for greater mobility.

Aboriginal Status

Year 3 numeracy scores for Aboriginal students were 27 points lower on average than non-Aboriginal students, and this gap widened by 1.4 points for each year of school thereafter, to a gap of 33 points by Year 7. For the Year 5 cohort, the initial gap was 15 points, widening to 21 points by Year 9. Though there are differences in the gaps between the Year 3 and 5 cohorts, the results indicate that there are substantial achievement deficits for Aboriginal students, and that the disparities between Aboriginal and non-Aboriginal students are established by Year 3, and become slightly wider over time.

Gender

At Year 3 there was a very small gap between girls and boys on numeracy achievement, where boys outperformed girls by just 2.2 points on average, and this gap increased to 7.4 points in Year 7. The differences were more substantial for the Year 5 cohort, where girls scored 8.9 points lower on average than boys at Year 5. Between Years 5 and 9, this gap narrowed to 6.9 points.

Caregiver characteristics

Maternal educational attainment was associated with substantial gaps in student achievement at Year 3, with particularly poor outcomes for students whose mother had completed only lower secondary education. Further, the gaps between students with high and low maternal education became slightly wider over time, by around 1 point per year of school. Similar effects were observed for paternal education for scores at Year 3, however the disparities remained constant throughout subsequent years of school.

Students whose mother did not hold a Group 1 occupation scored 5-7 points lower on average than students whose mother had a Group 1 occupation. There was a stronger socio-economic gradient in achievement for father's occupation compared to mother's occupation, with lower occupation levels associated with progressively lower levels of student achievement at Year 3. For both mother and father occupational status, the gaps observed at Year 3 remained constant over time.

A similar pattern of results by caregiver education and occupation were observed for the Year 5 cohort.

Main language spoken at home

The scale of difference in numeracy achievement between English and non-English speakers was modest overall, both in terms of baseline achievement and in further gains over time. In Year 3, students whose main language at home was not English scored 5.5 points lower on average than English speaking students. These students quickly caught up, however, with a rate of gain that was 4 points higher than English students per year of school. That is, while their achievement was 5.5 points lower in Year 3, the non-English speaking students overtook their English speaking counterparts to be 10 points ahead of them by Year 7. More modest effects were observed for the Year 5 cohort; there were no significant differences in Year 5, but non-English speakers gained at a gradually faster rate than English speakers, and were ahead by 15 points in Year 9. However, it should be noted that these represent small effects overall.

The effects of multiple disadvantages

The differences between the groups of students discussed above reflect the main effects of one factor independent of the other factors in the model. It is also useful to highlight the effects of experiencing multiple disadvantages. Here, we examine the impact of multiple disadvantages, using the data from Table 8.1 and Table 8.2. In these analyses, we defined the most advantaged and most disadvantaged students as follows:

Most advantaged group[11]

- Had consistently low unauthorised absence
- Attended a school in highest SEI quintile
- Non-Aboriginal

Least advantaged group[12]

- Had a high unauthorised absence rate in either 2008, 2012, or both years
- Attended a school in lowest SEI quintile
- Aboriginal

The trends for the Year 3 cohort are shown in Figure 8.3 and the Year 5 cohort in Figure 8.4. For the Year 3 cohort, though it is hard to discern from a visual inspection of the figure, the gap between the most advantaged and least advantaged widened over time from around 85 points in Year 3 to 103 points in Year 7, or an increase in disparity of 18 points. It is difficult to underestimate the significance of these effects. To put these differences in context, by Year 5, the least advantaged students were scoring lower, on average, than the advantaged students were scoring in Year 3. This means that the least advantaged students were at least two years behind their more advantaged counterparts by the time they were assessed in Year 5. By Year 7, the least advantaged students were performing at the equivalent level the most advantaged students were at some point between Year 4 and 5. That is, these students were now around two and a half years behind.

For the Year 5 cohort, the disparity increased from 82 points in Year 5, to 101 points in Year 9. For this group of students, the performance of the least advantaged students in Year 9 matched the Year 6 performance of the most advantaged students. That is, the achievement of these students at Year 9 was lagging the most advantaged students by three years.

In both Figures, the National Minimum Standards have been included as a reference, and are represented by the dotted grey lines. The area between the dotted lines represents scores at the National Minimum Standard, and scores below the lower dotted line represent scores below the National Minimum Standard. The average scores of the least advantaged students were consistently at, but not above, the National Minimum Standard each year.

[11] The most advantaged group represents around 18% of students in the Year 3 cohort (n = 2309) and 19% in the Year 5 cohort (n = 2186).
[12] The least advantaged group represents around 3.0% of students in the Year 3 cohort (n = 386) and 2.7% of students in the Year 5 cohort (n = 309).

FIGURE 8.3: YEAR 3 COHORT—PROGRESS IN NUMERACY SCORES BETWEEN YEARS 3 AND 7 FOR THE MOST ADVANTAGED AND LEAST ADVANTAGED STUDENTS[13]

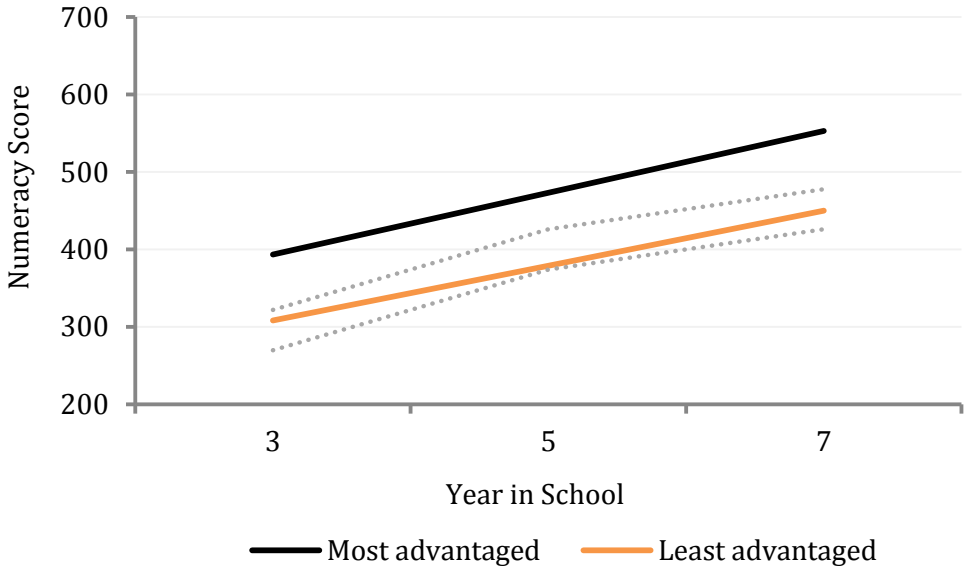
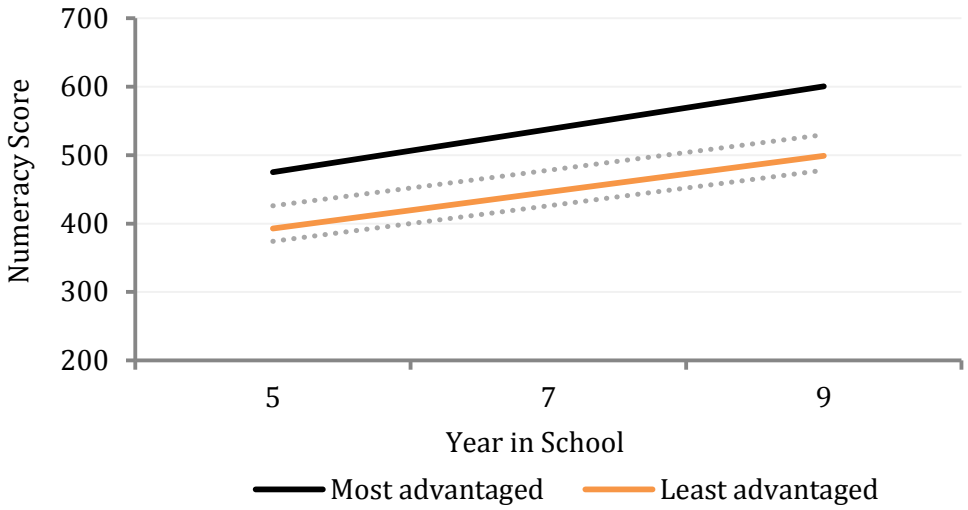


FIGURE 8.4: YEAR 5 COHORT—PROGRESS IN NUMERACY SCORES BETWEEN YEARS 5 AND 9 FOR THE MOST ADVANTAGED AND LEAST ADVANTAGED STUDENTS



[13] The two dotted lines in Figures 8.3 and 8.4 represent the National Minimum Standards. Scores above the upper dotted line are above the minimum standard. The minimum standards in Year 4, 6 and 8 were taken as the mid-point of the National Minimum Standards in Year 3, 5, 7 and 9.

TABLE 8.1: YEAR 3 COHORT—ESTIMATED DIFFERENCES IN NUMERACY SCORES IN YEAR 3 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 12,989)	*Year 3 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
Reference Group Baseline	..	460.7	(455.7, 465.7)	..	..
Reference Group Slope	..	..	..	41.9	(41.1, 42.6)
Unauthorised absence rate 2008 & 2012					
Consistently low (< 4%)	72.4	ref		ref	
Low in Year 3, high in Year 7 (worsened)	11.2	-11.5	(-15.0, -7.9)	-2.0	(-2.8, -1.2)
High in Year 3, low in Year 7 (improved)	8.8	-13.8	(-17.8, -9.8)	0.5	(-0.3, 1.4)
Consistently high (>= 4%)	7.6	-23.5	(-28.0, -18.9)	-1.1	(-2.1, -0.1)
Authorised absence rate 2008 & 2012					
Consistently low (< 4%)	34.4	ref		ref	
Low in Year 3, high in Year 7 (worsened)	23.9	-3.5	(-6.4, -0.6)	-0.9	(-1.5, -0.3)
High in Year 3, low in Year 7 (improved)	18.1	-1.1	(-4.2, 2.1)	-0.2	(-0.9, 0.5)
Consistently high (>= 4%)	23.6	-6.6	(-9.5, 3.6)	-1.5	(-2.1, -0.8)
School SEI (2008)					
1st (most advantaged)	21.3	ref		ref	
2nd quintile	20.5	-17.3	(-20.8, -13.8)	-1.6	(-2.3, -0.8)
3rd quintile	21.7	-22.7	(-26.3, -19.1)	-1.0	(-1.7, -0.3)
4th quintile	20.5	-26.3	(-30.0, -22.6)	-1.6	(-2.3, -0.8)
5th quintile (least advantaged)	16.0	-34.2	(-38.2, -30.1)	-2.0	(-2.8, -1.2)
Remoteness (2008)					
Major Cities (Perth)	62.6	ref			
Inner Regional Australia	15.4	-1.5	(-4.5, 1.5)	(a)	
Outer Regional Australia	12.7	-0.8	(-4.1, 2.4)		
Remote Australia	6.4	0.9	(-3.4, 5.2)		
Very Remote Australia	2.8	-5.0	(-11.3, 1.3)		
Number of enrolments[b]					
One	67.2	ref		(a)	
Two	22.9	-11.1	(-13.6, -8.6)		
Three or more	9.9	-18.8	(-22.4, -15.2)		

TABLE 8.1: YEAR 3 COHORT—ESTIMATED DIFFERENCES IN NUMERACY SCORES IN YEAR 3 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 12,989)	*Year 3 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Aboriginal status					
Not Aboriginal or TSI	92.2	ref		ref	
Aboriginal	7.8	-27.5	(-32.0, -23.0)	-1.4	(-2.4, -0.4)
Mother's education					
Post-school qualification	21.1	ref		ref	
Year 12 or equivalent	18.2	-10.8	(-14.6, -7.0)	-1.0	(-1.7, -0.3)
Year 11 or equivalent	11.3	-16.7	(-21.2, -12.3)	-1.1	(-2.0, -0.3)
Year 10 or equivalent	19.2	-19.3	(-23.3, -15.4)	-1.0	(-1.8, -0.3)
Year 9 or equivalent or below	3.0	-28.1	(-35.4, -20.9)	-0.9	(-2.5, 0.6)
Not stated/unknown[c]	27.2	-13.1	(-18.3, -8.0)	-1.0	(-1.7, -0.3)
Father's education					
Post-school qualification	14.4	ref			
Year 12 or equivalent	12.5	-11.4	(-15.9, -6.9)	(a)	
Year 11 or equivalent	6.6	-18.2	(-23.6, -12.8)		
Year 10 or equivalent	17.4	-18.5	(-23.0, -14.0)		
Year 9 or equivalent or below	3.1	-20.7	(-27.7, -13.7)		
Not stated/unknown[c]	46.1	-16.8	(-22.6, -11.0)		
Mother's occupation					
Group 1	7.9	ref			
Group 2	10.0	-5.4	(-10.4, -0.4)	(a)	
Group 3	14.1	-0.8	(-5.8, 4.2)		
Group 4	13.8	-6.8	(-11.9, -1.7)		
Not in paid work[d]	11.1	-5.3	(-10.0, -0.6)		
Not stated/unknown[c]	32.0	-7.3	(-13.2, -1.5)		

TABLE 8.1: YEAR 3 COHORT—ESTIMATED DIFFERENCES IN NUMERACY SCORES IN YEAR 3 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 12,989)	*Year 3 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Father's occupation					
Group 1	8.7	ref			
Group 2	12.0	-7.8	(-12.6, -2.9)	(a)	
Group 3	14.8	-13.1	(-18.3, -7.9)		
Group 4	13.6	-19.8	(-25.1, -14.5)		
Not in paid work[d]	2.3	-24.5	(-32.6, -16.5)		
Not stated/unknown[c]	48.5	-17.2	(-23.6, -10.9)		
Main language spoken at home					
English	65.5	ref		ref	
Language other than English	11.4	-5.5	(-9.2, -1.8)	4.0	(3.2, 4.8)
Not stated	23.2	1.0	(-1.7, 3.6)	-0.8	(-1.3, -0.2)
Gender					
Male	51.5	ref		ref	
Female	48.5	-2.2	(-4.4, -0.0)	-1.3	(-1.8, -0.9)

[a] Predictor not significantly related with change in attendance rates over time, and eliminated from the final model.
[b] Excluding the transition from primary school to high school.
[c] Includes cases where caregiver information is missing and should therefore be interpreted with caution.
[d] In the last 12 months.

TABLE 8.2: YEAR 5 COHORT—ESTIMATED DIFFERENCES IN NUMERACY SCORES IN YEAR 5 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 11,601)	*Year 5* (baseline)		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
Reference Group Baseline		550.5	(545.5, 555.5)		
Reference Group Slope				32.2	(31.4, 32.9)
Change in unauthorised absences					
Consistently low (< 4%)	67.7	ref		ref	
Low in Year 5, high in Year 9 (worsened)	15.3	-16.5	(-19.8, -13.3)	-3.2	(-4.0, -2.5)
High in Year 5, low in Year 9 (improved)	7.6	-9.0	(-13.3, -4.7)	-0.2	(-1.2, 0.7)
Consistently high (>= 4%)	9.3	-26.5	(-30.8, -22.2)	-2.6	(-3.6, -1.5)
Change in authorised absences					
Consistently low (< 4%)	23.6	ref		ref	
Low in Year 5, high in Year 9 (worsened)	36.7	-5.5	(-8.4, -2.6)	-2.2	(-2.9, -1.6)
High in Year 5, low in Year 9 (improved)	10.0	-5.2	(-9.3, -1.0)	0.2	(-0.8, 1.1)
Consistently high (>= 4%)	29.8	-9.0	(-12.1, -6.0)	-2.3	(-3.0, -1.6)
School SEI quintile					
1st (most advantaged)	21.6	ref		ref	
2nd quintile	19.6	-18.5	(-22.0, -14.9)	-1.2	(-2.0, -0.4)
3rd quintile	21.7	-24.5	(-28.1, -20.8)	-0.6	(-1.4, 0.2)
4th quintile	21.8	-30.2	(-33.9, -26.5)	-0.7	(-1.5, 0.1)
5th quintile (least advantaged)	15.2	-40.3	(-44.5, -36.1)	-0.7	(-1.6, 0.2)
School remoteness					
Major Cities (Perth)	64.4	ref		ref	
Inner Regional Australia	14.6	3.9	(0.6, 7.2)	0.2	(-0.5, 1.0)
Outer Regional Australia	12.2	1.2	(-2.4, 4.8)	0.5	(-0.3, 1.3)
Remote Australia	6.2	-0.9	(-5.6, 3.9)	0.9	(-0.2, 2.0)
Very Remote Australia	2.7	-13.4	(-20.5, -6.2)	0.9	(-0.8, 2.5)
Number of enrolments[a]					
One	68.8	ref		ref	
Two	22.0	-7.8	(-10.6, -5.1)	-1.1	(-1.7, -0.5)
Three or more	9.2	-11.8	(-16.0, -7.6)	-1.7	(-2.7, -0.7)

TABLE 8.2: YEAR 5 COHORT—ESTIMATED DIFFERENCES IN NUMERACY SCORES IN YEAR 5 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 11,601)	*Year 5* (baseline)		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Aboriginal status					
Not Aboriginal or TSI	92.7	ref		ref	
Aboriginal	7.3	-15.2	(-20.0, -10.5)	-1.5	(-2.6, -0.3)
Mother's education					
Post-school qualification	22.3	ref		(b)	
Year 12 or equivalent	18.3	-11.3	(-14.9, -7.6)		
Year 11 or equivalent	12.7	-21.0	(-25.1, -16.9)		
Year 10 or equivalent	22.9	-21.7	(-25.4, -18.0)		
Year 9 or equivalent or below	3.6	-29.3	(-35.7, -23.0)		
Not stated/unknown[c]	20.3	-19.5	(-24.9, -14.2)		
Father's education					
Post-school qualification	15.9	ref		(b)	
Year 12 or equivalent	13.8	-12.6	(-17.0, -8.3)		
Year 11 or equivalent	8.0	-14.8	(-19.9, -9.6)		
Year 10 or equivalent	22.0	-17.2	(-21.5, -12.9)		
Year 9 or equivalent or below	4.2	-20.0	(-26.4, -13.6)		
Not stated/unknown[c]	36.0	-11.5	(-17.2, -5.8)		
Mother's occupation					
Group 1	8.6	ref		(b)	
Group 2	12.1	-8.7	(-13.5, -3.9)		
Group 3	17.4	-7.4	(-12.2, -2.6)		
Group 4	18.5	-8.1	(-13.0, -3.2)		
Not in paid work[d]	18.7	-8.0	(-12.8, -3.2)		
Not stated/unknown[c]	24.9	-10.7	(-16.7, -4.8)		

TABLE 8.2: YEAR 5 COHORT—ESTIMATED DIFFERENCES IN NUMERACY SCORES IN YEAR 5 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 11,601)	*Year 5* (baseline)		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Father's occupation					
Group 1	10.3	ref		(b)	
Group 2	13.6	-5.1	(-9.7, -0.4)		
Group 3	17.6	-15.5	(-20.4, -10.7)		
Group 4	16.8	-17.6	(-22.6, -12.7)		
Not in paid work[d]	3.2	-20.5	(-27.7, -13.3)		
Not stated/unknown[c]	38.5	-18.9	(-24.9, -12.8)		
Main language spoken at home					
English	62.8	ref		ref	
Language other than English	11.5	1.8	(-1.9, 5.6)	3.2	(2.4, 4.1)
Not stated	25.7	1.5	(-1.0, 4.1)	-0.2	(-0.8, 0.3)
Gender					
Male	52.8	ref		ref	
Female	47.2	-8.9	(-11.1, -6.6)	0.5	(0.0, 1.0)

[a] Predictor not significantly related with change in attendance rates over time, and eliminated from the final model.
[b] Excluding the transition from primary school to high school.
[c] Includes cases where caregiver information is missing and should therefore be interpreted with caution.
[d] In the last 12 months.

Reading achievement and progress

The results of the multi-level models for reading achievement are provided in Table 8.3 for the Year 3 cohort and Table 8.4 for the Year 5 cohort.

Unauthorised absences

Year 3 cohort

Higher rates of unauthorised absence were associated with larger declines in achievement in reading than numeracy in Year 3. Compared with students who had consistently low unauthorised absence rates, those whose absences worsened over time were already 17 points lower on average in Year 3. Students who started out with a high absence rate but then improved scored 16 points lower on average at Year 3, and 35 points lower if they had consistently high absence rates in both Year 3 and Year 7.

In contrast to the patterns for numeracy, where the achievement gaps widened between Year 3 and Year 7, for reading the achievement gaps narrowed slightly between these years, irrespective of whether absence rates improved, worsened, or stayed consistently high, but this may merely reflect that the overall variance of NAPLAN test scores decreases in later years at school.

Year 5 cohort

There was a considerable gap (20 points) between the reading achievement of students with worsening attendance rates and those with consistently low absence rates, and this disparity did not change significantly in subsequent years. However, in contrast to previous patterns, students who improved their absence rates also improved their achievement levels, with the gap in achievement reducing from 8.5 points in Year 5 to just 2.9 points in Year 9.

Collectively, the results of the two cohorts combined suggest that students with higher levels of unauthorised absence start out substantially behind at Year 3, and catch up only slightly by Year 5. Beyond Year 5, the gaps remain more or less constant, with the exception of students whose absence rates improve between Year 5 and Year 9. These students managed to partly close the gap with the students whose absence rates were consistently low.

These results highlight that higher unauthorised absence rates are associated with substantial declines in reading achievement during the early years at school, where reading is a major focus of curriculum attention. Only students whose rates of unauthorised absence improves in the later years of their schooling show evidence of some closing of this gap.

The results broadly support the notion that reducing levels of unauthorised absences in the early years of primary school would likely yield some benefits with respect to reading achievement at school.

Authorised absences

The results for the Year 3 and 5 cohorts showed that there were only minor differences in achievement progress between students with different patterns of authorised absences.

School SEI

There was a gradient in reading achievement at Year 3 by school SEI, whereby those in lower SEI schools had substantially lower reading scores. Students in the lowest SEI quintile scored 46 points lower on average than students in the highest SEI quintile at Year 3. However, the gap did become slightly smaller over time, reducing to 33 points by Year 7. For students in other SEI quintiles, the disparities also narrowed across the years.

The same pattern was observed for the Year 5 cohort, where students in the lowest SEI quintile were substantially behind in Year 5, with the gap narrowing from 41 points in Year 5 to 30 points by Year 9.

Remoteness

At Year 3, compared with students in Metropolitan Perth, average reading scores were 7.0 points lower for students in Very Remote areas. This disparity in achievement remained consistent over time.

The results were a little different for the Year 5 cohort. At Year 5, students in Inner Regional schools scored 6.5 points higher on average than students in the Perth metropolitan area, on average, and maintained this (very small) advantage to Year 9. Students in Very Remote areas, however, scored 10 points less on average compared to Perth students, and this difference remained constant to Year 9.

Student mobility

Students with higher mobility (those who attended more than one school) had lower reading achievement than students who stayed enrolled at the same school, on average and the gaps remained consistent over time.

Gender

Girls in the Year 3 cohort scored 21 points higher than boys at Year 3, on average, and this gap narrowed very slightly over time. For the Year 5 cohort, girls were only 12 points ahead at Year 5. The rate of change beyond this point was negligible. Therefore, in any given year, girls scored around 10-20 points higher on average than boys on the reading test.

Aboriginal status

The achievement of Aboriginal students was significantly worse than non-Aboriginal students in Year 3, with a difference in reading achievement of 43 points that remained constant to Year 7. For the Year 5 cohort, the reading scores of Aboriginal students were 33 points lower on average than non-Aboriginal students. Taken together, Aboriginal

students were consistently around 30 to 40 points behind on reading achievement for any given year.

Caregiver characteristics

Lower levels of maternal education were associated with lower levels of achievement in Year 3. The effect of having a mother with a Year 9 education or below was of the same magnitude as having consistently high unauthorised absence rates, or attending a low SEI school. The same gradient of disadvantage was shown for paternal education level, though the magnitude of effect was smaller. For example, students whose mother had a Year 9 education or below scored 34 points lower on average than students whose mother had a post-school qualification. Students whose father had a Year 9 education or less scored just 23 points lower than students whose father had a post-school qualification. The disparities in reading achievement remained constant over time, for both maternal and paternal education level.

Students whose mother had a lower skilled occupation (Groups 2-4) scored between 3–10 points lower, on average, than students whose mother had a Group 1 occupation. Father's occupation showed a stronger gradient, with lower reading achievement observed for lower occupational levels. The gradients remained constant in subsequent years.

These patterns of Year 3 achievement by caregiver education and occupation were mirrored in the Year 5 cohort.

Main language spoken at home

English speaking students scored 5.6 points higher in the Year 3 reading test, on average, than students who spoke a non-English language at home, and this disparity did not appear to change over time. For the Year 5 cohort, the initial difference was 17 points, and this gap decreased to 6.5 points in Year 9.

The effects of multiple disadvantage

As for numeracy, we compared the progress over time of the most and least advantaged students in order to assess the association between multiple disadvantage and achievement. The pattern for the Year 3 cohort is shown in Figure 8.5 and the Year 5 cohort in Figure 8.6.

Generally, the magnitude of the effect of multiple disadvantages on reading was similar to those observed for numeracy. Overall, there was a substantial gap between the most and least advantaged students across all the years of school. However, in contrast to the numeracy patterns (where the disparities widened over time) the disparity in reading achievement narrowed: the gap for the Year 3 cohort decrease from 125 points at Year 3 to 93 points at Year 7; for the Year 5 cohort, the differences were 106 points at Year 5 and 88 points at Year 9.

Despite these gaps narrowing over time, the achievement of students with multiple disadvantages was substantially lower. In Figure 8.5 we can see that whilst the most advantaged students scored around 400 points on average in Year 3, the least advantaged

students didn't reach this point until some point between Year 5 and 6, that is, they were around two and a half years behind in their reading. In Figure 8.6 we can see that this worsens by Year 9. Whereas the most advantaged students were scoring around 500 points on average in Year 5, the least advantaged students didn't reach this level until Year 8. That is, the least advantaged students are likely to be over three years behind the most advantaged by Year 9.

FIGURE 8.5: YEAR 3 COHORT—PROGRESS IN READING SCORES BETWEEN YEARS 3 AND 7 FOR THE MOST ADVANTAGED AND LEAST ADVANTAGED STUDENTS

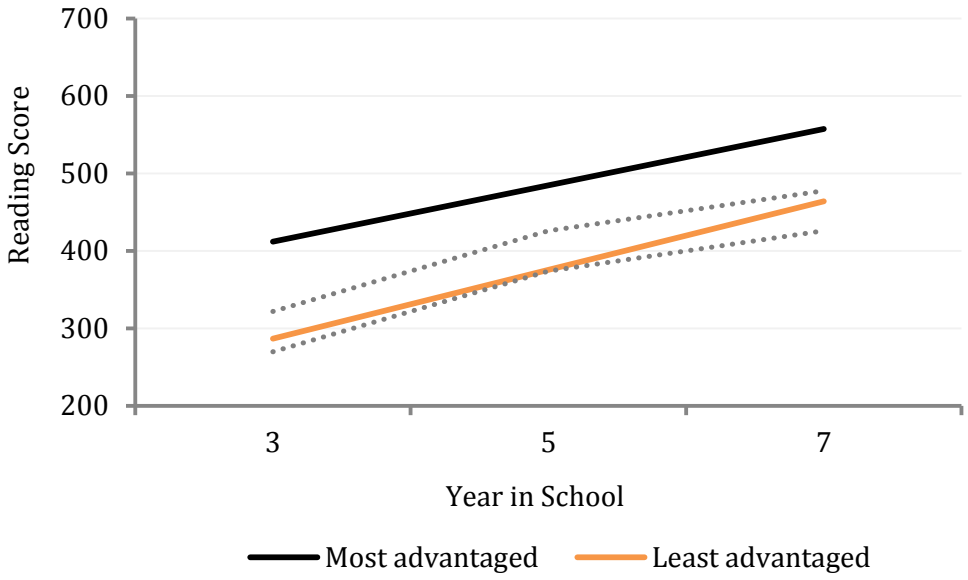


FIGURE 8.6: YEAR 5 COHORT—PROGRESS IN READING SCORES BETWEEN YEARS 5 AND 9 FOR THE MOST ADVANTAGED AND LEAST ADVANTAGED STUDENTS

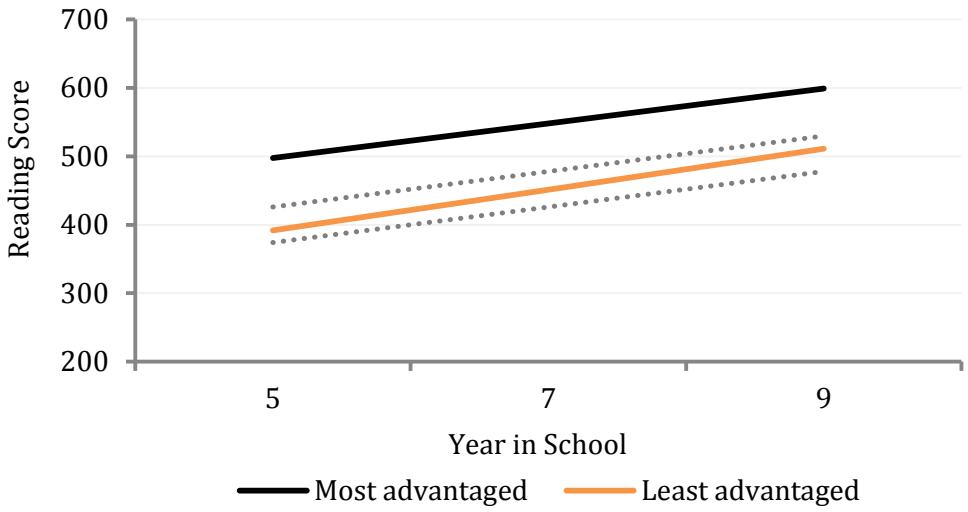


TABLE 8.3: YEAR 3 COHORT—ESTIMATED DIFFERENCES IN READING SCORES IN YEAR 3 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 12,896)	*Year 3 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
Reference Group Baseline		464.3	(458.5, 470.0)		
Reference Group Slope				36.6	(35.9, 37.4)
Unauthorised absence rate 2008 & 2012					
Consistently low (< 4%)	72.4	ref		ref	
Low in Year 3, high in Year 7 (worsened)	11.2	-17.1	(-21.6, -12.5)	1.4	(0.5, 2.3)
High in Year 3, low in Year 7 (improved)	8.8	-16.2	(-21.3, -11.0)	2.2	(1.2, 3.2)
Consistently high (>= 4%)	7.6	-35.5	(-41.4, -29.6)	3.3	(2.1, 4.5)
Authorised absence rate 2008 & 2012					
Consistently low (< 4%)	34.4	ref		ref	
Low in Year 3, high in Year 7 (worsened)	23.9	-2.5	(-6.3, 1.2)	0.1	(-0.7, 0.8)
High in Year 3, low in Year 7 (improved)	18.1	-0.4	(-4.5, 3.7)	0.4	(-0.4, 1.3)
Consistently high (>= 4%)	23.6	-4.3	(-8.1, -0.6)	0.5	(-0.2, 1.3)
School SEI quintile					
1st (most advantaged)	21.3	ref		ref	
2nd quintile	20.5	-20.3	(-24.7, -15.8)	1.0	(0.1, 1.8)
3rd quintile	21.7	-28.3	(-32.9, -23.8)	1.7	(0.9, 2.6)
4th quintile	20.5	-33.4	(-38.1, -28.7)	2.0	(1.1, 2.9)
5th quintile (least advantaged)	16.0	-46.0	(-51.1, -40.9)	3.3	(2.3, 4.3)
Remoteness					
Major Cities (Perth)	62.6	ref			
Inner Regional Australia	15.4	0.7	(-2.6, 4.0)	(a)	
Outer Regional Australia	12.7	1.1	(-2.5, 4.7)		
Remote Australia	6.4	1.0	(-3.7, 5.7)		
Very Remote Australia	2.8	-7.0	(-14.0, 0.0)		

TABLE 8.3: YEAR 3 COHORT—ESTIMATED DIFFERENCES IN READING SCORES IN YEAR 3 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 12,896)	*Year 3 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Number of enrolments[b]					
One	67.2	ref			
Two	22.9	-11.1	(-13.8, -8.4)	(a)	
Three or more	9.9	-19.4	(-23.4, -15.5)		
Aboriginal status					
Not Aboriginal or TSI	92.2	ref		ref	
Aboriginal	7.8	-43.4	(-49.3, -37.5)	1.1	(-0.1, 2.3)
Mother's education					
Post-school qualification	21.2	ref			
Year 12 or equivalent	18.1	-14.7	(-18.7, -10.8)	(a)	
Year 11 or equivalent	11.3	-22.5	(-27.0, -17.9)		
Year 10 or equivalent	19.2	-23.7	(-27.8, -19.6)		
Year 9 or equivalent or below	3.0	-34.4	(-41.8, -27.0)		
Not stated/unknown[c]	27.2	-18.1	(-23.6, -12.6)		
Father's education					
Post-school qualification	14.4	ref			
Year 12 or equivalent	12.5	-10.2	(-15.1, -5.2)	(a)	
Year 11 or equivalent	6.6	-17.8	(-23.8, -11.9)		
Year 10 or equivalent	17.4	-21.9	(-26.8, -17.0)		
Year 9 or equivalent or below	3.1	-23.1	(-30.8, -15.4)		
Not stated/unknown[c]	46.1	-15.7	(-22.1, -9.3)		

TABLE 8.3: YEAR 3 COHORT—ESTIMATED DIFFERENCES IN READING SCORES IN YEAR 3 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 12,896)	*Year 3 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Mother's Occupation					
Group 1	7.9	ref			
Group 2	10.0	-8.3	(-13.8, -2.8)	(a)	
Group 3	14.1	-3.2	(-8.6, 2.3)		
Group 4	13.8	-10.3	(-15.9, -4.8)		
Not in paid work[d]	22.1	-9.8	(-14.9, -4.6)		
Not stated/unknown[c]	32.0	-10.2	(-16.6, -3.8)		
Father's Occupation					
Group 1	8.7	ref			
Group 2	12.0	-8.9	(-14.2, -3.5)	(a)	
Group 3	14.8	-14.5	(-20.2, -8.9)		
Group 4	13.6	-19.9	(-25.7, -14.1)		
Not in paid work[d]	2.3	-20.8	(-29.6, -11.9)		
Not stated/unknown[c]	48.5	-18.7	(-25.7, -11.7)		
Main language spoken at home					
English	65.5	ref			
Language other than English	11.4	-5.6	(-9.3, -1.9)	(a)	
Not stated	23.2	-1.6	(-4.3, 1.1)		
Gender					
Male	51.5	ref		ref	
Female	48.5	21.0	(18.2, 23.9)	-1.0	(-1.6, -0.5)

[a] Predictor not significantly related with change in attendance rates over time, and eliminated from the final model.
[b] Excluding the transition from primary school to high school.
[c] Includes cases where caregiver information is missing and should therefore be interpreted with caution.
[d] In the last 12 months.

TABLE 8.4: YEAR 5 COHORT—ESTIMATED DIFFERENCES IN READING SCORES IN YEAR 5 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 11,496)	*Year 5 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
Reference Group Baseline		552.1	(546.4, 557.8)		
Reference Group Slope				23.8	(22.8, 24.7)
Unauthorised absence rate 2008 & 2012					
Consistently low (< 4%)	68.1	ref		ref	
Low in Year 5, high in Year 9 (worsened)	15.3	-20.5	(-24.4, -16.6)	-0.3	(-1.2, 0.5)
High in Year 5, low in Year 9 (improved)	7.6	-8.5	(-13.6, -3.4)	1.4	(0.3, 2.5)
Consistently high (>= 4%)	9.0	-31.1	(-36.3, -25.9)	0.9	(-0.3, 2.1)
Authorised absence rate 2008 & 2012					
Consistently low (< 4%)	23.6	ref		ref	
Low in Year 5, high in Year 9 (worsened)	36.8	-2.2	(-5.6, 1.3)	-0.7	(-1.4, 0.0)
High in Year 5, low in Year 9 (improved)	10.0	1.4	(-3.6, 6.4)	0.2	(-0.8, 1.2)
Consistently high (>= 4%)	29.7	-3.2	(-6.8, 0.5)	-0.1	(-0.8, 0.7)
School SEI quintile					
1st (most advantaged)	21.7	ref		ref	
2nd quintile	19.6	-17.5	(-21.8, -13.2)	0.5	(-0.4, 1.4)
3rd quintile	21.7	-22.2	(-26.6, -17.8)	0.9	(0.0, 1.8)
4th quintile	21.8	-27.5	(-27.5, -23.1)	0.6	(-0.3, 1.5)
5th quintile (least advantaged)	15.1	-41.1	(-46.7, -36.7)	2.8	(1.8, 3.8)
Remoteness					
Major Cities (Perth)	64.4	ref		ref	
Inner Regional Australia	14.7	6.5	(2.5, 10.5)	-0.4	(-1.2, 0.5)
Outer Regional Australia	12.2	2.9	(-1.5, 7.2)	0.6	(-0.4, 1.5)
Remote Australia	6.1	2.1	(-3.6, 7.9)	-0.2	(-1.4, 1.1)
Very Remote Australia	2.6	-10.4	(-19.1, -1.8)	-0.1	(-1.9, 1.8)
Number of enrolments[a]					
One	69.1	ref		ref	
Two	21.9	-6.2	(-9.5, -2.9)	-0.7	(-1.4, -0.0)
Three or more	9.0	-12.8	(-17.8, -7.8)	-0.5	(-1.7, 0.6)

TABLE 8.4: YEAR 5 COHORT—ESTIMATED DIFFERENCES IN READING SCORES IN YEAR 5 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 11,496)	*Year 5 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Aboriginal status					
Not Aboriginal or TSI	92.9	ref		ref	
Aboriginal	7.1	-33.5	(-39.2, -27.8)	0.8	(-0.5, 2.0)
Mother's education					
Post-school qualification	22.4	ref		ref	
Year 12 or equivalent	18.3	-9.7	(-14.2, -5.2)	-0.1	(-1.0, 0.8)
Year 11 or equivalent	12.7	-19.6	(-24.7, -14.5)	-0.8	(-1.8, 0.2)
Year 10 or equivalent	22.8	-22.9	(-27.4, -18.5)	0.1	(-0.8, 0.9)
Year 9 or equivalent or below	3.6	-30.1	(-38.1, -22.1)	-0.8	(-2.5, 0.9)
Not stated/unknown	20.1	-20.5	(-26.6, -14.4)	0.7	(-0.2, 1.6)
Father's education					
Post-school qualification	16.0	ref			
Year 12 or equivalent	13.9	-12.1	(-16.7, -7.4)	(b)	
Year 11 or equivalent	8.0	-15.3	(-20.8, -9.9)		
Year 10 or equivalent	22.0	-19.2	(-23.7, -14.6)		
Year 9 or equivalent or below	4.2	-24.2	(-31.0, -17.4)		
Not stated/unknown[c]	36.0	-9.7	(-15.8, -3.7)		
Mother's occupation					
Group 1	8.6	ref			
Group 2	12.1	-9.5	(-14.6, -4.4)	(b)	
Group 3	17.5	-10.4	(-15.4, -5.3)		
Group 4	18.4	-13.3	(-18.5, -8.1)		
Not in paid work[d]	18.7	-11.6	(-16.7, -6.5)		
Not stated/unknown[c]	24.7	-15.8	(-22.1, -9.5)		

TABLE 8.4: YEAR 5 COHORT—ESTIMATED DIFFERENCES IN READING SCORES IN YEAR 5 (BASELINE), AND DIFFERENCES IN THE RATE OF CHANGE FOR EACH YEAR OF SCHOOL, BY KEY FACTORS.

	(n = 11,496)	*Year 5 (baseline)*		*Slope (change per year of school)*	
Predictor	*%*	*Coefficient*	*95% CI*	*Coefficient*	*95% CI*
continued					
Father's occupation					
Group 1	10.3	ref			
Group 2	13.7	-5.8	(-10.7, -0.8)	(b)	
Group 3	17.6	-16.1	(-21.2, -11.0)		
Group 4	16.7	-18.3	(-23.6, -13.0)		
Not in paid work[d]	3.2	-18.1	(-25.8, -10.4)		
Not stated/unknown[c]	38.4	-20.2	(-26.7, -13.8)		
Main language spoken at home					
English	62.8	ref		ref	
Language other than English	11.5	-16.9	(-21.3, -12.4)	2.6	(1.6, 3.5)
Not stated	25.7	-1.1	(-4.2, 2.0)	0.4	(-0.3, 1.0)
Gender					
Male	52.7	ref		ref	
Female	47.3	12.4	(9.7, 15.1)	0.5	(-0.1, 1.0)

[a] Excluding the transition from primary school to high school.
[b] Predictor not significantly related with change in attendance rates over time, and eliminated from the final model.
[c] Includes cases where caregiver information is missing and should therefore be interpreted with caution.
[d] In the last 12 months.

SUMMARY AND CONCLUSION

Achievement disparities are well established by Year 3

Overall, the effects of all the factors we examined were well established by Year 3. Disadvantaged students, irrespective of the indicators used to assess socio-economic status, were significantly behind at the start of Year 3 and remained so throughout school, failing to catch up and in some cases falling even further behind their more advantaged counterparts. Though some of this can be attributed to attendance (or lack thereof) at school, much of this influence can be attributed to student background factors, and improving the performance of poorly performing students is therefore a challenging task for educators to achieve.

The role of schools is therefore all the more important for these at risk students. Where children do not receive the resources or encouragement to succeed outside of school, there is the opportunity for schools to fill the gap and make a difference, especially for younger students. If at-risk students are provided with greater educational support from the commencement of their school career, then it is likely there will be continued ongoing benefits. If the resources are provided in later school years, then the achievement disparities that are already established will be considerably harder to overcome.

Although NAPLAN tests commenced from Year 3, other research has consistently shown that disadvantaged children enter into school with substantial deficits in their readiness for school (e.g. Edwards et al., 2009). School, of course, cannot overcome these deficits—nor should this be expected. Engagement of families and communities in understanding these relationships and the opportunities for prevention and intervention is an essential step. A multifaceted approach is needed to have disadvantaged students more ready for school before they enrol. Programs that encourage early child development in the years prior to Year 1, such as compulsory Pre-Primary enrolment (recently introduced in Western Australia for 2013) are likely to assist in closing the gap between advantaged and disadvantaged students at Year 1.

Improving attendance may prevent students from falling further behind, and in some cases help them to catch up

The results for students who decreased their unauthorised absences rates (i.e. they improved over time) were mixed. For numeracy, students who improved their attendance record did not necessarily catch up to the students whose unauthorised absence rates remained low. However, students who went on to have higher unauthorised absence rates in later years did fall further behind. Therefore it may be suggested that improving unauthorised absence rates at any stage between Year 3 and Year 9 may prevent students from falling further behind in numeracy.

The patterns were different for reading outcomes. For the Year 3 cohort, substantial gaps in achievement were evident at Year 3, and these changed very little, and even narrowed over time. This suggests that unauthorised absence in the first years of primary school is particularly problematic for reading achievement. For the Year 3 cohort, reading scores improved over time for all students irrespective of whether unauthorised absence rates

improved, worsened or stayed consistently high over time. These results suggest that the early primary school years are a critical period for school attendance in relation to reading achievement. For the Year 5 cohort, reading scores improved only for the students whose unauthorised absence rate improved. Therefore for reading outcomes, it would appear that students who start out behind on reading in Year 3 can catch up to a degree if their attendance patterns improve in later years. This pattern was also reflected in the results for students from low SEI schools. However in later years, the catch-up is limited to the students who managed to improve their unauthorised absence rate into secondary school. The message from this result is that not only is good attendance important in the early years of school, but that good attendance needs to be maintained into the secondary years.

For numeracy results, declines in absence rates were related to declines in NAPLAN achievement. It is unlikely these changes were solely a result of the change in attendance, as we found that poor attendance in later years was independently associated with lower commencing baseline achievement. Nonetheless, these are important results with significant policy implications. Students who are at risk of lower achievement and poor attendance in later years can be readily identified in the early years and targeted for intervention. Among students with low unauthorised absence rates in Year 3, the students with lower NAPLAN scores are at risk of poorer attendance in later years and subsequent poorer performance on later NAPLAN tests. These students need encouragement to maintain their attendance at school and increase engagement in the classroom. Similarly, among students with high unauthorised absence rates in Year 3, those with lower achievement are very unlikely to improve, and should be targeted with interventions designed to address both their attendance at school and their learning and engagement in the classroom.

Taken together, the results shown in this chapter suggest that efforts aimed at reducing the achievement gaps between advantaged and disadvantaged students would have the greatest impact in the first two years of school. These efforts could include improving attendance at school for those with a propensity for unauthorised absences, but our findings suggest the efforts targeted solely in this area may have limited impact. A multifaceted approach that provides resources to students in low SEI schools, i.e. providing greater educational support for students who are not achieving to a satisfactory standard, in addition to targeting unauthorised absences from the commencement of schooling, would yield greater benefits in terms of closing the achievement gaps between advantaged and disadvantaged students than any of these approaches provided in isolation.

CHAPTER 9 SUMMARY AND IMPLICATIONS

In this final chapter we review the results described in the report and summarise the key findings made throughout. We conclude with a list of implications and specifically address the areas in which policy and practice intervention could make the greatest impact.

SUMMARY OF KEY FINDINGS

Children have highly stable attendance throughout the primary years

Student attendance data from the Western Australian public school system show that there was very little change in a child's attendance pattern over the study period (2008 – 2012). Remarkable stability in attendance patterns was demonstrated in a number of ways, including childrens' overall rates of attendance within year groups, proportions of those students with regular and poor attendance, and attendance rates within particular population sub-groups.

These attendance rates in Western Australian (WA) public schools are very similar to those reported in other states and territories (Australian Curriculum, Assessment and Reporting Authority, 2012a). The high degree of stability in attendance patterns and comparability across jurisdictions suggests that analysis undertaken here (on Western Australian data) may be generalizable to other jurisdictions and be an appropriate evidence-base to support national decisions on attendance policy.

The Western Australian Department of Education (WA DoE) launched the *Better attendance: Brighter futures* initiative in 2010 which included a number of strategies aimed at improving student attendance rates, and schools across the state have implemented a range of approaches to modifying attendance patterns. There has also been considerable change in economic circumstances in WA, with substantial migration into the state, and changes in the proportion of students enrolled in public sector schools. The fact that attendance rates in school have remained so stable in the face of these economic and social changes suggests that achieving substantial change in attendance at school is difficult and more likely to occur slowly over a long period of time with steady policy effort as well as public engagement.

Attendance rates fall in secondary school

While children's attendance patterns were consistently high between Year 1 and Year 7, attendance rates declined markedly in the secondary school years (from Year 8 onwards). This declining pattern was evident among all population sub-groups. In WA schools during 2008-2012 the transition to secondary school for almost all students occurred when moving from Year 7 to Year 8. As there were very few students who transitioned to secondary school at a different point in their school career, it was not possible to tell from the WA data if the decline in attendance that starts in Year 8 can be attributed to the transition to secondary school per se as distinct from an age-related developmental phenomenon.

From 2015, WA public school students will make the transition to secondary school when moving from Year 6 to Year 7. This move will bring WA students in line with several other jurisdictions. This event will mark an important "natural experiment." If the transition to high school is a reason why attendance rates start to decline from Year 8 onwards, then it is possible that the change to make the transition to secondary school at an earlier point in students' school careers may also impact on attendance rates from Year 7 onwards. Although other jurisdictions transition to secondary school between Year 6 and Year 7 we are unaware of any reports that show what effect this has on attendance rates in those jurisdictions. An examination of attendance rates in the jurisdictions that transition to secondary school between Year 6 and Year 7 (New South Wales, Victoria, Australian Capital Territory, Northern Territory and Tasmania) shows a small decline in attendance between Year 6 and Year 7 (Australian Curriculum, Assessment and Reporting Authority, 2012a). However the declines between Year 6 and Year 7 in those states are larger than the Year 6 to Year 7 declines in jurisdictions where the transition to secondary school occurs between Year 7 and Year 8 (Western Australia, Queensland and South Australia). Nonetheless, attendance rates are similar across all jurisdictions by Year 10, suggesting that although the downward trend may commence earlier when the transition to high school starts earlier, there is no substantive effect on final attendance rates at school in Year 10.

There is a range of possible reasons why declines in attendance rates are seen in the later years of schooling. The early teenage years are a period during which young people are more susceptible to illness and injury than in the pre-teen years (Australian Institute of Health and Welfare, 2012). Young people are also developing more autonomy from their parents and may have more direct involvement in the decision to attend school. For some students, particularly those who struggle academically, the work demands in secondary school may affect their engagement with schooling. The secondary school environment with students having separate teachers for each subject may also affect children's, and parents' level of engagement with schooling.

Disparities in attendance rates are evident from Year 1, and are carried into and become wider in secondary school

Student level characteristics and socio-economic factors were strongly associated with attendance rates. Most of these differences were evident from Year 1. This shows that attendance patterns are established early, and are influenced by factors and events prior to school entry.

Socio-economic factors

Several different indicators were available that measure aspects of socio-economic status. These include the Socio-Economic Index for schools (SEI; which is constructed using the same variables as, and is highly correlated with, the *Index of Community Socio-Educational Advantage*, as well as measures of caregiver employment and occupation. Each of these indicators of socio-economic status showed similar patterns with attendance. More advantaged students have better attendance in school. The gap in attendance between more advantaged and more disadvantaged students widened through students' school careers, particularly after the transition to secondary school.

While there was a decrease in attendance rates by quintiles of school SEI, the largest gap was between the two bottom quintiles, with students attending schools in the bottom quintile of school SEI having a much lower attendance rate in Year 1, and the only group of students where there was a noticeable decline in attendance over the primary school years. This gap widened further in the secondary school years.

School socio-economic status reflects a combination of factors, including the financial resources, employment and educational attainment of parents and families. Each of these could impact on school attendance. Parents with fewer financial resources may have more difficulties with transport and less flexibility with child care arrangements. For example, parents education levels may reflect their own experiences of school, and parents with poorer experiences of school themselves may be less engaged in their children's learning.

Student mobility

Moving schools was associated with poorer attendance rates, with each additional move (excluding the transition from primary to secondary school) having an effect on overall attendance. The analysis also revealed that the timing of school moves can make a difference. Students who had moved school during term had poorer attendance than those who moved at the end of term or end of the school year.

These differences in attendance rates were observed from the beginning of the study period, even before the moves occurred. This suggests that while some school days may be missed when moving between schools, the impact of student mobility is not limited to the direct consequences of each move. Students who move schools mid-term and students who have multiple school moves may come from families where the pattern of residential moves affects their ongoing attendance, and presumably engagement, with school. The implication of this observation is that there are ongoing school engagement issues for highly mobile families that impact children in these circumstances. As such simply focussing on supporting a child through the time of transition to a new school may not be sufficient to address the impact on their academic outcomes.

Aboriginal students

Aboriginal students in Western Australia have substantially poorer rates of school attendance than non-Aboriginal students. This is an ongoing, well-documented issue. Multi-level modelling that accounts for socio-economic factors and remoteness has demonstrated that part of the gap in attendance rates between Aboriginal and non-Aboriginal students can be attributed to these factors, but they do not completely explain the gap. Although the gap increases over the course of students' school careers, poor patterns of attendance are established very early, and these seem to be consistently maintained through time. This suggests the possibility of targeting the early years in school as a key focus of activity to improve attendance of Aboriginal students, before patterns become established and more difficult to change.

We also found substantially lower attendance rates in remote and very remote areas. The proportion of students who are Aboriginal is much higher in these areas, and these results reflect that within Aboriginal students there is a gradient in attendance patterns between

metropolitan, rural and remote areas. While attendance for Aboriginal students is substantially below that of non-Aboriginal students in all areas, the gap is largest in remote and very remote areas.

The *Western Australian Aboriginal Child Health Survey* investigated Aboriginal students' attendance at school (Zubrick et al., 2006), including a range of factors that are not available in the current datasets. Factors that were found to influence attendance at school included emotional and behavioural difficulties, the occurrence of stressful life events in the family, whether the child's primary carer had been arrested or charged with an offence, or whether the child's carers had been forcibly separated from their natural families. Additionally the survey found that Aboriginal children who had attended day care as well as kindergarten and pre-school were likely to go on to have better attendance patterns in school.

The gaps in school attendance levels between Aboriginal and non-Aboriginal students are substantial even in the first year of school, suggesting that poor attendance is not just a product of accumulated poor experiences in school, but begins with family and community factors. Addressing the substantial gaps in school attendance in Aboriginal students is likely to require a change in the way that schools engage with parents and their local communities (Zubrick et al., 2006), and potentially a means of addressing the consequences of some Aboriginal parents' poor experiences at school (Beresford & Partington, 2003).

Students from non-English speaking backgrounds

Students who live in homes where the main language spoken is not English had on average higher attendance rates than students who speak English at home. While attendance rates decline for all students in the secondary school years, there was a much slower decline in attendance rates to Year 10 in students from non-English speaking backgrounds compared with students from English speaking backgrounds.

The strong attendance of students from non-English speaking backgrounds may reflect cultural factors. For many migrants to Australia, a motivating factor for coming to this country is to improve the life prospects for their children. For many migrant families, education is seen as a key factor in improving their children's chances, and achieving their goals for their families (Considine & Zappala, 2002). Migrants to Australia are often not a random sample of their countries of origin and may represent families that have different aspirations for their children even at some cost to themselves.

Attendance matters for achievement

The principal aim of this study was to examine the relationship between attendance in school and academic achievement. Achievement was assessed via standardised scores in tests conducted under the National Assessments Program — Literacy and Numeracy (NAPLAN). A wide range of analyses are performed on NAPLAN data by ACARA, and it is well established that there are strong associations between NAPLAN achievement and a range of characteristics of students and the schools that they attend. These include the well-documented disparities in NAPLAN achievement between Aboriginal and Torres

Strait Islander students and non-Aboriginal students, and gradients in NAPLAN scores by the ICSEA. There have been few previous opportunities to analyse and describe the association between attendance at school and academic achievement, and how it is modified by other factors such as socio-economic circumstances and Aboriginal status.

Several methods were used in this analysis to examine the relationship between school attendance and academic achievement. These included the use of spline curves to examine the general shape of the relationship, and the use of multi-level modelling to examine the effect of attendance on academic achievement after adjusting for other student, school and caregiver characteristics.

Every day counts

The educational risk categories that describe attendance (i.e. regular, indicated, moderate and severe) were based on the idea that there may be a threshold effect between attendance and academic achievement. That is, children who missed more than 10% of school days were at risk of poorer academic achievement, and students who missed less than ten days of school per term would be able to catch up on the missed schooling fairly readily. Beyond this point, the amount of school missed would be beyond the resources of a student and their family and teachers to catch up on and achievement would be impacted. The spline models used in this analysis set out to test this theory, by allowing the data to describe the shape of the relationship between attendance and academic achievement.

All of the spline models fitted in this analysis consistently contradicted the notion of a threshold effect. In all analyses, average academic achievement on NAPLAN tests declined with any absence from school and continued to decline as absence rates increased. The consistent shape of these curves in all years at school, across all sub-groups of students strongly suggests that every day of attendance in school contributes towards a child's learning, and that academic outcomes are enhanced by maximising attendance in school.

Another key message from these results is that the achievement of students reflects not only their current experiences of school, but their experiences in the preceding years as well. The results for unauthorised absences demonstrated this most strongly. At all levels of education, unauthorised absences in the preceding two to three years were significantly associated with achievement on numeracy, reading and writing tests. That is, absence from school is associated with academic achievement in the current year and future years as well. Accordingly, as absences add up over several years there can be a cumulative effect on academic achievement.

While we found consistent gradients in academic achievement with declining attendance and no evidence of a threshold effect, small amounts of absence, particularly authorised absence, were associated with only small declines in academic achievement. It is unrealistic to expect large numbers of students to be able to complete their school careers without missing any days of school. A small amount of absence at a single point in time makes only a small difference to achievement. However, noticeable declines in achievement are observed where students are absent for substantial periods of time (i.e. within a semester), or where they gradually accumulate absences regularly over a

sustained period of time (i.e. over a period of years). Intervening early to correct poor patterns of attendance when they first emerge is likely to have onward benefits for students.

Unauthorised absences relate to larger declines in achievement than authorised absences

Unauthorised absences were associated with larger deficits in achievement than authorised absences. Even small amounts of unauthorised absence from school are associated with substantial falls in average NAPLAN test scores. This was seen consistently in Years 3, 5, 7 and 9. This is consistent with the notion that unauthorised absence can reflect more than just time away from school, but also possibly behavioural, family, and school engagement issues.

That there were effects for both authorised and unauthorised absences suggests that the amount of time off school, as well as the reasons for absence, is important. The substantially shallower gradient in academic achievement associated with authorised absence, and how these change with socio-economic status, do suggest that it is possible to compensate for days missed from school and that some students do have the resources, perhaps with their schools or families, to catch up on schoolwork missed.

Socio-economic gradients in unauthorised absences emerge from Year 1. In the majority of cases, parents would be aware if their 6 year-old was not at school and as such, any unauthorised absences in Year 1 would be known to parents. This may reflect underlying caregiver attitudes towards education that students adopt for themselves and carry with them throughout the rest of their schooling. Addressing the issue of unauthorised absence is not just about addressing truant behaviour, but also addressing parental attitudes towards their children's attendance at school.

Some authorised absence from school will be caused by factors that cannot be controlled or eliminated by the educational system, such as absences caused by illness or family circumstances that could occur to any child during their educational career. Most, if not all, students will suffer illness or other events that cause them to miss some school during their educational careers. While such absence is likely to affect all students, students and their families can differ in how they respond to these events. The most enthusiastic and engaged students may be those who are least likely to take time off school when mildly sick, and may be the most likely to follow-up on what they miss in school when they are absent.

Some students are more adversely affected by absence than others

There are distinct gaps in achievement depending on where students live, their socio-economic status, and Aboriginal status. We observed that more advantaged children have relatively high achievement levels irrespective of their level of attendance at school. This pattern is particularly evident in the primary school years. It suggests that more advantaged children have alternative and effective resources that help them achieve learning objectives, both at school and in the home, during the early years of school. In

effect, they are developmentally "buffered" from the immediate effects of being absent from school.

In later years, the steepest gradient in academic achievement with high attendance levels was seen in students from the most advantaged backgrounds, suggesting that these students appear to benefit the most from high attendance levels. This may reflect the fact that high performance in later years at school is conditional on prior learning, and the most advantaged students are most likely to have mastered all the foundational skills required for onward academic success.

At the same time, the findings suggest that less advantaged students (lower maternal education and school SEI) would benefit from improved attendance at school across all the years of school, and in particular, the early years of school.

Our analysis also considered the relationship between student mobility throughout the student career, absence rates and academic achievement. While there were some improvements in academic achievement associated with moving to schools in more advantaged areas, the models showed that students who moved from a less advantaged to a more advantaged SEI school still carried with them a legacy of having attended the less advantaged school and/or the circumstances external to school that may have impacted on their achievement. These results again provide evidence for the importance of the early years at school and the extent to which early disadvantage is related to poorer ongoing academic achievement.

Most achievement disparities are in place at the outset of Year 3. Improving the attendance of disadvantaged students may help to reduce these.

Disadvantaged students achieved at significantly lower levels at Year 3, and these achievement gaps remained in place throughout the advancing school years. Whilst some of the differences could be attributable to differences in their attendance patterns, the largest gaps in Year 3 achievement were observed for students from low SEI schools, Aboriginal students, and students who were highly mobile. The achievement of students who experienced multiple disadvantages was particularly low; on average such students were just above the National Minimum Standards in numeracy and reading, and by Year 9 these students were generally at least three years behind their more advantaged counterparts. With such consistently poor achievement, the onward opportunities for these students—training, employment, social and economic participation—is likely to be very limited.

Aboriginal students

The gap in the average achievement of Aboriginal and non-Aboriginal students was particularly large. These gaps did not appear to close during the study period, and remain at similar levels to those observed in previous studies, such as the *Western Australian Aboriginal Child Health Survey* which investigated Aboriginal students' attendance at school (Zubrick et al, 2006).

The marked difference in levels of academic performance between Aboriginal and non-Aboriginal students are paralleled by large disparities in average attendance rates. After

adjusting for remoteness and socio-economic status, there is still a substantial gap in academic performance between Aboriginal and non-Aboriginal students. Previous research (Zubrick et al., 2006) has shown that while attendance at school is an important contributor to the gap in educational attainment between Aboriginal and non-Aboriginal students, it is not the sole reason for the gap in attainment. This could clearly be seen by comparing Aboriginal and non-Aboriginal children with perfect attendance – even for these children, the gap in educational attainment was sizeable. It has previously been estimated that about one-third of the difference in academic performance between Aboriginal and non-Aboriginal students can be attributed to the poorer rate of school attendance in Aboriginal students. Other important factors that contribute to the disparity include the higher rate of emotional and behavioural problems in Aboriginal students, and the consequences of some Aboriginal parents' own poor experiences at school (Beresford & Partington, 2003).

Improving attendance

The longitudinal nature of the data allowed us to examine the extent to which achievement could be improved if attendance at school was improved over time. Improvements in absence rates over time, particularly for unauthorised absences, either prevented students from falling further behind, or in some cases, related to improvements in NAPLAN scores. Likewise, worsening absence rates were related to declines in numeracy achievement, though we also found that low-achieving students had a propensity for poor attendance in later years. The mixed results of the longitudinal analysis suggest there is no guarantee that reducing the unauthorised absence rates of at-risk students will lead to an improvement in their school achievement. However, the educational support and learning opportunities offered by schools to address the achievement gaps can only be effective if students are there to receive them.

OTHER FACTORS THAT AFFECT ACADEMIC ACHIEVEMENT

This study has focussed on the association between attendance at school and academic achievement. We have also been able to consider these relationships in the context of a range of other factors, including some demographic and socio-economic factors. There are, of course, many other factors that contribute to student learning and academic achievement that we have not been able to examine. While students need to attend school to benefit from what schools have to offer, degree of engagement with school learning, curriculum fidelity and content, availability of enrichment resources within the school environment, extra-curricular learning opportunities, and the quality of teaching and educational leadership have all been identified as important factors in improving student success. Factors such as student engagement and teacher quality are much more difficult to assess within administrative systems than attendance and achievement, and it is not currently possible to include them in routine administrative data collections.

Public investment in education is one of the only mandated activities in society that is explicitly undertaken to change aspects of human development. What takes place within the educational opportunity, and the quality of the teaching and its educational leadership has been consistently found to be a major determinant of student outcomes. School

attendance reduces this focus to a focus on quantity over quality. Still, for the vast majority of children, it's reasonable to assume that attending school is at least necessary, in contrast to being sufficient, for learning.

As factors such as student engagement and teacher quality were not able to be included in this analysis it is not possible to speculate from these data the degree to which factors such as these affect attendance and academic achievement, and the degree to which these factors may be on the pathway to improving student attendance rates.

LIMITATIONS

This study has a number of strengths including access to information on a large number of students over a five-year period and comprehensive coverage of public schools. There are several limitations to the study, some of which could potentially be overcome in future projects as more administrative data become available. Data in the WA attendance databases contain a summary of each student's attendance in each semester. The study did not have access to attendance information for individual days, and we were unable to assess different patterns of attendance within a semester. Absences were classified as authorised or unauthorised; while more detailed reasons for absence are available from WA attendance databases, this level of detail was beyond the scope of the project. Also, suspensions from school are recorded as authorised absences in the WA system, but absence due to suspension is likely to have a different impact on outcomes than absence due to illness or family circumstances.

As the study is based on administrative data only, there are limited variables available for inclusion in the analysis. Administrative data don't capture more detailed, nuanced or subjective factors that can impact on children's achievement in school, including school engagement, teaching quality, social and emotional wellbeing, and parental engagement with school. The impact of such factors can't be assessed in this study, and the extent to which factors such as these may explain associations seen in this study is unknown.

The study relies on observational data rather than experimental data, and the associations observed do not necessarily imply cause and effect. It is quite likely that while attendance at school can affect academic achievement, that academic achievement also affects ongoing levels of engagement with school and future attendance patterns. Good or poor patterns of attendance and academic achievement may become re-enforcing over time. While we have applied some longitudinal techniques in this study, which make some consideration of the sequence of events, our ability to examine the cyclic relationship between attendance and academic achievement was limited.

MEASURING AND REPORTING STUDENT ATTENDANCE

The Department of Education in Western Australia uses a set of standard cut-offs to classify attendance rates for reporting and monitoring purposes. These categories have been used in this analysis, along with direct analysis of absence rates. The cut-off points used to define educational risk categories based on attendance rates represent accumulated differences in achievement that are substantive. As seen in this analysis, there is a continuous gradient of decline in academic achievement as absence from school

increases. Although a small degree of absence from school is associated with only small decrements in academic achievement, as absence accumulates, academic achievement declines substantially.

Although the categories used to define educational risk based on attendance rates are associated with substantive differences in academic achievement, it is still the case that each day missed from school is associated with a decline in academic achievement. As such, categories of absence from school may be useful for reporting purposes, but shouldn't be taken to imply that there is a safe level of absence from school (such as 10%), below which academic achievement doesn't suffer. Even within broad categories, better attendance will be beneficial. In this regard the most effective message for parents remains: "Every day of school counts. There is no safe level of school absence." Parents would benefit from being told these details along with being given better descriptions of the typical pattern of attendance experience by most children. Community standards and expectations have not had the benefit of clear descriptions about what typically happens in the interplay between attendance and achievement. These messages can be non-stigmatising, developmentally helpful, and support better community dialogue.

Beyond this, the results documented throughout this report illustrate that school engagement is still a critical issue. So too are the circumstances in which children are raised and in what they bring to school from outside of it. Attendance at school is clearly important but not the only determinant of success in school. Attempting to catch up on missed school work after unavoidable absence from school is likely to be worthwhile regardless of the amount of time missed from school. While this is likely to be beneficial at any age, the results of this analysis suggest it is most important in upper primary school and during the secondary school years.

FUTURE RESEARCH QUESTIONS

More and more routinely collected administrative data are being computerised, and as software and computer networking improve it is becoming increasingly feasible to collect and warehouse administrative data. The data for this analysis has been drawn from system-wide databases that include summary attendance information for each student for each semester. More detailed information on attendance for each half day throughout each semester is maintained at the local school level. In future it should be feasible to access these data across the public school system for at least a sample of schools. Data at this level would allow further detailed analysis to be undertaken on different types of attendance patterns. For instance, does it impact students' learning more to miss a single block of days off school than to miss the same number of days spread throughout the school year? Also does it matter more if days are missed from school closer to the beginning or end of a semester?

It may also be possible in future to identify more detail on the reason for absence from school, whether linked to illness or family circumstances, or families taking their children on holiday during school term.

IMPROVING ATTENDANCE IN SCHOOL

Taken together, these results have several implications for the development of policy relating to attendance. Policies or programs addressing school attendance as a means to improving student achievement are likely to make the greatest impact by focussing on unauthorised absences rather than overall attendance.

A striking finding in these data is the persistence of attendance behaviour from the very earliest points in schooling. The initial attendance pattern of a child is a strong predictor of their subsequent attendance "career". Poor attendance is "a long fuse with a big bang." The development of policies and programs should be targeted at students from the commencement of schooling onwards, as the accumulation of absences over the years is associated with later achievement and the benefits of vigorous identification and intervention, assuming the improvements can be sustained, are likely to carry through to subsequent years. Thus taking action to prevent the establishment of a poor pattern of attendance as soon as a student starts having unauthorised absences from school is likely to have greater impact than addressing chronic unauthorised absences in the later years of school.

But apart from better understanding the reasons for absences, there is certainly scope to include the Western Australian community in a dialogue about school attendance by better informing all parents and caregivers about the role that they play. This must start with a simple description of what these data illustrate. In many respects, the community of caregivers and parents are "in the dark" about the typical pattern of attendance of students. Community expectations about attendance have not practically been informed by descriptions of typical student attendance either. There is a commonplace and perhaps growing assumption that children can be absent from school with little consequence on their onward academic achievement. These data show that every day of attendance matters and that there is no minimum threshold of tolerable absences. The safer approach is to assert that "every day matters." Minimising absences is desirable. For children who have other educational disadvantages, maximising attendance may be an important strategy to ensure that they are able to reach national minimum standards.

The reasons for absences are likely to be multi-faceted, and any approach to improving attendance among disadvantaged students will require multiple approaches with shared responsibility between students, parents, schools and a range of government agencies. The data are clear about where greater effort is needed. The results indicate that a child's onward attendance pattern is largely established in the first years of school. Vigorous efforts spent in considering ways to establish attendance excellence and high expectations about attendance in the commencing years of school, along with monitoring and intervention, are likely to yield benefits to onward educational and life outcomes.

SUMMARY OF IMPLICATIONS

STANDARDISE AND IMPLEMENT DEFINITIONS OF AUTHORISED AND UNAUTHORISED ABSENCES AND ATTENDANCE RATES

In order to compare across jurisdictions, it is essential that each state and territory defines and handles attendance data in the same way. To this end, we note that the National Standards for Student Attendance Data Reporting, finalised in December 2012, has provided a consistent framework under which attendance data should be reported and the way in which attendance rates are calculated (though see comments below) (Australian Curriculum, Assessment and Reporting Authority, 2012b).

Within jurisdictions and within Western Australia for example, there is currently room for absences to be recorded as authorised at the school's discretion (for example, if a student takes an extended family holiday). Whilst the various state and territory education departments can implement the framework at the state level, it is important that schools are aware of the reporting requirements and the importance of uniform reporting across all schools. Whilst some level of Principal discretion should be applied to decisions over the categorisation of absence type, such decisions should be made with reference to some guiding principles.

FOCUS ON IMPROVING UNAUTHORISED ABSENCE RATES

Though overall attendance rates will reflect levels of unauthorised absences within them, unauthorised absences better reflect differences in outcomes between students and more accurately highlight students at risk of lower academic achievement. National reporting standards should encourage jurisdictions to report absence from school using both authorised and unauthorised absence rates.

INITIATIVES AIMED AT IMPROVING ATTENDANCE NEED TO START EARLY

With the disparities in attendance evident from Year 1 onwards, it is clear that any programs that aim to improve outcomes for at-risk students (e.g. those in low SEI schools, Aboriginal students) need to be implemented early. If attendance rates can be improved from pre-school and Year 1, then greater benefits will likely accrue. This is not to say that programs aimed at older students are not important, as students will need ongoing support and encouragement to maintain their attendance.

EDUCATION CANNOT DO THIS ALONE: THE COMMUNITY NEEDS TO BE INCLUDED

Even if educators were successful in improving attendance rates for at-risk children, they need to be aware that good attendance is not a panacea for overcoming disparities in academic achievement. There are many other factors related to student achievement that are beyond the domain of schools. A whole-of-community approach that provides support for disadvantaged families and encourages parents to invest in and care about their child's education and learning will yield greater returns than simply aiming to increase attendance rates.

ENCOURAGE PARENTAL AWARENESS OF THE IMPORTANCE OF ATTENDING SCHOOL EVERY DAY

As part of this approach, educators need to encourage all parents — not just those in disadvantaged families — to be aware of the importance of attending school. Many parents hold the belief that children will not be adversely affected by missing school. Parents and caregivers would benefit from understanding what normal attendance looks like, and to hear the message that every day that their child misses school will have consequences for their learning and achievement.

ENCOURAGE PARENTS AND STUDENTS, AND SUPPORT SCHOOLS, TO HELP STUDENTS CATCH UP AFTER MISSING SCHOOL

The effects of school absence on academic outcomes can be minimised by actively seeking to catch up on work missed while away from school. This becomes more important in the later years of school. This may mean more homework needs to be done after a return from illness, but students also need access to curriculum content missed while they are away from school.

IMPLEMENT UNIQUE STUDENT NUMBERS SO THAT MOBILE STUDENTS CAN BE MORE EASILY IDENTIFIED AND ASSISTED

Though it hasn't been a focus of the report, it is important to remember that accurate data and reliable analysis of that data is dependent upon on the ability of analysts to accurately track students through the school system. This is typically achieved through matching of name, address and date of birth, which requires a large investment of time and can sometimes be inaccurate, particularly for highly mobile students. The job of tracking students would be much more efficient, and more accurate, if students were allocated a student number upon their first enrolment that they maintained throughout their school career. It would also allow more accurate matching across the various databases on which students are represented (e.g. enrolments, NAPLAN). Although we believe that the effect of mismatched data is likely to have had a negligible impact on the results of this study, the introduction of unique student identifiers will benefit the timeliness, cost effectiveness and accuracy of future research in this area.

ENCOURAGE EDUCATORS TO USE THE DATA THEY COLLECT TO IDENTIFY AT-RISK STUDENTS

Data is powerful. Unauthorised absence rates and early achievement data are key indicators of likely later achievement, and information on these indicators should be readily accessible to teachers, principals and administrators. They are, after all, the people who collect and record the data. It is important that schools use this data, if they are not doing so already, to identify the students (from the commencement of schooling) with a high unauthorised absence rate or unsatisfactory level of academic achievement. Educators can then target these students with additional support to help these students catch up, or at the very least, prevent them from falling further behind. The unique student numbers discussed above would be particularly useful in this regard, as they could assist educators to examine the history of any new students to determine what level of teacher support they may need. Schools should also be provided with training and

guidance on the best ways to maximise the usefulness of the data they collect, along with the best ways to identify at-risk students.

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