2010

The Pipeline Project: Trajectories of classroom behaviour and academic progress : a study of student engagement with learning

Max Angus

Tim McDonald

Chris Ormond

Rudy Rybarcyk

Anthea Taylor

See next page for additional authors

Authors

Max Angus, Tim McDonald, Chris Ormond, Rudy Rybarcyk, Anthea Taylor, and Anne Winterton

Edith Cowan University

Copyright Warning

TRAJECTORIES
OF CLASSROOM BEHAVIOUR
AND ACADEMIC PROGRESS

A study of student engagement with learning

Edith Cowan University 2009

Max Angus
Tim McDonald
Chris Ormond
Rudy Rybarcyk
Anthea Taylor
Anne Winterton

Contents

Chapters

Abbreviations

ADD	Attention deficit disorder
ADHD	Attention deficit hyperactivity disorder
AER	At educational risk
CBCL	Child behaviour checklist
DET	Department of Education and Training
DSM	Diagnostic and Statistical Manual of Mental Disorders
EA	Education assistant
ESC	Education Support Centre
ESL	English as a second language
IQ	Intelligence Quotient
LOTE	Language other than English
MCEETYA	Ministerial Council for Education, Employment and Youth Affairs
MSE	Monitoring Standards in Education
n	Number of cases
NAPLAN	National Assessment Plan – Literacy and Numeracy
sd	Standard deviation. A measure of variation from the mean or average
SAER	Student at educational risk
SAIS	Student Achievement Information System. A centrally developed data base
SEI	Socio-economic index
SES	Socio-economic status
WALNA	Western Australian Literacy and Numeracy Assessment
WAMSE	Western Australian Monitoring Standards in Education
WISC	Wechsler Intelligence Scale for Children

Tables and figures

Tables

Tables and figures *continued*

Acknowledgements

Executive summary

Description of the study

Its purpose

The Pipeline Project addresses three questions concerning the relationship between the classroom behaviour of students and their academic performance. First, to what extent does classroom behaviour explain why students fall behind and fail to meet acceptable standards in literacy and numeracy; second, if student classroom behaviour does influence academic performance, what forms of classroom behaviour are of most significance; and third, are the students whose behaviour has contributed to their underperformance in literacy and numeracy likely to ever catch up?

The design of the study

In order to examine the research questions it was necessary to follow what happened to students over an extended period. It was decided to select cohorts at Years 2, 4, 6 and 8 in 2005, and track the students in each cohort over four years. This meant that over its duration, the study collected data that spanned Year 2 to Year 11.

Teachers described the classroom behaviour of their students twice each year. These results were linked to the students' assessment results on academic performance measures for reading and numeracy. Other relevant information was also linked to the teacher reports of the student classroom behaviour.

The schools

Twenty-one primary schools, six education support centres and four high schools took part in the study. The 31 schools in the project composed four administrative clusters, each including a high school, feeder primary schools, and some special education schools or units.

The Pipeline schools are not statistically representative of schools in Western Australia. The sample is slightly skewed by the inclusion of a disproportionate number of schools drawing students from lower socio-economic status households. This was intentional as there was evidence that such schools would have larger numbers of students who were difficult to teach, and therefore might find participation in the project more relevant and useful.

The teachers

The total number of teachers in the study who provided information about their students during 2005 was 230. In some cases, teachers were involved in the project for more than one year, either because they were assigned responsibility for a new class which contained students participating in the Pipeline Project or, because they taught students from a new cohort. By the end of 2008, 421 teachers had taken part in the study.

The students

The target sample of students included all students in the designated schools in Years 2, 4, 6 and 8. According to school records, the target sample numbered 2,686. In total, the parents or carers of 69.8 per cent of target students gave their written consent. At the end of four years the attrition averaged 44 per cent for each cohort. However, nearly 1300 students who commenced the study in 2005 remained in the study over the four years.

The assessment of academic progress

The West Australian Literacy and Numeracy Assessment (WALNA) results for reading and numeracy were used as measures of student academic performance for Years 3,5,7 and 9 in 2004 and 2006. In 2008, the National Assessment Program - Literacy and Numeracy (NAPLAN) replaced the WALNA tests.

As well as drawing on the test results, the Pipeline Project surveyed all participating classroom teachers at the end of Term 3 and asked them to rate the performance of the students against literacy and numeracy benchmark standards, based on their day-to-day familiarity with the standard of each student's work.

Defining and measuring student classroom behaviour

In the study, the kinds of student classroom behaviours that impede a student's academic progress are referred to as 'unproductive' behaviours.

Teachers were asked to consider each student's classroom behaviour on two occasions during each school year. On the first occasion they completed the Student Behaviour Checklist. On the second occasion they were asked whether the unproductive behaviours reported on the first occasion were still evident; this gave an indication of the consistency or otherwise of the behaviour. They were also asked to rate the severity of the behaviour regarding its impact on the academic progress of the child.

Other evidence

Case studies were conducted in 2008 of students who exhibited exceptional patterns of behaviour or academic performance. Focus group meetings of teachers were also held in 2008 at which participants commented on some of the preliminary findings as well as raising other issues.

The main results

Differences among schools and year levels

In any year about 60 per cent of students were considered by their teachers to behave productively: as far as academic progress is concerned, the classroom behaviour of these students not being considered as an issue. The situation varied within individual schools where some classes were more difficult to manage than others; and among schools. In some schools teachers reported nearly 80 per cent of their students to behave productively whereas in others, as few as 20 per cent were reported to behave productively. While differences among schools were generally related to the socio-economic status of the suburbs from which they drew their enrolments, there were exceptions.

Of the ten categories of unproductive behaviour comprising the Student Behaviour Checklist, inattentiveness was the most frequently reported category with more than 20 per cent of students reported to be inattentive during lessons. In the primary years around 10-12 per cent of students were reported to be unmotivated but the percentage rose steeply in Year 10, reaching about 30 per cent in English classes and 22 per cent in mathematics classes.

Aggressive behaviour was confined to a relatively small proportion of all students, around 5 per cent in the primary years, though less than 3 per cent in English and mathematics classes during Years 8 to 11. The highest incidence of non-compliance in primary schools was found to be nearly 11 percent of students in Year 6 classrooms: In all ten categories of unproductive behaviour, the lowest levels were found in Year 8, which in W.A. is the first year of high school.

Less than 1 per cent of students were reported to be unproductive in all ten categories and about 6 per cent were reported to be unproductive in 5 or more categories. Students with multiple categories of unproductive behaviour were more likely to comprise the subgroup of students who, later in the year, were judged by their teachers to be behaving in ways that were having a serious impact on their academic progress.

The pattern of unproductive behaviours was generally consistent across the primary school from Years 2 to 7. There was no marked difference between junior primary and middle and upper primary students. However, the situation in secondary schools was more complex. In the secondary years marked differences were apparent between mathematics and English classes and across year levels. Initially, in Years 8 and 9, teachers reported less unproductive behaviour than in Year 7. However, the incidence rose sharply in Year 10 before declining somewhat in Year 11. In Year 10 the level of unproductive behaviour was considerably higher than any other year level in either primary or secondary schooling, particularly concerning behaviour usually associated with academic disengagement: inattentiveness, lack of motivation, unresponsiveness and lack of preparation.

The level of unproductive behaviour in Education Support Centres was more than twice the level for primary or high schools. This is not surprising as the students who attend

the centres are likely to have severe emotional and medical problems. Students with disabilities who are integrated into regular classrooms also indicated much higher than average levels of unproductive behaviour in most, though not in all cases.

Broad student behaviour groupings

Analyses of the responses to the ten categories of unproductive behaviour in the Student Behaviour Questionnaire revealed four distinctive groups. The first, the largest, was comprised of students who were behaving productively. The other three groups were identified by cluster analyses of the students who were reported to behave unproductively on one or more categories of the Student Behaviour Questionnaire. The members of the first of the unproductive behaviour groups, the largest, were disengaged with instruction but were not aggressive or non-compliant; by way of contrast the members of a second group were principally defined by their aggressive and non-compliant behaviour though commonly they were reported by their teachers to be unproductive on five or more categories. This was the smallest group. Finally, there was a group whose members were reported to show a mix of behaviours of which the most common was disruptive behaviour exemplified by calling out, seeking attention and provoking others.

These four behaviour groups were named the 'Productive', the 'Disengaged', the 'Uncooperative ' and the 'Low-level Disruptive'. The size of each group varied slightly according to the cohort and year of the analysis. In broad terms, there were about 60 per cent of students in the Productive Group, 20 per cent in the Disengaged Group, 12 per cent in the Low-level Disruptive Group and 8 per cent in the Uncooperative Group.

Consistency of unproductive behaviour

The Pipeline Project sought to map the behaviour of students over a four-year period. The analyses of the responses to the Student Behaviour Questionnaire showed the behaviour of about 40 per cent of students to be set on a steady, productive trajectory extending over four consecutive years. Of the remaining 60 per cent, nearly one third (19.5 per cent of all students) were reported to be unproductive during each of the four years. To put it simply, about 40 per cent of students

were consistently productive and about 20 per cent were consistently unproductive. The behaviour of the remainder fluctuated from year to year.

When the severity of the impact of the students' behaviour was taken into account, the percentage of students who were consistently and seriously unproductive shrank to 3 per cent. That is, only a small percentage of students appear to be locked into a pattern of behaviour that is seriously impeding their academic progress. This 3 per cent included students who have mental health problems and are educated in regular classrooms.

Although the group of students whose behaviour was seriously unproductive over four consecutive years is small, the educational significance of a student experiencing even one bad year should not be discounted. If a student has failed to grasp an essential understanding, or mastered a key set of skills during a particular year, then the educational scaffold required for later learning will be flawed. Unless the student is able by some means or other to make up this deficit then the student may struggle, even though he or she attempts to engage with what is being taught. With this caveat in mind, it should be noted that about 20 per cent of students behaved in a seriously unproductive way in any year with about 10 per cent being unproductive over two consecutive years.

There is no simple stereotype or identifying characteristic of the students whose behaviour had a persistent, negative impact on their learning. Students can seriously retard their academic progress by exhibiting any subset of unproductive behaviours measured by the Student Behaviour Questionnaire, though the wider the range the more likely they are to be members of the core with a serious problem of unproductive behaviour. None of the students appeared to particularly like school or engage energetically with their schoolwork.

Impact of behaviour on academic performance

Students who were uncooperative and did not comply with the classroom behaviour norms generally performed at the lowest levels. Typically, these students were unproductive in five or more categories and were usually disengaged from schoolwork. However, their performance was only marginally better than students who do not challenge the class rules but were also

disengaged from their schoolwork. Disengagement appears to be the prime correlate of student underperformance.

Some students behaved unproductively yet performed relatively well on measures of academic attainment. However, as a general rule, students who behaved unproductively were more likely to perform poorly in reading and numeracy, failing to meet proficiency standards. On average they performed in reading and numeracy at a standard between one and two year levels below their counterparts who behaved productively.

Students who were generally compliant and cooperative, though disengaged, constituted about a fifth of the student cohort. This is a large group. Most of these students were unlikely to have mental health problems requiring access to psychological and medical services. They were students who, for example, found their schoolwork uninteresting, were inclined to give up on challenging tasks, looked for distractions, failed to prepare for lessons, and opted out of class activities.

Academic trajectories

Academic progress, like unproductive behaviour, produces irregular academic trajectories for large numbers of students, with their individual results showing dips and peaks. This was illustrated by mapping the results on WALNA and NAPLAN for 2004, 2006 and 2008 of those students who performed at the 2nd and 9th decile in 2004. The results showed that, of the students who were performing at the 9th decile in 2004, more than half slipped down the performance scale in 2006 and 2008; whereas of the students who were performing relatively poorly in 2004, more than half improved their standing relative to other students, some by a margin of more that 50 percentile points.

The Pipeline data showed that the behaviour and academic performance of about half the students did not follow a smooth, steady trajectory; but over a four-year period there were ups and downs, and good years and not so good years. The trend lines based on cohort mean scores belie the fact that the individual pathways of many students zigzagged during the year, and from year to year.

However, it is also important to get off to a good start. Students who consistently behaved in a productive

manner performed on average at a significantly higher level in reading and numeracy and tended to maintain their advantage over the four-year period. On the other hand, the students in the unproductive behaviour group usually did not catch up. The differences between the three groups – the disengaged, the low-level disruptive and the uncooperative behaviour groups, based on the behaviour of students in 2005, tended to lessen/decrease.

The interviews with teachers and the investigations of individual cases revealed that circumstances change from year to year for students and teachers. The behaviour and academic performances of the students can deteriorate sharply because of a traumatic event and improve significantly because of the resolution that problem, or a determined effort by both student and teacher. The exceptional improvement in behaviour and academic performance, in some cases, was due to the commitment of teachers who had been able to establish a special bond with the student.

Gender differences

Sharp differences occurred between the behaviour of boys and girls. Boys were more likely than girls to exhibit unproductive behaviours in every year level from 2 to 11; this was also the case for high school students in both English and mathematics classes.

Teachers nominated inattentiveness, lack of motivation, and disruptive behaviour as the behaviours that most typified the unproductive behaviour of both the boys and girls whose unproductive behaviour persisted throughout the year. Irregular attendance was the unproductive behaviour most differentiating the genders.

Boys were much more likely than girls to be classified as members of the uncooperative behaviour group. This was the lowest performing group on the WALNA and NAPLAN assessments. Boys were three times more likely to be suspended than girls; the suspended students being particularly differentiated from other students by their aggressive and confrontational behaviours.

Although consistently higher levels of unproductive behaviour were shown by boys rather than girls, there were relatively small gender differences in reading and numeracy results. While girls performed better than boys on average in reading, the mean differences were relatively

small. In numeracy, however, the average for boys showed slightly higher tendency than girls, though the differences were not statistically significant.

Student mobility

Many students did not attend their local high school in Year 8. Those who did were less productively behaved, and performing at lower levels in reading and mathematics on average than the students who made the transition to non-Pipeline schools.

It was not possible to establish the particular destination of all the primary students, there being many reasons why the students might have attended other government or non-government schools. However, the diaspora at the end of Year 7 has an important consequence - Pipeline high school teachers found it harder to establish productive behavioural norms and produce satisfactory academic results than if their schools had a homogeneous group which captured the whole of the Year 7 intake. As a result, the high schools must deal with a higher concentration of students who behave unproductively than would otherwise be the case.

The findings outlined in this chapter bear on the metaphor of the 'pipeline'. The Pipeline study set out to test the assertion that regard to academic success, the die is cast in the early years; students who behave unproductively or perform poorly on academic tests rarely recover; they slide inexorably into the 'tail' of low-performing, troublesome students. This is clearly an oversimplification but students are constantly making up or losing ground. Even students who are among the lowest performing and least productively behaved can make remarkable recoveries.

The implications and recommendations

The Pipeline Project confirmed some of the conventional wisdom that informs current educational practice, but it also produced evidence to challenge widely held beliefs.

A number of recommendations are made which can be read in full in Chapter 12. Most are broadly framed and addressed to the central authorities in DET, assuming that appropriate collaborative and consultative processes with schools would be put in place if the recommendations were adopted.

Academic engagement

The most significant findings relate to the large numbers of students who are disengaged from their schoolwork yet otherwise cooperative with their teachers. These students perform at a significantly lower level than students who behave productively. In some year levels there appears to be little difference between the academic performance of this group of students and the smaller group of students who are reportedly non-compliant, aggressive and disruptive. The latter tend to be the students in whom most of the school systems behaviour management resources are invested.

Little comfort can be drawn from the fact that academic engagement is an issue in the school systems of most developed countries; none has found a straightforward and successful way of responding to the problem. Nor has the Pipeline Project discovered a 'cure' for disengagement, many contributing factors of which unfold in different ways in schools.

Because there is no obvious 'quick fix' to this problem, DET is urged, as a first step, to raise professional awareness of disengagement and its consequences. The importance of reducing levels of disengagement should be reflected prominently in Departmental policy statements on curriculum and pedagogy which currently are rarely mentioned. For example, new departmental interventions to improve literacy and numeracy should make explicit reference to strategies that are likely to encourage all students to engage with the teaching matter, and to persevere with the associated challenging tasks. Similarly, DET should ensure that national initiatives, such as the National Curriculum, take account of the current levels of student disengagement. Simply demanding that all students cover the prescribed content in a curriculum designed for academically engaged students would be a counterproductive policy in many schools and classrooms.

In addition to making disengagement a more salient issue, DET should begin to accumulate progressively expertise about successful strategies. While some of the expertise is likely to be found outside the Department in other school systems and in universities, there are teachers and principals within DET who, through their own experience and networking with other practitioners, have acquired a deep understanding about the problem and strategies that are likely to ameliorate it.

Therefore DET has an important leadership role, promoting discussion of the problem, and drawing on international experts. It should also recognise the expertise that exists in schools, thereby enabling a greater sharing of knowledge about how best to achieve a school climate of academic engagement.

Finally, in regard to the topic of academic engagement, DET should launch a series of projects in which schools elect to address engagement issues. The two most pressing issues, arising from the evidence analysed in this study, are the consideration of the early onset of disengaged classroom behaviour, and the adoption of a curriculum and a pedagogy that are more responsive to gender differences. The National Partnerships initiative launched by Australian governments provides a framework and a source of funding that could support such projects.

Case management

A second set of findings related to the consistency of student behaviour and academic performance. There appears to be much more individual student variability from year to year than conventional wisdom suggests. Only a small number of students (approximately 3 per cent) behave in ways that have a serious impact on their learning over four consecutive years. It is more common for students to have 'good' years and 'bad' years. These results can be interpreted in a positive light. It is clear that some students make remarkable recoveries and case studies suggest that teachers play an important role in these recoveries; however, others experience sharp declines. These findings point to the need to ensure that schools have the capacity to track the behaviour and performance of students from year to year as well as from school to school. Hence, a number of recommendations is made which call for the enhancement of information systems and case management practices in schools.

First, there is a need for a project that models what teachers and school personnel need to know about students who behave unproductively if they are to intervene successfully and accelerate an individual student's progress.

Such a project should draw on schools that have made considerable progress in developing their own information systems and case management processes. The results of the project should inform central staff who are responsible for designing departmental information systems. The

results should also be promulgated among schools for their consideration and possible adoption.

The Pipeline Project was reliant on assessments from WALNA and NAPLAN in Years 3, 5, 7 and 9. These assessment programs have been designed to map overall trends in performance from year to year. Schools receive average year level results and individual student results with advice on how the performance data might be used. Unfortunately, no technical details are provided about the reliability and validity of these tests, so individual student results must be interpreted with considerable caution. If teachers are enabled to map the academic progress of students and the consistency of their behaviour in particular classes, they need access to instrumentation designed for that purpose and available when they need it. Further, there should be a means of ensuring that information from such tests follow students when they change schools.

Therefore, the second set of recommendations pertaining to case management call for the development of appropriate assessment instrumentation. Academic performance measures should be developed and made available to schools to enable them to map individual progress through primary and secondary school with greater precision than is currently possible using NAPLAN/WALNA instrumentation. Such new assessment instruments should be used at the discretion of schools, not for school accountability purposes. They are essential for case managing students whose behaviour is unproductive.

Further, to assist the case management process, the student behaviour component of the Student Achievement Information System (SAIS) should be enhanced, and a scale constructed to allow the recognition of significant changes in behaviour over time.

It is also recommended that DET adopt a system of unique identifiers for all students, with appropriate security and privacy safeguards. This would facilitate the mapping of student behaviour and performance, and the linking of records when students change schools.

Finally, professional development of teachers should include the opportunity for them to upgrade their skills in interpreting qualitative and quantitative data describing performance and behaviour, and using appropriate data to case manage students at risk.

Reaching into the home

The final set of recommendations arises from the incontrovertible evidence in the research literature, also reinforced by the feedback from the Pipeline schools, that the home is the source of many of the behavioural problems that impede learning at school. Teachers provided examples of students whose behaviour and academic performance changed significantly for the better or worse because of events that occurred out of school hours.

In most school systems education authorities have found it too difficult to reach into the homes of students to address problems recognised by their teachers, for example, poor nutrition, inadequate supervision, sleep deprivation, low educational expectations, and modelling of dysfunctional social behaviour. Instead, schools have attempted, with varying degrees of success, to compensate such students while at school, in effect temporarily accommodating the underlying problem.

Most schools are not equipped to provide welfare services so that burden of intervening in a difficult home circumstance falls on a school staff member. The alternative, for many hard-pressed schools, is to hope that the situation will be rectified through the involvement of some other government or community-based agency.

In summary the report recommends DET ensures that schools with high levels of unproductive behaviour acquire the capacity to deploy an appropriately trained staff member to maintain contact between the students' carers and the school.

The report also recommends that the State Government launch a parent education campaign, using the mass media to illustrate how parents can contribute to the success of their children at school. Governments currently run such campaigns on various health and social topics and very large sums are invested in programs designed to improve the behaviour of citizens. It is time that parent education was given comparable priority and the public informed of how parents, in collaboration with schools, can assist their children to enhance their life chances substantially.

Preface

Confidence in public education

Confidence in a school (or, indeed, a system of schools) is largely related to two key indicators: academic performance relative to other schools and the extent to which the school provides an orderly and safe learning environment. A deterioration, or even the perception of a deterioration, in either can prompt the withdrawal of students from the school by concerned parents who are able to take advantage of government policies extending parental choice.

Australian governments want to strengthen their public education systems but there is no simple and obvious way of doing so. The evidence on which to formulate policy is lacking. One impediment is the uncertainty concerning what happens to students who fall behind in their schoolwork, and whose classroom behaviour seems to undermine any prospect of later academic success. Most studies of student academic progress are snapshots of progress over a single academic year and, moreover, map aggregate performance of groups of students rather than the trajectories of individual students during their formal schooling. Few of these studies take account of the students' classroom behaviour.

The Pipeline Project is an attempt to fill in these gaps by investigating the association between students' classroom behaviour and their academic progress over a substantial period of their schooling.

Educational determinism and student academic progress

The political rhetoric that is commonly associated with national testing calls for schools to ensure all children perform above the benchmark standard, implying that students have the capability and schools have the means to enable this to happen. The ideals of 'success for all' and 'no child left behind' assume that all children can make a good start to school, and that individual differences in initial school performance are either narrowed or held constant as children progress through school.

These assumptions fly in the face of evidence showing what usually happens when student performance is mapped over a number of years. A large number of studies show that the gap between high achieving and low achieving students tends to widen as they advance from year to year; initial advantage is compounded over time. However, there is a lack of evidence to determine whether this pattern is the invariable consequence of individual differences, or rather the consequence of an imperfect education system that can, and ought, to be perfected.

The importance of children making a good start at school is well understood among the general public and in professional circles. This is the reason for so much recent effort being made to ensure that children master the foundations of literacy and numeracy within the first three years of schooling. Most children are successful in this endeavour, though a relatively small number are not. Evidence from longitudinal studies suggests that they are at risk of repeated failure, eventually dropping out of the education system before graduating from high school.

Most of the research on academic progress is silent about the effect of students' classroom behaviour.

It is conceivable that students fall behind their peers progressively because of their classroom behaviour. If so, then it is possible that interventions to moderate the behaviour of such students might improve their performance and, indeed, set them on a successful academic trajectory.

The Western Australian context

The adoption of national performance standards and the publication of WALNA results have drawn attention to this 'tail' of students not meeting minimal standards in literacy and numeracy. The size of the tail has been relatively stable in spite of persistent efforts to reduce it. Between 5 -20 per cent of children fail to meet national benchmarks, depending on the particular test and year level; however the actual percentage of students struggling to make progress is considerably larger according to anecdotal reports from teachers who took part in this project.

The size of this tail also varies on a school-by-school basis and is related to the socio-economic status (SES) of the school intake. Children from low SES backgrounds, with boys being more so than girls, are much more likely than other children to compose the group who are failing to reach State benchmark standards in literacy and numeracy.

Schools are reporting increasing numbers of children who are difficult to manage and to teach. In some cases the children may be diagnosed with a physical disability or mental health disorder and attend regular schools as a result of government inclusion policies. Others are simply disruptive and disengaged from school learning in ways to be examined in the chapters that follow.

Some of the students are very difficult to manage in standard classroom settings, particularly when they are aggressive and defiant. It was not long ago that such behaviour was simply attributed to the onset of adolescence; nowadays, teachers report a growing incidence of such children in the early years of primary school. These trends were confirmed in a recent evaluation of DET's Behaviour Management and Discipline (BM&D) program (Robson, Angus & McDonald, 2008).

The 'pipeline'

Although the causal relationship between student in-school behaviour and student learning is likely to be recursive (either one causes the other), the relationship is not fully understood, particularly the extent to which early school failure produces or reinforces behaviour patterns that are seemingly irreversible in later years and which, in turn, undermine the student's capacity to achieve at school.

It follows that, insofar as classroom behaviour is related to student learning, those students who are consistently disruptive or disengaged are likely to progress through school on increasingly divergent trajectories from those who are engaged with academic work and comply with the behavioural norms of the classroom. It further follows that among the students who end up in the tails of distributions of academic achievement, those with behaviour problems are likely to be significantly over-represented.

In other words, there may well be a 'pipeline' that directs increasing numbers of under-performing students with behavioural problems through primary school and secondary school where the problem may become even more intractable. Hence, according to this line of argument, interventions that do not take account of the pipeline effect, nor of the factors that shape the negative behaviour or under-performance, are unlikely to produce long-term benefits.

Though research indicates there is a moderate relationship between classroom behaviour and academic progress, there is a dearth of evidence about the 'durability' of the relationship over time. Student behaviour may improve or deteriorate over the course of a student's schooling. Nor is sufficient known about the exceptions to the general rule. For example, even though manifestations of 'negative' behaviour in the early years of schooling may be strongly predictive of later school failure, some students overcome their initial difficulties; however, very little published research sheds light on this assumption.

The focus of the project

The Pipeline Project has therefore been undertaken to examine three main topics.

The first topic concerns the student classroom behaviours which are likely to impede their learning. The incidence of the various forms of behaviour will be reported. The data will be analysed according to student background factors. The question of whether the profile of behaviours is similar for different year levels will also be examined.

The second topic investigates the link between the behaviour of students and their academic performance in literacy and numeracy. The underlying question behind this topic concerns the importance of classroom behaviour as a determinant of academic performance.

The third topic addresses the consistency of the students' behaviour and their academic performance over an extended period of time. It examines the question of whether students are being 'pipelined' through the school system, or whether schools are able to intervene successfully by moderating student behaviour and improving educational performance.

The findings provide an evidence base on which policy and educational intervention can be formulated.

The report

The report that follows has been written for educational professionals and policy makers. Detailed technical matters have been confined to appendices. Because the project has accumulated large data sets of more than two hundred variables, a huge quantity of analysis has been undertaken, not every piece being reported. Only the tables bearing directly on the issues raised in each chapter will be included; to do otherwise would make the whole report incomprehensible.

The project has been a collaborative undertaking made possible by the extraordinary contribution of participating teachers and school principals, and by the continued backing of DET officials in the central and district offices.

1. The behaviour of children and adolescents

Introduction

The purpose of this chapter is to review the research evidence about the kinds of child and adolescent behaviour that shape success at school.

There is a large body of work that reports the findings of research into behaviour of young people. For the purposes of this report it can be divided into two parts. The first examines behaviour from a mental health perspective without specific reference to schools and classrooms. The second considers behaviour from an educational point of view, attending to the particular behaviours believed to impede teaching and learning in school settings.

Because the field is so large and the issues canvassed are so diverse and technical, the chapter is limited to three main considerations, namely the different ways in which behaviour is viewed, the prevalence of the behaviour, and the persistence with which young people display the behaviour.

There is little argument in academic circles that student behaviour is related to success at school. However, the agreement starts to evaporate the more the topic is unpacked and the detail subjected to close analysis. There is much less certitude than most people would expect in a field where so much research has been undertaken.

Achieving higher standards with more challenging students

Australian school systems all participate in state or national assessment programs that monitor students' academic progress. The assessments are derived from curriculum frameworks that define expected student performances in terms of levels of achievement on stipulated learning outcomes. Minimal satisfactory levels of performance, known as benchmarks, are delineated by cut-offs on the distributions of assessment results. The number of students who fall below the benchmark into the tail of the distribution varies among schools. Schools are under pressure from parents and governments to ensure that all their students perform above the benchmark levels.

At the same time, school principals report growing numbers of students in their intake who are difficult to teach. Some of these students have serious disabilities. Inclusion policies have led to the doubling of the numbers of such children in regular classrooms over the past decade. Australian primary school teachers report that about 20 per cent of their students have special educational needs (Angus, Olney & Ainley, 2007).

Epidemiological studies indicate that 10-20 per cent of Australian children and young people may suffer from a mental health problem (Stanley, Richardson & Prior, 2005). This estimate tallies with a recent survey of principals that found that in a class of 25 students, at least five needed mental health support (Rowling, Vince Whitman & Biewener, 2009).

Principals also point to fundamental social changes in Australian society over the past 20 or so years, citing as examples the increase in single parent and 'blended' families, the increase in the proportion of mothers in the workforce, and increasing levels of alcohol and drug abuse. Factors such as these have been shown to contribute to family dysfunction, thereby impacting on the capacity and disposition of children to engage productively with schoolwork (Australian Institute of Health and Welfare, 2007). In some of these cases the behaviour of the children while at school can be explained by tiredness, under-nourishment and hunger. In other instances, the children may be traumatised by violence and other forms of abuse in the home or in the community.

Family dysfunction occurs across all sectors of Australian society although it is more prevalent in households where there are unemployed adults, the family lives in sub-standard housing, and family members access welfare benefits and struggle to fit into the socio-economic mainstream. As a result, schools that draw large proportions of their intake from low-income neighbourhoods typically have higher numbers of children who are difficult to teach than schools with intakes from more affluent neighbourhoods. The net effect is that children whom teachers find difficult to teach are concentrated in low socio-economic schools, making it harder for their teachers to establish appropriate behavioural norms.

Important societal shifts in styles of parenting may also be occurring. Some commentators contend that many children come from households where parents and carers are unduly permissive, where children demand and receive immediate gratification, where the values embedded in popular culture dominate, and where educational success is ignored or devalued. Children who live in such households often struggle to respond positively to the direction of teachers and give up quickly on tasks when successful completion is not tied to an extrinsic reward.

There are also claims that the spread of various applications of digital technology are having a negative impact on student behaviour and academic progress. It is common for households to contain more than one TV set; some children have a set in their own bedroom. Many households also have computer games which some children find seductive. Search engines such as Google allow children to explore internet sites and acquire instantaneous feedback. Internet networking sites, such as Facebook and Twitter, and the ubiquitous mobile phones enable children to contact each other when they please.

These technologies may have three negative effects. First, if unsupervised, children may spend many hours at home in front of a screen of some kind, highly engaged with tasks that are unrelated to what is being taught in school. As a result, children come to school overtired and in no mood to quietly complete the work assigned by teachers. The misuse of these technologies, while providing immediate gratification, may also undermine the capacity of children to persist with the complex tasks traditionally required for higher order learning. Scientists contend that the extensive use of the internet reduces the frequency of 'deep reading' thereby contributing to the disengagement of children and adults from complex tasks that demand concentrated and extended effort (Wolf, 2007).

To summarise, the evidence suggests that a constellation of factors is making teaching in the twenty-first century a more demanding occupation than in the past. Regular classrooms now contain increased numbers of children who are difficult to teach, while at the same time schools are expected to achieve higher educational standards.

What is known about the behaviour undermining academic success? To answer this key question two important bodies of research will be reviewed; the first contains the findings of researchers who have construed problematic student behaviour as the outcome of a mental health disorder; while the second reviews what is known about the classroom behaviour of students from an educational perspective, that is, how day-to-day classroom behaviour impacts on academic success. While the two bodies of work are not always mutually exclusive, the assumptions that underpin the work of each are sufficiently different to warrant separate consideration.

Mental health research on student behaviour

A mental health perspective

A major source of knowledge about student behaviour problems is the research conducted within a mental health paradigm. This research has a distinctive orientation, the focus usually being on children and adolescents with severe behavioural problems. Secondly, the purpose of the research is to improve the diagnosis of the problem behaviour and to develop appropriate clinical treatments provided by psychologists and psychiatrists.

From a public health viewpoint, schools provide an ideal setting for efficiently identifying children and adolescents with undiagnosed mental health problems because they conveniently offer large populations of students. Hence, schooling sometimes comes into the picture but mainly for reasons of convenience: for example, where schools are used as collection points for data on children and adolescents and teachers are used to provide ratings of their behaviour. As a result, educational issues are seldom directly addressed in this work. Although teachers may have children with mental health problems in their classrooms, their responsibility for such students serves a different purpose; their job is to teach their students a prescribed curriculum. Moreover, they have responsibility for thirty or so other children of whom a considerable proportion may be behaviourally difficult -

though not necessarily to a degree, or in ways, that would make them of interest to mental health experts. From an educational perspective, student behaviour is problematic when it impedes classroom teaching and learning; whether the behaviour meets the definitional criteria of mental health disorders is of lesser consequence. Substantial numbers of children attending school are thought to have disorders.

Professionals in health, education and allied services use specialised languages (or discourses) to describe the behaviour of children. The discourses are constructed with professional knowledge, as well as various types of assumptions and values about which aspects of the behaviour are noteworthy and which are not.

Most of the mental health literature on child and adolescent behaviour problems is rooted in the Diagnostic and Statistical Manual of Mental Disorders (DSM) classifications. The DSM is published and updated by the American Psychiatric Association. Its classifications are designed to help clinicians diagnose and treat psychopathological disorders. Because the DSM is so influential much of the technical language used to describe disorders has crept into everyday use.

The fourth edition of the DSM (American Psychiatric Association, 2005) contains 39 specific disorders that are usually first diagnosed in infancy, childhood, or adolescence, and hundreds more that may be diagnosed later in life. However, the literature on child and adolescent behaviour problems tends to focus on a sub-set of the disorders described in the DSM.

The measurement of student behaviour by mental health researchers is based on the definitions authorised by the DSM. One of the most frequently cited instruments, the Child Behaviour Checklist (CBCL), developed by Achenbach (1991), addresses behavioural problems and social competence and identifies eight behavioural syndromes: withdrawn behaviour, somatic complaints, anxious/depressed behaviour, social problems, thought problems, attention problems, delinquent behaviour and aggressive behaviour. The CBCL is so widely used that the eight syndromes, or slight variations of them, tend to encapsulate many of the child and adolescent behavioural problems described in the literature. The behaviours in the CBCL are referenced to the DSM.[1]

[1] Different forms of the CBCL have been produced for completion by parents, teachers and for self-reporting (McConaughy, 2001). The CBCL contains 118 items rated on a three-point scale. The scales have been normed on random samples. A child can be scored on each syndrome and the score indicated whether the child is in the normal, borderline or clinical range. Children who score at or above the 98th percentile are diagnosed as having a problem that warrants clinical attention.

Frameworks such as the DSM have a significant impact on how children are educated in schools. One reason is that a significant proportion of the student population is thought to have a mental health disorder of some kind. Health professionals refer to the DSM to assist with a diagnosis. Sometimes teachers are urged to use medical frameworks to identify children having mental health problems so that they can be referred to appropriate professionals. It is argued that teachers need the skills to assess the psychological wellbeing of their students because parents are 'outsourcing' their responsibilities to schools.

Describing student behaviour in mental health terms

Mental health workers commonly differentiate between externalising and internalising behaviours that in severe and persistent forms are likely to lead to a diagnosis of a disorder of one kind or another. The former are marked by behaviours such as defiance, impulsiveness, disruptiveness, aggression, antisocial behaviour, and hyperactivity. Among the disorders characterised by displays of externalising behaviour, three are often associated with school children: conduct disorder, a general psychiatric classification that involves persistent patterns of rule-breaking and violent behaviour; attention-deficit hyperactivity disorder (ADHD), defined as developmentally inappropriate levels of inattention, impulsivity and overactivity; and oppositional defiant disorder, a developmental disorder marked by defiant, hostile behaviour towards adults known to the child but without the antisocial connotations associated with conduct disorder. Internalising behaviours include withdrawal, depression and anxiety.

There is some disagreement in the psychological research literature as to whether the subcategories of externalising and internalising disorders can be validly separated and applied. Some researchers assert that it is important to differentiate externalising behaviour problems into syndromes; they show that aggression and delinquency are distinctive forms of antisocial behaviour, and unless they are treated as such, research will obfuscate the true nature of mental health disorders (Stanger, Achenbach and Verhulst, 1997). Other researchers are of the view that although a distinction can be made between aggression-conduct problems on the one hand and inattention and hyperactivity on the other, further distinctions may not be warranted (Hinshaw, 1992). In his review of the literature on externalising behaviour problems, therefore, Hinshaw uses the terms aggression, antisocial

behaviour and conduct disorder interchangeably, though in practice, the literature accepts the separation of internalising and externalising behaviour into distinctive disorders.

A large body of work has concluded that the onset of anti-social behaviour in many cases leads eventually to delinquent and offending behaviour in adolescence and adulthood. This work is sometimes conducted under the auspices of consortia of researchers whose investigative framework is drawn from sociology, criminology, psychology, psychiatry and human development. The studies typically disregard the classroom as a site of interest and if teachers are engaged in the study they are confined to providing behavioural ratings and literacy performance data. Academic performance (literacy failure) is sometimes employed as an explanatory variable, a factor that might amplify the behavioural tendencies observed. However, the usual purpose of these studies is to establish the underlying causes of the antisocial and delinquent behaviour and to develop appropriate treatments for it, rather than find ways of turning around the academic performance of the students.

The epidemic of Attention Deficit Hyperactivity Disorder (ADHD) has spawned a large program of research. Most of the work has a strong mental health orientation due in part to the tendency to medicalise high levels of inattentiveness and view it as a condition responsive to psychiatric and pharmacological control. Schools now routinely manage the administration of medication for ADHD and there continues to be considerable debate in the research about the incidence of ADHD among students in regular classrooms. Some educators attribute the failure of a significant sector of those students who do not make academic progress to hyperactivity and consequential inattentiveness.

The prevalence of behaviour disorders

Moffitt (1993) reviewed studies that detailed the prevalence of conduct disorders among primary school-aged boys, adolescents and adults. She concluded that regardless of their age, between 4-9 per cent of males would be categorised as antisocial. Hinshaw (1992) reports that conduct disorder is estimated to have a prevalence of 9 per cent for boys and 2 per cent for girls. ADHD has a prevalence of about 3 per cent, though boys considerably outnumber girls. McGee, Partridge, Williams and Silva (1991) report that approximately 5 per cent of preschool boys are considered by their parents or carers to be 'very difficult to manage'.

A West Australian mental health survey is of special interest (Zubrick et al.,1997). The findings were based on a large, carefully drawn sample of 2,737 children aged 4-16 years, most of whom were in the West Australian school system. It yielded statistics on the overall incidence of the eight behaviour problems identified by Achenbach's CBCL. All told, 21 per cent of the school population had a mental health problem as defined by that instrument. Of the students who had been suspended or excluded from school on one or more occasions, 79 percent were identified by the CBCL as having a mental health problem. Of the students reported by teachers to have truanted, 70 per cent were shown by the CBCL to have a mental health problem. The syndrome with the highest incidence of morbidity was 'attention problems' (over 60 per cent of those students with a mental health problem). 'Aggression', 'social problems' and 'withdrawn' were evident in about 50 per cent of those with a morbidity. The survey report does not disclose the incidence of mental health problems for children of different age levels.

If the prevalence of conduct disorder were a stable phenomenon, and if children with the disorder were distributed evenly across schools, then on average, teachers could expect that at least 5-6 children in their class would have a mental health problem, one or two of whom probably had a severe conduct disorder.

The persistence of disordered behaviour

How stable are students' patterns of behaviour during the course of their schooling? What is the likelihood that students who exhibit normal behaviour patterns during their early years develop behaviour problems later, during their childhood or adolescence? The evidence is somewhat mixed and confined mostly to antisocial behaviour.

There is a large body of evidence indicating the persistence of antisocial behaviour syndromes. Campbell (1994) conducted a two-year follow up of 112 boys found difficult to manage in preschool. She found that 28 per cent of the original group were identified as showing persistent problems or had developed more severe problems after entry to school. Richman, Stevenson and Graham (1982) found that 61 per cent of problematic three-year olds still showed significant difficulties on a clinical rating five years later. In a review of longitudinal studies on the behavioural characteristics of children with learning disabilities McKinney (1989) concluded that the bulk of the evidence suggests that such children face an

elevated risk of behavioural and adjustment problems as they progress through school.

Farrington, Loeber and Van Kammen (1990) tracked a sample of 411 boys from age 8 through to adulthood. They found that early symptoms of ADHD (lack of concentration, impulsivity) and conduct problems (such as quarrelsomeness and defiance) were independently predictive of juvenile convictions. Broidy, Tremblay, Brame, Fergusson, Horwood, Laird et al. (2003) show that chronic physical aggression by boys during the primary school years specifically increases the risk of continued violence, as well as other non-violent forms of delinquency during adolescence, though this finding does not apply to girls. Tremblay, Pihl and Dobkin (1994) followed a sample of boys through adolescence. They found that 28 per cent of them who demonstrated antisocial behaviour when they entered kindergarten were delinquent by age 13. Achenbach, Howell, McConaughy and Stabger (1995) examined the developmental paths from adolescence to adulthood of a sample assessed at ages 13 to 22 years. They found moderate to strong correlations between pre-adult and adult internalising and externalising syndromes.

Offord, Boyle, Yvonne, Racine, Fleming, Cadman et al. (1992) found that the strongest predictor of conduct disorder in their follow-up study was conduct disorder four years earlier. Almost 45 per cent of children with a conduct disorder at ages 4 to 12 showed the symptoms of a conduct disorder four years later at ages 8 to 16. In the Isle of Wight Study, Rutter, Tizard and Whitmore (1970) found that three-quarters of the children diagnosed with conduct disorder at ages 10 and 11 still showed the disorders at ages 14 and 15.

A review of the field of antisocial and criminal behaviour by Rutter, Giller and Hagell (1999) concluded that the roots of many of the more serious and persistent forms of antisocial behaviour can be detected as early as age three in the form of oppositional and hyperactive behaviour.

The social origins of disorders

There is considerable variation in the behaviour of children during their early years of schooling. Home-background is an important explanatory factor. Large numbers of children begin their schooling unable to follow directions, play amicably with other children, or sit quietly. The recognition of the importance of the pre-school years in the cognitive and behavioural development of children has been recognised by governments and translated into 'intervention'

programs that involve the care and education of children and the support and education of parents or carers. These initiatives tend to be targeted towards neighbourhoods with high levels of single parent households, unemployment and criminal activity. Moffit (1993) describes how dysfunction in the home can contribute to behaviour problems and undermine the work of schools:

> In nurturing environments, toddlers' problems are often corrected. However, in disadvantaged homes, schools, and neighbourhoods, the responses are more likely to exacerbate than amend. Under such detrimental circumstances, difficult behaviour is gradually elaborated into conduct problems and a dearth of pro-social skills. Thus, over the years, an antisocial personality is slowly and insidiously constructed. Likewise, deficits in language and reasoning are incrementally elaborated into academic failure and a dearth of job skills. Over time, accumulating consequences of the youngster's personality problems and academic problems prune away the options for change. (p. 684)

However, these programs tend to be hit and miss and in the end, teachers become the de-facto parents and socialisers as well as the educators of large numbers of these children even though, at the end of the school day, these children return to their dysfunctional environment.

Situational and developmental factors

Not all episodes of dysfunctional behaviour are indicative of a deep-seated and persistent psychological condition. Situational and developmental factors come into play.

Moffitt (1993) points out that many people behave antisocially, but their antisocial behaviour is temporary and situational. A small number of people, however, exhibit persistent, stable antisocial behaviour. In their case, childhood aggression or conduct disorder can lead to delinquent and criminal behaviour. Moffitt posits that temporary versus persistent antisocial persons constitute two distinct categories. Her conclusions are supported by evidence from her longitudinal study of 1,037 New Zealand boys who were assessed every two years from age 3 to 15. Moffitt and her colleagues found that those boys who were disobedient and aggressive at age 3 (about 5 per cent of the sample), tended during later childhood to show evidence of conduct disorder. During the onset of adolescence they continued on an antisocial trajectory

and police arrested a significant proportion in the early teen years (White, Moffitt, Earls, Robins & Silva, 1990). Moffitt has described this group as 'life-course-persistent'.

According to Moffitt, a tidal wave of antisocial behaviour occurs between the ages of 11 and 15. From her longitudinal study of New Zealand boys, She found that approximately one-third of the total sample began to show delinquent behaviour during adolescence, joining the 5 per cent who had shown stable, antisocial behaviour since preschool. At age 15, the antisocial and delinquent behaviour of 'late developers' was undifferentiated from that of the early onset category. However, based on the earlier work of Farrington et al. (1990), Moffit predicts that by their mid-twenties, at least three quarters of the new offenders are expected to cease all offending. She writes:

> Adolescence-limited delinquents may [also] have sporadic, crime-free periods in the midst of their brief crime 'careers.' Also, in contrast with the life-course-persistent type, they lack consistency in their antisocial behaviour across situations. For example, they may shoplift in stores and use drugs with friends but continue to obey the rules at school. (Moffit, 1993, p. 686)

Verhulst, Eussen, Berden, Sanders-Woudstra and van der Ende (1993) conducted a six-year longitudinal study of children 4 to 11 years of age. They sought to explain the trajectories of those cases whose disorder persisted over the course of the study, those who developed a serious disorder and those whose disorder decreased in severity. They note that of the children who were regarded as disordered at the beginning of the study, those with internalising behaviours had better prospects of improving their functioning than those who showed aggressive or antisocial behaviours.

The differentiation between life-course-persistent and developmentally-tied behaviour patterns is indicated by results from the longitudinal study of children aged 2 to 8 (Shaw, Gilliom, Ingoldsby & Nagin, 2003). They report a decreasing use of overt forms of antisocial behaviour with age, though not all children follow this 'descending' trajectory. Their finding is consistent with other longitudinal studies tracing the developmental course of children's disruptive behaviour described above. Shaw and associates estimate that about 50 per cent of disruptive children continue to show antisocial behaviours throughout the school-age period and into early adolescence.

McConaughy (2001) concludes that adolescent-onset delinquent behaviour may be specific to a particular developmental period and to particular environmental conditions, citing Moffitt (1993), whereas, in contrast, aggressive behaviour tends to be more stable and chronic across the life span (Achenbach et al., 1995; Stanger et al., 1997). Williams and McGee (1994) and Fergusson et al. (1989) concluded that antisocial behaviour is quite stable over the early years of schooling.

There are nuanced differences in the conclusions reached by experts in the field about the trajectories of children with behaviour problems. In broad terms, the results of longitudinal studies of children with severe behaviour problems indicate that some students follow a positive trajectory, some persist, and for others, their condition worsens leading eventually to criminal activity. The reasons for children following one trajectory and not another remain conjectural though many researchers and clinicians propose explanations. Robbins et al. (1990) conclude that although the predictive power of childhood antisocial problems is well substantiated, the separation of children with behaviour disorders into those who will and those who will not recover is not yet achievable. Rutter et al. (1999) contend:

> It is quite simply meaningless to talk of, try to explain, or treat antisocial behaviour as if it were of only one 'type'. It is different in different people, in different situations, and at different times in the life history (p. 376).

Educational research on classroom behaviour

The focus on school discipline

Education authorities are concerned about the duty of care and student wellbeing. It is not surprising that student acts of violence, bullying, truancy, drug and alcohol dependency and self-harm are given a priority. Any student behaviour that leads to contact with the criminal justice system is of the utmost importance as, in extreme instances, there can be fatal consequences if the behaviour is ignored or dealt with inadequately. Given this focus, it is understandable that research which focuses on antisocial or delinquent behaviour should come to the fore.

Students with disabilities are also of particular importance. Some attend special schools while others are integrated into regular classrooms as a result of the adoption of student

inclusion policies. As stated earlier, about 5 per cent of students in regular classrooms have a disorder that has been clinically diagnosed (Angus et al., 2007). Reference was made earlier to students with attention deficit disorders but there are many other kinds of disability, some of which produce displays of disruptive behaviour. For example, teachers commonly find they require special behavioural management strategies for students with Autism spectrum disorders. The proper care of these students requires detailed medical and psychological knowledge.

School psychological services play a key role in the provision of consultancy services to schools providing advice on students with behaviour problems and students whose medical condition requires some educational adjustment. The medical and mental health research is highly pertinent.

However, many students in regular classrooms are neither a threat to other students or themselves, nor clinically diagnosed with a mental health disorder. Yet they behave in ways that impede their academic progress. For these students the mental health and medical research is largely irrelevant.

Research into student classroom behaviour

There is more to teaching than managing the behaviour of students. If most of the energy of the teacher is committed to maintaining order then there is limited time to do the real business of teaching – managing the learning of students. Teachers need to establish an orderly classroom environment because disorder leads to teacher stress and interventions from other school staff. However, the primary purpose is not self-preservation, but rather to enable students to engage with the learning tasks. For this to happen, teachers want students to:

• start on time,
• prepare for the lesson,
• attend to what the teacher says,
• comply with the teacher's direction,
• strive to finish assigned tasks to the highest possible standard,
• collaborate constructively with other students when required, and
• work without disturbing other students when required.

Students who do not behave in these ways are unlikely to achieve the educational outcomes expected of them. A behavioural disorder might be one factor that could

explain why a student's behaviour is dysfunctional, but many other factors could come into play.

While much of the educational research into classroom behaviour has drawn on the mental health frameworks to describe student behaviour, some researchers have employed a broader approach in which the individual student is one of 25 or so members of a social system in which the teacher is a key player. Researchers who view student behaviour in these terms are less interested in the mental states of students than in the interactions between the teacher and student or between students in groups, since they that define the kind of instruction taking place.

Some of the language used in the mental health research may still apply. It is necessary for students to attend in classrooms in order to learn, just as it is necessary for them to function successfully in other facets of daily life. However, while students may be consistently inattentive in a classroom, thereby failing to grasp what is being taught, educators are less inclined to see the behaviour as indicative of a mental health disorder requiring psychological support, but be more inclined to interpret the behaviour as a sign that some adjustment is probably needed on the teacher's part. In a similar vein, teachers may want to intervene if the student is confrontational, impulsive or behaving erratically. Their aim is to engage the student with the instructional task in hand since failure to complete the task will put the student's longer term success at risk.

A good example of how an educational perspective has been brought to bear on the topic of student classroom behaviour is provided in Galton, Hargreaves, Comber, Wall and Pell (1999). Galton and his associates conducted systematic classroom observations of children in 1976 and 1996. From their analysis of extensive, coded descriptions of the behaviour of students and their teachers, they identified distinctive patterns of behaviour. They described one group of students as 'ghosts' because for much of the day they remained unnoticed by the teacher. Other types were labelled as 'solitary workers', 'class enquirers', 'quiet collaborators', 'intermittent workers' and 'hard grinders'. They described one large group as 'easy riders' in these terms:

> Easy riders gave the appearance of working but did so more slowly than other pupils. They found ways of extending routine tasks without attracting the teacher's attention. They were often observed sitting and listening to the teacher talking to other pupils as if trying to

anticipate and, perhaps, subvert subsequent activity…
Easy riders are a particular problem in that, as argued
by Galton (1989), they can create in the teacher low
expectations of their ability by slowing down their work
rate, particularly at the beginning of the year when the
class is new. To the teacher, such pupils will finish only
half a page of problems, say in mathematics, while other
pupils complete the whole of the page. At the end of
the lesson a teacher may conclude that these easy riding
pupils have done their best but perhaps lack powers of
concentration. By half term, teachers may regard it as
satisfactory if an easy rider manages to produce at least
half a page of work during a lesson. In our analysis, over
a quarter of all pupils engaged in easy riding of one kind
or another (p.177).

There are several important features of this example. First,
the account is a description of student behaviour construed
as an education problem rather than a psychiatric or
psychological problem. An easy rider most likely does not
have a mental health disorder. The educational problem
of the easy riders is their academic underperformance.
Implied in Galton's account is the assumption that if the
teacher could cut the amount of 'easy riding', the students'
academic progress would improve.

Second, the behaviour of both student and teacher
contributes to the problem. Teachers can shape the
student behaviour either positively or negatively. The
authors imply a reflexive relationship between the teacher
and student behaviours. A student's problem is, ipso
facto, also the teacher's problem. To put it another way,
'easy-riding' has been framed as a pedagogical problem
rather than a behaviour management problem.

Third, to solve the problem of 'easy-riding' teachers must
address not only their relationship with one student but
more commonly, a group of students and, sometimes, the
whole class.

Fourth, the excerpt describes a dynamic pattern of
interrelating factors, not a symptom of a discrete and
stable syndrome. It suggests a kind of work avoidance
strategy used by students and unwittingly reinforced by
teachers. Students may choose to employ the strategy with
teachers whom they think are susceptible to this kind of
tacit negotiation, and in lessons which they either dislike
or have a record of low achievement. To put it simply,
students can turn it off or on depending on the situation.

Academic engagement

A core construct evident in most educational analyses of
student behaviour is academic progress. This construct
implies change (improvement) over time. It also implies
a sequenced curriculum from which teachers design tasks
that students must accomplish successfully in order to
demonstrate and make academic progress. Academic
progress and learning are different constructs though the
former is inclusive of the latter. Students who misbehave
are most likely learning, but not necessarily the skills and
understandings contained in the curriculum that must be
achieved to demonstrate academic progress.

It is also the case that improvements in academic progress
require changes in cognitive processes. Hence, an
educational framework for managing student behaviour
must employ constructs that link classroom behaviour with
mental processes. The construct of academic engagement
provides the link.

Early research into the construct of academic engagement
investigated how the teacher and student used their time
during formal instruction. It was found that during a regular
lesson the amount of time spent by students on the set tasks
differed considerably from classroom to classroom. In some
classrooms it took the students a long time to settle and there
were many disruptions and distractions, whereas in others
the students were focussed from the beginning of the lesson
and most of the set time was spent on the set tasks. Further,
within most classrooms there was considerable variation
among students: some students barely attended to what was
being asked of them whereas others quickly got on with the
job. The research showed the amount of time that students
spent on the assigned academic tasks was strongly correlated
with their academic performance. Some of the variation
was explained by the way in which teachers managed the
instructional process, some by characteristics of the students,
and some by the interaction between student and teacher.
The pedagogy was shown to be an important factor.

Various ways exist for analysing the construct of academic
engagement. One facet is *attention*. This may be defined
in relatively passive terms. Students may attend but make
no effort to process what they are reading or listening to
– hence *effort* is the second element. The third element is
perseverance suggesting that academic progress requires
effort over time rather than intermittent attention or effort.
Productive pedagogies according to this analysis will be

those that lead to sustained effort on the part of the student to master what is being taught. Most teachers recognise from experience that this is easier said than done and that success will depend on a number of factors, including qualities or capacities that individual students bring to the task.

This early work conducted during the 70s and 80s led to more sophisticated definitions of academic engagement. Corno and Mandinach (2004, p.300) define engagement as 'volitional aptitude', partly cognitive, conative (having to do with purposive striving), and partly affective (having to do with feelings and emotions). They see it more as a disposition than a set of behaviours, though the latter may indicate the presence or absence of the former. Newman, Wehlage and Lamborn (1992) define engagement in academic work as the student's psychological investment and effort directed toward learning, understanding or mastering the knowledge, skills or craft that academic work is intended to promote.

Audas and Willms (2001) define engagement as the extent to which young people identify with their school and derive a sense of wellbeing from their academic work. Striving is key to engagement. For Lee and Smith (1995) engagement was operationalised by the frequency with which students reported working hard and feeling challenged. Ogbu (2003) equates disengagement with a 'low effort syndrome'. Greenwood, Horton and Utley (2002) measured engagement by the amount of time committed to academic responding. Hargreaves and Galton (2002) conflated 'engagement' with 'motivation'.

It can be seen from these examples that researchers have employed a variety of definitions of academic engagement. The definitions all share the inference that students are academically engaged when they make an effort to successfully complete the set work.

Students who are disruptive and uncooperative are unlikely to be engaged with learning; yet, on the other hand, students who are compliant but make a minimal intellectual effort are also unlikely to be engaged. Engagement is the product of the disposition of the student and the pedagogy of the teacher.

Student suspensions

For reasons explained above, estimates of the prevalence of behaviour problems in schools will depend on how the term 'behaviour problem' is defined: mental health

morbidities and dispositions to behave unproductively are quite different constructs from the failure to make an effort to accomplish a task. Teachers and school administrators will take different factors into account when estimating the prevalence of behaviour problems. Their responses will depend on what they think they are being asked to estimate and upon the kind of evidence that is at hand.

Usually school statistics on problem behaviour are derived from records that are legally obliged to be kept. At the top of the scale are students who are at continuing risk of self-harm or of harming others. For legal as well as administrative reasons, incidents that indicate such behaviours are formally documented and students may be referred to psychologists and medical practitioners, or suspended or excluded from school in extreme cases. When these records are integrated with medical records and reports from classroom teachers, schools have their own comprehensive picture of the prevalence of severe cases.

The most common indicator of the prevalence of student dysfunctional behaviour is the record of suspension or expulsion from school. The suspensions are mainly precipitated by severe externalising behaviour events. Hyde and Robson (1984) found that the percentage of the student population suspended in the Western Australian government school system in 1968 and 1983 ranged from 0.09 to 0.6 per cent respectively. Approximately half of these cases were categorised as examples of 'wilful, persistent disobedience, misbehaviour, and insolence' with 20 per cent being for assault or threatening teachers or other students. Two thirds were boys and 94 per cent were in secondary schools. These rates of suspension corresponded with the reported incidence in the UK at the time.

Gonczi and Riordan (2002), on reviewing the rate of suspensions in NSW government schools, found that of the total number of suspensions, 20 per cent were in the primary years, and of these, over 80 per cent were in the upper primary years. Acts of violence (including the threat of violence) make up 45 per cent of all suspensions. The percentage of students suspended was 0.6 per cent. The figures on school suspension might usefully be compared with the prevalence of conduct disorder figures cited above. If 5 per cent of the school-age population across the board, and up to 30 per cent during adolescence, display antisocial or delinquent behaviour, then the suspension rate of less than 1 per cent of the school population is surprisingly low. One reason is that

suspension is used as a last resort and education authorities discourage schools from using this sanction liberally. The school records are likely to show a significantly larger proportion of students whose behaviour has warranted a letter from the school to parents or carers calling for a meeting with the student and school staff.

More recently, Robson, Angus and McDonald (2008) analysed the 2007 suspension records of the Western Australian Department of Education and Training. They found that there had been a substantial escalation in the use of suspensions since the 1970s. In 1971 only 1 per cent of secondary schools reported suspending 10 or more students and nearly half did not suspend a single student, whereas, by 2007, 95 per cent of secondary schools suspended 10 or more students and only 3 per cent did not suspend any students (these were all senior colleges enrolling student in Years 11 and 12 only). The increase has occurred in both primary and secondary schools, though the rate of suspensions is five times lower in primary than secondary schools. Year 9 is the year level at which the suspension rate peaks. Since suspensions are only employed for serious breaches of behaviour, it seems clear that schools generally are having to deal not only with higher levels of indiscipline than in the past, but in earlier year levels than used to be the case.

Teacher estimates

Suspension statistics can serve a useful purpose indicating major breaches of school discipline. However, it is highly unlikely that a student would be suspended for failing to make an effort, for not submitting homework, or for opting out of group discussions. Hence, suspension statistics reveal only part of the student behaviour picture. Moreover, despite the preoccupation with violence in schools all over the world in recent years (Debarbieux, 2003) teachers often report that low-level bad behaviour in classrooms grinds them down, contributes to low morale and interrupts learning (UK Department for Education and Science, 1989; Ofsted, 2005; Wilkin, Moor, Murfield, Kinder & Johnson, 2006).

Teachers are likely to use different standards to health professionals when they identify students who exhibit externalising behaviours in classrooms. Arbuckle and Little (2004) surveyed 96 Australian primary and secondary teachers and found that 18 per cent of male

students and 7 per cent of the female students whom they taught exhibited disruptive behaviour (distractibility, avoidance of on-task behaviour and lack of observance of classroom rules), severe enough to warrant additional support. Hill, Holmes-Smith and Rowe (1993) asked teachers in 90 primary and secondary schools to rate student behaviour on bipolar scales that measure attentiveness, restlessness and sociability. They found a tendency for teachers to rate up to 25 per cent of their students towards the restless and inattentive ends of the scales and noted that primary and secondary teachers recorded similar ratings even though there is a generally held perception that negative student behaviour is greater in high schools. However, Hill and colleagues are reporting cross-sectional data so it cannot be assumed that the same students each year are in the quartile showing negative behaviour.

The behaviours that are indicative of ADHD, particularly inattentiveness, are conceptually related to classroom learning and academic progress. Attention to teacher instructions and learning tasks, quite separately from any interest in ADHD, has been shown to be related to student academic performance. It is not surprising, therefore, that researchers seeking to explain why some children fail to grasp the core skills required to learn to read should employ attentiveness as an explanatory variable. This work is usually conducted within an education paradigm. The outcomes sought are usually indicators of literacy achievement, though sometimes numeracy outcomes are included as well. Behaviour tends to be defined in relatively narrow terms (scales of attentiveness-inattentiveness) and therefore does not include the full range of student behaviours that might restrict student learning.

Conclusion

Most of the literature on mental health problems of school-age children focuses on externalising behaviours. This is partly because externalising behaviour is more provocative and the links between it and delinquent and criminal activity in later life are thought to be of wider social importance. Internalising behaviours, on the other hand, tend to cause fewer obvious social problems no matter how debilitating they may be for the individual.

The mental health literature also focuses on severe cases – the 5 per cent of students who are aggressive

and antisocial. It is not possible to make comparable generalisations about the persistence of the behaviour of students that is insufficiently severe to warrant a clinical referral to a psychologist, but severe enough to substantially impede their own academic progress and the progress of fellow students. It might, or it might not, follow similar patterns to that of students with severe behaviour problems.

What can be stated about the persistence of antisocial behaviour? It is clearly a simplification to contend that the die is cast by the age of three. Some children improve, for some the condition is stable, and for others the symptoms become more severe. A peak of antisocial and delinquent behaviour occurs during adolescence (a tendency corroborated anecdotally by many high school teachers) but many students survive this 'delinquent' stage and appear to assume 'normal', productive lives. Generalisations about why the behaviour of some students improves and why for others it does not, remains speculative. It should also be noted that there is considerable division within the mental health research community over the psycho-social mechanisms that produce the behaviour, the robustness of the research findings and the extent to which they can be accurately applied to populations of children.

The findings can be read in either a positive or a negative light. The positive reading is that about half the children who start school with severe outbursts of antisocial behaviour can be expected to improve, and that maturation will ameliorate the behaviour of most adolescents who had indicated delinquent tendencies. Insofar as their behaviour militates against their academic success, the academic prospects of students whose behaviour assumes a more normal profile should also improve. The negative reading suggests that a substantial band of students will pass through the school without improving their behaviour.

For teachers, this conclusion holds few surprises and provides little to go on. A system of triage is commonly put into effect. Students with very severe behavioural problems are usually referred to the school administration and, eventually, to a psychologist. Case conferencing with teachers and psychologists may yield a strategy to improve or contain the problem behaviour. If the behaviour is antisocial and threatening the safety of others, then an aide may be assigned for a portion of the school week. However,

teachers must use their own resources to deal with students whose behaviour does not cross the referral threshold.

Managing disruptive students, whose behaviour could be described as anti-social, is core business for teachers. Most classroom teachers are expected to have some of these students in their class and to manage their behaviour satisfactorily. However, it would be misguided to assume that disruptive students are the only students whose behaviour requires moderation. The rest of the class, like the 'easy riders' described by Galton, may be behaving in ways that are curbing their academic progress. To a varying extent, these students are disengaged from their schoolwork. Engagement is a key construct in educational frameworks of student behaviour because it is a condition required for purposive learning.

While students who consistently display externalising behaviours are likely to be disengaged from schoolwork, students who quietly opt out of activities, for whatever reasons, may be even more so. Hence, the meaning ascribed to 'behaviour problem' depends very much on the perspective adopted.

However, statistics on student engagement are not routinely collected; nor has there been the level of interest shown in mapping the trajectories of disengaged students, that compares with the scale and quality of work undertaken by mental health researchers who have studied anti-social behaviour over the life-course. The most robust statistic, student suspensions, is a proxy for the measures used by mental health researchers in the study of antisocial behaviour.

As a consequence, the teaching profession is left with a paucity of evidence to answer pressing questions. What happens during the full course of their schooling to those students whose classroom behaviour contributes to their bad start to school? Does their unproductive behaviour persist? How often, and under what circumstances, do previously well-behaved students become hard to manage and difficult to teach? To what extent are students who are badly behaved set in a trajectory of declining academic progress and eventual school failure? These are important questions, the more so in an age of educational accountability when all students are expected to meet benchmark education standards defined by education authorities.

2. Student behaviour and academic progress

Introduction

This chapter examines what is known about the academic progress of students with particular reference to their classroom behaviour.

While a substantial body of literature links student behaviour with academic performance at a particular point in time, much less is known about the academic trajectories of students over a number of years. Do students who make a good start typically continue to do well from year to year? Do those who initially struggle ever catch up? Is the progression of students steady and predictable, or are there dips and peaks in their performance? And, to what extent does the classroom behaviour of students accelerate or retard their progress?

These are important questions for the Pipeline Project, mapping as it does the literacy and numeracy performance of students over a four-year period and investigating whether the students' academic trajectories can be explained by their classroom behaviour.

Trajectories of academic success and failure

The widening gap

During the late nineteenth century, scholars began to map the extent of individual differences in human ability and performance among adults and school children. They, and their successors, showed that as students progressed though school, the gaps in performance tended to increase, so that by the upper years, the range of abilities in a typical class spanned the equivalent of four or more year levels (Starch, 1918; Reed, 1927).

There is now a substantial literature showing that the gap in academic performance between those students who are successful at school and those who struggle with their schoolwork widens over the course of their schooling. As a result, when student attainments are plotted over time, the distribution assumes a fan shape (Walberg & Tsai, 1983). The phenomenon of cumulative increases in the differences in student achievement as a cohort progresses through school is known as the 'Matthew effect'[2].

Recent Australian evidence pertaining to the widening gap in performance as students progress through school is found in the various editions of the National Report on Schooling. For example, in 2007 fewer than 7 per cent of Year 3 students performed below the benchmark for numeracy; by Year 7 the percentage had grown to over 19 (MCEETYA, 2008).

There is no agreed explanation of the Matthew effect. The source of the increasing differentiation in performance is variously attributed to the learner, the teacher, the system, or the mix of all three. Some researchers explain the Matthew effect as the compounding consequences of failure to master essential cognitive processes at an early developmental stage. Others explain the effect as the consequence of repeated failure on the students' self-esteem and motivation to succeed at school. A third explanation attributes the effect to teacher expectations and the organization of schooling, whereby compliant high achievers are pushed harder by teachers than troublesome low achievers, who do not receive the attention they need and eventually lag behind.

Stanovich (1986) provides an explanation in terms of the cognitive development of reading skills. His hypothesis is paraphrased as follows:

---

[2] The term is a reference to the Gospel of Matthew: For to all those who have, more will be given, and they will have an abundance; but from those who have nothing, even what they have will be taken away (New Revised Standard Version, 25: 29).

Candidates for the label of 'reading disabled' enter school with markedly underdeveloped phonological awareness. Deficient phonological awareness makes it difficult for the child to understand the alphabetic principle and delays the breaking of the spelling-to-sound code. These differences in exposure to text begin to build up by the middle of the first-grade year and compound any out-of-school differences already present. Thus, the 'reading disabled' child is left even further behind peers in the development of the rapid, automatic processes of direct visual recognition. These are the processes that are necessary for enjoyable reading comprehension, rather than the demanding, conscious process of 'sounding out' words. (Stanovich, 1986, pp. 388-9)

Stanovich (p.389) writes: 'the resulting motivational differences lead to further increases in the exposure differences between good and poor readers that are exacerbated by further developments such as the introduction of more difficult reading materials'.

Audas and Willms (2001) refer to the 'frustration-esteem model' whereby poor school performance leads to low self-esteem and eventually a rejection of the system responsible for his or her performance. They cite Bernstein and Rulo (1976) who used this model to explain how the failure of the school to address undiagnosed learning problems shapes the educational and social outcomes of schooling.

As a child becomes increasingly frustrated and self-conscious about school failure, he or she exhibits deviant behaviour, which increases with age as long as the learning problems go undiagnosed. They argued that as more time is spent controlling undiagnosed behaviour, less time is spent on learning and correcting the learning disability. This leads to a cycle whereby the student falls further and further behind, increasingly frustrated and embarrassed, until he or she gets either suspended or expelled from school, and ultimately drops out. (Audas & Willms, 2001, p.14)

Burstall (1978) shows how teacher expectations of students' capacities can actually shape their performance. Where teachers hold higher expectations for 'bright' students and lower expectations for 'dull' students, and direct effort and set tasks accordingly, then the learning outcomes are likely to correspond with those expectations. Lower performing students are likely to drop further behind and the high achievers will stretch their advantage.

Each of the 'theories' described above is plausible. Each suggests the effect of a learning difficulty that leads the student to fall behind, thereby damaging the self-esteem and motivation to succeed, a process that compounds the initial disadvantage. All suggest a kind of spiralling decline of performance caused by a cluster of interacting factors. The fan-shaped distribution could therefore be explained by several networks of cause and effect that act simultaneously to mediate behaviour and academic performance. Given the complexity of cause and effect relationships, it is unlikely that such a comprehensive theory could ever be fully tested empirically.

Predictions based on prior achievement

One corroboration of the Matthew effect is the finding from longitudinal studies of student performance that the best predictor of future success is current or past success. Large scale studies of academic progress that include multiple predictor variables have shown that a student's prior academic achievement level is generally the strongest predictor of current or future academic achievement.

An example of this work is the study by Ainley and Fleming (2003) who tracked a cohort of nearly 4,000 Victorian students in 146 schools from Year 1 to Year 5. They found that the strongest influence on achievement in reading at the end of Year 5 was achievement at the beginning of Year 1, highlighting the importance of what happens in the preparatory and pre-school years.

Another Australian example is provided by Marks, McMillan and Hillman (2001) who analysed longitudinal performance data collected from a 1995 Year 9 cohort. They related these data to the students' university entrance scores. Marks and colleagues report that the strongest influence on tertiary entrance performance is literacy and numeracy performance in Year 9, of which the performance in numeracy is the stronger.

In a US study, Ensminger and Slusarcick (1992) traced the educational performance of a cohort of 1432 children who lived in low SES inner city suburbs. They were tracked from first-grade through to their school graduation year. Students who achieved A's and B's, as distinct from C's and D's, were much more likely to graduate from high school.

Determinism

Some people have concluded from the research literature that the life-chances of children are set even before they

are old enough to attend school and there is not much teachers can do to alter the pre-destined course of events. Hence, according to this view, if children are badly behaved and struggling with their schoolwork, that pattern is to be expected if the children performed accordingly from their first day at school.

Neuroscience posits a number of critical growth stages up to age six. Doherty (1997) summarises the neuroscience that identifies the age at which particular functions appear to be 'wired' into the brain. These functions include emotional control, language, peer social skills and abstract reasoning. For all of these key functions the most critical developmental point wanes after age six. McCain and Mustard (1999) assert that although it is possible to compensate for poor development, achieving the brain's full potential will be difficult. The research into brain development and academic progress is at a very early stage.

Distinguished Harvard developmental psychologist, Jerome Kagan, disagrees with this position. He contends that this interpretation is an example of the myth of 'infant determinism', based on a particular reading of the neuroscience research literature (Kagan, 1998).

Education authorities tend to occupy the middle ground though some appear to have assimilated the myth that for most students who are struggling with their academic learning, their problems can be sorted out with a short, sharp intervention in Year 1, such as Reading Recovery. If that fails, then there is little more that can be done. However, critics of this position contend that many children recover from a poor start, and with the benefit of good teaching and support from home go on to become successful students. However, these claims are based mainly on anecdotal evidence.

It is important to approach claims that the life chances of children are set by the time they complete the early years of schooling with a degree of scepticism. In fact, the universality of the Matthew effect is open to challenge. While the studies cited above may describe what is usually the case, it does not necessarily follow that it will always be the case. Shaywitz et al. (1995) were unable to identify a Matthew effect for reading in their longitudinal study of nearly 400 students over Grades 1 to 6. The results showed that those who were initially poor readers failed to make up ground, though the gap did not progressively widen. Bast and Reitsma (1998) also failed to find a Matthew effect for reading comprehension, though there was evidence of increasing individual differences for word

recognition skills. Hence, claims about the universality of Matthew effects should be treated with caution.

The Matthew effect is not the consequence of an iron clad scientific law or invariant outcome; even where the distribution of test scores forms a fan shape, some students deviate from the trend for better or worse. Anecdotally, there are many accounts of students who made a slow or difficult start to school but who later accelerated and became outstanding performers. Conversely, there are accounts of students who appeared to have made a successful start but whose performance later fell away. Most of the research examining the relationship between current and prior performance has relied on aggregated results, usually average results for large groups, and paid little attention to individual exceptions to the general rule.

Exceptions to the general rule

Thresholds, dips and plateaus

Some researchers claim that trajectories of performance for cohorts of students over time are not linear, that is, students tend to make faster progress at some year levels that at others. They posit the existence of achievement thresholds that optimise or minimise the prospect of successful acquisition of literacy and numeracy skills and school completion. For example, there is a body of work around the development of reading skills that suggests that the end of Year 2 is a critical juncture. Rowe and Rowe (1999) quote Kennedy's (1986) review that found that efforts to correct literacy problems beyond third grade are largely unsuccessful. Many of the current special literacy programs are predicated on the assumption that extra resources need to be targeted towards children who, in Year 1, have shown signs that they have not grasped the fundamental reading skills. This strategy is based on the work of Clay (1985).

British research points to dips in student performance during Years 3 and 4 and Year 7. Schagen and Kerr (1999) showed that the first of the dips follows the transfer of pupils from the Junior School to primary while the second dip occurs in the first year of high school. As Schagen and Kerr point out, although the regression is sometimes attributed to the failure of secondary teachers to build on what has already been taught by their primary counterparts, this claim is weakened by the fact that in some studies, the tests demonstrating a fall in performance were administered very soon after transfer. Galton, Gray and Rudduck (1999) showed that for

students transferring from primary to secondary school, two out of five students fail to make expected progress the year immediately following the change of school. However, they also showed that pupils lose ground at the point of school transfer and transition (moving up a year level), suggesting that the phenomenon may be triggered by a break in the continuity of schooling without necessarily requiring the upheaval of changing schools. This view is consistent with US research which shows that children tend to regress following the long summer holidays, whether or not they have changed schools in the interim (Cooper, Nye, Charlton, Lindsay & Greathouse, 1996).

Hill et al. (1993) analysed performance data in English and mathematics, collected from students in 90 schools in the Preparatory Year, and Years 2,4,7 and 9. The graphs of the English profiles in reading, writing and spoken language indicated a period of rapid growth during the early years of schooling, after which the rate flattened somewhat. The range of achievement was shown to widen markedly over each year of schooling. Further, the trajectory for students at the 10th percentile shows minimal improvement between Years 4 to 9. The authors note that the graphs also indicate a discontinuity between primary and secondary schooling for reading and spoken language, with a dip in the rate of progress of students in their first year of high school. The picture for mathematics displayed a similar increasing spread in achievement of the same proportion by Year 9, though not the disturbing dip for the students at or below the 10th percentile.

Sub-group trajectories

There is a tendency to consider academic progress as a linear, uninterrupted continuum with a steady gradient and with signposts that correspond with the year of schooling. Some students may travel along it faster than others, some may not travel the full distance, but most should complete the journey within 12 years. However, this may well be an oversimplification, and the gradient may vary considerably at different stages and for different groups of students.

In fact, researchers have shown that changes in middle childhood can strongly affect later adult success in life, often outweighing the effects of cognitive development that occurred prior to school attendance. It is during 'middle' childhood that children need to learn how to use their intellects in the interests of becoming active and responsible citizens (Feinstein & Brynner, 2004).

Feinstein (2003) found in a study of 1292 children that social background is a more powerful predictor of educational outcomes by age 10, than attainment of children at 22 months. Children from high socio-economic backgrounds, who performed relatively poorly on a test of cognitive ability at age 22 months, quickly caught up with children from low socio-economic backgrounds who at an earlier age had performed at a much higher level.

These findings suggest that the Matthew effect is more complex than so far described. For example, it appears to play out differently for children according to their socio-economic background.

Feinstein's (2003) work suggests that of those students from low socio-economic status backgrounds who make a poor start to school, few are likely to make up lost ground. This is not the case for students from high SES backgrounds who score relatively poorly on developmental tests administered at 22 months. They are much more likely to overtake their low SES peers by age 10. The trajectories of these two groups are heading in different directions. The extent to which the classroom behaviour of these students has shaped their trajectories remains an open question.

Individual student trajectories

Quantitative research on academic progress mainly describes average trends for the overall sample or subgroups within it. These trends are usually expressed as mean differences or gradients or displayed as box-and-whisker graphs. In estimating the rate of growth, the statistical procedures establish regression or trend lines that best fit the distribution of scores. In such studies there is always a tension between reporting the average trend and reporting exceptions to it. Since the aim of most research studies is to reach conclusions about general trends, usually this interest overshadows any interest in exceptions to the general trend. Outliers in distributions are often treated as error. Furthermore, the application of powerful statistical methods requires large samples, a feature that discourages the inspection of the progress of individual cases.

Seltzer, Choi and Thum (2003) used data from several schools that took part in the American Study of American Youth to investigate models of growth. To illustrate their modelling, they show distributions of mathematics achievement trajectories for individual students across Grades 7 to 10 in a US high school. The figure is a blur of overlapping lines:

to fit a single best fit growth trajectory to this data set would obscure obvious patterns of individual differences. Seltzer et al. (2003) argue that by exclusively focusing on overall trends, studies are at risk of failing to recognise significant differences in the trajectories of subgroups. They show, for example, that among students with relatively high initial status, rates of progress tended to be more rapid for boys than girls. This perspective is important for the Pipeline Study since it allows that differences in academic rates of progress might also be related to classroom behaviour patterns of students.

Gray, Schagen and Charles (2004) make this point convincingly. They collected assessment data from 315 schools from Years 2 to 6 for reading and mathematics. Students were awarded age-standardised scores and national curriculum levels and grades. From these data they constructed a composite score that indicated progress across the year levels on a standard scale. Graphs of the scores for the total sample showed relatively smooth progress and a degree of accelerated progress across Years 5 and 6, the final two years of primary school. The graphs for five randomly selected students on each subject show considerable variability in their rates of growth. Not only were there differences among the students but each student demonstrated a variability over the years.

Clearly, the notion of a steady, linear academic growth trajectory from kindergarten to Year 12 is an over-simplification. However, the body of work on dips and peaks, on cognitive growth, and on variation in academic trajectories, is quite limited. Therefore, it is not possible to conclude what causes the deviations from the regular, equi-stepped progression; however, it does invite speculation. To what extent might student patterns of classroom behaviour contribute to the patterns?

What produces the academic progress patterns?

Behavioural explanations

In general, student externalising behaviour disorders, especially aggressiveness, hyperactivity, delinquency and antisocial behaviour, are negatively related to school academic performance. This is a well established relationship (Ainley & Fleming, 2003; Rowe & Rowe, 1999, 19TT; McGee et al., 1988; Entwisle & Horsey, 1997; Williams & McGee, 1993; Ensminger & Slusarcick, 1992; McKinney, 1989; and Schonfeld, et al., 1988).

However, Zubrick et al. (1997) found that not all mental health problems are associated with lower school performance. While students with social and attention problems tended to indicate relatively lower academic competence, students with anxiety/depression morbidities tended to display above average academic competence. They observe that some levels of anxiety are undoubtedly associated with higher levels of performance, though good school performance may also mask unseen or unacknowledged levels of depression.

If conduct disorders are related to academic achievement, could the onset or changes in the prevalence of these behaviours account for the dips and peaks in the performance trajectories? There has been a growing body of work on the behaviour trajectories of students with conduct disorders.

A number of researchers have conducted longitudinal studies of anti-social behaviour of young children, tracking them from the pre-school years into their primary school years (Shaw et al., 2003; Tremblay et al., 1994; Campbell, 1994; Williams & McGee, 1994; Farrington et al., 1990; and Richman et al., 1982). Although these studies tend to show an overall decline in incidence over time, for a substantial proportion of those identified with severe levels of anti-social behaviour, their behaviour persists or worsens. These findings do not tally with the academic performance data of reading and mathematics progress which show a sharp growth in the early years and a tapering of growth around Year 3.

On the other hand, the onset of adolescence can clearly be a turning point in the academic progress of students. Moffit (1993) has shown a massive growth in the prevalence of delinquent behaviour in boys coinciding with the beginning of their adolescent years. Studies of student wellbeing show around these years a corresponding deterioration of attitude towards school. There are more reported cases of serious student misconduct from students in lower secondary than in other years. On the basis of this evidence, the argument that student behaviour contributes to a dip in performance is more tenable in lower secondary years than for other year levels.

Emotional development

In addition to the development of cognitive abilities, emotional development may also be a factor explaining changes in a student's classroom behaviour. Reference has already been made to Moffitt's finding that there is a significant increase in the delinquent behaviour of

boys during adolescence. The coincidence of the onset of adolescence with the upper years of primary school and start of high school has been a factor prompting an interest in reforms to the middle years of schooling (Arbuckle & Little, 2004). Rudduck et al. (2003) observe that once students have established anti-work identities, they are resistant to change. It is better to intervene in the earlier years than to wait until the secondary years. The students include not only the individually disengaged whose disruptive behaviours led their peers to reject them, but also students who are 'collaboratively disengaged', who are noisy and extroverted and who place little value on schoolwork.

Curriculum

While developmental assessment has obvious strengths, it also has weaknesses. The approach, which has been applied from kindergarten to Year 12, is pushing Piagetian theory beyond its limits. The notion of developmental stages, in any Piagetian sense, hardly applies to students in the upper years of high school. Further, the achievement levels that ought be reached by typical students in any year level, are arbitrary to a considerable extent. The assessment system is essentially empirical. The key question is whether it can provide an accurate estimate of a student's achievement over a stipulated period of time, that is, produce reliable trajectories.

Forster (2004) points out that the answer to this question depends on the design of the curriculum. If the learning experiences are chosen and structured to reflect an increasing conceptual demand, then the notion of a developmental continuum probably applies. If however, the author notes, there is no clear development but instead an accumulation of knowledge from different and related areas of course content, an assessment device that assumes conceptual growth would most likely be inappropriate.

Analysing the Western Australian assessment program Monitoring Standards in Education, Forster (2004) observed that growth varies not only within learning areas but also between learning areas. For example, she found that there to be substantially more growth in music (two levels of the framework, on average, between Years 7 and 10), the visual arts, and LOTE (both no more than one level) than in Technology and Enterprise where almost no growth occurs.

Pedagogy

Teachers vary in their capacity to engage the students and keep them on task. Principals often assign teachers and students to classes prior to the start of the year, based on their assessment of teachers' ability in managing student behaviour. Hence, students might behave quite differently in one class than in another. Individual teachers can also behave quite differently, sometimes unconsciously, towards students in the same class. Even the appearance of a student can shape how the teacher responds. Dion (1972) showed that severe misbehaviour of an 'unattractive' child was regarded as evidence of a chronic anti-social disposition, while similar behaviour from an 'attractive' child was regarded as a temporary aberration. Skinner and Belmont (1993) found that teachers were more involved with students who were behaviourally engaged and responded negatively towards students who were passive. Georgiou, Christou, Stavrinides and Panaoura (2002) found that teachers responded more positively to students if they were perceived to be making an effort. They concluded that the behaviour of some students led the teachers to write them off, or to put it more kindly, re-invest their effort in those students who they feel are deserving of it.

The use of appropriate pedagogies is also thought to be an explanatory factor. In its annual reports of standards in British schools, the Chief Inspector published the assessment by inspectors of the quality of teaching at each year level. These figures are based on ratings of teachers. The figures showing the distribution of ratings for each year showed a dip in the quality of teaching in Years 3 and 4 and another dip around Years 8 and 9 (Ofsted, 1999). Interviews of pupils conducted by Doddington et al., (2001) lend weight to the Ofsted findings. They suggest that the dips are real due to a complex array of factors, student disenchantment with school being a major factor.

Causal relationships

While correlation studies are able to shed some light on how behaviour influences school performance, they are unable to address the issue of causation. For example, does inattentiveness explain why a student has been unable to become a proficient reader, or has the student's inability to master the reading tasks set by the teacher led to inattentiveness?

In this simple example only two variables are considered: attentiveness and reading performance. However, it is conceivable that a child's inattentiveness and reading performance are each influenced by other factors such as absenteeism, tiredness, or dislike of school.

Rutter et al. (1970) have sought to explicate the problem of causation by posing four hypotheses:

- Does antisocial behaviour produce reading difficulties?
- Does reading disability produce antisocial behaviour?
- Are both antisocial behaviour and reading disability produced by a third factor?
- Could various combinations of these hypotheses be partly true?

Unless these 'other factors' are taken into account, or their effects are nullified through an experimental design, the likely causal relationships cannot be unravelled. Genuine experiments are rarely conducted in educational research because they require the random assignment of students to treatment groups and strict control of other factors that could influence the variables of interest. For ethical and administrative reasons it is seldom possible to interrupt the day-to-day instructional program of schools and impose the experimental requirements.

Longitudinal studies measuring a large number of variables on large samples of students constitute a second-best approach. While inferior to true experiments, longitudinal studies are able to show trends and can take into account other influences, if they are able to be measured and incorporated into the research design. Several extant longitudinal studies have sought to establish the causal relationship between student behaviour and academic success.

Williams and McGee (1994) in their longitudinal study of New Zealand students found that poor reading leads to a pattern of early antisocial behaviour at school. This is supported by the earlier work of McGee et al. (1988). Williams and McGee's (1994) structural equation modelling showed that the early antisocial behaviour was associated with 'oppositional' behaviour in preadolescence. Further, antisocial behaviour problems at age 9 predicted poorer reading at age 15. By adolescence, reading disabled boys were more likely to show conduct disorder. However, for most young boys and girls, early academic failure did not appear to be directly related to later offending. Williams and McGee (1994) concluded:

There was no direct predictive association between the latent variable for literacy and that for delinquency. The roots of delinquency appear to be found in earlier antisocial behaviour problems, particularly for boys, and in background disadvantage. Early disadvantage predisposes the child to both poor reading and antisocial behaviour, while later disadvantage is predictive of delinquency. (p. 455)

Audas and Willms (2001) note that 'although aggressive behaviour in children as young as five is an excellent predictor of early school leaving, a number of other factors which are positively associated with aggressive behaviour in children are also associated with early school leaving. The high level of colinearity (inter-correlation) among these variables makes the identification of "pure" influences extremely difficult' (p.2).

In summary, the issue of whether student behaviour explains academic success, or vice versa, remains vexed. Nearly forty years ago, Rutter et al. (1970) tentatively concluded that it was unlikely that antisocial behaviour caused the reading failure. Rather, it was more likely that reading failure led to the antisocial behaviour or at least was a contributing factor. Not much more can be concluded today.

It may well be the case that the relationship between behaviour and performance is reflexive: that is, the behaviour of students tends to deteriorate if they consistently fail to understand and succeed at the tasks assigned to them. This failure, in turn, produces a further decline in their attitude to learning and performance during subsequent attempts.

Conclusion

Much of the work that has tracked the behaviour of students and their success at schools has been conducted under a mental health paradigm, with attention being directed mainly towards children who are violent, aggressive or 'antisocial' or who exhibit 'conduct disorders' such as ADHD. The anti-social behaviour is thought to be a precursor to 'delinquency', that is, offending behaviour and eventual involvement with the criminal justice system.

The most commonly reported behaviour linked with student academic progress is attentiveness. This is probably due to the almost axiomatic precondition that academic learning

of complex skills and tasks requires attentiveness and engagement. It may also be due to the seemingly increasing prevalence of ADHD and the explosion of interest in the phenomenon, as well as the availability of measurement instruments. All the evidence points to a positive relationship between attentiveness and student performance. This will come as no surprise to practising teachers.

Although some mental health studies investigate the literacy levels of subjects, the interests of the researchers in literacy tend to be more technical than educational – literacy levels are regarded as a useful predictor variable rather than an outcome variable in their own right. Educational studies of academic progress tend to have stronger measures of academic performance but more limited measures of student behaviour than that of mental health research. None of the studies reviewed has attempted to examine the relationship between academic progress and student achievement from the perspective adopted by the Pipeline Project.

An overtone of determinism exists in the education literature, suggesting that there is not much that teachers can do to turn around the prospects of students who are badly behaved and performing poorly in their first few years of school. This is understandable for two reasons. First, when student conduct problems are defined in psychopathological terms, and the classroom behaviour problem is constructed as a psychosis, by definition the solutions reside with mental health experts, not teachers. Second, when the roots of many behaviour problems plainly reside in the home background of children, and when schools are overtaxed with the demands of face-to-face teaching, and when there is no valuing of what they do by the parents or the children, then these conditions contribute to a sense of hopelessness.

Is the die of educational success cast by the time children complete their first year of school? Examinations of aggregated assessment results would suggest that this is the case. However, the literature also suggests that there are exceptions to this general rule. Some children grow out of antisocial and aggressive behaviour patterns that they first demonstrate on arrival at school. In other cases, problems persist, and for some the problem behaviours worsen, leading to delinquent and criminal activity during adolescence and adulthood.

Do those students who fail to grasp fundamental language and computational skills during the early years recover? Again, the answer is that some do and some don't. There are signs that academic progress through school is not a simple growth continuum but a pathway with a varying gradient and gateways along the way, through which students must pass. Some begin well and fade, whereas others catch on and catch up.

Do the patterns of a student's behaviour as they progress though school correspond with their academic progress? Is negative student behaviour associated with slow or zero academic progress? The answers to these questions must be conditional and tentative because the evidence is simply not at hand. It seems likely, however, that some behaviour problems are more likely to retard academic progress than others, and some, under certain conditions, are more tractable than others.

What is most striking in the literature is the paucity of recognition as to how the teacher might have changed the academic trajectory of difficult-to-teach students for the better – in both behavioural and academic learning terms. This is partly the result of the statistical methods employed in research into student behaviour and learning – they have focused on general trends rather than exceptional cases.

Both the theory and methodology for studying trajectories of classroom behaviour and academic progress are limited. Most theories of academic progress assume that the development continua describing students academic progression are smooth and linear. Yet longitudinal studies of student performance show dips, peaks and plateaus. Without a strong theoretical foundation, it is difficult to assess whether the deviations are assessment aberrations, artefacts of the pedagogy and curriculum, or valid indicators of the cognitive development of the cohort at that particular stage of their schooling. Further, most studies of academic progress require large sample sizes in order to attribute cause and effect; they therefore pay little attention to trajectories of individual students.

Thus there is a gap in the literature that needs to be filled. More must be revealed about the long-term progress of students with behaviour problems throughout their schooling, and from such knowledge, the circumstances under which students show exceptional rates of progress must be documented.

3. Productive and unproductive classroom behaviour

Introduction

The aims of this chapter are to explain what is meant by the terms 'productive' and 'unproductive' classroom behaviour, each key constructs in the Pipeline Project, and to describe how unproductive behaviour was measured. These constructs were developed for the Pipeline Project and therefore do not appear in the educational research literature.

Behaviours that enable or impede learning

Behavioural disorders

When mental health researchers write about a behavioural problem, they are usually referring to a pattern of behaviour that has a specific medical definition: for example, 'delinquency' means what is precisely stated about the topic in the Diagnostic and Statistical Manual of Mental Disorders (DSM), even though the term may have a variety of colloquial meanings.

Most 'normal' children occasionally exhibit some of the behaviours that indicate a mental health problem (usually referred to as a 'morbidity" or 'disorder'). For example, children are typically inattentive when they are tired or bored. However, persistent inattentiveness can be disabling and under certain circumstances might be indicative of a disorder of some kind.

In epidemiological studies of child health, researchers use checklists to screen samples of children and adolescents for mental health problems. A mental health problem is only indicated if ratings of the child's behaviour on a standardised checklist are aggregated and the total score exceeds a specified cut-off point on the instrument's norms.

Various instruments have been used to measure child and adolescent conduct problems; for example, the 'Child Behavior Checklist', the Rutter scales, and the 'Social Behavior Questionnaire'.

Probably the most frequently cited instrument is the "Child Behaviour Checklist" (CBCL), developed by Thomas Achenbach (Achenbach, 1991). It identifies eight behavioural syndromes: withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behaviour and aggressive behaviour. The CBCL contains 118 items to be rated on a three-point scale. The scales have been normed on random samples. Thus a child can be scored on each syndrome with the score indicating whether the child is in the normal, borderline or clinical range. Children who score at or above the 98th percentile are diagnosed as having a clinical problem. Different forms have been produced for completion by parents, teachers, and for self-reporting, and the scales are updated to take account of the growing body of mental health research.[3]

The mental health literature frequently employs the term 'conduct problems'. This term usually implies antisocial behaviour of varying kinds and degrees of severity. Children who exhibit conduct problems are therefore likely to be disruptive, oppositional or aggressive.

It should be noted that some researchers have chosen to investigate the underlying 'neuropsychological deficits' that make it difficult for individuals to function 'normally' rather than the observed conduct problem per se. One such example is 'fearlessness' (Shaw et al., 2003). In this example, the conduct problem may be reckless, disorderly behaviour displayed because the child is unafraid (or fearless) of the consequences.

---

[3] See, for example, Achenbach's website on http://www.aseba.org/

Unproductive classroom behaviour

Classroom teachers share with mental health researchers a special interest in behaviour that threatens the safety of the child, the child's peers, or a teacher. Teachers have a duty of care that is of paramount importance.

They also have a pastoral concern for students who, while not being threatening or challenging, may have a serious mental health problem: for example, a form of psychosis, chronic depression, or eating disorder. Students showing signs of such disorders would normally be referred to a school psychologist and, if the symptoms were verified, be placed under the care of a medical practitioner.

However, teachers must attend to the behaviours of students who are not usually of interest to mental health experts. These are behaviours that 'normal' students may display if they are bored, tired, physically unwell, or unhappy. Sometimes such students are 'aggressive', 'delinquent' or 'inattentive' in displays that correspond with descriptions in the mental health textbooks, but generally, with a competent teacher, they comply with the class norms. In other cases, the behaviours are 'internalising', and the students appear inattentive and unmotivated, willing to comply to a degree, but generally 'switched off' and merely 'going through the motions' in order to deflect the teacher's attention and keep out of trouble.

In the Pipeline Project these behaviours have been called 'unproductive' behaviours because they militate against academic learning. In some cases, the link between the behaviour and learning is self-evident. If the student is absent from class when a complex construct is taught, unless the student is able and motivated independently to learn the construct, then the student will have an incomplete understanding of important subject matter. The student absence may not be evidence of a conduct problem, nor of alienation from school – the absence may be outside the student's control. However the consequences for learning are the same: an absence is an absence.

There are some overlaps, nevertheless, between the focus of the Pipeline Project and the mental health literature. In broad terms, aggressive, delinquent and antisocial behaviour are of interest, although teachers must work with students who cover the full range – not only the extreme cases that fall into the 2 to 3 per cent who are diagnosed in DSM terms as clinically deviant. Attention is another point of overlap. It is

not only self-evident that if a person is to learn from another how to accomplish a task, then attending to the instruction is critical. Strong empirical research evidence confirms this to be the case. However, inattentiveness may not necessarily be indicative of a mental health problem, such as ADHD.

Motivating and enabling students to engage with the learning activities is a constant challenge for teachers. A single, disruptive student can throw a whole lesson into disarray. Other students can be distracted, time is wasted, and the intended outcomes of the lesson undermined. However, passive, unthreatening behaviour can also impede learning because successful understanding and mastery of concepts and skills often takes concentration and persistent effort.

While it may be useful to distinguish between externalising and internalising behaviours in order to describe the behaviour of students, the distinction does not necessarily imply that the one is of more educational significance than the other. While teachers may be put under more pressure by students who act out or externalise their feelings than by students who withdraw, each in different ways may have an impact on the student's academic progress. A more appropriate distinction, from an educational point of view, is between productive and unproductive behaviours, that is, those behaviours that enable or impede learning.

The categories of unproductive behaviour

Ten categories of unproductive behaviour were generated by analysing descriptions of student behaviour in the literature, and by drawing on accounts of teachers' interactions with students in classroom settings. As far as possible the categories were intended to be mutually exclusive of each other, so that it was conceivable that a student might display one category of behaviour and not another. On the other hand, some students might display all ten. The categories are shown in Table 3.1.

Some of the category headings in the schema of unproductive behaviour correspond with those of DSM-listed disorders, including ADHD and several conduct disorders. Students who are inattentive, impulsive or aggressive during class are clearly being educationally unproductive. However, the intention of the categorisations, as pointed out earlier, is not to diagnose a deep-seated condition but to name what the student is doing that will undermine learning, in particular, academic

learning in classrooms. Hence, failure to complete homework may have nothing to do with a mental disorder but instead be explained by a preference for watching television or pursuing some other activity. While persistent demonstrations of an unproductive behaviour may indicate a habituated pattern, habituated behaviour is not necessarily indicative of a psychiatric disorder. Students can have productive and unproductive habits.

Table 3.1: Unproductive student classroom behaviours

Category	Examples of behaviour
	The student…
Aggressive	• physically or verbally threatens you and/or other students • loses temper and abuses you/and or other students • physically and verbally bullies you/and or other students
Non-compliant	• refuses to follow class rules • questions instructions – challenges you • talks back and is argumentative
Disruptive	• calls out to you and other students • seeks attention • provokes others
Inattentive	• is easily distracted • looks for distractions • does not appear to concentrate
Erratic	• has unpredictable mood swings • appears at times in an altered state • displays outbursts of emotion
Impulsive	• does not wait for turn • appears to act without thinking of the consequences • begins without seeming to understand the activity
Unmotivated	• does not try to finish assigned tasks • makes minimal effort to get things right • gives up quickly on demanding tasks
Unresponsive	• appears vague • does not participate in class activities • does not join in group work
Unprepared	• does not bring equipment to class • loses work • rarely completes homework
Irregular attendance	• comes late • misses lessons • misses days or weeks of school

Hence, a student who is consistently late, fails to bring the appropriate materials to class, seldom satisfactorily completes the assigned homework, does not pay attention, is slow to follow instructions, makes a half-hearted effort, gives up quickly, teases other students, and 'shows off' at inappropriate times, is clearly demonstrating unproductive behaviour. Although some of the symptoms may suggest a mental health problem, there would be many students who fit this stereotype yet fall well short of any clinical criterion of mental illness. Teachers might say that these are simply the behaviours of students who are alienated from school. Unproductive behaviours may be just as deleterious to academic progress of the student as the syndromes described in the DSM.

Just as clinicians have therapies to moderate mental health morbidities, teachers have strategies to manage unproductive behaviours. These do not exclude the participation of clinical or school psychological services, but they become an adjunct or last resort rather than the centrepiece. By adopting an unproductive behaviour construct rather than one of abnormal behaviour, the reference point changes from the clinic to the classroom. It is a deep shift, since it replaces the aetiology of mental illness with that of academic failure. There is less interest in whether the student is a gang member, shoplifts, gambles, or smokes, since these behaviours are only circuitously linked to whether the student is engaged with what is being taught in class during regular school hours.

The measurement of productive and unproductive behaviour

Unproductive behaviour and academic engagement

Unproductive behaviour is not a synonym for disengagement. As indicated in Chapter 1, disengagement has a conative dimension; what students feel about academic work can only be inferred from their behaviour. A useful parallel has already mentioned in the mental health research on child behaviour. Fearlessness was conceptualised by Shaw et al. (2003) as an underlying emotional state producing disruptive, disordered behaviour.

Consider, as an example, the relationship between aggressive classroom behaviour and engagement. In the Pipeline Project three cues were given to teachers to help

them categorise aggressive behaviour (refer to Table 3.1). A student was defined as being aggressive if he or she physically or verbally threatened the teacher and/or other students, if the student lost his or her temper and abused the teacher and/or other students, or if the student physically and verbally bullied the teacher and/or other students. These behaviours do not necessarily imply that the students who exhibit them are chronically disengaged. It is possible that those who tend to behave in any of these ways consistently during the school year, may calm down after each episode and participate in class work. It is therefore unwise to automatically infer disengagement from indications of aggressive behaviour.

By way of contrast, consider the category of unmotivated behaviour. Lack of motivation was indicated by students who did not try to finish assigned tasks, who made minimal effort to get things right, or who gave up quickly on demanding tasks. While it is conceivable that unwillingness to make the effort was not always be the dominant reason for students failing to finish assigned tasks, teachers were able to make reasonable inferences, based on months of observation and interaction with them, as to whether they lacked motivation and were fundamentally disengaged with schoolwork. Thus, this category of behaviour can be used as a proxy for disengagement.

At one level, it can be argued that all unproductive behaviours are indicative of disengagement, because if they interrupt the learning process, they will reduce the 'educational productivity' that should be occurring. The relationship is in this sense tautological. On the other hand, some of the categories are more obviously indicative of disengagement than others. Absenteeism, for whatever reason, constitutes absolute disengagement if the student makes no effort to complete schoolwork. Students who are erratic are by definition not on-task for some of the time and are disengaged. Inattentiveness is clearly indicative of disengagement. So is unresponsiveness.

While the categories of behaviour were not selected because they did, or did not, imply disengagement, it is possible to classify them as indicative of disengagement to a greater or lesser extent on this post hoc basis.

The student behaviour checklist

For practical reasons, it was important to design an instrument that would reliably identify students whose behaviour was unproductive within minimal time limits for the participating teachers. It was also important that the nature of the unproductive behaviour was disclosed as fully as possible. Hence the checklist required teachers to make only ten categorical judgments about each student.

To assist teachers to make consistent and informed judgments, a list of 30 descriptive behaviours was produced, with three anecdotal examples for each behaviour category. The examples are shown in Table 3.1. Teachers were encouraged to refer to the list of examples if they were unsure what was meant by a term, such as impulsive behaviour.

The list of students for whom consent had been given was printed on a spreadsheet and the teacher systematically considered each student according to each of the behaviour categories. Teachers completed the checklist in the presence of a research team member. This meant that any uncertainties on the part of the teacher could be referred to the researcher for clarification.

In completing the checklist, teachers provided a categorical 'Yes' or 'No' answer in response to the instruction, 'Please indicate with a tick which (if any) of the following categories of unproductive classroom behaviours are exhibited by each student. A tick should be recorded if you believe these behaviours are impeding the academic progress of the student or other students in their class'. Teachers refer to the examples during the process of making judgments about the student's behaviour. The complete checklist, with instructions and supporting materials, is shown in Appendix 1.

Measuring the impact of the unproductive behaviour

When completing the Student Behaviour Questionnaire early in the school year, teachers were asked to report whether the student exhibited any of the ten categories of unproductive behaviour. As it was relatively early in the school year, teachers were not asked to judge the impact of the behaviour on the student's academic progress.

Later in the year, if students were continuing to behave unproductively, teachers were asked to make a global judgment concerning the impact of the behaviour. The behaviour of students was rated according to the extent that it restricted their academic progress. Hence, the behaviour of each student was described twice each year using different protocols. The survey instrument is shown in Appendix 2.

It should be noted that in this second data collection teachers were rating the impact of the behaviour on learning rather than the frequency with which the teacher observed the behaviour. A teacher might have judged that a frequently occurring behaviour was not having a significant impact on the student's academic progress.

Validation of student behaviour checklist

Reliability trial

In June 2007, 21 teachers from five primary schools and one high school completed the checklist describing the behaviour of children in their classes as part of the scheduled data collection. In addition, two weeks later this sub-group of teachers completed an extended version of the checklist, where each child was rated on a five-point scale according to 30 statements describing unproductive behaviour – three for each of the ten categories. Teachers rated the frequency of each student's behaviour for each statement on a five-point scale according to the rubric 'never', 'hardly ever', 'occasionally', 'quite often' and 'frequently'.

This exercise produced two sets of data describing the behaviour of 350 students from six schools, reported by 21 teachers: the standard checklist data routinely collected as part of the 2007 data collection and the data derived from the extended form of the checklist for which each teacher rated students according to the 30 behaviours.

Consistency of judgments

In determining the consistency with which teachers were able to make their judgments, the most basic test would be to determine how many students were reported as exhibiting unproductive behaviour on one category of the 10-item scale, and were also rated as exhibiting the behaviour at least 'occasionally' on one of the three items on the 30-item scale. Clearly, if a student were reported as displaying an unproductive behaviour on one of the checklists and not at all on the other, then the result would be problematic from a reliability perspective.

There are two kinds of potential errors of classification: falsely classifying a student as exhibiting unproductive behaviour (false positive classifications), and failing to classify a student when a classification is warranted (false negative classifications).

If the 30-item checklist is considered to be the 'criterion test' as it is longer and allows more qualified judgments, what can be inferred about the accuracy of the classifications made by teachers on the 10-item checklist?

Table 3.2 depicts a high level of correspondence between students reported to be behaving unproductively on the 10-item checklist and the frequency of their unproductive behaviour approximately two weeks later. For example, of the nine students whom teachers considered their aggressive behaviour to be restricting their academic progress, all were reported several weeks later by the same teachers to be showing aggressive behaviour on at least some occasions. Across all categories, 17 instances were reported of students behaving unproductively on the first occasion, but who were not reported to be exhibiting similar behaviour on the second. Overall, 95 per cent of students who were reported as behaving unproductively on the Student Behaviour Checklist were also described as exhibiting unproductive behaviours on at least some occasions on the 30-item checklist.

Table 3.2: Correspondence of reporting of unproductive student behaviour on the 10-item and 30-item checklists (n = 318)

Behaviour	10 item checklist	30 item checklist	
	Number identified	Number corroborated*	Number additionally identified#
Aggressive	9	9	3
Non-compliant	22	20	14
Disruptive	35	33	17
Inattentive	67	67	37
Erratic	16	16	11
Impulsive	30	30	19
Unmotivated	46	43	28
Unresponsive	29	24	18
Unprepared	33	31	25
Irregular attendance	24	21	6

* Number reported to be unproductive on the 10-item checklist and who were later reported on the 30-item checklist to be showing the behaviour on at least some occasions according to the 30-item questionnaire.

Number reported as productive on the 10-item checklist but who were later reported to quite often or frequently exhibit the behaviours contained in the 30-item checklist.

However, the results also suggested that the 10-item checklist might have underestimated the level of unproductive behaviour. This is because the 30-item checklist identified students who frequently or quite often behaved in ways that described unproductive behaviour. There were 188 instances where a student was not identified as behaving unproductively on the 10-item checklist, but where the students were reported to quite often or frequently behave in terms of one or more of the items in the 30-item checklist.

The discrepancy can be partly explained by teacher inconsistency. The 30-item questionnaire required teachers to rate the behaviour on a five-point scale, rather than to make a dichotomous judgment. This difference may account for some of the variation.

It is also the case that the scale on the 30-item checklist was based on the frequency of the behaviour, whereas on the 10-item checklist, teachers were judging whether the behaviour was unproductive or not. Reporting the frequency of a behaviour requires a different kind of judgment than when determining whether to classify a student's behaviour as productive or unproductive. Teachers would weigh up all kinds of considerations before deciding whether the behaviour should be considered either productive or unproductive. This conclusion was supported in follow-up interviews with teachers, as described below.

Teacher interviews

Twenty-one teachers were contacted and interviewed in cases where the results for a student on the two instruments were discrepant. The interviews revealed that teachers had a deep knowledge of the students and their families. A common explanation of the discrepancies was that the student's behaviour had changed during the interval between the administration of the checklists.

In a small number of cases, teachers acknowledged that they had made an error of judgment and in hindsight would have classified the behaviour differently. In this regard, teachers pointed out that there was a greater risk of error in categorising the behaviour of students who were frequently absent from class, or who had recently joined the class.

However, in other cases where there was a discrepancy, teachers explained that although they reported that the behaviour occurred frequently on the 30-item checklist, they had not rated the behaviour as unproductive on the 10-item checklist because they considered it did not interfere with the student's learning. In a few cases the teachers explained that the behaviour of concern to them did not fit easily into the categories that had been provided: for example, a student who had problems coping with change.

Overall, the results suggest that students identified on the 10-item checklist have been correctly identified as unproductive but that teachers have been inclined to err on the conservative side when having to make dichotomous judgments. The interviews verified that the frequency of behaviour and the productivity of the behaviour, are separate but interdependent constructs.

Properties of the checklists

Students also varied according to the number of reported categories of unproductive behaviour. Anecdotal reports from teachers during the data collection process consistently indicated that students with multiple unproductive behaviours had greater difficulties engaging with the instructional activities than most other students. This feedback suggested that the number of behaviours ($0 - 10$) might be used as an unproductive behaviour scale. However, the results of a Rasch analysis of the Student Behaviour Questionnaire showed that the number of unproductive behaviours did not constitute a linear, uni-dimensional scale. For example, it is not possible to conclude that a student who exhibits eight unproductive behaviours is eight times more unproductive than a student who exhibits one. Nor can it be concluded that one form of behaviour necessarily has a greater impact on learning than another.

Conclusion

The notion of describing behaviour as productive or unproductive is a departure from the conventional practice of classifying child and adolescent behaviour. The constructs bring together two concepts that traditionally have been kept separate, namely, behaviour exhibited in classrooms and academic performance. Teachers were asked to make judgments about whether the students exhibited particular forms of behaviour and whether the behaviour was affecting their academic performance. In this respect, the Pipeline Project is breaking new ground.

Teachers are able to use the 10-item Student Behaviour
Checklist to make consistent judgments about student
unproductive behaviour. However, some misclassifications
are likely.

The evidence suggests that teachers are able to make
consistent judgments regarding the behaviour of students
when they use the 10-item Student Behaviour Checklist.
In 95 per cent of cases where a student was classified
as behaving unproductively on the Student Behaviour
Checklist, the same students were described several weeks
later to be exhibiting the same behaviours.

The accuracy with which teachers are able to report
unproductive behaviour is a key issue that will arise in
later chapters, when the relationship between classroom
behaviour and academic progress is examined.

4. The research design and methods

Introduction

This chapter describes the design of the study and the methods that have been applied.

The review of relevant research in Chapters 1 and 2 indicated that patterns of behaviour and performance can change over the course of a student's schooling. Hence, a longitudinal study was required to establish changes in trajectories across year levels.

The chapter also describes the framework that was employed to determine the data that would be collected to map the student trajectories of performance and behaviour and to explain variations that might be found. The methodological approach was primarily quantitative, though qualitative data were also collected.

The sample of schools, teachers and students incorporated into the study is described in some detail. The schools from which the student sample was drawn were selected on the basis of practical as well as theoretical considerations. Not all parents gave their written consent and some students dropped out of the study over the four years for various reasons. Hence, the students did not constitute a random sample of West Australian students.

The approach to the data analysis is discussed. By the end of the study, the project had accumulated measures of a large number of variables from a sample of more than a thousand continuing students.

Finally, the chapter considers some of the assumptions and limitations that arise from longitudinal studies of this scale. In all empirical studies researchers must make compromises, hoping that, on balance, they have not detracted from the validity of the study and the significance of the findings.

The conceptual framework

Student behaviour

It will be evident from the preceding chapters that the Pipeline Project is approaching the topic of child and adolescent behaviour from an educational perspective. The behaviours of interest are those that impede or promote the academic progress of children. The question of whether the behaviour is indicative of a mental health problem is of secondary interest.

In this approach, it assumed that the disposition of students to behave in productive or unproductive ways is not necessarily a fixed condition. Rather, student behaviour can be consciously modified by either the student or by the teacher, or through the ongoing interactions between the two. The art of teaching is, to a significant extent, the art of constructing a set of circumstances that are most likely to engage students with their schoolwork. While teachers may not always meet with success in engaging all students, some students may be more responsive than others. Generally, in most classrooms there is an accommodation between the standards of engagement preferred by the teacher and the actual behaviour of the students. Behaviour is not a constant.

The focus on unproductive behaviour

Although reference is made in the discussion to unproductive and productive behaviour, the focus is deliberately centred on the negative end of that spectrum, namely the unproductive types of behaviour. It is assumed that students who are not behaving unproductively are ipso facto behaving productively.

The study could have adopted a different beginning point by conceptualising the behaviour of students whose behaviour facilitates their academic progress. It is conceivable that if productive behaviour had been adopted as a focus

of the study, the behaviours deduced might have differed somewhat from those included in the Student Behaviour Checklist. For example, such students might typically seek the advice of teachers, stay behind after school for additional tuition, or initiate a discussion with peers or teachers about some curriculum-related matter.

However, for the purposes of classification in this study, students who do not exhibit any of the unproductive categories of behaviour are assumed to behave in ways that are conducive to academic success.

The teacher's perspective

Ideally, an investigation into student behaviour would interview students and take account of their explanations as to why they behave productively or unproductively. For practical reasons, particularly because of the scale of the study, it was not possible to acquire the student perspective. Instead, the study relies on the teachers' reporting of the student behaviour and the teachers' explanations of what had occurred and why it had happened.

In an ideal research context, it would have been preferable to interview students after some behavioural episode and to insert an independent observer into each classroom to corroborate what the teachers were reporting. However, each of these modifications would have introduced new challenges, consumed considerably more resources, and potentially introduced new sources of error.

Ultimately, it was decided that the study would, of necessity, become a study of teachers' reports of student behaviour and the relationship between the reported behaviour and the students' academic progress. There is no student voice in the text.

Factors that operate outside the classroom

The classroom is the principal site of the study. What happens in the playground, the shopping centre mall, or the home is also important, and the consequences may flow into the classroom situation, but for practical purposes they have be 'bracketed' and do not feature in the quantitative analyses that follow. It was possible, however, to interview teachers and principals and acquire anecdotal evidence about the home circumstances of students participating in the study.

It became clear early in the course of the study that primary school teachers had a very detailed knowledge of the home backgrounds of students and would share knowledge that was pertinent to the students' behaviour and performance at staff meetings and lunch breaks. Primary teachers who had knowledge of the students from previous years were also able to share that information. High school teachers were much less able to construct profiles of each student through this means. They often had contact with the students for only several hours per week, and they also tended to focus more upon the subject matter for which they had teaching responsibility.

Inferences of the home backgrounds of students can be made from the Socio-economic Index (SEI). However, the SEI is an aggregated index for the whole school and within any school the students vary considerably in regard to their home background characteristics. Hence, the absence of individual home background information is a limitation, and the study is reliant on teachers' anecdotal observation.

Summary of the framework

The conceptual framework that was employed in the study is summarised in Figure 4.1 below.

The shaded boxes indicate the factors that the Pipeline study took into account. The arrows indicate the possible directions of causal influence. For the shaded boxes, the arrows indicate that the causal influence could operate in all possible directions.

It is recognised that the unshaded boxes contain hypothetical variables that could influence behaviour and progress but they fall outside the scope of this study. The significance of which variables of possible influence were measured, and which were not, will be discussed in a later chapter.

Figure 4.1: Pipeline model for investigating student behaviour and academic progress
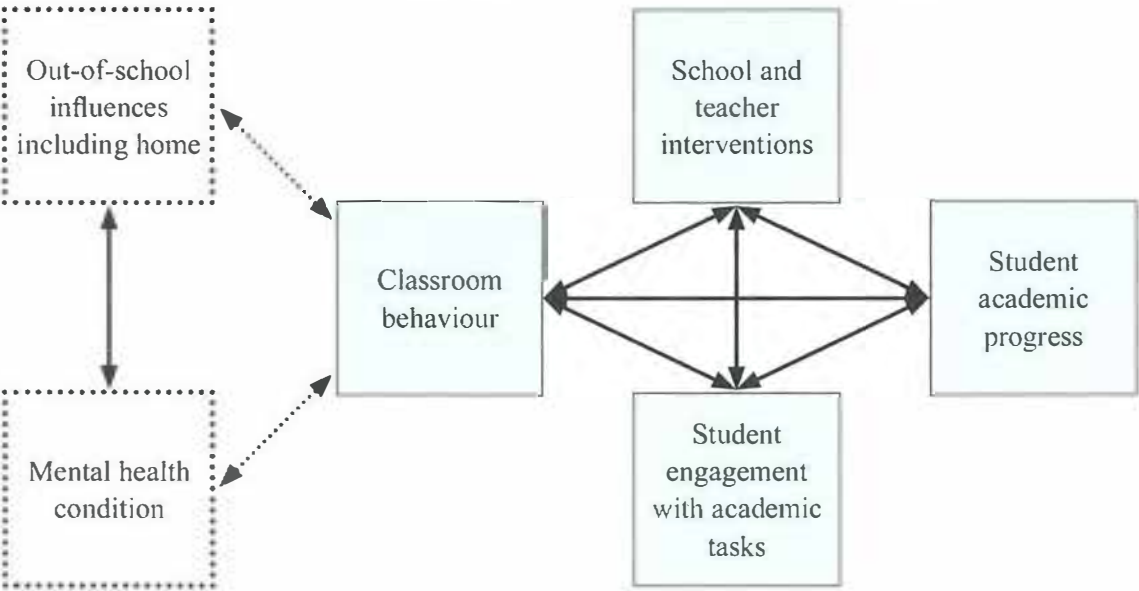
Design of the study

The importance of longitudinal studies in explaining academic progress

The investigation of the Pipeline Project research questions pertaining to growth and development required a longitudinal design.

For practical reasons, a twelve-year study of a cohort of students was considered not to be viable. Instead of a single cohort, four cohorts were designated with a view to tracking the progress of students in each cohort over four years. Thus, by selecting cohorts at Years 2, 4, 6 and 8, and tracking students in each cohort over four years, the study would span Year 2 to Year 11 as shown in Figure 4.2 below. This strategy would yield four sets of trajectories over four-year spans rather than a single set of trajectories over a 10-year span (Years 2 to11).

The decision about the segmentation of the 12 years of schooling was informed partly by the availability of assessment data. All students in the West Australian government school system complete Numeracy and Literacy tests in Years 3, 5, 7 and 9. By selecting the four cohorts commencing at the designated year levels, the research team would be able to examine behaviour and academic progress over four educational/developmental phases: the early years (Years 2 to 5), the pre-adolescent, upper primary phase (Years 4 to 7), the early adolescent phase that incorporates the transition from primary school to

high school (Years 6 to 9) and the lower high school phase (Years 8 to 11). The design is summarised in Figure 4.2.

For reasons of consistency and clarity within this document, the four cohorts will be defined by their initial Pipeline year, and referred to as Year 2 2005, Year 4 2005, Year 6 2005, and Year 8 2005. Thus, for example, a discussion involving Year 9's in 2008 would be prefaced with a definition as the second cohort, or Year 6 2005. This is necessary as it is often desirable to make comparisons both within, and between, the cohorts, and confusions may arise for the reader if this is not made clear.

Figure 4.2: Pipeline research design: the four cohorts
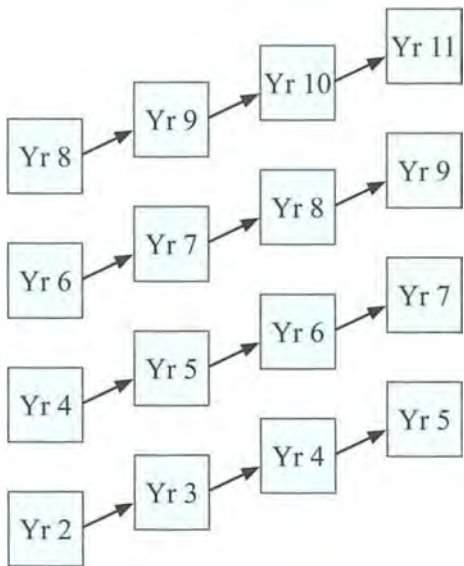
Methods

The Pipeline Project primarily employed quantitative methods to investigate the relationship between academic progress and student behaviour, although qualitative methods were used to illustrate the issues revealed by the quantitative data analyses. Quantitative methods were used to track the progress of cohorts and the different rates of progress of individuals within cohorts. This mapping enabled the study to identify the extent to which students exhibiting unproductive classroom behaviour progress at similar rates compared with other students, and whether they are over-represented in the tail of WALNA tests.

By following the cohorts over four years, it was expected that the study would be able also to establish the proportions of students who 'migrated' in and out of the performance tails. In addition, the tracking of individual students provided evidence about the consistency of the behaviour patterns throughout a four-year segment of schooling.

The study was able to compare the patterns of growth and consistency of behaviour for subgroups of students. Variation among classes, schools and localities (including SES) were analysed. Academic progress and classroom behaviour were examined according to such other student characteristic, as gender and ethnicity. The study also investigated the behaviour patterns for each cohort, examining whether the reported behaviour differed according to the year levels of the students. The rate of academic progress for subgroups of students within year levels was studied. These analyses are intended to provide baseline data rather than test causal hypotheses.

The Pipeline Project was also conducted in six Education Support Centres. Children with a wide range of cognitive, emotional and physical disabilities attend these centres. Some aspects of the Pipeline Project were inappropriate for these children; for example, the measures of student academic progress were not administered to most of the children as the tests were thought by teachers to be too difficult. It was agreed that although the research questions underpinning the study were relevant, it would be better to consider the students in these centres as a special subgroup for analytic purposes. Similarly, it was thought useful to divide the students into primary and secondary cohorts when undertaking the analysis of the data, though the trajectories of students from primary to secondary school is of particular interest.

The study employed qualitative approaches to case study the students whose rate of progress or change of behaviour has been shown to be exceptional. The case studies amplified the information provided on behaviour checklists and the academic assessment instruments. While the caveat of limited causal inference remains pertinent, it was possible to follow up individual students who showed a major shift in their rate of academic progress and make qualified inferences about the factors contributing to the shift.

Teachers were asked to comment on the student and suggest what might have caused the change. Teachers were expected to have an informed understanding of what might have contributed to the academic performance of their students. The study accumulated reports for each student from the teacher and other specialist staff, making it possible to link them to the quantitative behaviour and performance trajectories.

In 2008, four focus group meetings of participating teachers were conducted, at which some of the salient issues that had arisen in the project were opened up for discussion. The proceedings of these meetings were audio-recorded and excerpts have been used in this report to illustrate, in a more nuanced manner, some of the findings emerging from the quantitative analyses.

The study has been a collaborative enterprise with schools and researchers sharing the evidence as it becomes available. Purists may argue correctly that collaboration opens up the possibility that the participating schools will modify what they are doing in the light of the research evidence that becomes available. Such adjustments might have lowered the incidence of reported behaviour problems or might in some other way 'contaminated' the evidence so that the statistics would not be generalisable to other schools. This could have happened: however, it was considered professionally unacceptable to collect data from teachers over a four-year time span without providing them with the opportunity to consider the implications of it for their practice. Conversations about the data with teachers were also a means of generating further data, based on the knowledge of the teachers about the students, and their beliefs about how their practices are impacting on the behaviour of their students.

The sample

Schools

The 31 schools in the project compose four administrative clusters, each including a high school, feeder primary schools and some special education schools or units. All schools and centres in the four clusters, except one, agreed to participate in the study. The exception was a primary school in which the principal believed that staff members were under too much pressure to be involved. There are 21 primary schools, 6 special education centres and 4 high schools in the study.

Schools were selected on a cluster basis in order to capture in the sample as many primary school students as possible who could be expected to transfer to their local high school. This was seen as important for the Year 6 2005 cohort, whose members would graduate from primary school to high school in 2007. A random sample of schools or students would have significantly complicated the tracking. The decision to participate in the project was entirely voluntary. Only one invited school declined to participate.

The schools taking part in the study therefore are not statistically representative of schools in Western Australia. The sample is slightly skewed by the inclusion of a disproportionate number of schools drawing students from lower socio-economic households. This was intentional, as there was evidence that such schools would have larger numbers of students who were difficult to teach, and therefore might find participation in the project more relevant and useful.

The Department of Education and Training calculates the Socio-economic Index (SEI) of the student intake for every school. The SEI is an index of socio-economic disadvantage which is constructed from information about the household in which students live, using data collected by the 2001 census. It has five dimensions: Education, Occupation, Aboriginality, Single-Parent Family, and Family Income. The SEI has a mean of 100 and a standard deviation of 10. Thus an SEI of 110 indicates relative socio-economic advantage and an SEI of 90 connotes relative disadvantage.

In the Pipeline study, the average primary school SEI was 99.3 and ranged from 83.1 to 110.4 with a standard deviation of 7.3. The average SEI for the high schools was 95.2 and ranged from 90.0 to 100.8 with a standard deviation of 4.6.

The teachers

The study involved a large number of classroom teachers who provided information about the behaviour of students. Many of the target students were in classes spanning a single year level. The total number of teachers in the study during 2005 was 230. In some cases, teachers were involved in the project for more than one year, either because they were assigned responsibility for a new class which contained students participating in the Pipeline Project or, because they taught students from a new cohort. By the end of 2008, 421 teachers had taken part in the study.

In participating high schools, the students' English and mathematics teachers completed the checklist. Thus there were two independent sets of data describing the behaviour of students if they attended a high school.

The classroom teachers provided reports on the student behaviour, on two separate occasions, by each completing a checklist interactively with a member of the research team. In addition, 51 teachers participated in extended interviews and focus group meetings.

The students

The target sample of students included all students in the designated schools in Years 2, 4, 6 and 8. According to school records, the target sample numbered 2,686. Because of the nature of the project on unproductive student behaviour, and because a profile of the student was being assembled over four years, written consent was required from the parents or carers of students in these year levels. The approaches to the households were made through the participating school. Of those who returned the consent forms, fewer than 3.7 per cent refused consent. However, a larger proportion did not reply and in spite of several reminders never gave permission. In total, the parents or carers of 69.2 per cent of target students gave their consent.

Table 4.1: Target and actual samples in 2005 by year level and Education Support Centre enrolment

2005 Cohort	Target 2005	Actual 2005	% Attrition
Year 2	764	483	36.8
Year 4	631	507	19.7
Year 6	743	444	40.0
Year 8	445	339	23.8
ESC	103	86	16.5
Total	2686	1859	30.8

This high consent rate was due in large part to the endeavours of school principals and administrative staff who took every opportunity to approach parents or carers when they had occasion to visit the school. Table 4.1 shows the breakdown of target and actual 2005 participants by Year level. 2006 was the only year in which new students were recruited. It was thought that there would be little benefit in recruiting new students during either 2007 or 2008. The influx of 895 students in 2006 partly accounts for the high level of 'missing data' in analyses that require complete data sets for 2005 to 2008.

Table 4.2: Percentage of attrition by year level and Education Support Centre enrolment

2005 Cohort	%Attrition		
	2005-06	2005-07	2005-08
Year 2	14.5	27.7	36.9
Year 4	14.8	20.5	31.0
Year 6	11.0	66.7	71.4
Year 8	13.3	17.1	36.0
ESC	34.9	41.9	57.0
Total	14.5	36.5	44.3

It should also be noted that there was a high level of attrition in the 2005 Year 6 cohort following the graduation of the students from primary school to high school. More than half attended secondary schools other than the government high school associated with their cluster of primary schools. Table 4.2 shows that attrition rate was considerably higher for that cohort than any other in 2007, with 66.7 per cent of the original 2005 cohort having moved to schools that were not participating in the Pipeline Project.

The exclusion of students whose parents did not provide written consent, and the attrition of students over the duration of the project, each raise the possibility of bias.

Evidence that will be described in later chapters suggest that the students who left the lower SEI project schools came from families that opted to send their children to government and non-government schools characterised by stronger academic and behaviour norms: those leaving the Pipeline schools tended to be the higher achievers and better behaved students (see Appendix 3). On the other hand, a relatively small number of students, whose behaviour was exceptionally unproductive, and who came from highly dysfunctional households, were also among those who moved on to other schools These students are more mobile and tend to 'disappear' from the school system. For these reasons it is almost impossible to gauge the net consequence of the attrition.

Measurement and instrumentation

The assessment of academic progress

Typically in epidemiological surveys of child and adolescent health, researchers use IQ tests or off-the-shelf standardised achievement tests. Rutter et al. (1970), for example, measured reading ability and the WISC IQ. Zubrick et al. (1997), in their epidemiological study of a large sample of West Australian school children, used a progressive matrices test to measure the child's non-verbal ability and a word recognition test to measure verbal ability. McGee et al. (1988) used a word recognition test and a prose reading test to measure reading ability.

Tests of IQ and ability have lost favour in educational research on academic progress, since researchers usually want to find out the extent to which students have mastered what has been taught to them while at school. Hence, whatever the merits of most epidemiological studies in measuring changes in behaviour, they are ill-suited to measure academic progress because of the types of assessment instrument employed.

General aptitude or achievement tests were devised with relatively stable traits in mind. Further, they were designed to discriminate among strong and weak performers rather than estimating what a child learned in the interval between testing occasions.

New developments in measurement theory and practice, especially Item Response Theory and Rasch measurement modelling, now enable researchers to devise curriculum specific tests for different year levels, to use shared items to link the tests, and to map the performance of each student from multiple year levels onto a continuum that represents the underlying trait being measured.

The WALNA and NAPLAN assessments

The West Australian Literacy and Numeracy Assessment (WALNA) is an assessment program that tests students' knowledge in numeracy, reading, spelling and writing. The tests were until very recently administered to all students in Years 3, 5 and 7 in West Australian government schools. The tests were also voluntarily administered to students in non-government schools. Students sat the tests in the second term of the year and the results were marked externally. The program had been operating since 1998.

The tests were designed to assess whether students have met minimum national standards expected of Years 3, 5 and 7 students, known as the benchmark standards. The standards were defined by a national panel of experts.

In this report the terms 'mathematics' and 'numeracy' are used interchangeably. The WALNA Mathematics test is referred to in DET material as a measure of numeracy. The terms 'reading' and 'literacy' are also used interchangeably. The WALNA Reading test result has been adopted as an indicator of literacy performance in this study, even though the WALNA program also assessed writing and spelling. This decision was made because of advice that the WALNA Reading assessment instrument was more reliable than the instruments used to measure writing and spelling.

The student responses to the test items were scaled using a Rasch measurement model. The scaled scores were known as WAMSE scores (West Australian Monitoring Standards in Education scores). The scaling permitted comparisons over time within a given learning area such as numeracy or reading. The test instruments for Years 3, 5 and 7 were linked using Rasch analyses. The scores over Years 3 to 7 for each learning area typically ranged from 0 to 800, even though each assessment instrument might contain 30 to 40 items.

Year 9 students in Western Australia were also assessed in literacy and numeracy under a program known as Monitoring Standards in Education (MSE). The tests were conceptually similar to the WALNA tests and the results were scaled so that they could be linked to the WALNA results. In the account that follows, the MSE assessments and results will be referred to under the WALNA heading.

Table 4.3: Literacy and numeracy assessments used in Pipeline analyses

	2005 Phase	2006 Phase	2007 Phase	2008 Phase
Cohort 1	Year 2	Year 3 WALNA	Year 4	Year 5 NAPLAN
Cohort 2	Year 4 WALNA Year 3/2004	Year 5 WALNA	Year 6	Year 7 NAPLAN
Cohort 3	Year 6 WALNA Year 5/2004	Year 7 WALNA	Year 8	Year 9 NAPLAN
Cohort 4	Year 8 WALNA Year 7/2004	Year 9 WALNA	Year 10	Year 11

The tests have been calibrated so that in a given subject area, such as numeracy, it is possible to compare a Year 3 score with a Year 5, Year 7 or Year 9 score. This is an attractive feature of WALNA for longitudinal research purposes, as it facilitates the measurement of growth and the estimation of rates of academic progress. The WALNA tests were developed by the West Australian Department of Education and Training and, with the approval of participating schools, the results were made available for the Pipeline Project.

In 2008, the National Assessment Program in Literacy and Numeracy (NAPLAN) replaced the WALNA and the MSE programs. Like WALNA and MSE, the NAPLAN tests are administered to all students in Years 3, 5, 7 and 9. The results are also scaled using a Rasch measurement model.

It should be noted that because the WALNA assessment program was confined to Years 3, 5, 7 and 9, literacy and numeracy test results were not available for each participating student for each year of the project. Table 4.3 shows the years for which literacy and numeracy outcome measures were available for each cohort. Only the Year 4 and Year 6 2005 cohorts had three WALNA/NAPLAN assessment points.

As well as drawing on the test results, the Pipeline Project surveyed all participating classroom teachers at the end of Term 3 and asked them to rate the performance of the students against literacy and numeracy benchmark standards, based on their day-to-day familiarity with the standard of each student's work.

Defining and measuring student classroom behaviour

The definition and measurement of student behaviour were discussed in Chapter 3. To summarise, teachers were asked to consider each student's classroom behaviour on two occasions during each school year. On the first occasion they completed the Student Behaviour Checklist. On the second occasion they were asked whether the behaviours on the first occasion were still evident; this gave an indication of the liability or otherwise of the behaviour. They were also asked to rate the severity of the behaviour

in regard to its impact on the academic progress of the child and to make a prediction, in light of the student's current behaviour, as to what they thought would be the educational progress of the child in four years' time. The data was collected during an interview format from each teacher and anecdotal observations about the behaviour and academic performance of each child were noted.

Other evidence

As indicated earlier, by the completion of the final data collection in 2008, the master data matrix had grown to nearly 200 variables (or pieces of information) about each continuing students. For a student who commenced in Year 2 about 60 variables provided information about behaviour over the four-year term; for secondary students who began the project in Year 8, the number of behaviour-related variables doubled, since English and Maths teachers each reported the behaviour of the students.

Table 4.4: Key Pipeline Project variables, 2005 to 2008

Variable	Measurement
WALNA tests of academic progress	Tests of numeracy and reading (numerical variable)
Student Behaviour Checklist	Teacher judgment: 10 categories of classroom behaviour
Consistency of behaviour during the year	Categorical teacher judgment: yes/no
Severity of impact of the behaviour	4-point scale
Prediction of future academic success (2005 only)	5-point scale
Teacher judgment of level of performance in English (2006-8)	3-point scale
Teacher judgment of level of performance in Maths (2006 only)	3-point scale
School identity	Nominal variable
Student enjoyment of schoolwork (2006-2008)	4-point scale
Student suspended in 2008 (2008 only)	Categorical teacher response: yes/no
Student from a non-English speaking background requiring extra support (2008 only)	Categorical response: yes/no
Student with a formal diagnosis of a mental health problem (2008 only)	Categorical response: yes/no
Student is an education support student included in a regular classroom (2008 only)	Categorical response: yes/no
Year level identity	10 point categorical variable
Class identity	Nominal variable
SES school index (SEI)	Composite SES variable based on Census data

The study collected background information about each student to supplement the information provided by the behaviour checklists and the academic performance data. The key variables for which data were collected during 2005-8 are shown in Table 4.4 above.

As indicated earlier, the phenomena being examined are complex. In the mapping of behaviour and academic progress of students, not every factor that might have influenced the trajectories could be measured and tracked.

Hence, some factors that might explain behaviour and academic performance were deliberately 'bracketed' and considered to fall outside the scope of the study.

The collection of data

The principal researchers and a team of trained assistants collected the data from participating schools. The normal practice was to schedule a time when the classroom teacher could be released from his or her teaching duties in order to meet with a researcher and complete the checklists. This strategy helped to standardise the process used by teachers to complete the instruments, as well as providing an opportunity for teachers to clarify any matter relating to the project. The initial data collection was scheduled during May/June and the second collection scheduled in September/October of each year.

Data analysis

Missing data

As indicated earlier, there is a moderate level of attrition of the sample from year to year. Also in 2006, at the commencement of the school year, an effort was made to incorporate in the project students who were new to the school and who were joining the cohorts that were already taking part. Hence, these students have incomplete records, having joined the study in 2006 only.

Also to be considered is the fact that some students were absent from school on days during which the WALNA and NAPLAN tests were administered. In addition, a small percentage of students were officially exempted from the tests. This led to gaps in the students' records.

Finally, in a small number of cases the data was ambiguously recorded, not provided by authorities, or inexplicably missing. Follow-up to retrieve the data did not always yield the missing data.

For these reasons the number of cases tends to vary slightly, depending on the variables that were analysed. In most instances, there does not appear to be a systematic bias at work, though in a small number of cases it seems that a complete data set would have yielded a slightly different result.

Cross-sectional and longitudinal analyses

The principal research questions relating to consistency of behaviour and trajectories of performance hinged on the analysis of the longitudinal data. Hence, these analyses relied on complete student records for the full four years. Because of the attrition discussed earlier, the original sample of 2300 had dwindled to 1400, and of these students, approximately 1100 had complete sets of academic performance and student behaviour data. While this is a large number of cases, in some sub-categories only a few students are represented.

Some of the important research questions, however, could be addressed by a cross-sectional analysis in which the records for a single year are examined. In these situations, the number of cases was considerably larger than when examining trends over four consecutive years.

Data reduction and classification

Because of the large number of variables in the study, it is desirable to consolidate them wherever possible and appropriate. As indicated in Chapter 3, it was not possible to aggregate the number of reported behaviours to produce a single measure. An analysis of the responses had indicated that the categories did not fit a uni-dimensional Rasch measurement model.

However, it was possible to undertake a cluster analysis of the student responses and generate four distinctive student clusters. The SPSS 2-step cluster analysis software produced a cluster identifier for each student, thereby enabling comparisons to be made among the cluster groups in regard to the literacy and numeracy measures, as well as other relevant indicators. The cluster analysis was the main method of data reduction employed in the project.

Statistical significance

Technically, tests of statistical significance are employed to determine whether significant differences in a random sample could be expected to be found in the population from which the sample was drawn. The results of tests of significance are sensitive to the size of the sample. Typically, it is much easier to achieve a statistically significant result in a very large sample than a very small sample, even though adjustments are made to take account of sample size.

For this reason, tests of significance are not routinely reported for every contingency table where there are very large numbers in the cells. However, in comparisons of performance among different student groups, one-way analysis of variance has been completed and appropriate tests of differences among means have been undertaken.

The Pipeline Project was set up more as an exploratory project than a confirmatory study based on evidence-based models of student classroom behaviour and academic progress. The consequence is that it is not possible to undertake sophisticated analyses of the relative importance of various factors on student progress using some kind of hierarchical linear modelling. The data is neither sufficiently complete nor robust for that kind of approach.

Conclusion

At one level the Pipeline Project is a straightforward enterprise: follow four cohorts of students over four years and observe their classroom behaviour and academic progress.

At another level the study raises a multitude of technical questions about how best to think about student behaviour, to design such a study so that critical factors have been taken into account, to measure variables, and to analyse the data that has been collected.

The approach adopted in this study has been to walk the tightrope between providing participants with practical feedback that is readily comprehensible, and producing data that can be subjected to the most sophisticated technical analyses. Schools are extraordinarily busy institutions that have become less and less able to take on 'extra curricular' activities, such as serving as participants in research studies. The design and methods employed in the study were intended to strike an appropriate balance.

5. Patterns of student classroom behaviour

Introduction

This chapter describes the patterns of productive and unproductive student behaviour of students in Years 2-11. The analyses that follow draw principally on the results of the Student Behaviour Checklist which profiles the behaviour of students according to ten categories of productive and unproductive behaviour.

The issues of whether the behaviour of individual students is consistently productive or unproductive over a four-year period, and the impact of the students' behaviour on their academic progress, will be addressed in later chapters.

SPSS data files were produced for each of the four cohorts comprising the students being tracked during the study. For students in Years 2 to 7, the primary school classroom teachers used the Student Behaviour Checklist to report on the students' behaviour. For Years 8 to 11 the students' English and mathematics teachers each reported the behaviour of students during their lessons.

Levels of unproductive behaviour from 2005 to 2008

Overall levels

Figure 5.1 below shows the percentage of each age cohort that was reported as exhibiting one or more of the ten categories of unproductive behaviour over the three-year period. First, it should be noted from these results aggregated across Years 2-11 that approximately 40 per cent of students behave unproductively in classrooms, according to their teachers. There are only slight fluctuations in this pattern across the four years of data collection.

Figure 5.1: Percentage of students showing unproductive behaviours across all cohorts, 2005-2008*
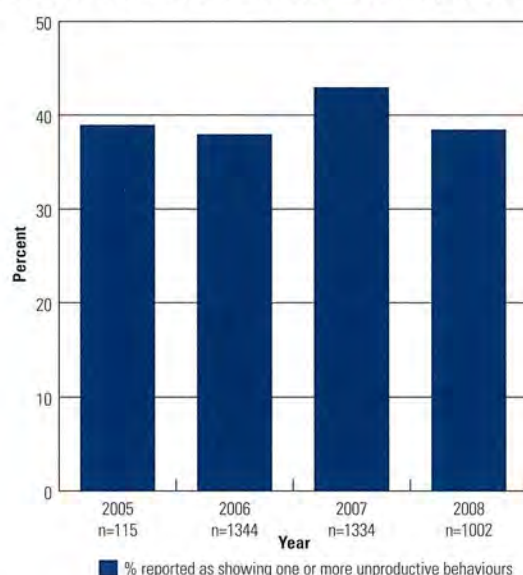
In Years 8-11 the behaviours are those reported by English teachers

The slightly larger percentage of students showing unproductive behaviour during 2007 may be explained by the exit from the study at the end of 2006 of a large group of students who attended high schools not part of the Pipeline study. Those who left were shown, on average, to be higher performing and exhibiting more productive behaviour while in Year 7.

Primary students

The incidence of unproductive behaviour is generally constant during the primary years. Figure 5.2 depicts the percentage of students in each year level reported to behave unproductively on one or more categories of the Student Behaviour Questionnaire ranging from 35.7 per cent in Year 3 to 40.2 per cent in Year 5. There is no

evidence of a simple trend of increasing or decreasing levels of unproductive behaviour as the cohorts of students progress through primary school.

Figure 5.2: Percentage of students showing productive or unproductive behaviours in Years 2-7

Figure 5.2: Percentage of students showing productive or unproductive behaviours in Years 2-7

% reported as showing one or more unproductive behaviours
% reported showing no unproductive behaviours
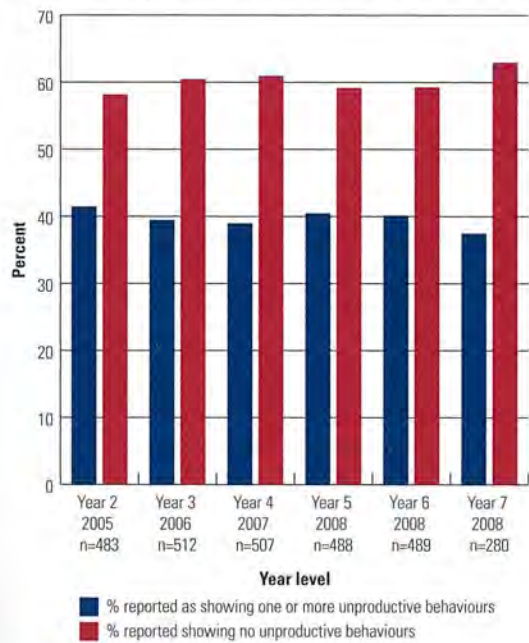
Secondary students

The picture grows more complex after the students make the transition to high school. During the early stage of their secondary education, there appears to be an initial decline in the extent of the unproductive behaviour, though there is a sharp escalation during Year 10. The incidence of reported unproductive behaviour in Year 10 is considerably higher than in any other year level. Nearly 57 per cent of students in English classes in Year 10 showed unproductive behaviour, nearly twice that reported in Year 8.

There were also notable differences after Year 8 between the levels of unproductive behaviour reported by English and mathematics teachers. As shown in Figure 5.3, the differences are greatest in Year 10 by a magnitude of nearly 13 per cent.

Figure 5.3: Percentage of students showing unproductive behaviours in English and mathematics classes, Years 8-11

Figure 5.3: Percentage of students showing unproductive behaviours in English and mathematics classes, Years 8-11

English   Mathematics
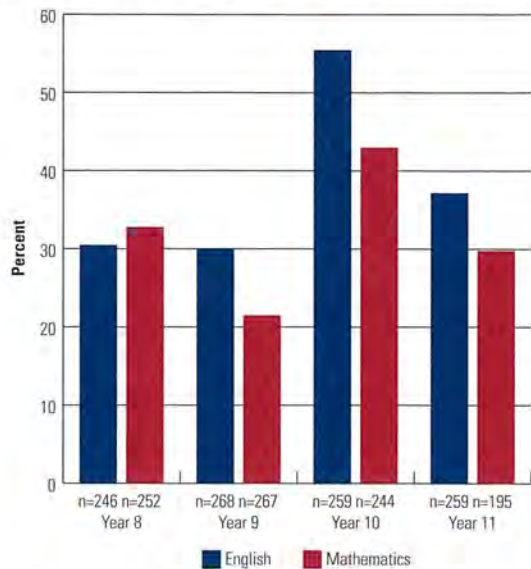
The substantial difference in levels of reported unproductive behaviour between the same students in English and mathematics classrooms after Year 8 is a noteworthy feature of Figure 5.3. This phenomenon will be considered in more detail in later chapters.

Students in Education Support Centres

In addition to the primary and high schools, six Education Support Centres participated in the project. A considerably higher level of unproductive behaviour was reported by teachers as shown in Figure 5.4 below.

Figure 5.4: Percentage of students showing unproductive behaviours in Education Support Centres

Figure 5.4: Percentage of students showing unproductive behaviours in Education Support Centres

% reported as showing one or more unproductive behaviours
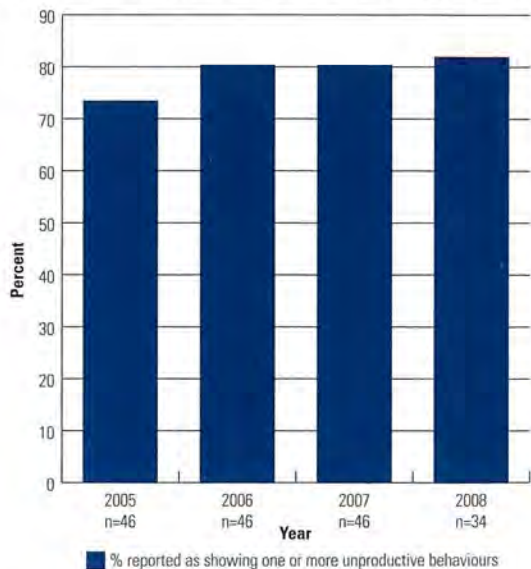
Frequency of specific categories of unproductive behaviour 2005-2008

Tables 5.1 and 5.2 that follow show the frequency with which each of the ten unproductive behaviours was reported by teachers. There are several key observations to be made about these results.

First, for each behaviour, the frequency with which it is reported is generally consistent from Years 2 to 7. In Years 8 to 10, there are differences from year to year and between English and mathematics classes, particularly in regard to inattentiveness, lack of motivation and unresponsiveness. However, generally, there is a common pattern between primary and secondary levels.

Second, there are relatively few students reported to be aggressive or non-compliant – on average between one and two students per class. These 'externalising' kinds of behaviours tend to dominate discussions of student behaviour management because in extreme cases, students who display these kinds of behaviour not only disrupt learning but may also put the wellbeing of teachers and students at risk. However, other forms of unproductive behaviour are much more common.

Third, the most frequently reported unproductive behaviour was inattentiveness. In the primary years, teachers were almost twice as likely to report a student as 'inattentive' than any other categories of unproductive behaviour. However, as students progress through school, teachers were increasingly inclined to categorise them as unmotivated, so much so that by Year 10 the level of inattentive and unmotivated behaviour were similar.

Table 5.1: Frequency of unproductive behaviour Years 2-7 as a percentage of the cohort

Cohort	n	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
Year 2	325	4.3	8.6	14.5	22.8	6.8	12.0	12.6	8.0	9.8	6.5
Year 3	325	4.9	5.8	13.5	19.1	8.0	9.8	10.8	8.0	9.2	4.6
Year 4	325	5.5	7.4	13.2	26.5	6.8	12.6	12.0	7.4	8.6	4.6
Year 5	373	4.8	6.2	13.7	24.9	8.8	13.4	11.5	7.2	11.5	6.7
Year 6	373	4.8	10.7	13.7	23.1	7.2	11.3	13.4	11.3	11.5	4.6
Year 7	360	6.4	9.2	13.6	19.4	9.4	10.5	13.6	8.1	8.6	6.1

Table 5.2: Frequency of unproductive behaviour in Years 8-11 reported by English and mathematics teachers as a percentage of the cohort

Cohort		n	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
Year 8	English	236	1.3	3.0	10.6	16.1	6.4	10.2	12.3	4.2	8.9	6.4
	Maths	228	0.4	0.9	11.4	16.7	8.3	7.9	8.3	4.4	15.4	6.1
Year 9	English	236	0.4	2.5	13.6	15.3	2.1	10.2	11.4	3.4	3.8	3.4
	Maths	228	0.9	1.8	5.7	11.0	0.9	2.6	11.0	2.2	12.7	3.1
Year 10	English	236	2.5	6.8	14.4	30.1	8.9	8.9	28.8	15.7	18.6	5.9
	Maths	228	2.6	9.2	17.1	26.3	6.1	7.9	22.4	9.6	6.1	7.5
Year 11	English	219	2.7	5.9	12.8	16.9	9.6	8.2	16.4	5.9	11.0	9.6
	Maths	195	2.5	5.1	9.2	15.4	9.2	7.2	15.4	9.7	14.3	7.7

The percentage of students reported as unmotivated in Year 10 is more than double the proportion reported in Year 9. Further, the difference in the incidence of unproductive behaviour in English and mathematics classes has narrowed. The mathematics teachers, hitherto inclined to report much less unproductive behaviour in their classrooms, indicate there to have been a major escalation. By Year 11 the differences between the behaviour of students in English and mathematics classes were negligible.

The pattern of behaviours of students in Education Support Centres (ESCs) differed from that of students in primary and high schools. As shown in Figure 5.4, there was a higher overall incidence in ESCs. With regard to the individual categories, ESC students were much more likely to exhibit externalising behaviours. They were approximately five times more likely to show aggressive, non-compliant and disruptive behaviour than the other students. Among the ESC students, 21.7 per cent were reported to be aggressive, 41.3 per cent non-compliant and 37.0 per cent disruptive.

Students showing multiple categories of unproductive behaviour

In general, more than half the students behave productively and nearly one fifth display one or two categories of unproductive behaviour. It is very uncommon for a student to show more than five or six categories of behaviour and less than one per cent show all ten. The distribution (see Table 5.3) was consistent for each year of data collection. One minor exception was the dip in the 2007 numbers of students behaving productively - about 5 per cent fewer than for the other years.

Table 5.3: The frequency of students reported to be unproductive according to multiple categories of behaviour

Number of reported categories of un-productive behaviour	Year of data collection			
	2005 n=1134 %	2006 n=1134 %	2007 n=1113 %	2008 n=1002 %
0	60.2	61.1	55.5	61.0
1	12.4	12.9	15.8	14.7
2	9.0	8.6	9.6	8.7
3	6.8	6.4	6.2	5.9
4	4.4	4.9	4.6	2.9
5	2.0	2.4	2.4	2.2
6	2.1	1.1	2.0	1.8
7	1.2	1.5	1.3	1.0
8	1.0	0.7	1.3	1.1
9	0.4	0.4	1.0	0.6
10	0.4	0.1	0.2	0.2

Of the 2007 cohort, only 42.7 per cent of the Year 10 cohort did not exhibit an unproductive behaviour compared with 61.4 per cent of the Year 4s. The spike in unproductive behaviour in Year 10 was the main contributor to the lower percentage of students reported to be behaving productively in 2007.

Clusters of behaviours

Cluster analysis

The next question to be addressed is whether the full cohort of students can be divided into groups that are defined by particular sets of behaviours. This is an important question. If the population of students can be subdivided into subgroups, each sharing common classroom behaviour patterns, then it may be possible to provide teachers with support by establishing classroom behaviour management policies that differentiate among the subgroups. Interventions could be developed that specifically target one or another according to the exhibited behaviours.

It should be kept in mind that the behaviours most commonly exhibited might not be those most useful for defining group membership. To take the extreme case, if

every student exhibited a particular behaviour it would be of no value for grouping the students, even though the form of behaviour might be very significant for other reasons.

Cluster analysis is a method for sorting cases into groups. The technique looks for patterns among the cases such that each case had more characteristics in common with other members of the group than with members of other groups. The particular method used below is known as two-step cluster analysis and suits categorical data and large data sets.

Cluster analyses were conducted for all students who exhibited an unproductive behaviour in 2005, 2006, 2007 and 2008. Students who did not display any unproductive behaviour were excluded from the analyses. Each cohort of students reported to be behaving unproductively was subjected to a separate cluster analysis.

Results of the cluster analyses

The cluster analyses of the 2005-2008 cohort databases yielded similar three-cluster solutions for each year. Though the profile of each cluster changed slightly over the four-year period, the differences from year to year were minor. The occurrence of minor differences is to be expected as the students matured over the four-year term of the Pipeline study and during each year were subject to new educational experiences. The size of each cluster group is shown in Table 5.4.

Table 5.4: Cluster membership for students showing one or more unproductive behaviours, 2005-2008

Year	Total number of cases	Cluster 1		Cluster 2		Cluster 3	
		n	% of total	n	% of total	n	% of total
2005	472	215	45.6	178	37.7	79	16.7
2006	549	255	46.4	177	32.2	117	21.3
2007	616	322	52.3	187	30.4	107	17.4
2008	493	217	44.0	160	32.5	116	23.5

There are two questions that arise from Table 5.4: first, what are the defining behaviours for each group? Second, to what extent do the groupings apply over the four-year period?

To address the first question, SPSS Two-Step Cluster analysis produces contingency tables for each variable that show

the distribution of responses for the cluster compared with the distribution for the group as a whole. A variable may contribute to the group definition if disproportionately high or low numbers of students in the particular cluster exhibit the behaviour compared to the other two clusters.

For example, consider aggressive behaviour. In 2005, no student among the 215 students in Cluster 1 was reported to show aggressive behaviour yet 62.4 per cent of students in Cluster 3 were reported to be aggressive. Clearly aggressive behaviour differentiates Clusters 1 and 3.

Consider as a second example unmotivated and unresponsive behaviours. No student in Cluster 2 was reported to be unmotivated or unresponsive whereas 68.2 per cent of students in Cluster 1 were reported to be unmotivated and 71.1 per cent were reported to be unresponsive. These behaviours differentiate Clusters 1 and 2.

In general terms the three clusters can be characterised as follows.

The largest cluster of students, about half of those reported to show an unproductive behaviour, includes those who in various ways do not engage with their schoolwork. Typically the students in this cluster are easily distracted, appear to make very little effort to get things right, give up quickly on demanding tasks, come to class unprepared and tend not to participate in class activities. It should be noted that members of this group were seldom aggressive, non-compliant or disruptive. Generally, they did not challenge the teacher or the classroom order. This cluster can aptly be referred to as the Disengaged Behaviour Group.

Cluster 3 had the fewest members, containing about 20 per cent of all students reported to be unproductive. It is almost the obverse of Cluster 1. Members of this group were most likely to be students who are assertive and uncooperative: for example, they lose their temper and are abusive towards the teacher or other students, refuse to follow class rules, are argumentative and provoke other students. However, in common with the members of Cluster 1, though to a lesser extent, they were also likely to be inattentive and unmotivated, as well as erratic and impulsive. For the purposes of the study this group has been named the Uncooperative Behaviour Group.

Members of Cluster 2, between a third and a quarter of the unproductive students, were typically disruptive by seeking

attention, interrupting the flow of a lesson, annoying other students and calling out in class. However, unlike the members of Cluster 1, they were not typically reported by their teachers to be disengaged. They differ from Cluster 3 in that they were seldom reported to be aggressive towards other students or resistant to the teacher's authority. The most appropriate way of describing this group is to refer to it as the Low-level Disruptive Behaviour Group.

Other cluster group characteristics

By cross-tabulating the cluster membership with other variables of interest it is possible to obtain a deeper understanding of the behaviour of students within each of the three cluster groups. One such variable is the number of unproductive behaviours reported by teachers as characterising the classroom behaviour of students. Table 5.5 shows the percentage of students in each cluster in 2006 that show only one category of unproductive behaviour, between 2 and 3, between 4 and 6, and between 7 and 10 categories.

There is a recognisable pattern. The students in Cluster 3, the Uncooperative Behaviour Group, were much more likely than students in the other clusters to behave unproductively across a wide range of categories. On the other hand, the unproductive behaviour of the majority of students in Clusters 1 and 2 were mainly restricted to an upper limit of three categories of unproductive behaviour.

Table 5.5: Number of reported behaviours by cluster, 2006 students

Number of reported behaviours	Cluster 1 Disengaged %	Cluster 2 Low-level Disruptive %	Cluster 3 Uncooperative %
1	44.7	33.9	0
2-3	44.3	55.4	0
4-6	11.0	10.7	65.0
7-10	0	0	35.0

Later in 2006, teachers were asked to judge whether the unproductive behaviours reported earlier in the year were having an impact on the students' academic progress. There were significant differences among the clusters in regard to the severity of the impact (see Table 5.6).

Cluster 2, the Low-level Disruptive Behaviour Group, defined mainly by the incidence of disruptive and inattentive behaviours, contained only 10.7 per cent of students who teachers consider to be behaving in ways that have a severe impact. Students in the Uncooperative Behaviour Group were three times more likely to be behaving unproductively in ways that have a serious consequence for their learning.

Table 5.6: Reported impact of unproductive behaviour by cluster, 2006 students

Impact on academic performance	Cluster 1 Disengaged %	Cluster 2 Low-level Disruptive %	Cluster 3 Uncooperative %
Severe	18.4	10.5	31.1
Considerable	52.9	50.4	53.8
Very little	28.7	39.1	15.1

The three clusters of students described above will form the basis of a number of analyses to be reported in later chapters that explore the relationship between unproductive behaviour and academic performance. The disengaged, the low-level disruptive and the uncooperative behaviour groups will be compared with a fourth group, the students who behave productively.

Conclusion

In any year about 40 per cent of students across all year levels display at least one form of unproductive behaviour.

The picture is consistent across the primary school years from Year 2 to 7. There is no marked difference between junior primary and middle and upper primary students. The fact that the incidence is as high in Year 2 as in Year 7 is noteworthy since, according to the myth, all students begin school as endearing, curious young people who only later in their school life are turned off schooling by uninspiring experiences in the classroom.

The situation in secondary schools is more complex. In the secondary years there are marked differences between mathematics and English classes and across year levels. Initially, in Year 8 and 9, teachers report less unproductive behaviour than in Year 7. However, the incidence rises sharply in Year 10 before declining in

Year 11. In Year 10 the level of unproductive behaviour is considerably higher than any other year level in either primary or secondary schooling.

There is a noteworthy difference in the levels of unproductive behaviour of students in English and mathematics classes. Mathematics teachers reported fewer students behaving unproductively than English teachers.

The high level of unproductive behaviour in Year 10 is due to sharp increases in the level of behaviour usually associated with academic disengagement: inattentiveness, lack of motivation, unresponsiveness and lack of preparation.

The level of unproductive behaviour in Education Support Centres is more than twice the level for primary or high schools.

It is possible to divide the total Pipeline group of students into four groups according to their behaviour patterns. The dominant group is composed of students who do not exhibit unproductive behaviours.

Of the students whose behaviour is unproductive, the largest group consists of those who do not engage with their schoolwork yet are seldom aggressive, non-compliant or disruptive. In 2006 there were approximately three times as many of these disengaged students as the students who are commonly reported to be 'difficult' or 'challenging' because they are aggressive or oppositional towards their teacher or their peers.

This latter group contains the students for whom most of the behaviour management resources are targeted. Much less attention is focused on the students who seldom 'cause trouble' but who lack motivation, interest in schoolwork, responsiveness and so on. Solving the problem of student disengagement is seen as the responsibility of the classroom teacher.

There is a third identifiable group. Its members are often also characterised by their disruptive behaviour and inattentiveness. However, they generally accept the authority of the teacher and engage with their schoolwork.

6. Classroom behaviour and academic performance

Introduction

This chapter examines the relationship between the classroom behaviour of students and their academic performance in reading and numeracy. The descriptors of student behaviour are taken from the Student Behaviour Checklist and the follow–up surveys of the teachers' judgments on the severity of the students' unproductive behaviours. Academic performance is measured by standardised tests of literacy and numeracy as well as their teachers' global assessments of their performance.

Student behaviour has been classified in two ways in the analyses that follow. First, each of the four student year level cohorts has been divided up into groups according to teachers' judgments of the severity of the impact of the students' behaviour on their academic progress and, second, according to the clusters of behaviours described in Chapter 5.

The analyses that follow are cross-sectional, linking the behaviour of students during 2006 with their performance on the 2006 WALNA Literacy and Numeracy assessments for that year. These analyses are repeated for the 2008 student behaviour data and the students' NAPLAN assessments of 2008. The consistency of the students' behaviour and their academic progress over the four-year span of the Pipeline Project will be discussed in Chapter 7.

The overall performance of Pipeline students on WALNA and NAPLAN

The students participating in the Pipeline study are not a random sample of government school students. Hence, there are likely to be some differences between the Pipeline statistics and the population parameters. Figure 6.1 compares the Pipeline sample with the population on the reading and numeracy assessments.

Figure 6.1: Mean scores for the 2006 WALNA population and the Pipeline sample
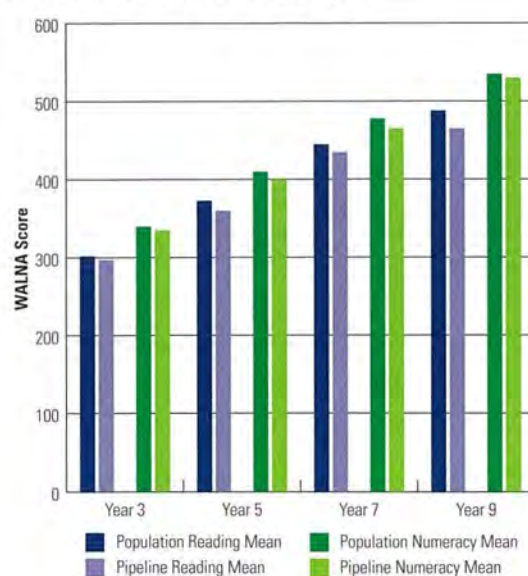
Figure 6.1 shows that at each point of comparison, the Pipeline students scored marginally lower.

For the 2006 WALNA Year 5 assessments 14.2 per cent of students performed below the numeracy benchmark and 7.9 were below the reading benchmark. For the

Pipeline sample 14.9 and 8.7 per cent had fallen below the numeracy and reading benchmarks, a slightly higher percentage. This is not a surprising result given that the Pipeline schools on average have a lower Socio-economic Index (SEI) than the State average.

Teachers' judgments of student performance

Each year teachers rated the performance of students in literacy and numeracy on a three-point scale: below the benchmark, slightly above the benchmark and well above the benchmark. The purpose was to provide a second indicator of academic performance in addition to the test results. It was expected that there would be a high level of correspondence between the test results and the judgments of performance made by the students' classroom teachers.

The pattern of results is generally consistent for reading and numeracy performance. The results for the Year 5 cohort in 2006, and again when the students had reached Year 6 in 2007, are shown in Figure 6.2. It is noteworthy that nearly twice as many students are judged by teachers to be performing below the benchmark than identified by the Year 5 WALNA tests. The difference between the test results and the teachers' judgments is considerably greater for reading than numeracy, suggesting that either the reading benchmark is set too low or that teachers have been particularly tough-minded when making judgments about the students' reading performance. The results might also be interpreted to suggest that teachers had lower performance expectations for numeracy than reading.

Figure 6.2: Teachers' judgements of performance of students in 2006 and 2007

■ Percentage judged to be performing below benchmark
■ Percentage judged to be performing slightly above benchmark
■ Percentage judged to be performing well above benchmark
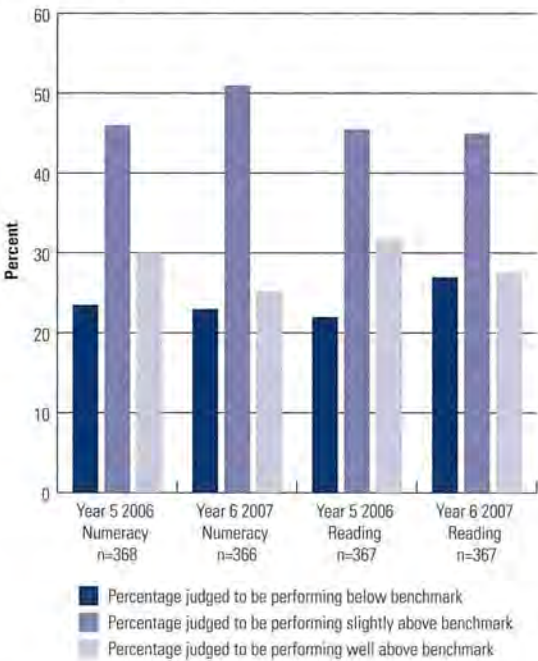
No student who was considered by teachers to be performing well above the benchmark actually performed below the benchmark on the WALNA numeracy test. However, a small percentage of students who scored below the benchmark on the WALNA assessment were considered by teachers to be performing slightly above the benchmark.

More than two-thirds of the students who scored below the benchmark on WALNA were also judged to be performing below the benchmark by their teachers, the remainder being considered by teachers to be performing slightly above the benchmark.

The patterns of results for numeracy and reading are similar. Nearly all the students who were identified on WALNA as performing below the benchmark on reading were also independently judged by teachers to be performing below the benchmark.

While it would be surprising if there were a perfect correspondence between the two forms of assessment because of misclassifications arising from measurement error and teacher misjudgement, nevertheless, teachers appear to be applying a more conservative standard than the experts who set the WALNA benchmark standard.

Severely unproductive student behaviour and academic performance

Descriptions of student behaviour were acquired on two occasions each year. On the first occasion teachers were asked to report whether the student exhibited any of the ten categories of unproductive behaviour. As it was relatively early in the school year, teachers were not asked to judge the impact of the behaviour on the student's progress.

Later in the year, if students were continuing to behave unproductively, teachers were asked to make a global judgment of the impact of the behaviour. The behaviour of students was rated according to the extent that it restricted their academic progress. Teachers were then asked in relation to these students, to what extent their unproductive behaviour had contributed to their academic under-performance on a four-point scale: none, very little, considerable, severe.

It should be noted that teachers were rating the impact of the behaviour on learning rather than the frequency of its occurrence. A moderate correlation between the number of reported behaviours and the later rating of the severity of the impact of the student's behaviour ($r = 0.48$) was revealed: the more unproductive behaviours reported, the more a student was likely to be reported to be behaving in ways that had a severe impact on their learning.

Figure 6.3 shows for each year level cohort the reading performance of the students according to their behaviour classification. The line graphs generally show a consistent gradient between behaviour categories for the Years 3, 5 and 7 cohorts: but student performance deteriorates according to the teachers' judgments of the severity of the impact.

For secondary students the judgments of the students' behaviour made by English teachers were reported. The intervals in reading assessment scores between cohorts for the four categories of behavioural impact were slightly uneven, particularly for the 7 and 9 cohorts. For the students who were behaving productively in Years 7 and 9, the gap was much narrower than between Years 5 and 7. Further, for the students whose behaviour was judged to be having a severe impact on learning, there was only a slight difference between the Year 7 and 9 levels.

Figure 6.3: Teachers' judgements of behavioural impact on learning compared with 2006 WALNA reading performance
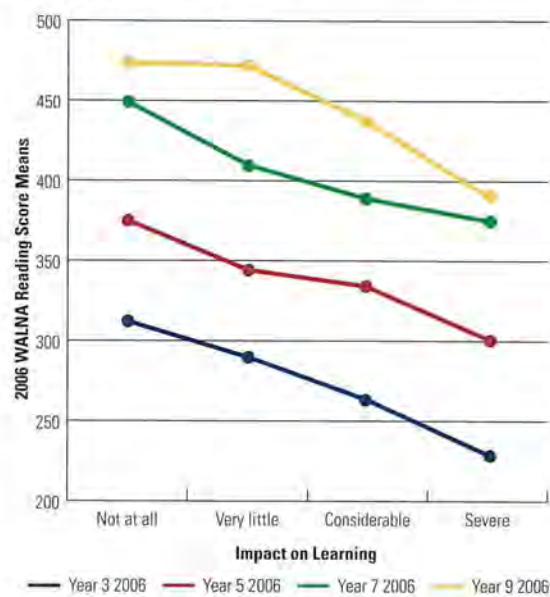
The numeracy results show a consistent relationship between the students' WALNA performance and teachers' judgments of the severity of their behaviour. However, Figure 6.4 illustrates the difference between Years 7 and 9 students to be even smaller for numeracy, than for reading (see Figure 6.3). It is possible that because of the small numbers of cases in the severe impact category the results may be unstable; only 5 per cent of all cases were classified as 'severe'.

Figure 6.4: Teachers' judgements of behavioural impact on learning compared with 2006 WALNA numeracy performance
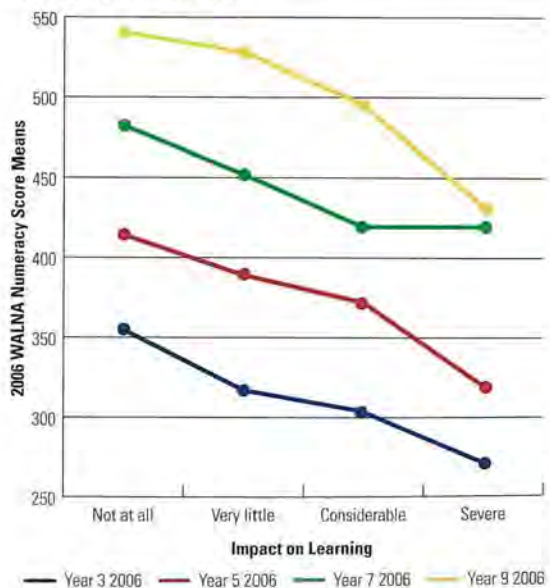
The 2008 NAPLAN results for Years 5, 7 and 9 were analysed according to the teachers' judgements of the impact of the behaviour on the students' learning. The 2005 Year 8 cohort had by 2008 progressed to Year 11 and did not sit the NAPLAN tests. Hence, there are only three trend lines in the Figures 6.5 and 6.6 that follow.

Overall, the WALNA and NAPLAN analyses yielded a similar picture. The NAPLAN results for reading are shown in Figure 6.5. In Years 5 and 7, the results show a consistent trend: the more severe the teacher-reported impact of the unproductive behaviour, the lower the reading score. The difference between the productive behaviour and the severely unproductive behaviour groups is approximately 100 NAPLAN points. While the Year 9 students who behaved productively clearly out-performed the unproductively behaved groups of students, the margin of differences is smaller than for Year 5 and Year 7.

Figure 6.5: Teachers' judgements of behavioural impact on learning compared with 2008 NAPLAN numeracy performance
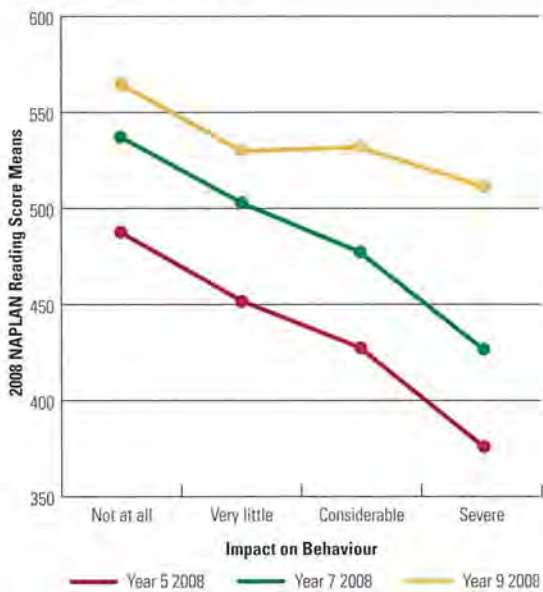
The 2008 NAPLAN numeracy results presented in Figure 6.6 also show a consistent relationship between the severity of the unproductive behaviour and the students' academic performance. However, the difference in the performance between the group of students whose behaviour was considered to be having a considerable impact on their learning and the group whose behaviour was judged to be having a severe impact was of a smaller magnitude for Years 7 and 9.

Figure 6.6: Teachers' judgements of behavioural impact on learning compared with 2008 NAPLAN numeracy performance
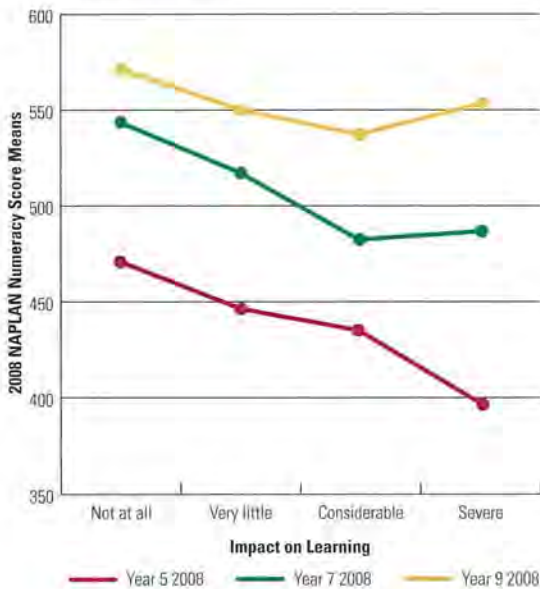
A second noteworthy observation to be made about the numeracy results is that the magnitude of the differences in the level of performance between the productively behaved and the unproductively behaved students, especially in Year 9, is considerably smaller than for reading.

The main conclusion to be drawn from Figures 6.3 to 6.6 is that for reading and numeracy there is a general, downward association between the severity of the unproductive behaviour reported by teachers and the actual performance of the students on state and national tests. The more severe the impact of the students' unproductive behaviour, in the judgment of their teachers, the lower the performance of students on measures of academic performance.

Teacher judgments of academic performance and student classroom behaviour

In Chapter 5, cluster analyses revealed that the student cohorts can be divided into four relatively distinct groups according to their behaviour. The largest group was composed of students who regularly met teachers' expectations of appropriate, productive behaviour. The next largest group comprised students who were disengaged from schoolwork but did not challenge

the teacher. The third group consisted of students who were nuisances in class, distracting the teacher and fellow students while they went about their work. The final group, the smallest, was made up of students who displayed uncooperative behaviours, for example, refusing to follow directions, losing their tempers and provoking other students.

Of the students who exhibited uncooperative behaviours, two thirds were considered by teachers to be under-performing academically. Approximately an eighth of the students who were behaving productively were reported to be under-performing. The reasons for their under-performance were not reported. The most obvious explanation is that factors other than classroom behaviour contributed to their underperformance. It is also likely that in some cases they may have been misclassified and, in others, their behaviour could have deteriorated during the year, prior to the second data collection point.

When teachers rated the academic performance of the students in relation to benchmark standards of performance in literacy and numeracy, the results followed a similar pattern. The breakdown for literacy is shown in Figure 6.7.

Figure 6.7: Percentage of students in each cluster group judged by teachers to be performing below the Literacy benchmark, 2006.
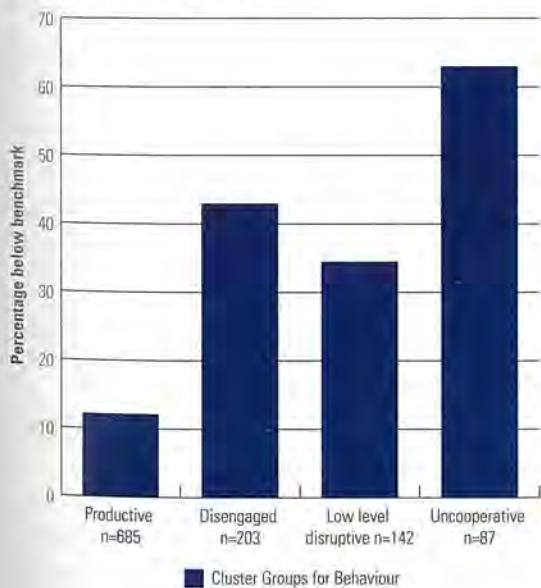
In summary, so far the relationship between student behaviour and academic performance has yielded consistent patterns of results. Students judged by

teachers to behave unproductively perform less well than those who behave productively. WALNA test results and teachers' global judgments of performance yield consistent results. In the final sets of analyses, the performance of students in the four cluster groups will be compared against the 2006 WALNA results and the 2008 NAPLAN results.

2006 WALNA performance in literacy and numeracy and student classroom behaviour

In 2006, the students participating in the Pipeline study were in Years 3, 5, 7 and 9 and sat for the WALNA tests. It is therefore possible to compare the performances of the four cluster groups described in Chapter 5 – the productive, disengaged, low-level disruptive and uncooperative behaviour groups – on the reading and numeracy assessments.

The Year 3, 5 and 7 groupings are the same for the reading and numeracy analyses since in primary schools students are usually taught reading and numeracy by their classroom teacher and only a single measure of student behaviour was collected. In high schools, most students have separate English and mathematics teachers, and students are more likely to vary their behaviour depending on the subject being taught to them. Therefore, independent measures of the students' behaviour were collected from their English and mathematics teachers. Hence, separate cluster analyses were employed to form the groupings for secondary English and mathematics. Thus students may be included in different groups depending on whether reading or numeracy is being analysed.

It is clear from Figure 6.8 that for WALNA Reading, the students reported to behave productively tended to out-perform other students in each of the three unproductive behaviour groups. The lowest performing group was composed of the students in the uncooperative behaviour group, although the students who formed the disengaged behaviour group performed only slightly better.

Figure 6.8: Mean WALNA Reading scores for the productive and unproductive cluster groups, 2006
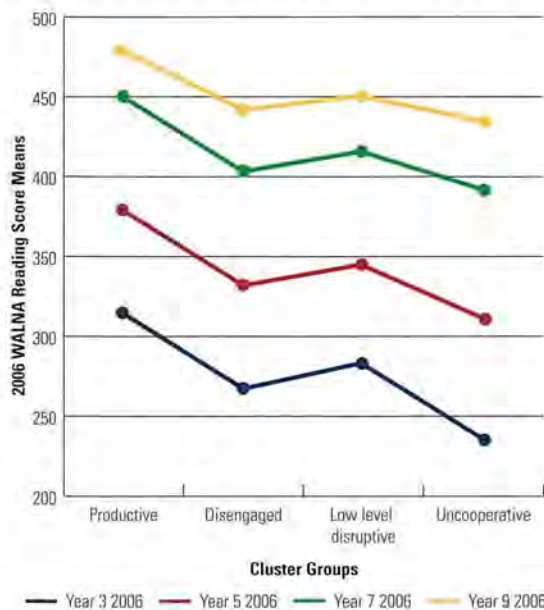
To test the significance of the differences in mean performances for each cluster group in each year level cohort, a one-way ANOVA was applied. In all cases, the analyses yielded F ratios that were significant at $P < .05$. To test the significance of the differences in the means of each pair of cluster groups, Scheffe's test was applied. Most, though not all differences, were significant.

In the case of WALNA Reading results, tests for the statistical significance of the difference between each pair of cluster group means showed the difference between the productive group and each of the unproductive groups to be significant at $P < .05$ in Years 3 and 5. In Year 7 Reading the difference between the productive behaviour group and the low level disruptive behaviour group was not statistically significant. The mean differences in Reading between the pairs of unproductive groups were not statistically significant.

The analysis of the WALNA Numeracy results (see in Figure 6.9) yielded a similar pattern to the Reading results shown in Figure 6.8. ANOVA and multiple comparisons of mean differences showed that the difference between the group of students behaving productively and each of the three other groups was statistically significant ($F = 25.2$, $P < .01$).

Although the group characterised by low level disruptive behaviour again outperformed the disengaged and uncooperative behaviour groups, the differences in mean performance were not statistically significant. It would

therefore be unwise to differentiate the three unproductive behaviour cluster groups concerning their performances in reading and numeracy, even though consistently small differences were observed. These may be due to errors of classification or WALNA measurement error.

Figure 6.9: Mean WALNA Numeracy scores for the productive and unproductive cluster groups, 2006
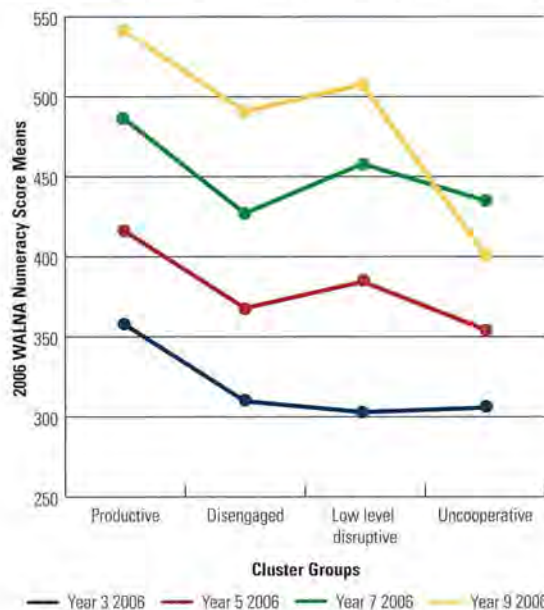
The relationships between the students' cluster group membership and their academic performance was examined using the 2004 WALNA assessment data and the 2005 student behaviour checklist data. Although the two sets of variables are separated by approximately nine months, one would expect the relationships to resemble those a year later. The number of cases was smaller because there were no WALNA results for the Year 2 students in the 2005 cohort. The 2004 WALNA assessments show a nearly identical pattern to the 2006 results.

Differences in 2008 NAPLAN performance among the cluster groups

The analyses described above were replicated using the 2008 NAPLAN test results and the cluster groups formed on the basis of the 2008 student behaviour data. Students in Years 5, 7 and 9 in the Pipeline Project sat for the NAPLAN tests as part of the State-wide administration of the tests. These same students had sat for the WALNA tests in 2006.

Table 6.1: Cluster analysis results for 2008 analyses of mathematics and English

Cohort	Total number of unproductive cases	Cluster 1 Disengaged		Cluster 2 Low level disruptive		Cluster 3 Uncooperative	
		n	% of unproductive total	n	% of unproductive total	n	% of unproductive total
2008 Mathematics	451	175	38.8	217	48.1	59	13.1
2008 English	493	222	45.0	176	35.7	95	19.3

Overall, the 2008 NAPLAN assessments showed a similar pattern to the 2006 WALNA assessments. The productive behaviour group consistently out-performed the unproductive behaviour groups. Of the three unproductive behaviour groups, the low level disruptive group tended to out-perform the other two groups. The uncooperative behaviour group performed at a lower level in reading than the disengaged behaviour group, although this was not always the case for numeracy. The performances for the four behaviour groups in reading and numeracy are graphed in Figures 6.10 and 6.11.

Figure 6.10: Mean 2008 NAPLAN Reading scores for the productive and unproductive cluster groups
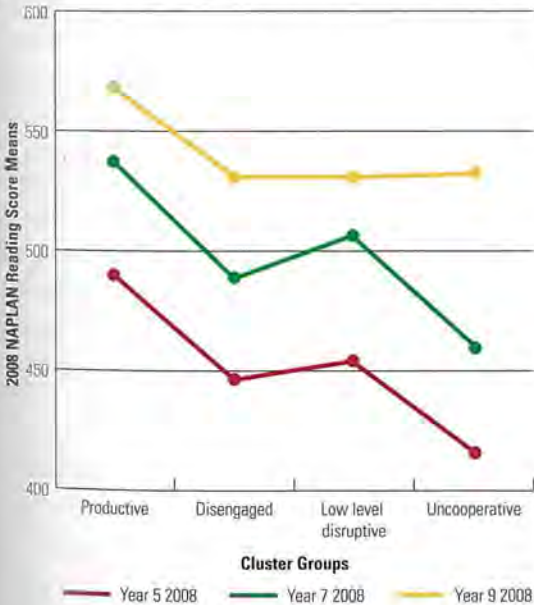
In NAPLAN numeracy, the pattern approximates the 2006 WALNA results, where the low level disruptive group tended to perform at a higher level perform than both the disengaged and the uncooperative behaviour groups. For reading, the Year 9 results show the low level disruptive group performing below the disengaged group.

Figure 6.11: Mean 2008 NAPLAN Numeracy scores for the productive and unproductive cluster groups
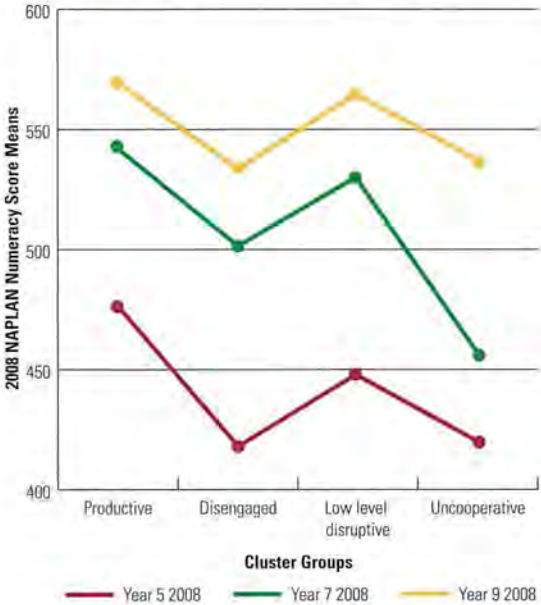
It is evident that there has been a relatively even level of performance in each of the four behaviour groups in the Year 9 reading and numeracy tests shown in Figures 6.10 and 6.11. This parallels the results for the 2006 WALNA assessment of reading. This was not so for numeracy, where in 2006, the results of the uncooperative group plummeted.

The scale of the differences

With large sample sizes, a small mean difference may be shown to have statistical significance but have little practical significance. Hence, the question arises whether the differences among the cluster groups are of a sufficient scale to warrant serious consideration.

One way to answer this question is to compare the differences against the expected growth in performance for the year level cohort as a whole.

Figure 6.12: Differences between the mean WALNA results for year levels for the State population and the Pipeline sample, 2006
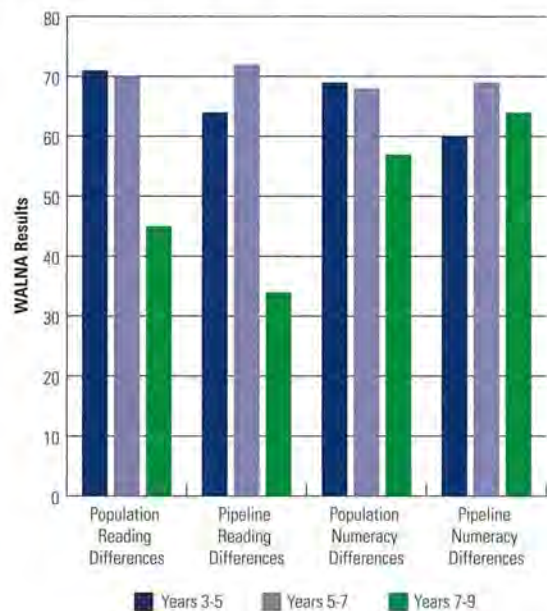
Figure 6.12 shows the mean differences between year levels for the WALNA population and the Pipeline sample. For example, it shows that the difference between the mean Year 3 performance and the mean Year 5 performance in reading for the population as a whole is approximately 70 points; for the Pipeline sample, the corresponding difference is nearly 65 points. Overall, a high level of correspondence exists between the two sets of results.

It should be noted firstly that the differences are on the same scale, and secondly, that the differences reflect two years' growth in academic performance – approximately 70 WAMSE points for the primary year level cohorts and 40 and 60 points for secondary reading and numeracy respectively. The differences between the Year 7 and Year 9

cohorts were smaller, particularly in reading. These figures provide an approximate scale for judging the importance of the differences between the four behaviour groups.

Table 6.2 records the differences between the WALNA means for the productive behaviour group and each of the three unproductive behaviour groups for the three primary cohorts. For example, the difference between the mean Year 3 WALNA result for the productive behaviour group and the disengaged behaviour group was 46.7 points. This difference was statistically significant with a probability of less than one in a hundred that it was a chance result. Further, reference to Figure 6.12 indicates that the difference between the two groups represents well over a year's growth in reading.

These differences between the means for each pair of behaviour groups, shown in Figure 6.2, correspond with the graphs of mean reading and numeracy performance shown in Figures 6.8 and 6.9. For reading, the students who form the uncooperative behaviour group have the largest difference when compared with the productive behaviour group, equivalent to approximately two years of academic growth in literacy. For the disengaged group, the difference is considerably more than a year. For numeracy, the differences between the disengaged and uncooperative groups are minor. In general terms, the disengaged group performs as nearly as poorly as the uncooperative behaviour group and in some years, the performance of both groups lag nearly two years behind the group of students who behave productively.

The 2008 NAPLAN results for Years 5, 7 and 9 shown in Table 6.3 follow a similar pattern though the mean differences for the uncooperative behaviour group are considerably lower than the productive behaviour group. These differences correspond with the graphs shown in Figures 6.10 and 6.11.

Table 6.2: WALNA differences between productive and unproductive behaviour group means, Years 3, 5, 7 & 9, Reading and Numeracy, 2006

Year level	Reading			Numeracy		
	Disengaged	Low-level disruptive	Uncooperative	Disengaged	Low-level disruptive	Uncooperative
Year 3	46.7**	32.6*	78.0**	46.7**	54.1**	53.0**
Year 5	46.0**	33.7**	68.1**	48.4**	31.6*	63.3**
Year 7	47.5**	34.7*	58.5**	58.3**	29.7ns	52.1**
Year 9	36.0ns	28.6ns	44.3*	50.6*	35.6ns	140.2*

** Sig. p<.01, * Sig. p<.05, ns = not statistically significant.

Table 6.3: NAPLAN differences between productive and unproductive behaviour group means, Years 5, 7 & 9 Reading and Numeracy, 2008

Year level	Reading			Numeracy		
	Disengaged	Low level disruptive	Uncooperative	Disengaged	Low level disruptive	Uncooperative
Year 5	43.8**	35.9*	74.2**	58.9**	27.8**	57.2**
Year 7	48.9**	31.2*	77.6**	41.2**	12.9ns	86.2**
Year 9	36.6**	37.9**	35.8ns	36.7ns	6.1ns	33.6ns

** Sig. p<.01, * Sig. p<.05, ns = not statistically significant.

The standard deviation for each year level cohort on NAPLAN Reading and Numeracy ranges between 60 and 70 points. The 'growth' in performance on the NAPLAN tests between Year 5 and Year 7 amounts to about 40 points. For the uncooperative behaviour group their mean performance was about two standard deviations lower than the mean performance of the productively behaved group. This is a massive difference. Although the disengaged group was not as retarded according to the NAPLAN tests, even so, they had fallen behind the students in the productive behaviour group by the equivalent of slightly more than two years' education.

In regard to the interpretation of these results, two caveats are important. First, student behaviour is not the only determinant of academic performance: it is possible other factors have contributed to the differences among the groups. Second, as discussed in Chapter 2, the causal relationship between behaviour and performance is most likely recursive. In other words, successful (or unsuccessful) performance may shape students' behaviour rather than the other way round: academic failure might prompt unproductive behaviour. This issue is considered further in Chapter 11.

Conclusion

Chapter 5 showed that about 60 per cent of students typically behave in ways that are conducive to success. Of those who behave unproductively, the largest group is composed of students who do not consistently engage with their schoolwork. These students are seldom aggressive, non-compliant or disruptive. In 2006 there were about three times as many of these disengaged students as those who are commonly reported to be 'difficult' or 'challenging' because of being oppositional or defiant towards their teacher or their peers.

The analyses in this chapter confirm that students who behave productively reap the benefit with better results in reading and numeracy on average. This was found to be the case for both the WALNA and NAPLAN assessments and for the teachers' global judgments of student academic performance.

In general, students whom teachers considered to be behaving in ways having a serious impact on their learning performed less well on the measures of academic performance than other students behaving unproductively, and much less so than students behaving productively. This is a predictable finding. However, there were exceptions to this general conclusion; some students whose behaviour was highly unproductive still managed to perform well above the benchmark. Cases of such students will be examined in Chapter 9.

The magnitude of the differences in academic performance among the behaviour groups is educationally significant. Setting aside the difficult question of whether the students' behaviour explains their academic performance or whether their performance has shaped their behaviour, students whose behaviour is unproductive perform on average at a standard between one and two year levels below their counterparts who behave productively.

Concerning the differences among the three unproductive behaviour groups, students who were members of the uncooperative behaviour group generally performed at lower levels than students in the other unproductive behaviour groups. The differences were considerably more marked on the 2008 NAPLAN test results than on the 2006 WALNA results. However, for some of the year level comparisons, the differences among the three unproductive behaviour groups were not always statistically significant, partly due to the small numbers of students who composed the group.

Therefore, when the impact of classroom behaviour on academic performance is considered, even though the trends suggest that students who form the uncooperative behaviour group have lost the most ground, generalisations concerning differences in reading and numeracy performance among the three unproductive behaviour groups must be considered cautiously. There is only a small difference in the educational outcomes of students who are compliant though disengaged, and those students who are uncooperative and non-compliant.

This uncooperative behaviour group comprises students for whom most of the behaviour management resources are targeted. Much less attention is focused on students who seldom 'cause trouble' but who lack motivation and show little interest in schoolwork. Solving the problem of student disengagement is seen as the responsibility of the classroom teacher. This finding raises the important question of whether sufficient support is being directed toward the group of disengaged students whose behaviour is holding them back.

The analyses revealed a more complex picture of behaviour and learning in the secondary years than in the primary years. In Chapter 5 it was evident that behaviour of the same students reported by mathematics teachers differed sharply from that reported by English teachers. It is not clear whether students behaved differently depending on the subject being taught, or whether mathematics and English teachers applied different standards. The analyses in this chapter revealed a somewhat anomalous set of results for the Year 9 NAPLAN tests where the relationship between behaviour and academic performance appeared weaker for numeracy than for reading. Without access to technical information pertaining to the psychometric properties of the NAPLAN tests, held in confidence by MCEETYA, it is not possible to determine whether the Year 9 results are a technical aberration or indicative of genuine differences in how students respond to English and mathematics instruction.

7. Trajectories of behaviour and performance

Introduction

The aim of this chapter is to describe the extent to which students whose behaviour was described as unproductive in 2005 behaved unproductively over the next three years.

The chapter will also describe the academic trajectories of students over the four-year period, estimating the extent to which a student's performance in 2004 was a good predictor of how the student would perform in 2008. The chapter will describe the extent to which the academic and behaviour trajectories indicate a smooth progression or decline, or whether there is a mix of peaks, dips and plateaus.

Finally, the chapter will explore the relationship between the behavioural and academic trajectories of the students, with a view to determining the correspondence between the two.

The analyses reported in this chapter draw upon the records of the 1357 students who formed the original year level cohorts in 2005 and continued throughout the four years of the project.

The consistency of student behaviour

Changes during the school year

So far in the analyses of behaviour and performance, it has been assumed that classroom behaviour patterns are generally stable during the school year. This assumption appears to be unfounded.

Towards the end of each year teachers were asked to review the behaviour of students whose behaviour they had described earlier in the year. In particular, they were asked with respect to each student whether their behaviour had improved, deteriorated or stayed the same. The responses of teachers collected during the 2007 school year were analysed and the results are shown below.

With regard to primary (or secondary English) classrooms, across Years 4, 6, 8 and 10, the behaviour of 27.2 per cent of all students was considered by their teachers to have improved during the year, and 7.7 per cent to have worsened, a ratio of nearly 4 to 1. Of the students who were reported to have shown an unproductive behaviour earlier in the year, slightly more than half (51.8 per cent) were reported later to have improved. This result runs counter to a stereotypical view that classroom norms of good behaviour gradually unwind as the year wears on. It would seem to the contrary that over time the norms of acceptable behaviour are more widely observed.

The results for each year level cohort are shown in Tables 7.1 and 7.2. Table 7.1 shows the 2007 results for students in Years 4 and 6. Relatively few changes occur for the students who were earlier reported to behave productively. Little difference is noted between the year levels in question. While teachers have reported large-scale improvement in individual student behaviour, this should not be interpreted to mean that all of the students whose behaviour had changed for the better were subsequently behaving productively – just better than before.

Table 7.1: Changes in behaviour during 2007 for students initially reported to be productive or unproductive while in Years 4 and 6

Cohort	Group	N	Behaviour deteriorated during 2007	Behaviour improved during 2007	No change in 2007
Year 4	Productive behaviour	273	4.0	7.7	86.8
	Unproductive behaviour	160	10.0	52.1	35.6
Year 6	Productive behaviour	284	5.6	11.6	81.0
	Unproductive behaviour	182	8.2	50.0	39.6

The picture for the Years 8 and 10 cohorts of 2007 reveals a similar pattern. There are relatively few changes for the better or worse to the behaviour of the group of students reported to behave productively. Generally, they form a stable group. There is a slight tendency for Year 10 teachers to rate a larger proportion of their students to be more badly behaved than the teachers of Years 8 and 9; this is consistent with the discussion in Chapter 5, where it was pointed out that Year 10 appeared to be the most 'difficult' year.

Table 7.2: Changes in behaviour during 2007 for students initially reported to be productive or unproductive while in Year 8 and Year 10 English and mathematics classes

Cohort	Group	N	Behaviour deteriorated during 2007	Behaviour improved during 2007	No change in 2007
Year 8 English	Productive behaviour	59	10.2	13.6	76.3
	Unproductive behaviour	66	6.1	63.6	30.3
Year 8 Maths	Productive behaviour	88	7.2	0	92.8
	Unproductive behaviour	46	8.7	47.8	43.5
Year 10 English	Productive behaviour	108	10.2	1.9	88.0
	Unproductive behaviour	138	12.3	45.7	42.0
Year 10 Maths	Productive behaviour	136	10.3	6.6	83.1
	Unproductive behaviour	99	15.2	38.4	46.5

What can be made of these results? First, the unproductive classroom behaviour of many students changes during the school year, mainly for the better. This is more the case in the primary than the high school years. Second, only a small percentage of students begin the year behaving productively and acquire bad habits later.

Since this pattern applies across the four year level cohorts, the results raise an important question: If there is an overall improvement in behaviour by the end of the school year, why isn't there an accumulated improvement for the population of students over a number of years? The results presented in Chapter 5 do not indicate a cumulative year-by-year improvement for the population as a whole.

It would seem therefore that each year constitutes a cycle during which teachers strive to enhance the classroom behaviour of their students, achieving more successes than failures. Then in the following year a new cycle commences, usually with a new teacher and sometimes a freshly constituted class of students, who together spend a large part of the year negotiating, then adopting, more acceptable norms of behaviour.

The consistency of student behaviour, 2005-2008

As explained in Chapter 4, when teachers completed the Student Behaviour Checklist they did not make judgments about the severity of the students' unproductive behaviour. For example, a student was judged to be unproductive if he or she showed a tendency to be inattentive. Since it is unlikely that any student fully attended during every minute of every lesson, the decision to report a student as being inattentive is a matter of judgment. There will always be some inconsistency in the classification of borderline cases.

At the other extreme, for a student who is reported to behave unproductively on several categories of the checklist during one year, the probability that the student has been unproductive in one or more categories of behaviour greatly increases.

In Chapter 5, cross-sectional analyses revealed that in each year of the project, about 40 per cent of each year level cohort was reported by their teachers to behave unproductively on one or more categories of the Student Behaviour Checklist, while 60 per cent behaved productively. These results were corroborated by analyses using the database containing only those students who had continued with the project over four years: there was less than one percent variation. This database of 1357 continuing students provides the source of the analyses included henceforth in this chapter.

The consistency of *productive* behaviour

The question that will now be addressed is whether the same students who were behaving productively in 2005 continued to behave productively in each of the following

years. To answer this question, the students who, in 2005, were reported to show one or more unproductive behaviours, were tracked over each of the following years. In 2005, 60 per cent of students were classified as behaving productively. As shown in Table 7.3, by 2006, 81.3 per cent of that group continued to behave productively. A similar proportion of the 2005 cohort behaved productively in 2007 and 2008. In each year, about 20 per cent of the 2005 *productive* behaviour group were reported to behave unproductively on one or more categories of the Student Behaviour Checklist.

Table 7.3: Percentage of the students who behaved productively in 2005, continuing to behave productively in 2006, 2007 and 2008

Pipeline students	Continuing to behave productively in 2006	Continuing to behave productively in 2007	Continuing to behave productively in 2008
Percentage of productively behaving students in 2005	81.3	79.8	78.8

These results suggest that the productive behaviour group was quite stable but this is not the case. In fact, upon closer analysis a relatively high degree of instability was revealed. In summary, only 38.7 per cent of the 2005 productive behaviour group were *never* reported to show an unproductive behaviour in any of the four years, whereas about half of the students who were reported to behave productively in 2005 were reported to behave *unproductively* during at least one of the subsequent three years.

The consistency of *unproductive* behaviour

Regarding unproductive behaviour, 46.3 per cent of the students were reported to behave unproductively during one or more years of the four-year period, and 15.7 per cent during all four years. These results also indicate a high level of instability.

Of the students who were consistently unproductive over the four years, they were more likely than other students to be unproductive across multiple behaviour categories, averaging slightly more than three. Table 7.4 compares the percentage of reported categories of unproductive behaviour for students who were continuously unproductive and those who were unproductive, with the percentages for all students.

These results indicate that students who consistently exhibit challenging behaviours are approximately three to four times more likely to be reported as behaving unproductively than students generally. This applies to all 10 categories of the Student Behaviour Questionnaire.

To summarise, the Pipeline Project sought to map the behaviour of students over a four-year period. The analyses of the responses to the Student Behaviour Questionnaire showed that the behaviour of 37.9 per cent of students is set on a steady productive trajectory extending over four consecutive years. Of the remaining 58.2 per cent, nearly one-third of this group (19.5 per cent of all students) were reported to be unproductive in each of the four years. To put it simply, about 40 per cent of students are consistently productive and about 20 per cent are consistently unproductive. Of those students whose behaviour is consistently unproductive, their behaviours cover the full spectrum incorporated in the Student Behaviour Checklist. The behaviour of the remainder, about 40 per cent of all students, fluctuates from year to year.

Table 7.4: Comparison of the frequency of unproductive behaviour for the total group in 2008 with the subgroup of students who were continuously unproductive over four years

Frequency of Unproductive Behaviour	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
All students n=1207	4.5	7.3	13.6	20.4	7.5	9.6	13.3	7.1	10.4	6.7
Continuously unproductive over 4 years n=149	16.1	29.5	43.6	59.1	29.5	34.9	35.6	24.2	32.9	21.5

The students with seriously unproductive patterns of behaviour, 2005-2008

The core of students whose behaviour is seriously unproductive

According to their teachers, the unproductive behaviour of some students does not appear to have much impact on their academic performance. On the other hand, teachers report that for others, their behaviour has a significant impact. The analyses that follow will examine the subset of students whose behaviour was considered to have a severe impact on their learning. As this group is a subset of the 15 per cent described above, it therefore contains only a relatively small number of students.

Table 7.5 shows the percentage of the total group of students in each Pipeline year who were reported to be behaving in ways that have a considerable or severe impact on their learning. Approximately 20 per cent of students in each year were reported to be so behaving by their primary classroom or English teachers, and their mathematics teachers.

Table 7.5: Percentage of the students in each year whose behaviour was reported to have a considerable or severe impact on their learning 2005-2008

Cohort	Percentage of the students whose behaviour had a considerable or severe impact on their learning			
	2005	2006	2007	2008
Primary classroom or English teacher judgments	19.3	22.1	25.2	18.1
Mathematics teacher judgments	18.3	17.7	23.4	19.6

The percentages varied only slightly from year to year, and learning area to learning area. To examine the consistency of seriously unproductive student behaviour, the students who were categorised as having a serious behaviour problem in 2005 were tracked for each of the following three years. The results are shown in Table 7.6.

Table 7.6: Percentage of the 2005 Pipeline cohort whose behaviour continued to be seriously unproductive in 2006, 2007 and 2008, according to primary classroom or secondary English teachers

	Seriously unproductive		
	2005 & 2006	2005, 2006 & 2007	2005, 2006, 2007 & 2008
Percentage of all 2005 students	9.0	5.0	3.1

Table 7.6 shows that of the group of students whose behaviour was reported by their primary classroom or English teachers to be seriously unproductive in 2005, amounted to 19.3 per cent of all Pipeline students, with only 9 per cent of the students reported to have behaved unproductively in 2005 and 2006. It can be inferred that the behaviour of slightly more than half of the group of students whose behaviour was seriously unproductive in 2005 improved. On the other hand, about the same number of students whose behaviour did not merit a seriously unproductive rating in 2005, were judged to be behaving in a seriously unproductive manner in 2006. Over the four-year period, the behaviour of only 3.1 per cent of the total Pipeline group of students was reported to be seriously unproductive for each year. This is a small core of students whose behaviour is consistently unproductive and having a serious impact on their learning.

The behavioural characteristics of the core

In order to describe the features of this core group of students who consistently behave in a seriously unproductive manner, their behaviour was compared with all students composing the 2005 and 2008 groups, according to the 10 categories reported on the Student Behaviour Checklist. The analyses are restricted to those instances where behaviour was reported by classroom or English teachers for students who began in 2005 and continued through to 2008.

Table 7.7: Comparison of the behaviour of the continuously and seriously unproductive core group of students 2005-2008, with the total groups of 2005 and 2008

Percentage Frequency of Unproductive Behaviour	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
All students 2005 n= 1159	5.0	9.0	13.6	25.4	10.0	14.1	15.5	8.6	12.6	6.8
All students 2008 n=1207	4.5	7.3	13.6	20.4	7.5	9.6	13.3	7.1	10.4	6.7
Seriously unproductive 2005-2008 n=27	14.8	37.0	37.0	70.4	37.0	44.0	51.9	37.0	55.6	25.9

Table 7.7 shows that a student who is seriously unproductive over four consecutive years is about four times more likely to exhibit one or more unproductive behaviours than other students. Further, 44.4 per cent were in the uncooperative behaviour group (characterised by aggressive, non-compliant and disruptive behaviours) and 33.3 per cent were in the disengaged behaviour group (characterised by inattentive, unmotivated and unresponsive behaviours). The group of 27 students also harbours 11.1 per cent of the students suspended during 2008, 18.5 per cent of those ESC students being integrated in regular classrooms and 14.8 per cent of those students who had been diagnosed with a socio-emotional disorder.

In summary, only a small proportion of the cohort of students behave in severely unproductive ways over a four-year period – fewer than one student per class on average. This result challenges the perception of large groups of students who habitually behave in ways that seriously undermine their academic prospects.

On the other hand, a much larger proportion, about 20 per cent of each year level cohort, is likely to experience a 'bad year'. This said, there is a reasonable probability that for some of these students their behaviour will improve. Most of them are on a trajectory characterised by dips and peaks.

There is not a simple stereotype of the chronic, seriously misbehaved student. While some show aggressive and oppositional behaviour towards their teacher and peers, a considerable proportion do not. The classic disengagement behaviours such as inattentiveness, unpreparedness and lack of motivation are more common.

The questions now to be addressed are: how do the students' behaviour trajectories correspond with their academic trajectories; and, do some students make exceptional academic progress, and if so, to what extent can their trajectories be explained by productive or unproductive classroom behaviour?

Trajectories of academic performance

The Matthew effect

As explained in Chapter 2, the evidence acquired from large-scale studies of student academic progress shows a tendency for the gap between high and low performers to widen over time. This phenomenon is sometimes referred to as the Matthew effect. It would be reasonable to expect the WALNA and NAPLAN results to show similar trends.

Correlations of student performance on the WALNA and NAPLAN tests, 2004-2008

One way of measuring the consistency of student performance over time is to correlate the students' results on two occasions. There were three sets of results for both the 2005 Year 4 and 2005 Year 6 cohorts. The results for the 2005 Year 4 cohort (Year 3 in 2004) are shown for numeracy and reading in Tables 7.8 and 7.9 below. The correlation coefficients in each range from 0.63 to 0.8, indicating that about half of the variation on a testing occasion can be explained by the student's performance on a prior testing occasion. Some students performed better or worse than expected in 2006. The question of special interest is whether changes in student academic performance can be explained by changes in their classroom behaviour.

Table 7.8: Correlations among numeracy assessments, 2004, 2006 and 2008, for the 2005 Year 4 cohort

	2004 Numeracy Year 3	2006 Numeracy Year 5	2008 Numeracy Year 7
2004 Numeracy Year 3	1.00	.70	.63
2006 Numeracy Year 5	.70	1.00	.80
2008 Numeracy Year 7	.63	.80	1.00

For the 2005 Year 6 cohort, the numeracy correlation coefficients range from 0.75 to 0.82; the correlation coefficients were slightly lower for reading, ranging from 0.65 to 0.75.

These correlations indicate that for students who progress from Year 3 to Year 9, for both numeracy and reading there is a moderate to strong level of predictability. A perfect or near perfect correlation would indicate little change in relative standing and would suggest that there is little teachers can do in later years.

Table 7.9: Correlation among reading assessments, 2004, 2006 and 2008, for the 2005 Year 4 cohort

	2004 Reading Year 3	2006 Reading Year 5	2008 Reading Year 7
2004 Reading Year 3	1.00	.69	.68
2006 Reading Year 5	.69	1.00	.80
2008 Reading Year 7	.68	.80	1.00

The WALNA numeracy and reading results are also highly correlated with each other; the correlation coefficients for reading and numeracy for the 2005 Year 6 cohort range from 0.61 to 0.70. Put simply, student performance on either WALNA test is a good predictor of performance on the other. This would suggest that a significant proportion of students who are performing below the benchmark in numeracy are also performing below the benchmark in reading.

In fact, 65 per cent of the students who performed below the benchmark on WALNA Reading in 2006 were also sub-benchmark performers on the numeracy test.

This result can be interpreted from different perspectives. On the one hand there is a substantial level of predictability. Overall, students who performed well on one occasion tended to perform well on the next. On the other hand, the results also show that schooling is like the game of snakes and ladders: the moderate size of the correlation coefficients indicate a significant number of students must do better or worse than expected.

The consistency of student academic performance using teacher judgments

Another way to gauge the consistency of student performance is to examine the extent to which the students' classroom teachers vary from year to year in their estimate of the standard at which the students have been performing.

In 2005, 2006 and 2007, teachers estimated the level of performance of students in reading and numeracy against a benchmark standard: well above, slightly above and below. This global judgment can be used to gain a rough indication of the consistency of student performance over a three-year period. The question that will now be addressed concerns the extent to which students who were judged to be performing below the benchmark in reading in 2006 continued to perform at this level in 2006 and 2007.

In 2006, across Years 3,5, 7 and 9, teachers reported that 26.2 per cent of students were performing below the benchmark. In 2007, the percentage fell slightly to 25.7 percent. However, the membership changed quite radically. In 2007, 64 per cent remained at their 2006 level, and 32 per cent had improved and were now performing 'around' the benchmark. Four per cent had performed at an even higher level and were performing 'above' the benchmark. Their place in the 2007 sub-benchmark group was taken by students who had in the previous year been judged to be performing at a higher standard.

In 2008, there was even more mobility. By the third year, the group of students who had been judged by their teachers to be performing below the benchmark contained only 40.1 per cent of the students who were classified as performing at that level in 2006. The performance of 60 per cent had improved while the performance of a corresponding percentage had deteriorated.

These results, though based on broad teacher judgements, suggest that there is much more mobility in academic performance than is commonly thought to be the case. The extent of the variability in standards of performance will now be examined more closely using the assessment data.

The consistency of student academic performance using WALNA and NAPLAN

It was reported in Chapter 4 that only two of the four year-level cohorts participating in the study acquired three sets of reading and numeracy performance results, namely the 2005 Year 4 and Year 6 cohorts. Only two sets of reading and numeracy assessments were acquired for the 2005 Years 2 and 8 cohorts. It was therefore decided to map the academic progress of the two cohorts with three sets of performance measures.

Chapter 4 explained that the WALNA results had been scaled using a Rasch measurement technique so that the scores of students for either reading or numeracy were directly comparable, even though students sat different tests and were in different year levels. However, the NAPLAN results and the WALNA results are not on the same scale. To address this problem in some of the analyses that follow, the assessments of reading and numeracy were converted to percentiles or deciles. While these are ordinal measures and are not normally subjected to the kinds of statistical techniques applied to variables measured on an interval scale, they can however be used for limited mapping purposes.

One way to estimate the amount of variability of student performance from year to year is to track the performance of students at the 2nd and 9th deciles. The students in 2005 who achieved at the 9th decile are among the highest performing students. If the Matthew effect applies, then this group of students should maintain their high level of performance in 2006 and 2008 and consolidate or enhance their initial advantage. Conversely, the students at the 2nd decile in 2005 should be expected to languish on the bottom.

Figure 7.1 shows the distribution of results on WALNA numeracy 2006 and NAPLAN numeracy 2008 for the group of students who, in 2004 while in Year 3, scored at the 2nd decile level. For those students, in 2006, 56 per cent of them substantially improved their performance relative to other students. The performance of a smaller proportion, 29 per cent, fell into the first decile. Altogether, only 16.1 per cent maintained their ranking in the second decile.

In 2008, a similar pattern prevailed: a majority of the lower performing 2nd decile students improved their relative standing, while a majority of those performing at the 9th decile in 2004, fell below the 9th decile in 2008.

Figure 7.1: Trajectories of the 2005 Year 4 student performance at the 2nd decile on 2004, 2006 and 2008 numeracy assessments
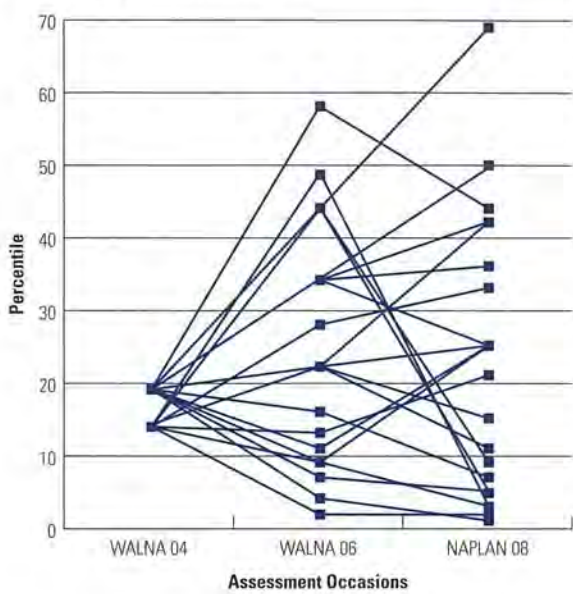
A similar level of variability is apparent for the students performing at the 9th decile in numeracy in 2004. The results for this decile are shown in Figure 7.2. In 2006, the performance of nearly 28 per cent had risen to the 10th decile and only 17 per cent continued to perform at the same decile. Of the remainder the performance of three per cent of the students declined dramatically, falling 7 deciles.

Figure 7.2: Trajectories of the 2005 Year 4 student performance at the 9th decile on 2004, 2006 and 2008 numeracy assessments
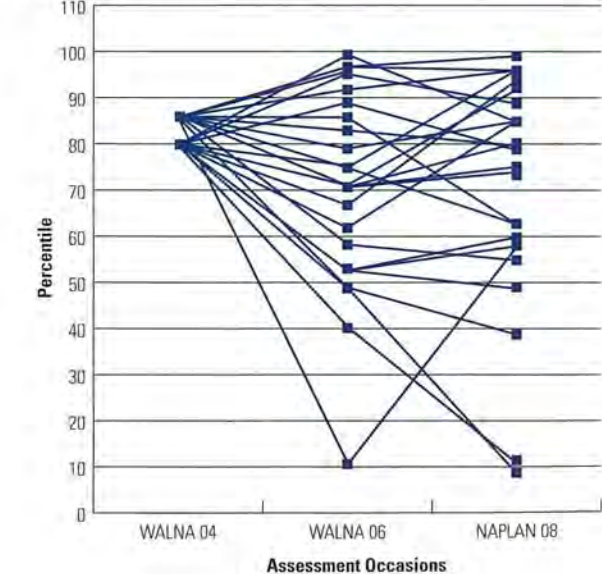
The analysis of the reading assessment results yielded similar results. Approximately half of the low performing students improved their standing, and the standing of a similar proportion of the high performing students declined.

This result corroborates the findings in the analysis of teacher judgments of student performance reported earlier, where the performances of substantial proportions of students varied considerably on testing occasions.

Taken together, these results challenge the impression arising from trend analyses where aggregate performances are reported as smooth progressions, a form of representation that appears also to validate the Matthew effect. Though trends in academic progression are often presented with box and whisker bands around the general trend-line, they do not reveal the 'snakes and ladders' pathways of individual students.

Some of the variation from testing occasion to testing occasion may be due to unreliability of the assessment instruments, and the subsequent misclassification of students into deciles. Nevertheless, the distribution of results within each decile is of considerable magnitude, and also outside the range of what could reasonably be expected to occur solely from measurement error. In the space of two years considerable movement up and down the performance ladder has occurred. The cases of individual students described more fully in Chapter 9 show that some students made exceptional progress, or conversely, suffered a sharp decline in their performance for reasons that their teachers were able to document convincingly.

Trajectories of behaviour and academic performance

The foregoing analyses in this chapter have shown that student behaviour *and* student performance vary considerably over a four year period.

Given that for a large proportion of students their behaviour changes from year to year, it follows that the membership of the four cluster groups – the productive, disengaged, low-level disruptive and uncooperative behaviour groups – will also change from year to year: a student may be classified in the disengaged behaviour group in one year and in the productively behaving group in another. To put the issue another way, student behaviour may positively influence academic performance in one year and negatively influence it during another.

It is possible to follow the performance of cluster groups based on the 2005 patterns of classroom behaviour and establish whether there is an initial difference among the groups and, if so, whether the difference is sustained over the following three years.

Figure 7.3 shows the pattern of results for the 2005 cluster group on the three testing occasions. It should be remembered that the WALNA and NAPLAN results are not calibrated on identical scales; this means that while any observed differences in 2008 are real differences measured in term of the 2008 NAPLAN scale, it is not possible to infer that the growth from 2006 to 2008 is on an equivalent scale to the growth from 2005 to 2006.

Figure 7.3: Differences in reading performance among the behaviour groups, 2004, 2006 and 2008
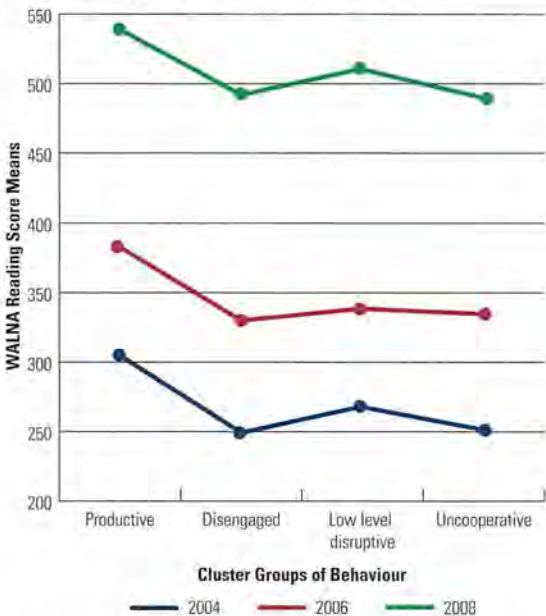
The differences in reading between the productively behaved group and each of the three unproductively behaved groups are statistically significant (p<.01). The same groupings of students produced a similar set of results in 2006 and 2008, though in 2008 the magnitude of the difference between the productive behaviour group and the low-level disruptive group was significant at a slightly lower level (p<.05). In neither 2004, 2006 nor 2008 were the differences among the unproductive behaviour groups statistically significant. In other words, over the 2004-2008 period, the productively behaved group members maintained their advantage.

The fact that the differences between the three unproductive behaviour groups were not found to be

statistically significant may be explained by the high level of inconsistency of student behaviour described earlier in this chapter. The analyses summarized in Figure 7.3 were based on the sorting of students into behaviour groups using the 2005 Student Behaviour Questionnaire data. Some of the students may have modified their behaviour after 2005, and properly been classified in another group.

Conclusion

There is a large core of students who are considered by their teachers to be productively behaved. About 40 per cent of each year level cohort did not exhibit any unproductive behaviours over a four year period. They exhibited what might be described as an 'unblemished' behaviour trajectory.

At the other extreme, there is a considerably smaller core of students, about 15 per cent of each year level cohort, who over a four-year period are reported under at least one unproductive behaviour category in each of the years. In many of these cases, however, teachers do not consider that the behaviour is having a considerable or severe impact on the students' academic progress.

However, as shown in Table 7.7, a small core of about three per cent, each year behave in ways that seriously undermine their prospects of satisfactory progress. This 'hard core' contains students who exhibit a variety of behaviours; there is no simple stereotype, nor identifying characteristic. Students can seriously retard their academic progress by exhibiting any subset of unproductive behaviours, although the wider the range the more likely they are to be members of this core. None of these students appears to particularly like school or engage with their schoolwork.

In between these two core groups - the 40 per cent of productively behaved students and the 3 per cent of seriously unproductively behaved students - stretch over more than half of the student cohort who manage to behave satisfactorily in some years but not in others.

There are three main explanations for the dips and peaks in the behaviour trajectories of students. Some of the variation may be caused by changes in the out-of-school circumstances of children. Their classroom behaviour improves or deteriorates because the situation has changed for the better or worse at home. A second explanation is that a change of teacher (and promotion to a new year level) can improve or worsen the behaviour of a student. Errors of classification provide a third possible explanation. The study

is not able to prioritise these explanations and it is possible that all explain some of the variation. However, what is not in dispute is that the behavioural trajectory of a large number of students shows dips and peaks.

The picture of academic progress over the four-year study seems to follow a similar pattern, marked by considerable variability.

An analysis of WALNA and NAPLAN results from 2004 to 2008 showed that of the students who were performing exceptionally well at the 9th decile in 2004, more than half slipped down the performance scale in 2006 and 2008, whereas of the students who were performing relatively poorly in 2004, more than half improved their standing, some by a considerable margin.

These results call into question the standard interpretation of the Matthew effect that implies there to be very little slippage or overtaking during schooling, that is, that the course is set early during formal education and is mostly unwavering.

Finally, in regard to the confluence of academic and behavioural trajectories, the strongest and most compelling generalisation that can be made is that students who consistently behave in a productive manner perform on average at a significantly higher level in reading and numeracy; further, over time they maintain their academic advantage. On the other hand, the students in the unproductive behaviour group mostly do not catch up, although the differences between the three groups – the disengaged, the low-level disruptive and the uncooperative behaviour groups – based on the behaviour of students in 2005, tend to flatten out.

This conclusion regarding behaviour and performance is, of course, based on average results. Within each group and in any year there are significant exceptions to the general rule. These exceptions are very important yet they are often lost sight of in quantitative studies.

Overall, these findings cast a positive light on the work of schools. Firstly, they challenge the myth of a large core of unproductively behaved students being set on a course of school failure. Second, much of the improvement in behaviour and academic performance is due to the persistent effort of teachers. However, not all students show a sustained improvement in behaviour or academic progress. The fact that some students regress highlights the constancy of the challenge. What might be done to redress the regression will be explored in Chapter 12.

8. Differences among students

Introduction

The aim of this chapter is to describe more fully the characteristics of the students who behave unproductively.

Chapter 5 mapped the incidence of unproductive behaviour according to year level, showing that the pattern was relatively constant through the primary years but varied considerably during Years 8-11. In this chapter, gender differences are systematically examined for each year level. Gender is one of the most obvious differences among students, research literature suggesting that for developmental reasons boys tend to adapt less well to schooling than girls.

This chapter also compares the behaviour of students who have special education needs with the behaviour of other students participating in the study. Particular reference is made to the subgroups of students who have socio-emotional disorders, immigrant students with poor English language skills, and education support students. The behaviour of students who have been suspended from school is also examined, since these students are commonly thought to place teachers under the most pressure, and considerable resources are committed to the management of their behaviour.

Finally, the chapter describes the behaviour profiles of students who fall below the 20th and above the 80th percentile on literacy and numeracy assessments. One of the ideas that initially prompted the Pipeline Project was a proposition concerning students who failed to meet benchmark standards in literacy and numeracy: namely, that a significant proportion could be assisted by interventions that moderated their unproductive behaviour. The chapter therefore examines the extent to which unproductively behaved students are over-represented in the tail of literacy and numeracy assessments.

Gender differences

The primary years

In almost all of the analyses of gender differences undertaken, the Pipeline Project found systematic behavioural differences favouring girls ahead of boys.

Figure 8.1 shows the differences in the incidence of productive and unproductive behaviour between boys and girls from Years 2 to 7 using two year level cohorts from the available four, namely Year 2 2005 and Year 4 2005. The differences are consistent throughout the primary years.

Figure 8.1: Percentage of students showing unproductive behaviours in Years 2-7, by gender

- % girls showing one or more unproductive behaviours
- % boys showing one or more unproductive behaviours
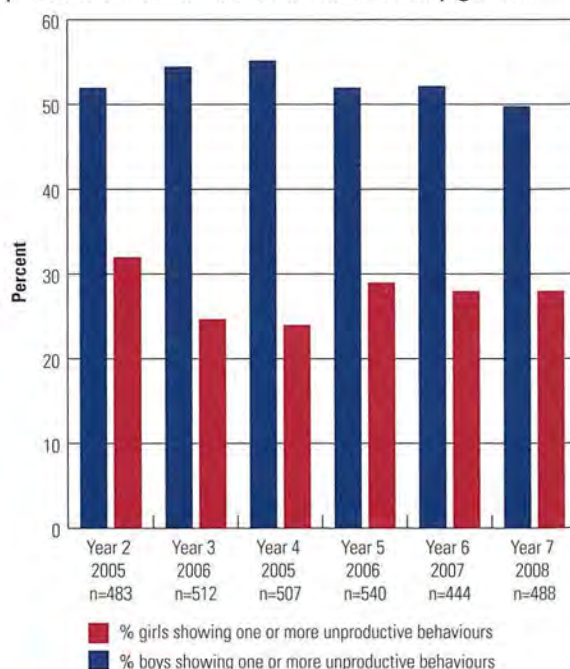
In every year, half the boys exhibited at least one unproductive behaviour. By contrast the proportion of girls is closer to one in four, with the exception of Year 2 where the incidence is slightly higher.

During September-October each year, teachers were asked to nominate the particular behaviour that was the most dominant of the unproductive behaviours shown by students. Table 8.1 shows the dominant behaviours reported for students in Years 3, 5 and 7 according to the gender of students. The figures in each cell in parentheses show the percentages of the total number of dominant unproductive behaviours for each year level attributed to the particular behaviour. Thus, in Year 3 for boys, inattentiveness constituted 13.8 per cent of all the instances of unproductive behaviour reported to be the dominant behaviour for boys. In year 5, inattentiveness constituted 19.9 per cent of all the dominant behaviours, and in Year 7 it peaked at 28.3 percent. Further, boys were more than five times more likely than girls to be reported with inattentiveness as the dominant behaviour.

Table 8.1: The dominant unproductive behaviours for Years 3, 5 and 7, by gender

Year level	Boys	Girls
Year 3 2006	Inattentive (13.8)	Disruptive (11.7)
	Unmotivated (9.7)	Inattentive (4.8)
n=145	Disruptive (9.7)	Unmotivated (4.8)
Year 5 2006	Inattentive (19.9)	Inattentive (11.4)
	Impulsive (10.2)	Irregular attendance (6.2)
n=176	Disruptive (9.1)	Impulsive (4.0)
Year 7 2008	Inattentive (28.3)	Inattentive (5.7)
	Disruptive (11.3)	Irregular attendance (4.4)
n=159	Unmotivated (6.9)	Unmotivated (3.1)

There is a considerable overlap of behaviours reported for boys for each year level: the most common of dominant unproductive behaviours were inattentiveness, lack of motivation, disruptiveness and impulsiveness. The dominant behaviours for girls are similar with one exception: in Year 5 and Year 7, irregular attendance was the second most frequently nominated unproductive behaviour.

The secondary years

As pointed out in Chapter 5, the frequency of unproductive behaviour differs across year levels and between English and mathematics classes during the high school years. Figure 8.2 shows the differences according to gender. The most noteworthy example is in Year 9. The incidence of unproductive behaviour in mathematics in Year 9 is the lowest for boys and girls of any year of schooling. For girls, only 13.5 per cent are reported to behave unproductively, half the frequency of reported unproductive behaviour in either the preceding or following years.

The pattern is therefore quite uneven: Years 8 and 10 have relatively high levels of unproductive behaviour and Years 9 and 11 relatively low levels. Year 10 is the peak year level.

These results, based on large samples, present a conundrum. The conventional wisdom suggests that Year 9 is the troublesome year: youngsters have shed any awe that followed their transition from primary to high school, and hormones are flowing freely. Moreover, mathematics has tended to be regarded as one of the least preferred subjects for girls, which if true, would be expected to prompt unproductive behaviour.

Figure 8.2: Percentage of students showing unproductive behaviours in Years 8-11, by gender
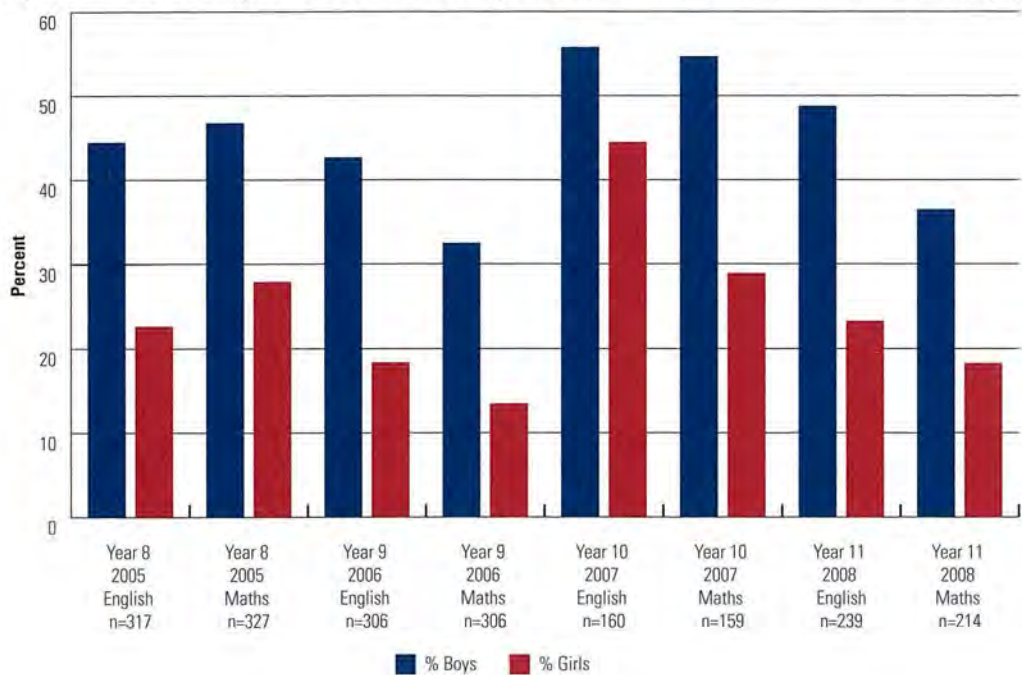
Table 8.2: Dominant unproductive behaviours in English and mathematics classes for Years 8-11, by gender

Year level	English		Mathematics	
	Boys	Girls	Boys	Girls
Year 8, 2005 ne=65 n_m=36	Inattentive (24.6)	Inattentive (9.2)	Inattentive (27.6)	Inattentive (8.3)
	Disruptive (7.7)	Irreg. attend. (6.2)	Unmotivated (11.1)	Unmotivated (8.3)
	Unmotivated (6.2)	Unmotivated (4.6)	Erratic (8.3)	Unprepared (8.3)
Year 9, 2006 ne=83 n_m=58	Inattentive (26.5)	Disruptive (9.6)	Unprepared (18.6)	Irreg. attend. (6.8)
	Impulsive (18.1)	Irreg. attend. (6.0)	Unmotivated (16.9)	Inattentive (6.8)
	Unmotivated (14.5)	Inattentive (2.4)	Inattentive (10.2)	Unmotivated (5.1)
Year 10, 2007 ne=126 n_m=74	Unmotivated (19.0)	Unmotivated (10.3	Unmotivated (17.6)	Unmotivated (10.8)
	Inattentive (13.5)	Inattentive (9.5)	Inattentive (13.5)	Inattentive (8.1)
	Disruptive (10.3)	Erratic (4.0)	Disruptive (9.5)	Non-compliant (5.4)
Year 11, 2008 ne=55 n_m=49	Inattentive (9.5)	Irreg. attend (9.5)	Unmotivated (24.5)	Irreg. attend.(10.2)
	Unmotivated (5.4)	Inattentive (4.0)	Disruptive (12.2)	Unmotivated (10.2)
	Unprepared (5.4)	Erratic (4.0)	Inattentive (6.1)	Inattentive (2.0)

Table 8.2 compares the behaviours for boys and girls reported by teachers to be 'dominant'. Many are shared for the boys and girls: inattentiveness, disruptive behaviour and lack of motivation are common, though irregular attendance, as for students in their primary years, is much more often cited for girls. An analysis of the 2006 Student Behaviour Checklist, for example, indicates that for 9 out of the 10 categories of behaviour boys were three times more likely than girls to exhibit unproductive behaviour. However, for the tenth category, irregular attendance, slightly more than 60 per cent were girls.

In general, and importantly, for both primary and secondary years the dominant behaviours that are holding both sexes back are the behaviours symptomatic of disengagement.

Enjoyment of school

In September-October each year, teachers were asked to rate the extent to which each student enjoyed the set work. Again, there was a stark contrast between the ratings by teachers of boys and girls. The figures for primary school are tabulated in Figure 8.3. In the 2005 Year 2 cohort, by Year 3, nearly three quarters of all girls were thought by teachers to 'nearly always' enjoy doing the set schoolwork. For the 2002 Year 4 cohort, by the time students had reached Year 7 more than 13 per cent more girls than boys were reported to nearly always enjoy school.

Figure 8.3: Percentage of students reported by teachers to 'nearly always' enjoy school, by gender
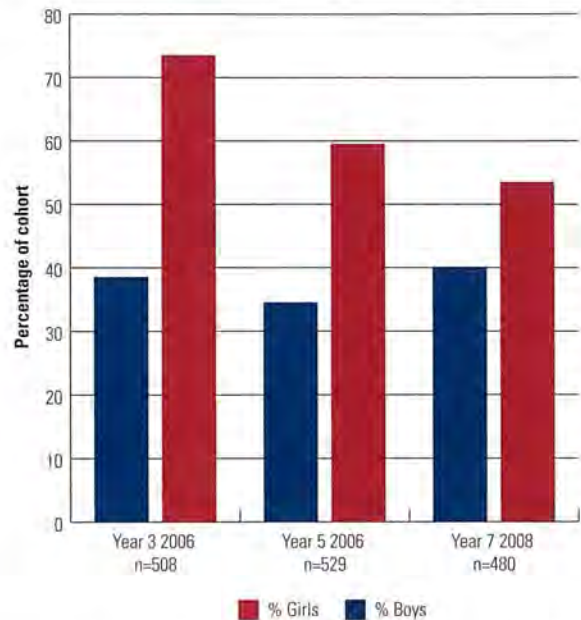
In high school, as in primary school, boys were less likely than girls to be reported by their teachers to be nearly always enjoying their schoolwork. This was the case for both English and numeracy.

Figure 8.4: Percentage of the gender cohort reported by teachers to 'nearly always' enjoy school, by gender

| | Year 8 2005 English n=65 | Year 8 2005 Maths n=62 | Year 9 2006 English n=289 | Year 9 2006 Maths n=297 | Year 10 2007 English n=160 | Year 10 2007 Maths n=159 | Year 11 2008 English n=221 | Year 11 2008 Maths n=213 |

Nearly always enjoy set work

■ % Boys   ■ % Girls
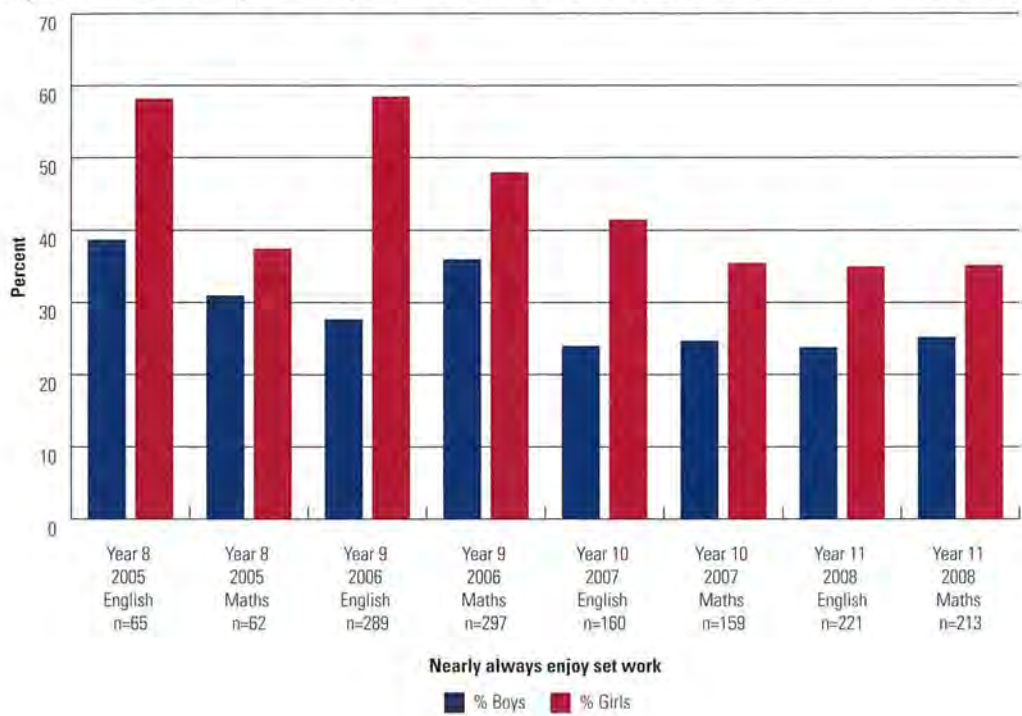
Figure 8.4 shows that higher proportions of girls than boys are reported to enjoy mathematics during their high school years. This is a noteworthy result. Mathematics has been regarded as a 'boys' subject' and on average boys tend to achieve at a higher level in large scale testing programs. Nearly half of all girls in Year 9 are considered to enjoy the set work in mathematics classes. Of the girls in this year level, only 13.5 per cent exhibited an unproductive behaviour (see Figure 8.2).

In Year 10, the 'troublesome year', the reported levels of unproductive behaviour are uniformly higher and the levels of enjoyment are uniformly lower. Moreover, the behaviour data was collected in May-June and the enjoyment data in September-October, making it more likely that the teachers were able to make independent judgments about behaviour and enjoyment of school.

Cluster analyses by gender

One way to summarise the gender differences in behaviour is to examine the proportions of each gender comprising the cluster groupings described in Chapter 5. There were four groups: the productively behaving students, the students who were disengaged, the low-level disruptive students and the group whose members exhibited uncooperative behaviours.

The membership of the four groups differed markedly in terms of the gender of students (see Figure 8.5). Girls were more likely than boys to form the group identified by teachers as behaving productively. For the group defined by disengagement behaviours, a slightly higher percentage of boys was confirmed. In the group characterised by low-level disruptive behaviour, there were over twice as many boys as girls. For the group defined by uncooperative behaviour, including aggressive and oppositional behaviour, the ratio of boys to girls was more than four to one.

Figure 8.5: Gender memberships of clusters as a percentage, 2006 group

Student behaviour groups
■ % Girls ■ % Boys
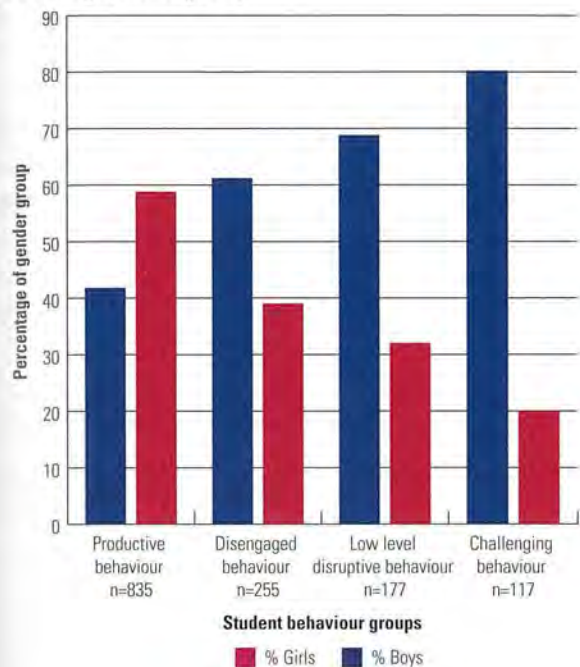
Academic performance by gender

The results of the NAPLAN tests for Years 3, 5 and 7 were published by the Ministerial Council for Education, Employment and Youth Affairs (MCEETYA, 2008) in conjunction with the Annual National Report on schooling. The preliminary report for 2006 showed that girls outperform boys, on average, at a statistically significant level in reading and, at a non-significant level, in numeracy.

Table 8.3: Mean scores for Years, 3, 5, 7 and 9 on the 2006 WALNA results, by gender

Cohort	Reading			Numeracy		
	Males	Females	Significance	Males	Females	Significance
Year 3	292.4	302.3	n.s	338.7	336.5	n.s
n	242	242		244	243	
Year 5	354.8	367.2	<.05	406.5	389.1	<.05
n	260	261		259	260	
Year 7	425.4	439.2	<.05	471.6	462.4	n.s
n	227	248		228	249	
Year 9	459.4	476.6	<.05	535.8	525.3	n.s.
n	157	137		156	137	

Table 8.4: Mean scores for Years 5, 7 and 9 on the 2008 NAPLAN results, by gender

Cohort	Reading			Numeracy		
	Males	Females	Significance	Males	Females	Significance
Year 5	465.9	475.8	ns	467.2	454.5	ns
n	188	188		186	188	
Year 7	516.0	525.9	ns	543.3	518.9	<.01
n	204	209		203	209	
Year 9	550.9	548.3	ns	575.7	543.9	<.01
n	80	71		81	70	

The results for the Pipeline sample revealed a similar pattern on WALNA: females have a slight, statistically significant advantage in reading. And although boys out-perform girls in numeracy, the differences in average scores were not statistically significant except for Year 5. It is also noteworthy that the differences in Year 3 for both reading and numeracy were not statistically significant. The gender differences on the 2006 WALNA assessment are shown in Table 8.3.

The NAPLAN results, shown in Table 8.4, yielded a slightly different result. While the difference in reading for each year level cohort favours females, none was large enough to be statistically significant; whereas in numeracy the boys out-performed the girls in Year 7 and Year 9 at a statistically significant level. Neither of the comparisons for reading or numeracy yielded a statistically significant difference for Year 5.

These results (see Table 8.4) raise the important question of why the girls did not consistently out-perform the boys on WALNA and NAPLAN, given that classroom behaviour predicts academic performance, and girls generally behave more productively than boys. The analyses of WALNA and NAPLAN data described in Chapter 6 show that for each cohort, the students who were reported to behave unproductively produced WALNA results that were lower than those of the other students. The results tabled earlier in this chapter show that for every comparison, the frequency of unproductive behaviour and the estimated severity of its impact were higher for boys than girls.

This study cannot completely resolve this conundrum. However, a more detailed analysis of each year level cohort provides some clues. Consider, for example, the 2006 Year 3 mathematics results shown in Table 8.3, which show that boys outperform girls by a small margin. If girls behave more productively why didn't they do better overall?

To address this question the Year 3 cohort results were examined by cross-tabulating the gender of students by their cluster group membership and their WALNA mathematics results. For ease of interpretation, the WALNA results were converted to percentiles.

The analysis showed that 62.1 per cent of the productively-behaved group were girls. However, of the students in this group performing below the 20th percentile, two thirds were girls. In other words, girls were over-represented in the 'well behaved' group, but there is also a much larger proportion of low-performing girls than boys in that group.

Conversely, boys were over-represented in the unproductive behaviour groups, but unlike the girls, more of the boys were relatively high performers. For example, of the small group of students who exhibit uncooperative behaviours (the group that on average was shown in Chapter 6 to be the lowest performing on WALNA tests), a quarter of the boys performed above the 50th percentile, whereas none of the small number of the girls in this group performed above the 30th percentile.

In summary, the relationship between the academic performance of students and their behaviour follows a different pattern for boys than girls. Boys are more likely than girls to perform at relatively high levels on measures of academic achievement, even though they are reported to exhibit unproductive behaviour, whereas girls who are 'well behaved' are more likely to under-perform in numeracy. It is possible to speculate why this may be so, but the study cannot conclusively explain why this pattern exists.

Special needs students

Education support students

Approximately 5 per cent of students in regular classrooms have a formal diagnosis of a medical or mental health disability. These students are taught in a mainstream class as part of the school's 'inclusion' policy. The school may have decided to place such a student in a mainstream class with a teacher assistant as additional support. It is also possible that a parent requested that their son or daughter be educated in the mainstream rather than in an education support setting.

In 2008, teachers were asked to indicate which students in their Pipeline class, if any, were classified as education support students. spent part of the day in a mainstream class and part of the day in a supported setting, or received extra education support from the Student at Educational Risk (SAER) Coordinator, AER Coordinator or EA support because they had been identified as having learning problems. Of the 84 students identified by this means, 47.6 per cent were in primary schools (5.1 per cent of the Year 5 and Year 7 primary students), 45.2 per cent were in Education Support Centres (representing all the students in the Pipeline Project from Education Support Centres) and 1.4 per cent from high schools (representing 3.6 per cent of the high school students).

In Chapter 5 it was observed in Table 5.5 that approximately 80 per cent of students in Education Support showed one or more unproductive behaviours each year, between two and three times the frequency of students in regular classrooms. The question now addressed is whether education support students in regular classrooms show different patterns of unproductive behaviour from students in mainstream classes. For this analysis, the behaviour of ESC students in mainstream classes is compared with the behaviour of students in ESCs. The results are shown in Table 8.5: they reveal only minor differences.

Students with socio-emotional problems

Teachers were asked to indicate whether a student had been formally diagnosed with a socio-emotional condition of which ADD, ADHD, Depression/Anxiety Disorder, Oppositional Defiance Disorder, and Autism spectrum were given as examples. They were not asked to identify the specific disorder. Overall, 6.1 per cent of all students in the Pipeline primary schools, high schools and Educational Support Centres were identified by this means.

Of the students in primary and high schools, 3.6 per cent were reported to have a formal diagnosis of a socio-emotional disorder. Half of this group exhibited unproductive behaviour that was having a serious impact on their learning during 2008; the behaviour of the remainder was reported to have little or no impact. Of this group, only 14 per cent were among the education support students who were being mainstreamed.

These statistics suggest that only a small percentage of students in regular classrooms have a diagnosed socio-emotional disorder - a smaller percentage than expected, given the results of various surveys of student mental health. For example, a survey of West Australian school students found that 21 per cent had indications of a mental health problem (Zubrick et al., 1997). There are several possible explanations for the discrepancy. First, teachers in the Pipeline Project may have under-reported the incidence since some of their students have an *undisclosed* formal diagnosis. Second, a substantial number of students may have an *undiagnosed* mental health illness. And third, it is also possible that mental health surveys tend to over-estimate the incidence of mental health problems in populations.

Nevertheless, as shown in Table 8.6, the students in regular classrooms who teachers have reported as having mental health conditions are much more likely to show unproductive behaviours, particularly of the aggressive, non-compliant, erratic and impulsive kind. Four out of every five of these students are boys.

Table 8.5: Frequency of unproductive behaviour for students in ESCs and mainstream classes, 2008

Frequency of Unproductive Behaviour	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
ESC students special schools n=39	23.1	51.3	43.6	61.5	38.5	43.6	41.0	43.6	17.9	10.3
ESC students in mainstream primary classes n=37	21.1	50.0	44.7	60.5	36.8	42.1	39.5	44.7	15.8	7.9

ESL students

Australia has implemented a substantial immigration program for people who speak a language other than English at home. Some of the migrants enter Australia with high levels of education and workforce skills; others enter Australia on refugee or humanitarian grounds. Children who are 'new arrivals' from non-English speaking backgrounds, often refugees, are provided with intensive English language instruction in special centres attached to schools, from where they are progressively integrated into regular classrooms. Some of these ESL children, for example those from Sudan, must cope with a new culture while recovering from trauma experienced at home or in refugee camps. While acknowledging that the circumstances of new arrivals may differ widely in the analyses that follow, they are not disaggregated but simply referred to as ESL students.

The results shown in Table 8.7 indicate that ESL students in regular classrooms and in Education Support Centres, taken as a whole, behaved unproductively in approximately the same proportion as non-ESL students on about half of the behaviour categories. However, the higher incidence of behaviours typically associated with disengagement – inattentiveness, lack of motivation and unresponsiveness – are noteworthy. For example, ESL students were nearly three times more likely to be described more unresponsive than the non-ESL students. It is possible that these elevated levels were due to cultural and language challenges that they were facing. Some of these students may have experienced recent trauma. Altogether 21.3 per cent of ESL students were reported to be behaving in ways having a considerable or severe impact on their learning. For all other students in the Pipeline sample the figure was only marginally lower – 18.9 per cent.

Table 8.6: Frequency of unproductive behaviour for students in regular classrooms with socio-emotional disorders compared with all other students, 2008

Frequency of Unproductive Behaviour	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
Students with socio-emotional disorders in regular classrooms n=37	24.3	32.4	29.7	48.6	32.4	40.5	24.3	27.0	27.0	13.5
All other students in regular classrooms n=1095	3.8	6.3	12.9	18.7	6.1	8.2	12.2	5.9	9.4	5.7

Table 8.7: Frequency of unproductive behaviour for ESL students compared with all other students, 2008

Frequency of Unproductive Behaviour	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
ESL students n=46	2.2	13.0	15.2	37.0	10.9	21.7	21.7	19.6	15.2	6.5
All other students n=1170	5.1	8.4	14.2	21.0	8.0	10.1	13.4	7.8	10.2	6.0

Students who have been suspended

Altogether 5 per cent of the 2008 students were reported by their teachers to have been suspended, either by mandatory removal altogether from their class or, by being prohibited from attending school for a period of time. The former sanction is referred to as an 'in school' suspension and the latter as an 'out of school' suspension.

Of the 66 students suspended, 58 showed an unproductive behaviour during 2008, although 8 students did not. As shown in Table 8.8, suspended students exhibited a much higher level of unproductive behaviour than other students in every category, particularly behaviours that challenged the authority of their teacher and the wellbeing of other students. The largest discrepancy between those who were suspended and those who were not was in the category of aggressive behaviour. The suspended students were more than 20 times more likely to have been described by their classroom teachers as aggressive, and 10 times more likely to have been described as non-compliant. For the other unproductive behaviour categories the magnitude of difference is large. Suspended students are over-represented in the uncooperative behaviour group.

With regard to the impact of the behaviour, classroom teachers reported that for 61 per cent of the suspended students, their classroom behaviour was having a considerable or severe impact on their academic performance. For the other students, the comparable statistic was 17 per cent.

It seems that boys are three times more likely than girls to be suspended.

Table 8.8: Frequency of unproductive behaviour for students suspended during 2008 compared with all other students

Frequency of Unproductive Behaviour	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
Students suspended during 2008 n=66	51.5	54.5	63.6	60.6	45.5	47.0	43.9	28.8	33.3	15.2
All other students in regular classrooms n=1155	2.3	5.9	11.4	19.4	6.0	8.4	12.0	7.0	9.0	5.5

Which students compose the academic tail?

The final issue to be addressed in this chapter concerns the behavioural profile of students who composed the academic tail on assessments of literacy and numeracy. To elucidate this issue the 2003 WALNA results for the Year 2 2005 cohort will be examined by contrasting the behaviour of students who performed below the 20th percentile with those who performed above the 80th percentile. Table 8.9 shows the differences between the two groups according to the levels of unproductive behaviour as reported on the Students Behaviour Checklist.

The higher performing subgroup typically did not display unproductive behaviours; only one in five recording one or more, although one student was reported to have behaved unproductively in eight categories. Only one student was reported to be behaving in ways that were having a severe impact on academic performance – and, not surprisingly, it was the same student whose unproductive behaviour had spread across eight categories.

Of the students who performed below the 20th percentile in numeracy, the picture was quite the opposite. Nearly two-thirds showed unproductive behaviours and 44 per cent were considered to be behaving in ways having a considerable or severe impact on their learning.

Of the students whose behaviour was considered by teachers to be having a considerable or severe impact on their academic performance in numeracy, 7.7 per cent achieved above the 80th percentile. Of the students achieving below the 20th percentile on the WALNA numeracy test, 41.4 per cent were behaving in ways that teachers judged to be having a considerable or severe impact on their academic performance.

The results for Year 3 reading followed a similar pattern. Table 8.10 compares the patterns of behaviour for students who scored above the 80th percentile and below the 20th percentile on the WALNA reading test. There are no noteworthy differences for any of the behaviour categories when compared with the WALNA numeracy test.

Interestingly, of the 10 categories of behaviour on the Student Behaviour Checklist, unresponsiveness was the category that most strongly discriminated between the students in the two groups for both reading and numeracy. Students were between 6 and 7 times more likely to be described as unresponsive if they were in the tail of students performing below the 20th percentile, than if they were performing above the 80th percentile.

With regard to students' gender, there was almost no difference in the proportion of boys and girls in the WALNA numeracy tail; however, there were 22 per cent more boys than girls in the WALNA reading tail. Students of each gender were equally represented in the group whose members scored above the 80th percentile in reading and numeracy.

Table 8.9: Frequency of unproductive behaviour for students below the 20th percentile and above the 80th percentiles in numeracy, Year 3, 2006

Percentage of Unproductive Behaviour Year 3 Numeracy	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
Students below the 20th percentile n=105	9.5	17.1	28.6	39.0	16.2	20.0	20.0	22.9	19.0	10.5
Students above the 80th percentile n=105	1.9	7.6	7.6	9.5	8.6	6.7	7.6	3.8	5.7	1.9

Table 8.10: Frequency of unproductive behaviour for students below the 20th percentile and above the 80th percentiles in reading, Year 3, 2006

Percentage of Unproductive Behaviour Year 3 Reading	Aggressive	Non-Compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular Attendance
Students below the 20th percentile n=88	6.8	13.6	25.0	40.9	11.4	18.2	23.9	21.6	25.0	6.8
Students above 80th percentile n=99	3.0	5.1	6.1	10.1	4.0	6.1	5.1	3.0	8.1	2.0

Conclusion

Girls were reported to behave more productively than boys from their earliest years of schooling. This trend was observed from Years 2 to 11 and was found to apply in both English and mathematics classes during the secondary years.

Inattentiveness, lack of motivation, and disruptive behaviour were the behaviours most commonly nominated by teachers as the dominant behaviour for boys and girls whose unproductive behaviour persisted throughout the year. There was one noteworthy addition; irregular attendance was found to be one of the dominant behaviours characterising girls during the primary and secondary years.

Boys were much more likely than girls to be classified as members of the group characterised by uncooperative behaviour. This was the lowest performing group on the WALNA and NAPLAN assessments. Boys were three times more likely to be suspended than girls; the suspended students were particularly differentiated from other students by their aggressive and confrontational behaviours.

The consistently higher levels of unproductive behaviour of boys did not appear to make much difference to their academic results in literacy and numeracy. While girls performed better than boys on average in reading, the mean differences were relatively small. In numeracy, however, boys did slightly better than girls, though the differences were not statistically significant.

Considerably more boys than girls were represented in the lowest two deciles of the WALNA reading test, though the gender difference for WALNA mathematics performance was marginally in favour of boys.

Unproductive behaviour was more prevalent among the lower performing students. The students who fell into the WALNA tail were five times more likely than high performing students to behave in ways that teachers considered to have a major impact on their academic progress. However, even among the students in the top two WALNA deciles, there were students whose behaviour was seriously unproductive. Boys were over-represented in this group. It is reasonable to assume that these students could perform at higher levels if they moderated their behaviour.

Students in Education Support Centres exhibited the most unproductive behaviour of any category of student in the study. The level of unproductive behaviour of these students was at a noticeably higher level than for students with disabilities who were included in regular classrooms. In regular classrooms, students with disabilities exhibited higher levels of unproductive behaviour than their peers.

Students with socio-emotional problems also displayed above average levels of unproductive behaviour.

9. Trajectories of individual students

Introduction

In Chapter 7 it was shown that there was considerable variation from year to year in an individual student's behaviour and academic progress as reported by class teachers over the duration of the Pipeline Project.

In this chapter, the cases of 12 students are reported in some detail. The students were selected because either their academic performance or classroom behaviour showed exceptional improvement or deterioration. The teachers of these students were then invited to comment on the results, drawing on their extensive knowledge of factors that may have spurred or impeded their progress at school.

As far as possible, students were selected from class teachers who had attended the focus groups. In total, 22 teachers were interviewed in order to obtain background information about 36 students. From this group, 12 students were selected, providing examples of improvement and deterioration in both academic performance and classroom behaviour. In selecting these 12 students, an effort was made to represent year levels and gender. The teacher interviews were conducted in the participating schools during November and December 2008.

It should also be noted that the cases were selected because they illustrated complexity, unexpected outcomes, or provided examples of important influences on behaviour and learning that were not incorporated in the quantitative analyses described in previous chapters.

The academic trajectories are based on percentile rankings calculated separately for each cohort from their scaled scores at two-yearly intervals. It should be noted that changes over time relate to percentile rankings and that these are not percentages. Low percentile rankings correspond with low academic performance and vice versa.

Individual case study students have been represented by a letter of the alphabet; the girls are represented by vowels and the boys by consonants. Two additional students, referred to by teachers, both girls, have been identified by the letters Y and Z.

Exceptional trajectories

Case study students who illustrate exceptional trajectories over 2005-2008 have been grouped in four categories according to whether their academic performance, or their behaviour, improved or deteriorated. The categories are not absolutely discrete.

Improved test results

Student A

Student A was selected because, although her academic results showed overall improvement, she was reported to be disruptive over four years. Her case raised the question as to why her disruptive behaviour did not appear to be having a negative impact on her learning.

Figure 9.1 shows that A's test results improved from Year 3 to Year 5, particularly in numeracy where she improved her ranking by 26 percentile points (see pink lines). Table 9.1 shows she was disruptive every year from Year 2 to Year 5.

One of A's teachers described her as 'very disruptive but not in a naughty way. It's just that she's a born leader. She's got to be out there. She's got to be in your face. She likes to do things to help. You need a child like this in every class because when you're in a hurry and you want something done, pick her and you know it will be done'.

The other class teacher saw A differently. She had a 'run in' with A and her mother because a throwaway line had caused A to 'feel so terrible that she didn't want to come to school'.

In general terms, A might be described as 'high maintenance' but also highly engaged.

Student B

Student B was selected because his behaviour *and* academic performance improved from Year 4 to Year 7. Also, B had a formal diagnosis of Attention Deficit Disorder for which he takes medication.

Figure 9.1 shows that B attained very high reading results (see blue lines) with little variation from Year 5 to Year 7. His numeracy results, however, increased by 27 percentile points over the same period.

B's teacher in Year 4 reported a range of unproductive behaviours. She provided a daily report on his behaviour to his parents. His behaviour continued to be a problem the following year (see Table 9.1). However, at the end of Year 7 he was awarded the school's science award. The deputy principal taught him in Year 5 and commended his active interest in the natural environment. He also provided an example of outstanding creativity in a science class.

According one of his teachers, in the early primary years, B had just wanted to sit and play, to do his own thing. This tendency continued in the later primary years so that he could be observed sitting in class 'designing things in his own mind instead of doing what the class is doing'. His teacher explained his improvement resulted from his higher level of engagement with his school work after it became more challenging in the senior primary years.

Student C

Student C was described by a teacher as a bright boy who 'looks as though he doesn't enjoy his schoolwork but in fact he doesn't show his enjoyment; he's pan-faced, not unhappy'. Table 9.1 shows that he was identified as inattentive in Year 4, unresponsive in Year 5, unmotivated in Year 6 and disruptive in Year 7. Teachers observed that C could be an annoying child to teach because he 'doesn't contribute to class discussion and he never smiles'.
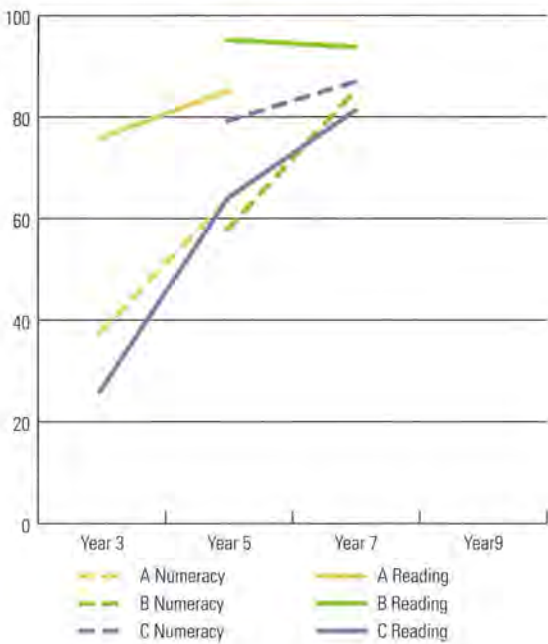
The deputy principal said that C's mother wants him to do well at school having drilled into him that he must listen to the teacher and not talk in class. Figure 10.1 shows that over the four-year period, C's reading results have climbed 55 percentile points so that he is now performing very well in both numeracy and reading.

Table 9.1: Teachers' ratings of classroom behaviour, test results improved over time, three students

| Year level | 10 behaviours identified by classroom teachers | | | | | | | | | |
	Aggressive	Non-compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular attendance
Student A										
2	✓	✓		✓						
3		⨉			✓					
4	✓	✓		✓						
5		✓								
Student B										
4	✓	✓	✓	✓			✓			
5	✓	✓	✓	✓	✓	✓	✓		✓	
6			✓						✓	
7	⨉									
Student C										
4				✓						
5				✓				⨉		
6							✓			
7			✓							

✓ Behaviour identified in May.

✓ Judged dominant behaviour in October if no improvement observed.

⨉ Behaviour not identified in May but judged dominant behaviour in October.

Figure 9.1: State and national test results of case study students, test results improved over time, three students

Legend:
A Numeracy (dashed yellow) — A Reading (solid yellow)
B Numeracy (dashed green) — B Reading (solid green)
C Numeracy (dashed purple) — C Reading (solid purple)

Improved behaviour

Student D

Student D was selected because his pattern of behaviour from Year 4 to Year 6 changed dramatically in Year 7. Table 9.2 shows that in Year 4 he was reported to have 6 unproductive behaviours, 10 in Year 5 and 9 in Year 6. It was very uncommon in the Pipeline Project for a student to be reported as unproductive in all 10 categories.

For D, a diagnosis of diabetes early in Year 7 appeared to be a turning point in the reversal of his behaviour pattern. Table 9.2 shows the number of unproductive behaviours reported declined dramatically from the levels evident in Years 4, 5 and 6. In the opinion of his class teacher, health problems prior to the diagnosis were exacerbated by 'a very unfortunate home life'. Adding to these difficulties, he was excluded from the peer group thus becoming very angry towards his peers.

D was frequently absent from school in the first half of Year 7 while he was learning to manage his diabetes; this accounts for the irregular attendance reported in Table 9.2. During the second half of Year 7 his teacher observed him to be happier, reporting that he has 'come along in leaps and bounds and he's shown a heck of a lot of maturity and responsibility'.

D's classroom teacher gave a positive, overall assessment at the end of Year 7: 'He's good at numeracy. His writing is weak but that's a function of all the school he's missed. He's smart enough but he gets hamstrung by his home background'. Figure 9.2 shows D's test results support this contention (see blue lines). It is interesting to note that, even while his behaviour was being assessed as highly unproductive during Year 4 to Year 6, his numeracy results were improving markedly. The trajectory of his reading results is positive and encouraging for the future.

Student E

Student E was selected because her behaviour deteriorated after Year 3 and then improved in Year 5; Year 4 seemed to be an exception. Table 9.2 shows that a range of unproductive behaviours was reported in that exceptional year.

It was during Year 4 that E 'palled up' with another girl in her class. E's friend, Z, had serious problems. 'They were like chalk and cheese' said the deputy principal explaining that Z was an intimidating person. The two girls were in a class with only 14 students and lived a few doors apart in the same street. E's parents didn't get home from work until 6PM and both girls went to Z's house after school. The school sent letters home explaining their concerns but the parents didn't make contact.

The following year everything changed. Initially the girls were put into different classes. After a long period of non-attendance, Z left the school after being placed in care. E's parents changed their work arrangements so that one of them could pick her up from school every day. Subsequently, E's behaviour improved.

The deputy principal explained the situation at the end of Year 5: 'E was intelligent and mature enough to realise that if she played with other children she would make friends'. She described her attainments as 'below average but certainly not a failing student'. E's test results, shown in Figure 9.2 (see red lines) are consistent with this view. During her relationship with Z, between the Year 3 and Year 5 WALNA assessments, E's numeracy fell 60 percentile points, though her reading improved slightly - 14 percentile points.

Student F

Student F was selected because his behaviour improved during Year 6 and Year 9.

In primary school F's teachers reported a wide range of unproductive behaviours in Years 6 and 7 (Table 9.2), his Year 6 teacher reporting he had been diagnosed with an attention deficit disorder. Since commencing high school, F's behaviour has been less of a problem.

F's high school deputy principal said that at the beginning of Year 8 she considered him to be a 'nervous, introverted boy' who may have been torn between recently separated parents. Problems surfaced in English classes in Year 8 but not in mathematics classes. The deputy principal put this down to a lack of experience on the part of the English teacher, possibly contributing to a personality clash. 'I think he does have a tendency to be aggressive but the teacher didn't de-escalate some situations,' she explained.

In Year 9, F has become more confident and wanting to become more involved. The deputy principal attributed the improvement to maturation. It is also worth noting that, despite the high number of unproductive classroom behaviours reported in primary school, irregular attendance was not identified.

F's test results (see green lines) show his performances in reading and mathematics to be above average. His results peaked in Year 7 but declined somewhat in Year 9, even though his behaviour improved in that year. Over the four-year period, this student improved his performance relative to other students by 19 percentile points in numeracy while maintaining his level of performance in reading.

Table 9.2: Teachers' ratings of classroom behaviour, behaviour improved over time, three students

Year level	Aggressive	Non-compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular attendance
Student D										
4				✓		✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓		✓	✓	✓
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	x
7				✓						✓
Student E										
3										
4		✓	✓		✓	✓	✓		✓	
5										
Student F										
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	
7	✓		✓	✓	✓	✓	✓		✓	
8E	✓									
8M				✓						
9E										
9M				✓						

✓   Behaviour identified in May.

✓   Judged dominant behaviour in October if no improvement observed.

x   Behaviour not identified in May but judged dominant behaviour in October.

Student E did not join the study until 2006.

Figure 9.2: State and national test results of case study students, behaviour improved over time, three students
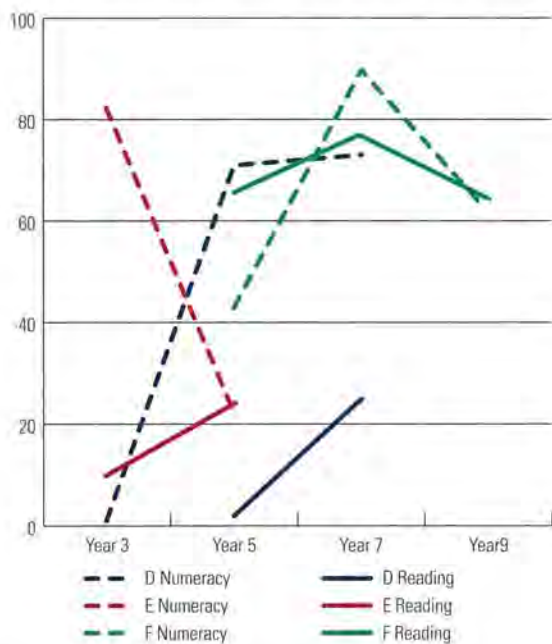
(Year 3 numeracy result for Student D was not available.)

Test results that deteriorated

Student I

Student I was selected because she was reported to behave productively yet had been suspended.

The Year 6 teacher reported I had family and emotional problems, but these problems did not impact severely on her academic work. Table 9.3 shows relatively few unproductive behaviours to be evident during Year 6 to Year 9. However, the Year 8 English teacher reported I was under-performing. In Year 9 both her English and maths teachers reported that until May she behaved productively, but by October her behaviour had deteriorated. This English teacher identified irregular attendance as the source of her problem behaviour; and the maths teacher reported unpreparedness to have limited her academic progress to a considerable extent.

The Year 9 coordinator explained how I had been cared for by a grandmother in a household with an extended Indigenous family but the co-ordinator felt that she would not be able to succeed at school if she continued to do so. With the support of the school's student services she had successfully extricated herself from her grandmother's household and moved to live with an aunt. The aunt actively supported her schooling but lived a considerable distance from the school. At the end of Year 9, she was described as 'a determined young lady with a lot of life skills for her age'. The Year 9 coordinator said staff members expect her to do well in the long run.

Figure 9.3 shows that I's test results declined between Year 5 and Year 9 (see pink lines). The greatest deterioration was evident in numeracy, which fell 52 percentile points. The decline in reading was not as great but failed to build on the promise of a small improvement between Year 7 and Year 9.

Student O

Student O was also selected because she was reported by her teachers to behave productively yet had been suspended.

The deputy principal confirmed that this was the case: O's academic performance was satisfactory and she had received an in-school suspension because she physically attacked another child in the playground.

There were no reports of unproductive behaviour throughout the period Year 2 to Year 5 (see Table 9.3) and the transgression in the playground appears to have been an isolated incident rather than a pattern of playground behaviour, described as resulting from 'interpersonal stuff'. Both parents and a step-parent had met with staff and supported the consequences imposed.

The deputy principal felt the mother was 'reactive' and inclined to take her daughter's side. The mother had taken her children to another school after a disagreement with the school some years before, but the family had since returned and the children had re-enrolled. No such conflict was evident following the playground incident in Year 5.

Despite O's apparently productive classroom behaviour and her parents' support for the school, Figure 9.3 shows that her numeracy and reading results declined from Year 3 to Year 5 (see yellow lines). The magnitude of the deterioration was greatest in numeracy, a decline of 33 percentile points; reading declined 12 percentile points.

Student G

Student G was selected as an example of a student who behaved productively in class yet had a formal diagnosis of a socio-emotional problem.

Table 9.3 shows that during the period from Year 2 to Year 5, other than being inattentive in Year 2 to an extent that limited his academic work moderately, G was not reported by any of his teachers to behave unproductively. However, the Year 2 teacher provided an annotation on the behaviour checklist explaining he was under the care of a psychologist, had been diagnosed with Dyspraxia, was very bright but was not socially well-adjusted.

G's Year 5 teacher had quite a different view. On the question of the diagnosis of Dyspraxia, she said that he was left-handed, and a boy, so neatness was an issue. However, this had not limited his performance in spelling, reading or writing. She saw him as productive: 'He's a good kid, he's attentive, he socialises well and he's a lateral thinker'. She explained that he did not show a great deal of emotion, but does smile and laugh and enjoys school.

The teacher said she had ticked the formal diagnosis box because G had attended a psychiatric ward for a week during the year and his mother had reported that a diagnosis had been made. 'His mother seems to be his biggest problem', the teacher said. 'I don't know what the formal diagnosis was, but once she got a label she was happy'. The teacher apologised for being judgemental but questioned whether the problems at home may have been the result of ineffective parenting.

Despite the teacher's view that G is productive in class, his reading results declined 30 percentile points over a two-year period (see blue lines in Figure 9.3).

Table 9.3: Teachers' ratings of classroom behaviour, test results deteriorated over time, three students

Year level	Aggressive	Non-compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular attendance
Student I										
6										
7										
8E										
8M										
9E										×̲
9M									×̲	
Student O										
3										
4										
5										
Student G										
2				✓						
3										
4										
5										

10 behaviours identified by classroom teachers

✓   Behaviour identified in May.

✓̲   Judged dominant behaviour in October if no improvement observed.

×̲   Behaviour not identified in May but judged dominant behaviour in October.

Student O did not join the study until 2006.

Figure 9.3: State and national test results of case study students, test results deteriorated over time, three students
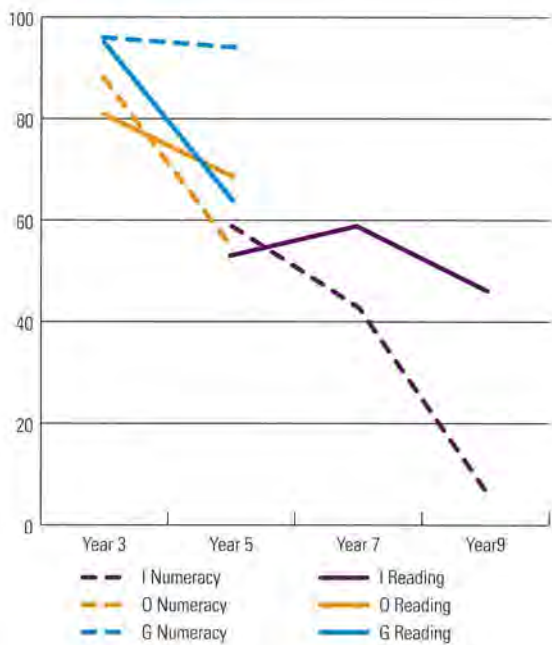
Behaviour that deteriorated

Student H

Student H was selected because he performed well on the Year 3 WALNA test – his score was ranked at the 82nd percentile – but subsequently his behaviour deteriorated and his academic performance declined (see Table 9.4 and Figure 9.4). In Year 5, improvement was initially evident. A comment by his Year 3 teacher in October explained that H had been a new student when the survey had been completed in May, but he had had 'problems at his last school' which had taken a while to present. She also asserted he was 'moody and plays the victim'.

'He started off with a flurry at the beginning of the year. He was the first in with homework. Now, nothing has been handed in', said his teacher who attributed the change to his mother's new partner joining the family after the boy's long-standing step-father departed.

H's teacher said he was academically able but 'he's not really interested in anything. Just a complete turn-off since the home situation happened'. She also reported that he had lots of absences. At the beginning of Year 5 the reason for this was hand surgery, but later in the year the teacher suspected the absences occurred because he was unwilling

to accept his mother's direction that he attend school. 'He has lost respect for her', his teacher surmised.

Student U

U was selected for two reasons: her behaviour had deteriorated from Year 8 to Year 9 and she was reported by her English teacher to have had a 'formal diagnosis' of a mental health problem.

In Year 9, both of U's English and mathematics teachers reported a wide range of unproductive behaviours (see Table 9.4). The English teacher said that non-compliance was the dominant behaviour and the mathematics teacher reported aggressive behaviour to be dominant.

There were a number of circumstances that could account for the deterioration in U's behaviour. The deputy principal felt that E was a clever, attractive girl who has been spoilt and protected at home, often getting her own way. She began high school in a competitive-entry, specialist program but was withdrawn from the program by the school because of her behaviour.

During Year 8, U had been reportedly traumatized by the death of one of her parents after which her behaviour declined significantly. 'She's constantly refusing to follow instructions, won't negotiate with teachers and is still truanting school', said the deputy principal. 'We haven't had any improvement at all'.

The only available information about U's 'formal diagnosis' was communicated verbally by U herself. She said she had bi-polar disorder; it was not known whether she had been told this by a medical practitioner or had self-diagnosed. Regardless, U believes herself to have this disorder.

U's numeracy result declined 28 percentile points while her reading result improved 32 points between Years 5 and 9. Her performance in both is above average for her year level despite her noncompliant behaviour and suggestion of a 'formal diagnosis'.

Student J

Student J was selected as an example of a student who had a formal diagnosis of a mental health disorder and had been suspended.

His Year 7 teacher explained that the suspension had been an internal arrangement in the school. His diagnosis was an Attention Deficit Disorder for which he takes medication. Table 9.4 shows that he has been disruptive every year since Year 4 and that, in Year 7, aggressive and noncompliant behaviour were evident.

J's Year 7 teacher saw the influence of another class member, Y, a very disruptive girl, as his biggest problem. For J, 'it's really important what happens socially which is what happens in a Year 7 class anyway, and he's very aware of who's doing what'. The teacher described J's mother as caring but struggling with two difficult sons. She's aware that J's 'learning is reduced and that he needs help' so she comes to the school to see what he's doing occasionally. According to the mother, J's teacher reported, the father 'doesn't involve himself'.

J's test results in Year 3 suggest he has some academic ability. This was supported by the teacher's observations when they studied two novels: 'He loved it and he got totally engrossed in it and his understanding of the story was excellent.'

Despite this observation, the teacher's expectations were low: 'He gives up if he can't do it. Unless a miracle occurs, I don't think he's going to get better.' Referring more to his academic performance than his behaviour, she said, this had improved during the course of the school year. She made the point that he had not continued to be aggressive, her description of the improvement being more in terms of an accommodation: 'We work along quite well together most of the time'.

J's test results (see green lines in Figure 9.4) have declined since Year 3. Over four years he has dropped 40 percentile points in numeracy and 20 points in reading.

Table 9.4: Teachers' ratings of classroom behaviour, behaviour deteriorated over time, three students

Year level	Aggressive	Non-compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular attendance
Student H										
2										
3		✓				✓	×̲			
4	✓	✓	✓̲	✓	✓	✓			✓	
5					✓̲	✓				
Student U										
6		✓				✓				✓
7					×̲				✓̲	
8E									✓	×̲
8M			×̲						✓	
9E	✓	✓̲	✓	✓	✓	✓	✓	✓	✓	✓
9M	×	✓	✓	✓	✓	✓	✓			✓
Student J										
4			✓	✓	✓	✓				
5	✓	×̲	✓			✓			✓	
6			✓				✓̲			
7	✓	✓	✓	✓	✓	✓̲				

✓   Behaviour identified in May.

✓̲   Judged dominant behaviour in October if no improvement observed.

×   Behaviour not identified in May but judged dominant behaviour in October.

Figure 9.4: State and national test results of case study students, behaviour deteriorated over time, three students

Legend	
H Numeracy	H Reading
U Numeracy	U Reading
J Numeracy	J Reading
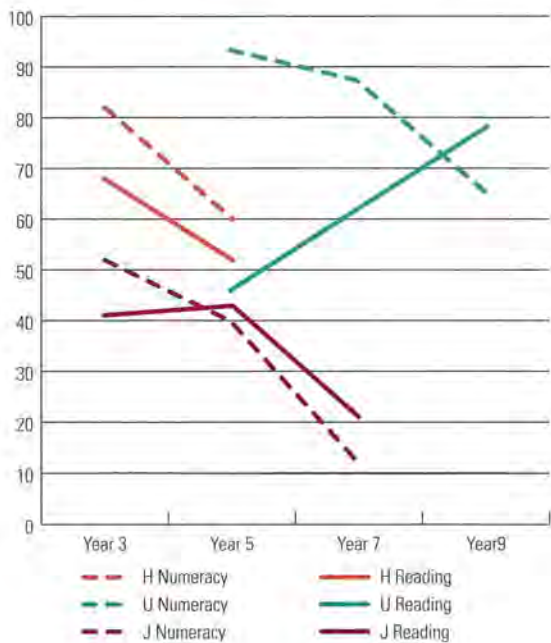
Conclusion

It is possible to draw a number of tentative conclusions from the four sets of case studies.

The case studies of students with positive performance trajectories of academic progress show that they do not always behave productively. This evidence is consistent with the findings reported in Chapter 6 where, for the Pipeline sample as a whole, the relationship between the level of unproductive behaviour and academic performance was strongly, but not perfectly, correlated. The case of a Year 5 girl (Student A) is illustrative: she had been consistently disruptive over four years yet made good progress. Another example is the Year 7 boy (Student B) who was non-compliant yet won the school's science prize. Despite the annoyance these students may have caused their teachers and classmates, they were both actively engaged in their studies. A third child (Student C) had been reported to exhibit disengaged behaviour. However, discussions with his teachers suggested that this interpretation of his behaviour may have been a misreading of his personality and affect – indeed, a classification error. By Year 7, he was engaged with learning and his family expected him to achieve to a high standard.

It should also be noted that there were many more productively behaved students who improved academically. However, the purpose of this exercise was to look at some examples of students with unproductive behaviour who had shown improvement. These three cases show it to be possible to make academic gains while behaving unproductively, particularly if the students are able to maintain a level of intrinsic interest in, and engagement with, the schoolwork.

The case studies of students whose behaviour improved showed that, although there was no immediate and automatic improvement in academic performance, some students were able to improve their performance once the causes of the unproductive behaviour were ameliorated. A Year 7 boy's numeracy results and classroom behaviour improved following a significant medical diagnosis and treatment (Student D). A Year 5 girl's numeracy performance fell steeply as her classroom behaviour deteriorated during Year 4 (Student E). Once the factors prompting her unproductive behaviour were addressed, her classroom behaviour improved even though her mathematics performance had not shown

signs of a corresponding improvement. The behaviour of a Year 9 boy (Student F) improved dramatically after his transition to high school. The improvement was attributed by his teachers to maturation. His relatively high level academic performance, however, dipped slightly in Year 9.

The case studies of students whose academic attainments showed downward trajectories indicated there to be more to their stories than just classroom behaviour; all three students having experienced difficulties from influences outside the classroom. Two girls both showed steep declines in their numeracy trajectories, the Year 9 girl having problems with her carer (Student I), and the Year 5 girl with peer relationships (Student O). A Year 5 boy's circumstances were unclear, but there were question marks about his mental health and the adequacy of the parenting he received (Student G).

In the final group of case studies, each of the students had behaviours in all three of the clusters of unproductive behaviour; they were, or had been, disruptive, unmotivated and uncooperative all in the one year. Two of these students had been influenced by events in their families. The Year 5 boy's family had broken up and then re-formed with a new 'step-father' (Student H); and there had been a death in the Year 9 girl's family (Student U). The third child in this group, a Year 7 boy, was adversely affected by another member of his class (Student J). The Year 9 girl's reading results provide an exception to the downward trajectories of attainments among this group.

One of the categories which provided a basis for selecting case study students was a teacher's answer to the question: 'To your knowledge, has a formal socio-emotional diagnosis been made on the student?' This group of students was of interest because of the mental health definitions of students' behaviour problems, described in Chapter 1, and are prominent in the literature on the management of school and classroom behaviour. Teachers of four of the twelve case study students had indicated that they did have knowledge of a 'formal socio-emotional diagnosis'. Two of these four were boys taking medication for attention deficit disorders. The other two students' diagnoses were potentially serious but had question marks about their validity. In one case the student may have self-diagnosed and in the other the information available was incomplete.

The feedback from teachers has provided insights into the web of interacting factors that influence student behaviour and academic progress. However, the cases described in this chapter, are not representative of all the students in the study; they were not selected to confirm the findings contained in earlier chapters. Instead, they reveal the complexity of student-teacher relations, often hidden behind trends produced from large data sets. While quantitative analyses of large samples can produce powerful evidence pertaining to overall trends, case studies can provide critically important contextual information that would otherwise be overlooked. For example, it is clear from the case studies that, for some students, the unproductive behaviour was a transitory phenomenon; whereas for other students their classroom behaviour appeared to be a more deep-seated and an enduring response to schooling or to events occurring out of school. It is important to note how relations with family members and peers can shape students' learning since, as explained in Chapter 4, the quantitative surveys of the Pipeline students did not incorporate measures of home background and peer relations; yet it is clear these factors have an important bearing on students' success at school.

10. Teachers' perspectives on behaviour and learning

Introduction

The aim of this chapter is to provide teachers' perspectives on issues raised by the quantitative analyses. Twenty-nine teachers participated in five focus group sessions conducted during October 2008. The teachers were drawn from seven primary schools, three senior high schools and two education support centres. The method of convening the focus groups has been described in Chapter 4.

The teachers were presented with the preliminary findings, based on data gathered in the first three years of the study. They were asked to comment on data aggregated for all schools participating in the study.

The focus groups provided an opportunity for teachers who had reported on their students during the study to provide a commentary on early results. This commentary has been summarised around four key areas:
1. Influences on student behaviour;
2. Teacher and student interactions;
3. Pedagogy and curriculum; and
4. Students with additional learning needs.

Discussions were informal and often animated. Generally, more than one teacher from each school was present and, in many cases, more than one teacher had taught a student or class group under discussion. As a result, there was a tendency for speakers to add to each other's accounts during the telling. Square brackets have been used to show the utterances of additional speakers.

Out-of-school factors

Social change

Teachers reported that student behaviour in schools is more of a problem than it used to be, and that there are many factors contributing to this trend that are outside their control.

> … what I'm finding is the behaviour is really an issue nowadays. It's increasingly an issue. I've noticed it over the last ten years or so. There's been a change in behaviours and I think it's not just kids. I think kids reflect what's going on outside, definitely (*senior high school English teacher*, *FG* 2, 45).

Teachers attributed some of the problems to shifting values about acceptable behaviour communicated through the media.

> A few years ago I noticed that they were swearing on the radio. [Yeah, they do that a lot now.] That didn't happen when I was a kid. [Yeah.] [Stickers on cars with swearing.] Yes. So everything is so much more acceptable and we're becoming desensitised to it all. [Yes.] And then it's okay (*primary school teacher*, *FG*1, 127).

English teachers complained that students now confused invective with expressiveness.

Technological changes that teachers frequently referred to were: the use of mobile phones and computer games, and the frequency with which children have access to their own computers and televisions in their bedrooms.

Teachers also referred to the increasingly high levels of drug use and alcohol abuse.

I think, from my own experience this year and probably last year, a lot of the children's behaviour comes from the problems that are going on in the family. And much of it's out of our control. I think we have to accept that there's mental illness in children that we've never seen before. [Oh, yeah.] I think there's drug abuse. I believe myself the impact of drugs in society is coming into education. I think we have a lot of children who are being born to drug-addicted parents or people dabbling in dope. [It's around them all the time.] Alcohol. This is a huge picture yet no one ever gets up and says it. But we are teaching the children of the hippy, drug society who smoke dope and think: 'It's not going to hurt anyone, you know, it's quite harmless'. [Yeah.] Well, I tell you it does. When it goes on in families there's abuse in families, there's drug use in families, parents are in prison. [Every class has one.] I find these poor little souls are not only my worst behaviour problems but they are the ones who are sitting on the bottom of the rung (*primary school teacher, FG1, 109*).

Other teachers also reported that children burdened by substance abuse in their homes were likely to be absent or late and, when they did attend, they were often tired.

The observations of the participants in the focus group discussions about these social changes illustrated how the task of persuading children to accept standards of behaviour necessary for the good order of a school has become more difficult. The widespread exposure of young children to adult television, computer games, the internet and magazines means that inappropriate language and behaviour are being modelled for them. Children and adolescents may learn, for example, that aggressive behaviour is an acceptable way of solving problems; that intoxication is normal; that self-interest trumps legitimate authority; that tasks that become too hard can be ended by the flick of a switch; and that only 'nerds' are compliant and try hard to succeed at school.

Child-rearing practices

Teachers reported problems with the way parents and children interact, in particular, problems they experience when managing children who have not been disciplined at home. This factor emerged in interviews with teachers and the case studies of individual students.

Many parents, according to the focus group teachers, struggled to apply 'tough love'. 'They want to be their best friend' a teacher explained. Parents find it difficult to say 'No' to either young children or teenagers. One of the teachers observed this now to be a common feature of contemporary parenting and not necessarily a sign of neglect:

> You know a lot of parents are good parents … like the mother of the child in my class I just mentioned. She loves him, she gives him money, she buys him things, she cooks for him, she listens to his reading and she makes sure that he's safe – he's not neglected. But she doesn't know that she has to teach him morals or she don't know how to teach morals. They are doing all of the things that they *think* (*emphasis added*) *is good parenting but they are not engaging in the hard stuff like saying, 'No'. And they're not setting boundaries* (*primary school teacher, FG 3, 61*).

The tone was not one of blame. Teachers recognised the dilemma facing parents, indicating they had similar experiences in raising their own children.

A primary school deputy principal linked this style of parenting with other social trends.

> A lot of it is a conscience thing. The parents are going off to work and they're buying the kids' love because they're not there when they get home from school. They're not there on the weekend. Or mum and dad want to go off to the pub or whatever so, 'Here's $50. Go and buy yourself a pie or spend it on whatever you like' (*primary school deputy principal, FG 3, 55*).

Teachers discussed the kinds of options available to parents to sanction their children, such as sending a child to his or her bedroom in response to an act of unacceptable misbehaviour. They saw this as a sound strategy not unlike the strategies they use to sanction problem classroom behaviour. However, they observed that the bedroom may no longer be a quiet place for reflection as so many children have their own television, computer games and internet access in their bedrooms. While parents still send an uncooperative child to his or her bedroom, this serves only to remove the annoyance from the parent and to reinforce the influence of the electronic media; it does not serve as a sanction and it is not instructive.

Teachers gave many examples of individual students whose parents, in their view, failed to provide their children with adequate care to enable them to function in a classroom. Examples included children who were physically and emotionally neglected; those who from a young age were required to take on parenting roles for younger siblings; those caught up in conflicts between divorced and separating parents; children with parents who expected the school to discipline their children when they would not; and parents who failed, in teachers' opinion, to recognise the value of schooling. It was the view of teachers that societal influences have changed relations between students and parents, and that the net effect of these influences has resulted in schools being confronted with a significant proportion of children who have never been effectively disciplined prior to their commencing school.

A teacher pointed out the importance of parents' attitudes to learning.

> There is definitely a clear correlation between the students who cannot do the work and behaviour. I would like to draw it back to their home environment because, after meeting some of the parents at the parent-teacher meetings, you can clearly see those parents who are interested in their children's school work. Those kids try hard at school, even if they can't do it. Even low achievers would still try and they would still ask. But then you've got the kids whose parents are not involved. The kids go home and they play X-box the whole day. You can just pick them up from their clothes as well as from the food they eat at recess and lunch. And they are the kids who are not interested in anything in your class. They can't do it first of all, but they don't want to try either, because they don't get encouraged at home to try. What really frustrates me is that they are more than happy to sit in lesson after lesson after lesson and learn nothing (*senior high school maths teacher, FG* 4, 8).

Teachers were disparaging of some of the agencies because it appeared they were only prepared to become involved in extreme cases, namely, students about whom there was clear evidence of physical or sexual abuse. Teachers were also critical of the high staff turnover in these agencies and the fact that case workers had rarely met the children who were on their case loads.

Teacher and student interactions

Expectations

In previous chapters, reference was made to the phenomenon of 'easy riding' where difficult students were able to 'negotiate' with their teachers an agreement to behave in a reasonable manner in return for a lower level of academic output. Teachers are constantly having to make judgments about the weight of pressure that they are prepared to apply to students: excessive pressure can push students beyond a threshold of acceptable classroom behaviour. On the other hand, too little pressure can lead to complete disengagement.

Teachers discussed the strategies they used to shape classroom behaviour and engage students in academic work. They claimed successful teaching requires much more coaxing, persuading and negotiating than was the case in the past. They talked about 'the language of choice' that they saw providing a framework for enlisting student cooperation. Their emphasis was very much on being positive.

> Part of our job is to actually teach the children to have positive expectations and try to support the parents to have positive expectations for their children. And I think every child would like to be able to learn and succeed at school but not every child feels supported and able to learn at school (*senior high school deputy principal, FG* 2, 85).

Even with the most challenging students, there was a reluctance to admonish directly a student who was behaving inappropriately thereby expecting an immediate, positive response. For example, a teacher referred to a student whose behaviour had continued to be a problem throughout the school year.

> I'll try never to push her in a corner. You always sit there and work it out and listen to her side and be fair. I think if you don't behave like that you shouldn't really be teaching. Because you're still trying to help children, aren't you? You just hope that maybe, your little words of wisdom or your helping might turn her slightly. And they might (*primary school teacher, interview* 14, 16).

In tandem with the reliance on negotiation and coaxing, teachers have instituted systems of rewards to elicit appropriate responses from students. It is also now commonly

the case that students expect to be rewarded for cooperation. Teachers reported that students' expectations about their entitlement to rewards have increased generally.

> Kids get instant gratification these days. It's got to happen now with bells and whistles and if it's missing the kids say: 'Not interested' [*primary school teacher, FG* 1, 139).

They described rewards that were usefully embedded in learning tasks and those which intruded on instruction. One teacher gave the following example of how she used rewards to promote engagement:

> In my Year 9 class, I get them working on a task and I say, 'Okay, if you show me your draft, I'll let you go on the computer' and my better kids are up there and they're producing really good work (*senior high school English teacher, FG* 2, 63).

However, the use of rewards can be excessive as a teacher pointed out. For example, another teacher described an interaction with a boy to whom she had been teaching spelling on the day of the focus group. The boy had successfully matched two words and said: 'I won. What's my prize?' Don't I get a prize?' She said the group clapped and the boy was praised to which he responded, in disbelief, 'Is that my prize?'

Such expectations, teachers recognized, made it difficult for students to develop a love of learning or experience the satisfaction derived from the sense of achievement as its own reward.

Modifying a class's behaviour

Explicit reward systems were widely used by some teachers to modify class behaviour. One teacher who had had serious behaviour problems with her class described how a colleague had supported her to introduce a system of rewards designed to improve the behaviour of the whole class.

> What we did was very much reward-based. We asked the children: 'What do you like?' and they came up with games. So we came up with a list of games. As soon as they got their 20 jellybeans on the board: 'Right, out for a game. Get our hats and out we go.' Almost every hour: reward, reward, reward. They

weren't really jellybeans – that's what we called the marks on the board. And sometimes it could be every half hour. And I was concerned about the curriculum because I'm thinking they're out there playing games but the teacher who supported me assured me that after you get the behaviour under control the learning will take care of itself. And it really has because we're doing things now that I don't think we could have done in Term 2 (*primary school teacher, FG* 1, 94).

This teacher reported that she still had a problem with one child, and on occasions a second child, but both students responded to individualised strategies. The inattentive and disruptive behaviour of the class group was no longer unmanageable.

Consequences

Teachers talked about 'consequences' as part of a 'language of choice'. In this framework, sanctions are rarely imposed simply because a child has transgressed a rule. Rather, students are given choices and a sanction, generally referred to as a 'consequence', is the result of the child's choice. The child is represented as an active participant in the process through which the consequence is imposed.

Examples of consequences referred to in the focus group discussions were: relocation within the class, removal from class, being sent to the office, being escorted to the office, someone from the office coming to the classroom, detention, not being allowed to attend a school function or excursion and suspension. Generally parents were informed about the imposition of a consequence and asked to support the school.

The teacher who had used the formal system of rewards to modify her class's behaviour explained how she used rewards and consequences as compatible strategies.

> The ones who were troublesome in my class were mainly the boys and if I could get them out playing a game they were quite happy. So it linked into that. At the end of the year there was one boy – I go: 'Okay, you've got a choice.' He says: 'Fine, then.' Before I could even give him the options, he knew he could do one thing and go to the office or do something else and it was to sit in the corner. And he knew that he wasn't going to get away with anything without having a consequence. So by the end of the year, he would cooperate (*primary school teacher, FG* 1, 140).

Teachers expected older students to exercise a greater degree of responsibility and regarded poor academic work as evidence that students lacked diligence. A high school teacher explained how he presented to his students the choices before them.

> I expect students to be at a certain level with behaviour. I say to them: 'If you choose not to work, I'm not going to force you to. If you've chosen not to work, that's fine; you will fail, you won't graduate, you won't get a job. Put the work in and you'll get rewarded. If you don't, that's fine, but if you mess up in my class, you're out' (*senior high school mathematics teacher, FG 2, 55*).

A high school teacher in a learning support role questioned whether all high school-age students have the maturity to accept responsibility for their choices.

> Children muck up in class so I go into the Year 9 class to provide support. The teacher will time and time again give the students detentions and they don't show up. They do not understand consequences. [I would agree with that.] They don't understand that if you don't do your homework you will not make progress (*senior high school mathematics teacher, FG 4, 44*).

While this teacher is presumably drawing from the experience of teaching low-achieving students, it was unclear from the discussion whether the 'choice' of academic failure ahead of the application of consistent effort was confined to such students.

Negotiation

The expectation that teachers coax and persuade students to make an effort implies that the burden falls equally on teacher and student. Students can take advantage of this by seeking to bargain about how little effort will be accepted. A teacher explained how she tried to place pressure on students who were wasting class time.

> I put some kids out of the class because they weren't working. I sent them to a buddy class with some work to complete. They said: 'What's this for? Why would I go there?' So I've gone through all the steps in our management code of practice and they'll probably get a suspension. But they think I'm at fault, not them. They think I'm a mean teacher. So they actually see the staff as being at fault because we are expecting them to work (*senior high school English teacher, FG 4, 45*).

Expectations on the part of students that everything is negotiable make it very difficult for teachers to insist on high standards of work.

> I think we get so overwhelmed and tired. I mean I didn't chase some Year 9s up last term because I didn't have a chance and now it's worse because I've let them go. But I think it's about everybody saying, 'Right, I want a proper sentence. I want a paragraph. If you don't do this, you do it again.' Otherwise, it's not going to happen. We need to be consistent and say that there needs to be this level of achievement. It's about everybody having higher expectations (*senior high school English teacher, FG 4, 63*).

Many teachers in the focus groups talked about the issue of standards, in particular the need for higher standards. However, it is difficult to imagine how standards can be raised when transactions between teachers and students rely so heavily on a system in which so much is negotiable.

Pedagogy and the curriculum

Student engagement with learning

Teachers were asked during the focus group discussions whether they had students who were disengaged from learning. There were many descriptions of students whom teachers identified in this way.

> What I notice in one of my English classes is that some of the low achieving boys are very quiet. They can switch off. They've learnt that if they're quiet they don't get into trouble and since I've rung home they are handing their work in but before that they were tending not to hand their work in. And they could switch off and they could go under the radar (*senior high school, English teacher, FG 4, 3*).

This teacher identified similar groups of students in other classes she teaches. She described attempts to engage students in a Year 11 class.

> This year I did something so that most of them did engage but even so, two of them didn't come to the party with the other kids. They didn't finish the work off. They certainly didn't want to sit the exam. They don't want to do the written assignments. They don't hand them in. They're disorganised (*senior high school, English teacher, FG 4, 5*).

Primary school teachers also gave examples of disengaged students. One teacher recognised that disengagement was more of a problem in his current school than some others he had taught in.

> One of the things that really strikes me about this school is the lack of motivation in the children. In my previous schools, kids would get excited and here they don't. Kids would say, 'That's fantastic' and 'I want to find out stuff' and bring things to school. They would embrace learning and go for it. We took the kids here on an excursion to the cultural centre and they really enjoyed it but there wasn't a sense of excitement about a day out. (*primary school teacher, FG* 1, 135).

This teacher's comment highlights the fact that disengagement is more of a problem in some communities. Teachers from one school said they thought that disengaged students were the exception.

> A student may not like English or maths but you still try. If you talk to most of the kids, they are active in Cubs or sports or after-school activities. They go on holidays, do things with their families. Most of them value education and they want to do well (*primary school teacher, FG* 3, 66).

This scenario contrasts with that in another primary school. A teacher described the difficulties of teaching narrative writing in upper primary when students lack out-of-school experiences that support learning.

> They can get to Year 5 and they haven't had a visit to the zoo. [That's right.] [Yeah.] [They haven't been to Perth. They haven't been on a train.] So it's so much harder for those children who have had such little experience. They've got nothing to draw from. They don't even go to the beach (*primary school teacher, FG* 1, 48).

These descriptions of disengagement are drawn from the examples teachers gave from their own classes. Teachers also described the strategies they used to engage specific students.

Two teachers described the case of a student who had been transformed into a switched-on member of the class. The teachers had taught this particular student in previous years. The student had also attended an after-school tutor group which the two teachers had taught collaboratively. The tutor group was an intervention for students identified as

performing below benchmark standards. By their account, the investment in time and other resources was substantial, drawing on support additional to their own contributions.

> Last year, he was one of those kids – you put writing in front of him and he would smash his head on the desk, 'Huhhh! I'm not doing this!' and 'Why did you put that in front of me, you know I can't read. Are you crazy?' He wasn't one of the violent kids or the really disruptive ones but it was the effort; you could not get him to do any piece of work (Year 3 teacher, last year, FG 1, 73).

> This year he clicked. I can't think exactly what it was but at one point he clicked. It was like he's gone: 'There's all this really cool stuff out there that I can find out about and I have to be able to read and write to do it'. We've done everything by themes and he's gone: 'Volcanoes. They're cool. They kill thousands of people, I want to know about it. So I want to read. I want to write about it' (*Year* 4 *teacher, this year, FG* 1, 79).

The teachers explained that this Indigenous boy's literacy had not improved greatly since his transformation but learning had become fun and 'because his behaviour has improved a lot of 'hangers-on' have followed his example'. He also made a pronouncement that after-school tutoring was 'really cool' reinforcing the idea that an extra hour of school was a benefit not a penalty.

Learning area and gender differences

The aggregated data presented to the teachers who participated in the focus groups reported differences between English and mathematics teachers and boys and girls. This prompted a number of discussions about differences in teaching and learning styles and the impact these have on student behaviour.

Generally, the focus group teachers agreed that in high schools there are fundamental differences in the teaching of English and mathematics. Their comments tended to corroborate the statistical evidence produced by the Pipeline analyses: unproductive behaviour is more likely to be a problem in English than mathematics classes.

A deputy principal gave an overview of the differences she observed in secondary school English and mathematics classrooms.

I see a lot more activity in English classrooms, there's more movement around the room. There's more of a sense of different students doing different work. There's a more individual approach to student learning than I find in the bulk of the mathematics classrooms where they are generally working from the one program or the one text book and they do the same tests And they are often designated a particular seat and they have to stay there. So I find very, very different practices in the classrooms. And given the greater responsibility placed on students in English classrooms, I'm not surprised that the student behaviours there are identified as being a bit more problematic than where they don't have that freedom of movement, freedom of choosing the work that they're going to do, or how they're going to present their work (*senior high school deputy principal, FG* 2, 44).

In primary schools, focus group teachers taught both English and mathematics; they also commented on differences between the teaching methods in the two learning areas.

Writing is not an easy fix. With maths you can pinpoint the problem a child's having to give them strategies to remedy it but with writing – I don't know whether it's just the creative side of it – but it's a lot harder to pinpoint exactly what it is and to fix it for want of a better word. The process is a lot different. [It's a long process, isn't it.] Yeah. [There's lots of bits too, lots of things that come together.] Yeah. With maths you've just got a maths example. The process is quite quick and simple but if you're writing a narrative the process is huge and there's so many parts. You've got your sentences, your descriptive language, your punctuation, it's sort of endless but with maths it's a lot more specific (*primary school teacher, FG* 1, 40).

When describing differences in the way English and mathematics were taught, teachers were inclined to draw attention to the gender of students as a significant factor.

As they get into the upper primary school, I find it's not that students don't know the process and the structure; it's more that boys just don't want to do it. It's a laborious task. And of course we expect more from them: half a page isn't good enough in Year 7 whether you're a boy or a girl and that's where the inattentiveness and those kinds of behaviours are evident. They might just sit there and do nothing (*primary school teacher, FG* 1, 41).

A primary school teacher explained how these differences impacted on the behaviour of two students in her class.

I've had two extreme behaviour problems in my class: both of them there was no problem with maths because they were quite capable at maths. One of them wasn't too bad at language but didn't enjoy it. The other one is very weak where language skills are concerned and he just opts out straight away. You say the word 'writing' and he says: 'I'm not going to do it'. But I don't have problems with him in maths. He's engaged, he's motivated, he's quite happy to do it. But he also has a high opinion of his maths ability and a very low opinion of his language ability so certainly the self-esteem comes into it as well (*primary school teacher, FG* 1, 37).

A number of explanations were given for gender difference. Primary school teachers agreed on the importance of what they called 'hands-on' learning strategies.

For boys, it's so much easier when they've done it in a hands-on way. [You have to.] It's so much easier for them to recall the information and write it down (*primary school teacher, FG* 1, 48).

As well as suiting the learning preferences of the boys, 'hands-on' strategies were presented as well-suited to teaching mathematics and science. An experienced Year 1 teacher reported gender differences in mathematics which she attributed to family support.

I find the boys in Year 1 generally brighter, quicker at mathematics. But do you know why? It's the thing that fathers do with their boys now. Mothers do a lot of things with their kids and namby-pamby them but dads, when they spend quality time with their sons, teach them maths (*primary school teacher, FG* 3, 107).

There were other relevant factors but they tended to play out differently at the primary and secondary levels and in different schools. Some mathematics programs were organised around a single textbook but English programs were not. Also, there was a tendency for English to be taught to classes with wide variations in student ability and achievement, while mathematics classes tended to consist of students with similar levels of attainment.

The curriculum and pedagogy

No clear agreement about the impact of the curriculum on behaviour was evident, but individual teachers raised a range of issues.

A secondary maths teacher questioned the view that the problem of engagement is the result of the curriculum and its content.

> I've heard it said that if the kid's not interested, it's the curriculum and you've got to make the curriculum more interesting. I think that's a pile of rubbish. I really do. I've tried in maths putting practical subjects for some pretty low, bad kids and, yeah, they're interested and we deal with cars, measuring pistons and cylinders and all this. It's fabulous for a week but you can't keep it going, you know. And it doesn't matter what you try. Something new is okay for an hour and that's it. So I don't think disengagement is a result overall of the curriculum. I think for a lot of our students we find home factors. If we've got a kid who's disengaged, disruptive or whatever else and I go along to the coordinator and say, 'I'm having a problem with this kid', the coordinator will say, 'You should see the problems he's got at home. I've been trying to contact parents, blah, blah, blah.' So I think that is a lot of it: home factors. I don't think it's got a great deal to do with the curriculum or the pedagogy (*senior high school maths teacher, FG 2, 76*).

The English teachers agreed that whole class instruction has become very difficult at the secondary level because there is an expectation that teachers teach students at a level at which they can succeed.

> You've got classes where the students do range from levels 2 to 5. You have to plan engaging stuff, particularly at the lower level, stuff that's achievable. It's a lot of work to do to plan for such a range of students. And in a classroom, you've got so many different things going on, different texts, different students, catering for their different needs. It does inevitably create more behavioural problems because you can't be teaching one text for the whole class. You can occasionally but some of them aren't going to get it and you want to push those students who can do well (*senior high school English teacher, FG 2, 48*).

Teachers reported it to be very difficult to hold a class discussion. 'The levels are just too scattered,' said a high school English teacher. Another English teacher at the same school mused that this was associated with a decline in students' listening skills.

> I'm finding it harder in terms of the listening skills. I think there has been a shocking deterioration in listening skills. If a student is giving a speech and other people are talking then I find that insulting. I find that quite demeaning for them. I think it is dreadful for their self-esteem (*senior high school English teacher, FG 2, 49*).

Concerns about the impact of the formal curriculum on behaviour were only reported by secondary teachers.

Students with learning needs

Among the focus group participants were teachers in mainstream primary and secondary classes, primary education support classes and one teacher who provided support in mainstream secondary classes. The view that higher proportions of students with lower abilities and more severe problems are taught in mainstream settings than in the past was widely held.

Teachers expressed concern about the pressure associated with teaching very low-achieving or high-resource need students.

> When people say: How do kids go through school and not learn to read and write? I can tell you how they do it: the teacher's time is spent on special needs children. [Disarming riots.] And children with emotional problems. [Yeah.] They turn up to school everyday and – so called – learn. And there are just more and more problems in society. I don't know whether it's magnified in this area or not (*primary school teacher, FG 1, 135*).

The education support teachers explained the problems they have managing classroom behaviour. While individuals differ 'as a general rule you will find that the children in education support will act out bad behaviour in a less controlled fashion'. One of the teachers gave an example from her class.

> I've got a boy just like that. When he goes to his mainstream class, he doesn't know when to stop. He'll copy some of the other boys' behaviour but they know when to stop and he doesn't (*education support teacher, FG 5, 28*).

The demands of teaching children on the autism spectrum were raised by mainstream and education support teachers. Both teachers described them as disruptive.

A number of teachers raised concerns about 'the poor middle kids' who they believe are being ignored at the expense of very low-performing students.

> The bottom-end kids don't move. [The gap gets bigger and bigger.] They stay there and stay there and the others keep going. [That's right.] The gap gets bigger the higher up the school you go (*primary school teacher*, FG 1, 55).

Teachers were concerned about higher levels of resources that are focused on these students, some of whom make relatively small gains over time, leaving those students who are more likely to show improvement, as a result of additional investments, without sufficient support.

Conclusion

In summarising the focus group discussions, those matters where agreement among numbers of teachers was clearly evident have been given weight.

There was agreement among the focus group participants that much of the unproductive behaviour that teachers deal with in classrooms can be explained by out-of-school factors. Teachers gave examples of students from families which failed to support their children's education, and the difficulties this created for all concerned. They also pointed to the adverse affect the broader social context has had on childhood, the family and schools as institutions.

One of the social changes having had a large impact on teaching is the tendency for many students to resist confidently engagement with schoolwork they consider to be too challenging or of no personal interest. The days have long since passed when teachers can rely on the intrinsic motivation of students to complete assigned tasks, or exercise their authority to compel students to persist and make an effort. It is now common for teachers to use reward systems, offer choices or negotiate terms under which students will complete their particular responses. Even when these systems are in place, teachers gave examples of students who flatly refused to make any effort.

These students pose a dilemma for teachers. Some teachers find it hard to justify directing their effort when they are persistently rebuffed, or when there is no reciprocal display of interest, especially when other more receptive students need and want their help.

With regard to disengagement, there was no consensus on how best to respond to it. Teachers were divided as to whether they can make a difference by modifying their pedagogy, changing the curriculum, streaming students according to their ability, or raising expectations that students must take responsibility for their own learning.

There was agreement that behaviour is more of a problem in English than mathematics, particularly for boys. This view is consistent with the different rates of unproductive behaviour reported by English and mathematics teachers over the four years of the study.

The focus group discussions were held to acquire the perspective of teachers on the analyses of student behaviour and performance presented in earlier chapters. The small group of teachers who took part is not necessarily representative of all the Pipeline teachers and their views; therefore, the outcomes described above should not be interpreted as indicative of what most teachers think about these behavioural issues. It is clear, however, that teachers hold strong views based on their first-hand experience and any effort to improve student behaviour and academic performance must take account of the way in which teachers respond to students on a day-to-day basis.

11. Summary and Conclusions

Introduction

This chapter summarises the main findings of the Pipeline Project. The chapter draws on the literature review, the development of the measures of unproductive behaviour, the quantitative analyses of student behaviour and performance in literacy and numeracy, the focus group discussions with participating teachers, and case studies of individual students.

The generalisations from the study must be tempered by the fact that the Pipeline samples of schools and students were not drawn randomly from the state populations. The schools in the sample on average have lower Socio-economic Indices than the state average; and they are all located in the metropolitan area of Perth. The students in the sample perform slightly below the state averages on the WALNA tests. These features suggest that there is probably a slightly higher level of unproductive behaviour in Pipeline schools than in the state population of school students.

The implications of these findings for policy and practice are presented in the final chapter, Chapter 12.

Unproductive behaviour

The construct of unproductive behaviour

An extensive research literature about child and adolescent behaviour exists. While it is recognised in this literature that certain kinds of abnormal and dysfunctional behaviour will restrict the capacity of students to perform adequately in classroom environments, the frameworks and typologies most commonly used treat schools and classrooms as sites of secondary importance. The instruments were not designed for the purpose of illuminating teaching and learning processes in classrooms.

The Pipeline Project focused on behaviour in classrooms. It proposed a set of student behaviours that were thought likely to impede academic progress. Behaviours that retard student learning were described as unproductive. It was thought that unproductive behaviours were more likely to shed light on the conditions affecting academic progress than behaviours indicating behavioural disorders, though it was recognised that some of the indicators of unproductive behaviour might also indicate the possibility of a mental health problem.

Student behaviour has always been an important issue for teachers. All teachers know that they can only teach effectively if students behave appropriately. Serious incidents threatening the wellbeing of students or staff members must have the highest priority in a system of behaviour management. The question of their impact on the child's academic progress is of lesser importance at that time. Even when no serious threat to wellbeing is apparent, teachers know that keeping behaviour under control is of critical importance, and that a few, poorly managed disruptive incidents can produce ripple effects through the whole class, thereby destroying the educational value of the lesson. As a result, there is a widely held view among teachers that constructive teaching and learning can only occur after a positive climate has been achieved.

For these reasons, a large proportion of the resources for behaviour management are directed towards those students who threaten others, or who put the most pressure on teachers. Whole management systems have been set up to deal with extreme incidents, possibly warranting student suspension, and thus involving parents or carers. Less serious incidents and low-level, non-intrusive behaviours are usually left to the school to sort out. Yet, as this study has shown, low-level behaviours, especially those indicative of academic disengagement, may have as great

an impact on a student's academic performance as the behaviours of students who act out and are openly hostile towards the school's norms of acceptable conduct.

Patterns

The variation in frequencies of unproductive behaviour among schools is linked to the SES of the communities from which the schools draw their students; however, even among schools with similar SES indices, differences occur. The differences may be due to the approaches taken by the schools to manage behaviour and performance, but they may also be due to a more complex set of factors; for example, schools sometimes have unusually high intakes of 'difficult' students in a particular year, and teachers are aware that, when it is their turn to teach this group of students, they will be required give extra attention and effort.

In any one year about 60 per cent of students are considered by their teachers to behave productively because, as far as academic progress is concerned, the classroom behaviour of these students is not an issue. The situation varies within individual schools where some classes are more difficult to manage than others; and among schools, particularly schools drawing their intake from suburbs of low socio-economic status. In some schools teachers report that nearly 80 per cent of their students behave productively, whereas in others, as few as 20 per cent are reported to behave positively on this dimension.

Of the ten categories of unproductive behaviour incorporated in the Student Behaviour Checklist, inattentiveness is the most frequently reported category, with more than 20 per cent of students reported to be 'distractable', and to lack concentration during lessons. In the primary years around 10-12 per cent of students are reported to be unmotivated, but the percentage rises steeply in Year 10, reaching about 30 per cent in English classes and 22 per cent in mathematics classes.

Aggressive behaviour is confined to a relatively small proportion of all students, around 5 per cent in the primary years, and then decreasing to 3 per cent in English and mathematics classes during Years 8 to 11. The highest incidence of non-compliance in primary schools is found in Year 6 classrooms, with nearly 11 per cent of students reported. In all ten categories of unproductive behaviour, the lowest levels are found in Year 8, the first year of high school.

Less than 1 per cent of students were reported to be unproductive in all ten categories, and about 6 per cent were reported to be unproductive in 5 or more categories. Students having multiple categories of unproductive behaviour were more likely to constitute the subgroup of students who, later in the year, were judged by their teachers to be behaving in ways having a serious impact on their academic progress.

The pattern of unproductive behaviours is generally consistent across the primary school years from Year 2 to Year 7. There is no marked difference between junior, middle and upper primary students; however, the situation in secondary schools is more complex. In the secondary years there are marked differences between mathematics and English classes across all year levels. Initially, in Year 8 and Year 9, teachers report less unproductive behaviour than in Year 7. However, the incidence rises sharply in Year 10 before declining somewhat in Year 11. In Year 10 the level of unproductive behaviour is considerably higher than any other year level in either primary or secondary schooling, particularly in regard to behaviour usually associated with academic disengagement: inattentiveness, lack of motivation, unresponsiveness and lack of preparation.

The level of unproductive behaviour in Education Support Centres is more than twice the level for primary or high schools. This is not surprising as the students attending these centres do so because of their severe emotional and medical problems. Students with disabilities who are integrated into regular classrooms also show much higher than average levels of unproductive behaviour in most, though not in all cases.

Analyses of the responses to the ten categories of unproductive behaviour in the Student Behaviour Questionnaire produced four distinctive groups. The first and largest comprised students who were behaving productively. Cluster analyses of the students who were reported to behave unproductively on one or more categories of the Student Behaviour Questionnaire produced three additional groups. Members of the first group (1) were disengaged but were not aggressive or non-compliant. By way of contrast, members of the second group (2) were principally defined by their aggressive and non-compliant behaviour, though they commonly were reported by their teachers to be unproductive on five or more categories. This was the smallest group. Finally, there was a group (3) whose members were reported to show a mix of behaviours of which the most common was disruptive behaviour exemplified by calling out, seeking attention and provoking others.

These four behaviour groups were named the 'Productive', the 'Disengaged', the 'Uncooperative ' and the 'Low-level Disruptive'. The size of each group varied slightly according to the cohort and year of the analysis. In broad terms, the Productive Group held 60 per cent of students, 20 per cent were in the Disengaged Group, 12 per cent were in the Low-level Disruptive Group and the remaining 8 per cent comprised the Uncooperative Group.

Incidence

There are no benchmarks against which the incidence of unproductive behaviour reported in this study can be compared. As indicated in Chapter 3, it is conceivable that a student with a behavioural disorder could be reported as behaving productively during lessons and, conversely, a student who is highly unproductive in class have no recognisable mental health problem. Numbers of cases fitted these categories.

The most commonly used index of student behaviour problems is the rate of school suspensions. However, these statistics include cases where students behave productively in the classroom but have committed a serious misdemeanour elsewhere at the school or on the way to school. Students are not suspended for failing to concentrate or make an effort to produce work of satisfactory quality.

Students therefore may be sanctioned in the most severe way open to the school for committing a serious breach of the school code of conduct. Yet, if the breach were an exceptional event, the behaviour that led to the suspension, and the suspension itself, might have only a temporary and moderate impact on a particular student's academic progress. Persistent, low level disruption or inattentiveness may have a much more damaging impact on academic progress, yet the behaviour does not usually generate a formal sanction from the teacher or the school. Hence, suspension rates are not sound indicators of the level of unproductive classroom behaviour.

The incidence of student mental health problems is sometimes used as an alternative to suspension rates as an approximate estimate of the numbers of students who need special assistance. There are widely varying figures for the particular problem behaviours, or clusters of such behaviours, depending on the behaviour measured and the population from which the information has been collected. Though for some disorders the estimated incidence is one

per cent or less, for other kinds of disorders the incidence is reported in the literature to be as high as 15 per cent. Surveys of school students have indicated that the figure may be higher than 20 per cent when aggregated across a range of mental health problems (Zubrick et al., 1997).

The Pipeline Project found that, with regard to unproductive behaviour, a large proportion of students exhibit one or more unproductive behaviours during the year: 40 percent is the approximate figure. But for half of these students, their behaviour does not impact critically on their academic performance. Furthermore, their behaviour is three times more likely to improve than worsen during the year, and the improvement may extend into the following year. Only a small subset of each cohort, about 3 per cent, behave in ways from year to year that have a serious impact on their learning.

Teachers in regular classrooms reported that 3.6 per cent of all students had a formal diagnosis of a socio-emotional problem as far as they were aware. Half of these students behaved in ways that had a serious impact on their learning in class.

How can these results from the Pipeline Project be reconciled with the literature on the incidence of mental health problems in children and adolescents? It would seem that as far as academic progress is concerned, in many cases, the students' mental health is not a big handicap either because its onset is episodic, teachers manage the students' behaviour adroitly, or because some other ameliorating factor is apposite. It is also possible that some of the discrepancy can be explained by errors of classification, that is, fewer students have mental health problems than reported in surveys, and/or more students consistently behave in a seriously unproductive way than was reported in the Pipeline study. Other possible explanations could usefully be explored more comprehensively in a subsequent study.

One important implication arising from this analysis is that if in any year 20 per cent of students behave in ways having a serious impact on their learning, and if fewer than 4 per cent have a diagnosed mental heath problem, then other factors are contributing to the behaviour of the remaining 16 per cent. The case studies would suggest that events occurring in the home are prime factors.

While it may seem to be stating the obvious, the general conclusion to be drawn from this discussion is that student behaviour can be measured in different ways for different purposes. The incidence of mental health problems in schools is of importance when considering the student support services that should be made available to schools. The incidence of unproductive behaviour is of importance when considering the *educational* support that should be made available to schools. The two sets of figures and the two purposes should not be conflated as though the provision of one kind of support will solve problems requiring another.

Behaviour trajectories

Considerable research has been undertaken into the trajectories of students who were identified at an early age to be anti-social. In some cases, the studies have tracked subjects from infancy to adulthood using various psychological instruments to measure the extent of their anti-social behaviour. In general, these studies show that about half the children who start school exhibiting episodes of antisocial behaviour can be expected to improve over time. While it is difficult to generalise across the commonly reported externalising disorders among children of school age, the tendency for half of the students diagnosed with behavioural disorders to improve over time seems to hold true. Many children with severe behaviour problems at some point or other improve either as a result of maturation, effective parenting, or some kind of intervention.

The Pipeline Project sought to map the behaviour of students over a four-year period. The analyses of the responses to the Student Behaviour Questionnaire showed that the behaviour of about 40 per cent of students is set on a steady productive trajectory extending over four consecutive years. Of the remaining 60 per cent, nearly a third of this group (19.5 per cent of all students) were reported to be unproductive during each of the four years. Put simply, about 40 per cent of students are consistently productive and about 20 per cent are consistently unproductive. The behaviour of the remainder fluctuates from year to year.

When the severity of the impact of the students' behaviour was taken into account, the percentage of students who were consistently and seriously unproductive shrank to 3 per cent. That is, only a small percentage of students appear to be locked into a pattern of behaviour that seriously impedes their academic progress. This 3 per cent,

as mentioned earlier, includes students who have mental health problems and are educated in regular classrooms. However, as the case studies have shown, some students have exceptionally good and bad years.

Although the group of students whose behaviour is seriously unproductive over four consecutive years is small, the educational significance of a student experiencing even one bad year should not be discounted. If a student has failed to grasp an essential understanding or mastered a key set of skills during a particular year, then the educational scaffold required for later learning will be flawed. Unless students are able by some means or other to make up this deficit then they may struggle even though they attempt to engage with the teaching matter. With this caveat in mind, it should be noted that about 20 per cent of students behave in a seriously unproductive manner in any one year, with about 10 per cent being unproductive over two consecutive years.

There is no simple stereotype or identifying characteristic of the students whose behaviour is having a persistent, negative impact on their learning. Students can seriously retard their academic progress by exhibiting any subset of unproductive behaviours measured by the Student Behaviour Questionnaire, though the wider the range the more likely they are to be members of this core with a serious problem of unproductive behaviour. None of the students appear to particularly like school or engage energetically with their schoolwork.

Academic performance

Measures of academic performance

The study employed two kinds of indicators of academic performance: teacher global judgments and student results on state and national tests. It was found that teachers' judgments yielded a more conservative picture of the performance of students than that produced by the WALNA and NAPLAN results. Teachers reported that more than twice the number of students was performing below the benchmark standards than were identified by the tests.

The use of the WALNA and NAPLAN results to produce academic trajectories also raised questions about the use of the tests for this purpose. The tests were designed to estimate population parameters and may not have the precision required to map the progress of individual students. Though they have been used in this way in the

Pipeline study, it was clear that tests of only 25 or so items in length were being stretched to their limit when used to describe changes in performance over time. This matter will be discussed further in Chapter 12.

Impact of behaviour on academic performance

The study has found that students who are aggressive and do not comply with the classroom behaviour norms generally perform at the lowest levels. Typically, these students are unproductive over five or more categories, and are usually disengaged from schoolwork. However, their performance is only marginally better than students who do not challenge the class rules but are also disengaged from their schoolwork. Disengagement appears to be the prime correlate of student underperformance; it is also the case that some students behave unproductively yet do relatively well on measures of academic performance. However, as a general rule, students who behave unproductively are more likely to perform poorly in reading and numeracy, thereby failing to meet proficiency standards. On average they perform at a standard between one and two year levels below their counterparts who behave productively.

The students who are generally compliant and cooperative, though disengaged, constituted approximately one fifth of the student cohort; this is a large group. Most of these students would not have mental health problems requiring access to psychological and medical services. They are students who, for example, do not find their schoolwork interesting, are inclined to give up on challenging tasks, look for distractions, fail to prepare for lessons, and opt out of class activities.

Academic trajectories

These conclusions regarding behaviour and performance are, of course, based on average results. Within each group and in any year there are significant exceptions to the general rule. These exceptions are very important though they are often obscured in quantitative studies.

Academic progress, like unproductive behaviour, produces irregular academic trajectories for large numbers of students with their individual results showing dips and peaks. This was illustrated by mapping the results on WALNA and NAPLAN for 2004, 2006 and 2008 of those students who performed at the 2nd and 9th decile in 2004. The results showed that of the students who were performing at the 9th decile in 2004, more than half

slipped down the performance scale in 2006 and 2008; whereas of the students who were performing relatively poorly in 2004, improved their standing by more than half relative to other students, some by a margin of more that 50 percentile points.

These results call into question the standard interpretation of the Matthew effect which implies there to be very little slippage or overtaking during schooling, that is, that a student's academic trajectory is set early in the formal educational journey and is generally unwavering. The Pipeline data show that the behaviour and academic performance of about half the students do not follow a smooth, steady trajectory; over a four-year period there are ups and downs, good years and not so good years. The trend lines based on cohort mean scores belie the fact that the individual pathways of many students zigzag during the year and from year to year.

However, it is also important to get off to a good start. Students who consistently behave in a productive manner perform on average at a significantly higher level in reading and numeracy, tending to maintain their advantage over the four-year period. On the other hand, the students in the unproductive behaviour group generally do not catch up, although, based on the behaviour of students in 2005, the differences between the three groups – the disengaged, the low-level disruptive and the uncooperative of behaviour – tend to even out.

The interviews with teachers and the investigations of individual cases show that circumstances change from year to year for students and teachers. The behaviour and academic performances of students can deteriorate sharply because of a traumatic event and improve significantly because the problem has been resolved, or the determined effort of particular students. They also show that in some cases, exceptional improvement in behaviour and academic performance is due to the commitment of teachers who have been able to establish special bonds with the student.

This conclusion, based on a small number of case studies, is supported by the finding that emerged from the quantitative analysis, namely, that the behaviour of unproductively behaved students is three times more likely to improve than worsen over the course of the year. Teachers make a significant difference to the prospects of the majority of students.

While there are individual 'success stories', there are also cases where students, particularly in high school, appear to have given up and teachers feel powerless to ignite any enthusiasm for learning. As students mature during the secondary years, teachers are more likely to expect students to act responsibly and engage with the material being taught. Where students flatly refuse, and various stratagems adopted by the teachers fail to be effective, teachers under these circumstances tend to place the interests of compliant, hard-working students ahead of those who tune out and become disruptive.

Key issues

Causal relationships

The Pipeline study was not designed in such a way that the direction of the causal relationship between classroom behaviour and academic performance could be rigorously tested; thus the observations that follow are, to some extent, speculative.

It would seem that significant numbers of children have acquired unproductive behaviour patterns prior to reaching Year 2. Anecdotal evidence from teachers suggests that many of these children begin school unable to socialise with peers, follow directions, concentrate, sit still, or behave in ways that are required for formal instruction in classrooms. It is improbable that students began to behave in these ways in the early years because of frustration from constant school failure, since these patterns were established before their first attendance at school.

However, it is possible, indeed likely, that for some of these children the tendencies were exacerbated by their early experience of schooling. Failure to keep up with peers, irritability caused by tiredness, the obligation to sit quietly and still for extended periods of time, and a general lack of social skills could all combine, leading to patterns of unproductive classroom behaviour and poor academic performance. In this example, not only are there multiple causes but the negative relationship between behaviour and learning is reflexive, hardening as the negative feedback acquired by the student reinforces the earlier experiences.

The issue of causality is important because if the direction of the relationship were simple and linear, whereby academic performance largely determines behaviour, then interventions might concentrate on providing every student

with some degree of academic success by moderating the curriculum, grouping students according to their ability and employing other kinds of step-by-step instructional techniques. If on the other hand, classroom behaviour determines academic success, then interventions might focus on moderating the unproductive behaviour through professional development of teachers, counselling of students and so on.

The question of how schools should approach this issue will be taken up in Chapter 12.

Gender differences

Sharp differences between the behaviour of boys and girls were apparent. Boys are more likely than girls to exhibit unproductive behaviours in every year level from 2 to 7; this was also the case for high school students of Year 8 and upwards in both English and mathematics classes.

Teachers nominated inattentiveness, lack of motivation, and disruptive behaviour as the behaviours that most typified the unproductive behaviour of both the boys and girls whose unproductive behaviour persisted throughout the year. Irregular attendance is one behaviour differentiating the genders; it is one of the dominant behaviours most frequently nominated for girls during the primary and secondary years.

Boys are much more likely than girls to be classified as members of the Uncooperative behaviour group - the lowest performing group on the WALNA and NAPLAN assessments. Boys are three times more likely to be suspended than girls, the suspended students being particularly differentiated from other students by their aggressive and confrontational behaviours.

The consistently higher levels of unproductive behaviour of boys do not appear to make much difference to their academic results in literacy and numeracy. While girls perform better than boys on average in reading, the mean differences are relatively small. In numeracy, however, boys do slightly better than girls, though the differences are not statistically significant.

There are considerably more boys than girls in the lowest two deciles of the WALNA reading test, though the gender difference for WALNA mathematics is slightly in favour of boys.

Student mobility

The capacity of a school to produce a productive educational climate, encouraging high levels of academic performance, is very strongly tied to enrolment demographics. The simplest way to improve the academic standing of a school would be to exclude students who are disruptive and disengaged and enrol new students with ability and a work ethic. This kind of strategy is possible under policies that extend parental choice of schooling and encourage parents to shop around. Hence, schools that fail to retain well behaved, academically oriented students run the risk of sliding into a spiral of decline. The Matthew effect is played out on a school-level basis: advantaged schools become more advantaged and those that are struggling, fall lower in repute thus finding it even harder to retain their able students.

This dynamic was evident when the impact of the transition of the Pipeline Year 7 students to high school was analysed. Many students did not attend their local high school in Year 8. Of those who did, they were less productively behaved and performed at lower levels in reading and mathematics on average than the students who made the transition to non-Pipeline schools.

It was not possible to establish the destination of these students and there are many reasons why the students might have attended other government or non-government schools. However, the diaspora at the end of Year 7 has an important consequence - Pipeline high school teachers will find it harder to establish productive behavioural norms and produce satisfactory academic results that would be possible if their schools had been able to capture all of the Year 7 intake. As a result, the high schools have to deal with a higher concentration of students who behave unproductively than would otherwise be the case.

However, the transition from primary school to high school is not the only point at which students change schools. One of the practical problems faced by the Pipeline Project was the attrition caused by students changing schools. Over a four-year period 44 per cent of the 2005 cohort had enrolled in non-Pipeline schools, obviously a significant turnover in school enrolments. While some of the students who move do so at the instigation of parents who prefer another school, others are the result of families shifting their residence or the break-up of families where children are cared for by a separated parent or by a member of the extended family. Thus, the group of students who are mobile may be composed of students who are highly productive in class as well as those who are seriously at risk.

Conclusion

This chapter has reported the most salient and significant findings from the Pipeline Project. These may be summarised as follows:

The constructs of productive and unproductive behaviour usefully differentiate the classroom behaviour of students.

Students who behave productively have a much greater likelihood of reaching proficiency standards in literacy and numeracy.

The most prevalent form of unproductive behaviour is student disengagement.

Year 2 students exhibit levels of unproductive behaviour comparable with other primary year levels.

Year 8 teachers report the lowest levels of unproductive behaviour of any year level from Year 2 to Year 11; the highest levels are reported in Year 10, though the reported levels in Education Support Centres are considerably higher again.

Student productive behaviour is strongly related to academic performance; it seems most likely each contributes to the other.

The behaviour of students is three times more likely to improve during the course of the school year than worsen.

Not all of the issues addressed by the Pipeline study were resolved and some of the findings challenged conventional wisdom concerning classroom behaviour and performance.

The frequency of unproductive classroom behaviour is about the same at all primary year levels. This may be a surprise to people, unfamiliar with contemporary school life, who imagine that in the early years students are docile, compliant and generally well behaved. Teachers in the early years of primary schools must work just as hard in shaping the behaviour of their students as teachers in the senior primary years.

In high school, Year 8 students are reported to exhibit the lowest levels of unproductive behaviour of any year level and the Year 10 students the highest. Conventional wisdom has it that student behaviour is more of a problem in high school than primary school; moreover it is often thought that student discipline problems peak at Year 9 so that at this year level the highest levels of unproductive behaviour should be found.

The frequency of unproductive behaviour varies considerably from school to school. While the socio-economic status of the school is generally related to the frequency, there are exceptions to this general rule.

The gender differences in classroom behaviour are consistent and of a relatively large magnitude; boys clearly show more unproductive behaviour than girls. However, the differences in academic performance are relatively small and, notwithstanding their behaviour, boys show an edge in numeracy.

A high level of volatility in student behaviour and performance from year to year is apparent. While some of the variation may be due to errors of classification and measurement, errors of this kind do not explain the full extent of the variation.

The size of the group of students, whom teachers consider each year over a four-year period to behave in a way that is seriously unproductive, is relatively small (3 per cent). This finding challenges the conventional wisdom that students who are responding poorly in class most likely have a long record of behaviour problems

The findings outlined in this chapter bear on the metaphor of the 'pipeline'. The Pipeline study set out to test the assertion that with regard to academic success, the die is cast in the early years; students who behave unproductively or perform poorly on academic tests rarely recover; they slide inexorably into the 'tail' of low-performing, troublesome students. This is clearly an oversimplification; students are constantly making up or losing ground. Even students who are amongst the lowest performing and least productively behaved groups can make remarkable recoveries.

12. Implications

Introduction

This final chapter examines the implications of the results summarised in Chapter 11. The suggested changes to policy and practice are confined to those arising from the findings relating to the focal point of the study, namely, trajectories of academic performance and classroom behaviour.

It should be noted that the Pipeline study did not set out to review the services made available to schools, or to evaluate the methods used by them to address behaviour problems and improve academic performance; but had a specific research focus. Hence, it would be inappropriate in this final chapter to make gratuitous recommendations about what needs to be done. However, the findings from the study do suggest a number of areas where attention should be focused.

The first addresses the topic of student academic engagement. While the evidence collected did not indicate that student disengagement was more of a problem in Western Australian schools than in other jurisdictions, or that a particular factor was exacerbating the problem in Pipeline schools. Nevertheless it is clear that substantial numbers of students from their early years do not engage with what is being taught, thereby reducing their prospects of academic progress. To use a colloquial turn of phrase, with regard to student behaviour and performance, disengagement is 'the elephant in the classroom'.

The next consideration is what more could be done to assist schools to improve their use of information in guiding school policies and practices relating to behaviour and academic performance. These suggestions are based partly on what the Department of Education and Training (DET) and individual schools are already doing, as well as what has emerged from the analyses of Pipeline data.

The third area contains further suggestions aimed at strengthening the capacity of schools to address problems of behaviour *and performance. This focuses particularly on the problem of establishing an effective partnership between the school and home for students who are failing to meet academic proficiency and behavioural standards, and where a downward trajectory is evident.*

There is no single, obvious way of improving behaviour and performance. The core of what is being proposed can be best summed up as 'systemic reform'. Various aspects of the school system should be subjected to review in the light of the evidence provided in the Pipeline Project. In some cases existing arrangements should be modified, current initiatives should be extended or given a higher priority and, in some instances, new initiatives should be launched. The outcomes of these reviews should be synthesised to form the basis of a concerted drive to lift the level of academic engagement of West Australian students.

Academic engagement

Establishing engagement as a systemic priority

System structures

In order to assist schools to manage the behaviour of students, DET provides a range of services. For example, approximately one third of schools receive additional funding, many classroom teachers have participated in professional development programs, and the Department provides schools with access to various kinds of consultancy services. Much of this additional support is focused on supporting schools to manage the group of students who are highly disruptive and whose behaviour threatens their wellbeing as well as that of peers and teachers.

The Behaviour Management and Discipline strategy has allocated over $60 million over the past seven years to assist schools in managing the behaviour of these students; and the Government has recently announced its intention to appoint additional school psychologists and school chaplains. Much less support is directed towards students who are disengaged from their schoolwork, but are not disciplinary problems. Schools are expected to deal with this problem from within their existing resources.

Within the Department, student behaviour services are managed and provided separately from those providing curriculum and pedagogical support designed to improve educational standards of performance. This has been a longstanding practice, even though it is recognised that standards of both behaviour and academic performance are interdependent.

Student engagement with learning forms the nexus between student behaviour and academic achievement. It is unclear where, in the departmental structure, responsibility for improving student academic engagement resides. The creation of a new division of student engagement that spans curriculum and psychological services is not suggested. However, some kind of bridging is required to ensure: appropriate policies are formulated; centrally developed programs take account of the relationship between student behaviour and performance; and schools struggling to establish a culture of academic engagement have access to the various forms of support needed.

Making productive student behaviour an explicit goal in programs and policy statements

In the current educational climate, the improvement of student performance on standardised academic tests is assuming an unprecedented importance. New agreements between Commonwealth and state governments tie the actual level of Commonwealth funding to the achievement of student performance targets in literacy and numeracy. School systems will be given reward payments if they are able to demonstrate they have achieved 'ambitious' goals. As these agreements take full effect, there will be increasing pressures on schools to demonstrate they have been able to use existing resources to raise specific proficiency standards of students.

Particular scrutiny is being focused on the percentages of students who perform at or below minimum proficiency standards for literacy and numeracy. Over past decades

there has been a substantial investment of funding, specifically intended to lift the performance of these students, but little overall progress has been made: the percentage of students in Australian schools who do not reach the minimum standard has remained nearly constant.

In the various documents describing the interventions designed to improve literacy and numeracy for these students, there is seldom any reference to student behaviour. The Pipeline Project has shown there to be multiple causes of low academic performance and demonstrated that classroom behaviour is clearly one prominent among them. Students whose behaviour is reported to be severely unproductive generally perform at statistically significant lower levels in literacy and numeracy than those who behave productively. Many of the students who are under-performing have a history of disengagement.

Raising academic standards tends to be construed mainly as a curriculum and assessment problem so that any extended discussion of student behaviour would be seen as out of place. It is suggested that this should change.

As a general principle, initiatives designed to improve literacy and numeracy should incorporate strategies to improve student academic engagement.

One of the few references to student behaviour in the recent National Education Agreements of the Council of Australian Governments is contained in one of the five listed priority areas. The document states that 'All children *are engaged in* and benefiting from schooling' (italics added). This is the only explicit reference to student behaviour in the documents specifying the basis of the agreements. This is an appropriate goal but nothing further is stated about how the goal should be achieved. The inference is that either improving student behaviour is not perceived to be an essential strategy for improving student academic performance, or the authors of the agreements were unable to articulate how it should be done.

The Department of Education and Training should use the National Partnerships with the Commonwealth Government to focus systemic effort on improving engagement, in order to meet nationally agreed targets for Literacy and Numeracy.

One of the difficulties in framing an educational strategy to lift the levels of student engagement is that

such improvements need the negotiating of so many boundaries. A major US review of the problem of academic engagement (National Research Council, 2004) summarised the problem this way:

> No single educational policy or practice, no matter how well grounded in research, can be expected to increase students' academic engagement if the policies and practices in which they are embedded are ignored. For example, small, personalised schools may not enhance meaningful cognitive engagement and learning if they do not also provide effective teaching and a strong press for achieving high academic standards; the most engaging teaching practices may have little effect on a student who is homeless, has serious, untreated health problems, or faces the chronic threat of violence (p. 10).

In other words, the policies and practices must be aligned. Changes in one policy area can have negative repercussions in another. If this is so, then where should DET begin when addressing this problem?

A starting point might be to examine current and prospective school improvement initiatives ensuring that each contributes specifically to the engagement of students in regular classrooms. For example, all Australian governments are collaborating in the production of a national curriculum. This development provides a rare opportunity to design a curriculum that has the prospect of maximising the engagement of students with differing interests, abilities and backgrounds. It is a difficult task since the designers will want to produce curriculum that also encourages high standards, suitable for talented and well-motivated students. However, the curriculum must also encourage the engagement of students who struggle to keep up with peers and who find academic learning pointless. In other words, teachers must be given scope to make significant adaptations to the curriculum. It is in the students' interest that they actually engage deeply with a limited body of essential learning. It is much harder to engage students who are generally unmotivated when they must cover an extensive and excessively prescribed body of content.

The Department of Education and Training should ensure that the National Curriculum is drafted so that it takes account of student disengagement. While defining the knowledge and skills that are required by all students, it should provide scope for teachers to modify its delivery according to the background and interests of students.

The National Curriculum is only one example. If each new initiative was systematically put to the test, it may be possible to make serious inroads into the level of disengagement in schools.

Strengthening engagement in schools

Building a school ethos of engagement

It is clear that unproductive classroom behaviour is caused by multiple factors that combine to form a complicated, interactive web. It is also clear that the trigger for unproductive behaviour varies from student to student. Hence it would be improbable that any single intervention, unless broadly conceived, would remedy the situation.

The Pipeline study has focused on student behaviour in individual classrooms. Yet the school, rather than the classroom teacher or the individual student, is the key organisational unit in which improvement strategies must be built and rebuilt. Schools are aggregations of classrooms and students; thus improvement likely lies in the adoption of better school-wide processes than in the adoption of a new 'product' that hitherto has been missing. Many of the strategies that can be used to strengthen academic engagement are outside the control of individual teachers and require the support of the whole school. Hence, schools will need, from time to time, central and regional support.

The Pipeline Project has not attempted to produce a recipe for what needs to be done to build an ethos of academic engagement. Some of the obvious factors read like clichés from the effective schools literature. This is not surprising as a school can only be effective when its students are motivated to learn. The factors include: a strong and energetic leadership team; clearly enunciated expectations regarding respectful behaviour and academic standards; parental backup; flexibility to modify the curriculum and reorganise classes; staff who can work with students out of the regular classroom context in school time and out of hours; respect for, and acknowledgement of, the efforts of staff members who make small gains under daunting circumstances; and an evidence base that maps progress, confirming success and drawing attention to failures.

The problem with such lists is that they are easier to compile than to put into practice. Because the Pipeline study did not explicitly examine the question of how

to improve engagement it would be inappropriate to recommend a specific course of action. A more realistic starting point would be to canvass school principals to find examples of schools that have constructed a climate of engagement against considerable odds.

While schools serving low-SES communities may potentially face higher levels of disengagement than other schools, the relationship is not fixed. Schools with similar demographics have met with varying degrees of success in extending students' enthusiasm for learning because of the ways in which they have approached the problem.

Changing behavioural norms is likely to be a hard, protracted process. In so far as 'easy riding' can be recognised as symptomatic of 'negotiated disengagement', changing these practices will require a concerted effort from school staffs.

Schools enrolling low-SES students, and that have made significant progress in promoting a culture of engagement with learning, should be invited to take on a leadership role for the school system and their continuing work should be facilitated by delegations of authority that allow them to expand what they are doing.

It should also be noted that the most challenging schools are those where the level of engagement has ebbed to very low levels. Different approaches may be needed to actually 'resuscitate' a school, as opposed to only maintaining the level or moderately increasing it. It may be unreasonable to expect school staff to address these problems successfully within the existing regulatory frameworks.

This is not a novel suggestion. Over recent decades, education departments have introduced structural changes. Middle schooling is one such change: purpose-built middle schools catering specifically for Years 6 to 9 have been constructed in some communities. This initiative should now also be reviewed in the light of Pipeline study findings and the results of evaluations made available for analysis. While concern has been expressed about the academic standards achieved in middle schools, these schools are typically organised in ways that are expressly designed to foster student engagement.

DET should consider 'waiving' existing policies and rules in such cases, allowing the school staff members as much scope as possible to modify the learning environment.

The Government's decision to support an extension of autonomy to selected schools may provide an opportunity to trial alternative forms of school organization.

It is timely for DET to undertake a review of school organisational structures that are conducive to the achievement of a high level of student engagement.

Starting with the education of boys in the early years

Among the most salient findings of the Pipeline study was the high incidence of disengagement in the early years, particularly the predominance of boys. The results are contrary to the conventional wisdom that disengagement is largely a high school phenomenon. For example, a recent OECD study of science education observes:

Most children come to school ready and willing to learn. International studies of primary school age children generally reveal high levels of interest and positive attitudes to subjects such as science (OECD, 2007a: p. 122).

Similarly, an authoritative US review of student engagement begins with the following observation:

Children often come to school eager to learn but, as this report suggests, many lose their academic motivation as they move through elementary school into high school. In fact, by the time many students enter high school, disengagement from course work and serious study is common (National Research Council, 2004: p. ix)

While the way in which students express their disengagement may change as they grow older, the Pipeline evidence challenges this conclusion. Not only is disengagement a serious issue for students in the early years, but gender appears to be a significant factor. The Pipeline results invite readers to question the suitability of current educational practices for boys.

A recent OECD report posits several possible reasons for the over-representation of boys in the populations of students with behaviour problems (OECD, 2007b). Explanations suggested in the report include the possibility of a greater vulnerability of boys than girls during the developmental years to the effects of illness and trauma; the tendency for males to externalise their feelings in

school more openly than girls; and the feminisation of schooling which has subtly shaped the curriculum so that language skills are emphasised at the expense of others.

DET is currently reviewing the curriculum for the early years and developing assessment tools that will detect a student's grasp of the foundational skills for literacy. It is important that gender differences in developmental readiness are taken into account. The new framework needs to be sympathetic to the gender differences, or the reforms may unintentionally exacerbate the disengagement of a significant proportion of students. It would be a mistake to dismiss the unproductive behaviour as 'boys being boys', and to assume they will eventually 'come good' when they mature. Questions also exist about how best to approach the teaching of numeracy to girls .

The gender differences also raise the question about the value of extending the proportion of the school day allocated to teaching literacy for students performing below benchmark standards, particularly if the students' behaviour is problematical, they are disengaged, and they are boys.

As with many of the problems addressed by the Pipeline study, no simple solution is in sight. The gender differences have been observed over many years and reported in the research literature; in some quarters these differences have come to be regarded virtually as a natural phenomenon - an unduly fatalistic position. Many of the Pipeline teachers work extraordinarily hard to accommodate such differences, reporting examples of success. However, the issue is one of systemic importance, and DET should provide leadership in this area by coordinating the work of schools committed to redressing the gender problem.

DET should provide selected schools with the resources to undertake networked school improvement projects designed to share strategies that engage boys in activities that will simultaneously engage them and promote language competence.

Using information about behaviour and academic progress

Information for case management

Evidence-based decision making

Most contemporary public policy documents urge agencies to use evidence to inform decisions about the delivery of services. Digital technologies have enabled agencies to collect large bodies of data pertaining to demographics, costs and effectiveness of programs. DET has been at the forefront of these developments as they apply to education; but it is unlikely that interest in basing important decisions on relevant evidence will diminish. The Department should aim to become the national leader in the field of education.

It is important that opportunities for evidence-based approaches to decision making are extended to schools. This became apparent during the course of the Pipeline Project. The starting point should be the clarification of what schools need to know. Too often, the starting point is the identification of what central authorities need to know about schools and, after establishing the centre's information needs, the information systems are subsequently adapted for school use. Evidence-based practice means that practitioners must have access to pertinent information about their students and use it judiciously.

Adopting a long-term perspective

The grouping of students into classes according to year levels has been an enduring, taken-for-granted feature of the organisation of schools. In February each year, students are assigned to a class and meet their teachers under whose care they will spend the school year. The following February the process begins again. The progression through school is divided into discrete, annual stages. Not surprisingly, academic progress is mainly construed as progress during a single school year. It is uncommon for student progress to be tracked and *trends* reported over the duration of a student's primary or secondary schooling.

What is being asserted here is that the systems in place generally revolve around annual cycles. This encourages teachers to focus on the wellbeing of their students mainly while they are in their classrooms, making it hard for them to adopt a long-term perspective.

The Pipeline Project has shown over a four-year period that, although many students followed a steady and predictable trajectory of improvement, some trajectories zigzagged, and others showed a general decline. These patterns would not be obvious in a school with the main focus on the 'here and now', and where there is no means of acquiring extended trajectories of student behaviour and performance. Yet students with *chronic behavioural and learning problems require monitoring over several years*.

The Pipeline study has shown that the amount of effort invested in an individual student can be blown away so easily. Where students make exceptional improvement in the one year, the momentum needs to be maintained over subsequent years; where there is a decline, the slump needs to be arrested.

Teachers as case managers

There is currently a high level of ambiguity about the role of teachers in addressing the social and medical problems faced by students. Information is informally shared in staff room discussion about students whose patterns of behaviour are known to them. Sometimes facts that may explain a student's behaviour are revealed serendipitously in these discussions. Teachers are encouraged to feel responsible for addressing the problems impeding the students' academic progress; yet they are also encouraged to feel reliant on expert advice from other service professionals. These are not usually readily accessible; thus their support is found hard to acquire.

The Pipeline Project showed that teachers and other school staff members must deal with many complex cases where students are experiencing problems which hamper their academic progress. In most of these cases, teachers have an extensive knowledge of the circumstances contributing to the problem. Together with staff members who have taught such students over several years, or have been acquainted with these students over an extended period of time, they are able to weigh up what is known about the student and assess what is holding the student back. However, there is some uncertainty as to whether teachers should assume this role and 'case manage' these students; or whether that job should be assigned to experts.

Some teachers are concerned that the disclosure of information about students, even to fellow staff members, might label them as 'problem students' and set in train a

self-fulfilling dynamic, thereby prejudicing their prospects. The argument is sometimes made that the segmentation of schooling into year levels is actually a positive feature since it enables students each year to make a fresh start. There are also uncertainties about what type of information held by the principal or other agencies should be shared with teachers, for example, the medical history of a student or parent. There is a certain irony about this situation since, in many instances, teachers know about sensitive family matters because of self-disclosure by parents or their children.

The issue of access by teachers to information about student background and wellbeing is a matter that needs resolution. Obviously, the sharing of this kind of information raises complex ethical issues and appropriate protocols should be put in place. But there are also good reasons for teachers needing access to all the information thought to bear on a student's behaviour and performance at school.

Therefore, DET should undertake a review of the information available, and of the information needed to enable school personnel to make evidence-based judgments about how to address the problems indicated by student behaviour and performance.

> *DET should undertake a project which draws on cases such as those described in this report, and model what teachers and school personnel need to know about the students if they are to intervene successfully and accelerate an individual student's progress. Such a developmental project would appropriately fit under the umbrella of the COAG National Partnership activities.*

The capacity of schools to operate in this manner is variable. Some schools, on their own initiatives, have developed sophisticated processes for screening students and for reviewing their performance and behaviour; whereas others have found it difficult to inculcate a culture that values evidence-based decision-making. Therefore, three further initiatives should also be undertaken to assist schools. First, DET should harvest the expertise that currently resides in schools.

> *Innovative schools that have developed their own information systems and case management processes should be acknowledged and their successful work widely promulgated.*

Second, DET should develop a training program, drawing both on the experience of schools that are leading practitioners and experts from other areas. The skills and understandings required to make evidence-based judgments about student behaviour and performance do not appear to have been the focus of recent professional development.

Professional development of teachers should include the opportunity for them to upgrade their skills in interpreting qualitative and quantitative data describing performance and behaviour.

A staff member with the technical capacity should be appointed to every school to acquire information, map progress over the course of a student's attendance at the school, and develop student trajectories enabling teachers to keep track of progress and to monitor whether their interventions are having a measurable effect.

Each school should have a staff member with the technical expertise to use information systems that map individual student behaviour and academic progress.

Providing better data on student progress

Using NAPLAN to measure progress

Traditionally, standardised tests reported student performance relative to other students who sat the test. Over the past decade or so, such normative reporting of results has been replaced by standards-referenced reporting assessment results. These report whether students have met a nationally defined benchmark or standard. Now an interest is emerging in using tests that have been designed to measure whether individual students are making progress. In order to determine the *progress* of a student, multiple measures of academic performance are needed to ascertain whether the student's performance has improved over a designated period of time.

National assessment is assuming critical importance in educational policy making. The tests are designed to produce reliable estimates of school and system productivity. The use of the tests to measure progress over time is, in a sense, a by-product. However, the accuracy with which the NAPLAN tests can be used to measure individual student progress from testing occasion to testing occasion is unclear. The statistics describing the technical capacity of the tests to perform these functions are not publicly available. With regard to the WALNA tests, and the NAPLAN tests that have superseded them, users of the results must act on faith that the scores accurately measure the performance of students; and that inferences regarding a student's growth can be reliably made from the test results.

However, these national tests were not designed for use by teachers to measure the progress of individual students, even though they can be used for that purpose as demonstrated in this study. A more serious limitation is the infrequency of the measures, namely, four occasions during the primary and secondary years. If teachers are to map progress and use the results to make decisions about the progress of individual students, different kinds of tests are required. These could be administered by schools when they judge it to be necessary.

'On demand' testing to measure progress

The Pipeline Project results have pointed to the need to consider student progress in terms of trajectories, and to use the trajectory as an indicator of whether to make a specific intervention in the education of a student. The question that arises concerns how this could best be done. How should individual student progress be measured?

An impediment to assessing student progress over more than a single year is the lack of appropriate assessment instruments. However, there is a considerable amount of activity in this area both in Australia and overseas.

The British Department for Education and Skills (DfES) has launched a project known as *Making Good Progress*, *designed to assist schools measure individual student progress, and recognising that individuals learn at different rates* (DfES, 2006). In addition to establishing how many students attain national benchmarks, the DfES has piloted a system that identifies whether students have made exceptional progress, particularly students who have fallen behind and have been helped to 'catch up'. Schools have been provided with software to help monitor the progress of students. As well, tests have been developed that are focused on particular levels of attainment. Schools arrange for a student to sit the tests if they think the student has demonstrated progress by reaching appropriate milestones. Two matters are of note: schools having students who achieve a specified level of improvement are paid a per-student financial bonus; and an independent authority administers the tests.

The Victorian Curriculum and Assessment Authority (VCAA) has introduced 'on demand' literacy testing whereby schools can acquire appropriate assessment instrumentation by downloading the tests from a Departmental website (VCAA, 2008). This ambitious initiative is intended to assist teachers to monitor progress by enhancing their technical capacity to do so.

DET has, for a number of years, provided schools with access to performance data for their students from the WALNA program through the Data Club. This is a nationally significant initiative ahead of its time, but many school systems in Australia and elsewhere are still grappling with appropriate use of the results from a large scale testing program. Schools are provided with software that allows staff to look at trends over time, and consider whether individual students have achieved academically as expected. The software contains appropriate caveats against simplistic interpretation of results; however, it is a potentially useful tool for evidence-based decision making at the school level.

For reasons explained above, it would appear that the Data Club assessment instrumentation (WALNA) should be upgraded so that teachers can reduce the interval between assessment occasions therebt obtaining more robust estimates of the students' academic progress.

The two-year interval between national testing occasions is too long for the purpose of monitoring individual student progress. For this purpose, schools need to have access to assessment instruments that indicate whether students are meeting proficiency standards for each year of schooling. Such tests should be made available and administered by schools on a voluntary basis, at a time that suits them, and to assess students for whom testing is appropriate. As this is a large undertaking, DET should consider collaborating with other state education departments and assessment authorities already working on such projects and, in doing so, share the developmental costs.

Academic performance measures should be developed and made available to schools so that schools can map individual progress over time with greater precision and confidence than is currently possible using NAPLAN/WALNA instruments. These assessment instruments should be used at the discretion of schools and not be used for school accountability purposes.

Monitoring student behaviour

The Student Achievement Information System (SAIS) has also developed into a comprehensive tool for maintaining school records and issuing reports on student behaviour and performance. With regard to student behaviour, each semester teachers can submit ratings on a number of dimensions of the student behaviour, that bear on cooperation, confidence and effort. These behaviours are indicative of engagement. Trajectories can be produced for each student over a three-semester period and compared with the aggregated responses from other schools. Attendance records can also be entered and reported.

The student behaviour component of the SAIS should be enhanced and a scale constructed that would allow the recognition of significant changes in behaviour over time.

There are several ways in which these analytic tools could be further enhanced. They should be used to help school staff members identify, on a case-by-case basis, who is failing to make progress, whether classroom behaviour is a contributing factor, and what changes are necessary.

Tracking students

Unique student identifiers

The Pipeline study has shown there to be considerable student mobility, resulting in schools often having incomplete data for a considerable number of students. In order for schools to map student progress from year to year, students need a unique numeric identifier so that information about an individual student can be linked with data from previous schools attended.

The use of unique student identifiers raises issues of security and privacy. The adoption of a national system has been under consideration by the Ministerial Council for Education, Employment and Youth Affairs (MCEETYA) since 2005. Queensland and Tasmania have their own system already in place. Victoria is trialling a system during 2009. Given that other states have already proceeded, DET should not wait for agreement on a national system. It should fast-track the adoption of a similar system.

The system could be utilised for an additional purpose. The Pipeline study has shown that there is a dispersal of students at the end of Year 7, following their transition from primary to high school. The evidence from the study suggests that market forces are accentuating the concentration of students in particular schools according to their behaviour and academic performance. It is of considerable strategic importance that DET establishes a system which enables it to monitor broad trends of this kind. The adoption of a unique student identifier would enable policy makers to recognise trends in parental choice while at the same time protecting the anonymity of the individuals involved.

There is a high level of student mobility within the school system. Sometimes the school is informed that a student is leaving and their destination is disclosed. In other cases the students simply disappear. The latter group often contains those students who are having trouble at school or at home. Indeed, there were numbers of cases during the course of the Pipeline study where staff members invested considerable time and effort to assist particular students who were struggling, recognised improvement, and then discovered that the student had suddenly left the school and 'vanished'.

The focus on the 'here and now' robs teachers of the satisfaction of recognising the cumulative value of their work. Teachers may make a huge effort to assist a student to make exceptional improvement in behaviour and performance, only to see the student leave. Teachers lose touch and there is no expectation of feedback on how students have adjusted to their new school.

DET should adopt a system of unique identifiers, with appropriate security and privacy safeguards that would facilitate the mapping of student behaviour and performance and the linking of records when students change schools.

Supporting schools

Learning from successful schools

The Pipeline study observed school differences in the level of unproductive behaviour reported by teachers. The levels were moderately related to the school's Socio-economic Index (SEI) score. Some of the schools with low SEIs had much better than expected levels of productive behaviour

and achievement. This may be because the SEI is an imperfect measure, or because some low SES schools have been able to manage behaviour more effectively than others. Both possibilities may be true.

Some of the principals in the Pipeline Project were confident they had introduced new programs and operating procedures that had improved student behaviour and performance. Throughout the whole system many schools are likely that to have made similar improvements. While the evidence suggests that home-grown solutions to problems are hard to universalise, acknowledging and publishing accounts of what the schools have achieved promotes a professional culture thereby spurring other schools to explore what they might also achieve. Such dissemination and accumulation of knowledge requires a research-minded attitude and should not be confused with marketing and public relations.

DET should develop its capacity to identify schools that achieve higher than expected NAPLAN results; and in collaboration with the schools, systematically examine the circumstances that appear to have enabled that performance, and provide a means for the schools to disseminate the strategies they have employed.

Extra-classroom support

As indicated earlier in this report, the construction of a productive school climate in which there is a high level of engagement is seen as the responsibility of school staff members, and it assumed that they collectively have the capacity to achieve such a climate. The Pipeline study suggests that, while schools accept this responsibility, much more targeted support is warranted in order to achieve a quantum improvement across the whole school system.

Reference was made earlier in this chapter to the adoption of a more individualised, case-management approach to students behaving unproductively and performing poorly. This initiative can only be successful, in the long term, if schools have additional capacity. The schools in most need of such an approach are likely to find it exceptionally difficult to bring relevant staff together for the necessary amount of time. It is a resourcing issue.

Schools also have access to specialist support staff depending on their circumstances. This staff includes psychologists, speech pathologists and chaplains. Some are based in regional or central offices whereas others are appointed to schools. Generally, they are involved with individual students who are experiencing some kind of personal problem. Their successful intervention can make a difference to the level of engagement in classrooms since a single student can cause a high level of disruption and undermine the norms that support productive behaviour.

However, it is likely that much of the disengagement reported in the study is more endemic to the school or classroom culture, rather than being the product of one student's classroom behaviour. The challenges confronting teachers may spring from the home, the curriculum, or the pedagogy teachers are employing, as well as the inner psychological states of students. It is a tall order to expect a consultant to be expert in such a wide range of areas, unless specifically trained and of relevant experience.

Some professional development programs have addressed student engagement and sought to extend the range of strategies to be employed by principals and classroom practitioners; DET should review the success of these programs. Additionally, it should review the roles and responsibilities of consultants and ancillary staff to ensure they can contribute to the amelioration of disengagement in a consistent and appropriate way.

Strengthening the capacity for out-of-school intervention

Teachers believe that for many students the explanation for their unproductive behaviour is tied to events that happen outside the school, or in conjunction with what happens at school. Family trauma of the kind directly or indirectly involving the students has a large bearing on their behaviour and performance at school.

Parents (and carers) also play a key role in shaping student beliefs about the value of education and of doing as well as possible at school. The likelihood that they will be motivated and engaged is in direct proportion to the extent of family members and peers effectively supporting their purposeful involvement in learning at home and in school.

Schools schedule events to which parents are invited but they are often poorly attended. Contact with parents is made through the principal or a designated staff member, sometimes on the school site and sometimes at the parent's residence. For a small number of schools, the location of social work and medical agencies on site can strengthen the capacity to liaise with parents. For most schools, staff members must operate in the grey area between educator and social worker.

Principals report that it to be almost impossible to acquire the support of qualified social workers to help them solve problems unless such events are thought to involve violence or sexual misconduct. Thus they are left to their own resources, the main impediment to support acquisition appears to be the inadequate funding of these agencies. Sometimes non-government agencies, including churches, partially fill this gap.

Schools with high levels of unproductive behaviour should have the capacity to deploy an appropriately trained staff member to maintain direct contact between the students' carers and the school.

The unproductive behaviour of some students appears to arise because of over-indulgence rather than neglect. Many of the disengaged students simply do not respond to instruction and are incredulous or unresponsive when pressure is applied by teachers. This pattern is approaching endemic proportions according to teachers who participated in the focus group discussions. Parents, for various reasons, find it easier to gratify their children than to inculcate habits of persistence, patience and respect for others. Schools need to be supported by parents when they attempt to develop these productive attitudes and habits of mind.

In the field of health, large-scale campaigns are waged to promote healthy lifestyles. Obesity in children is the focus of a current campaign there being constant attention drawn to the problem in the mass media; yet the development of positive attitudes towards schooling is just as important, with the promotion of education always being given the same priority as, for example, health promotion.

The State Government should launch a parent education campaign, using the mass media and copying relevant health promotion initiatives, that illustrates how parents can contribute to the success of their children at school.

Conclusion

This study has shown that, in general, students who perform well in one year are likely to perform well in the next; and that the behaviour of large numbers of students is consistently conducive to academic success. On the other hand, both the behaviour and performance of a substantial proportion of students change significantly from year to year, some for the better and some for the worse. Of the students whose behaviour undermines their chances of reaching their potential at school, some make a rapid recovery; others have good and bad years; and still others show no signs of improvement.

A relatively small group of students exhibit behaviour so extreme that school staff members have no choice but to take whatever action to deal with the behaviour and to nullify its impact on other students. It is towards these students that most of the school's behaviour management effort is directed. In the unproductive behaviour of many of these students, their behaviour can be attributed, in part or whole, to events that occur out of school. Schools need additional, appropriately trained personnel, who can liaise with parents or carers.

However, there is a much larger group of students who do not threaten the wellbeing of others, or draw particular attention to themselves, but whose disengagement from schoolwork is significantly restricting their academic progress. These students under-perform on academic assessments, but because they do not threaten others they tend to escape the attention they warrant.

Disengagement from schooling is a problem in all developed countries. There is no single solution to the problem of disengagement because there are multiple causes. The homes from which children come and the quality of parenting which sees school success as neither valued nor supported, contributes to disengagement. Governments should support schools with regular parent education programs. However, schools also bear responsibility; but they can only exercise that responsibility where they have the capacity to do so - a whole-school capacity.

Australian governments have agreed to a series of national partnerships that will direct additional funding to schools serving low socio-economic communities, especially if literacy and numeracy outcomes will be improved. There is an opportunity to focus interventions devised through this program so schools with a critical mass of students who are unmotivated and disengaged from schooling are supported.

Schools need the technology and the expertise that will enable staff members to keep the trajectories of such students under surveillance, and to respond to each student at risk of failure. This is not a radical recommendation, since the basis of such a system is already in place. The evidence from the Pipeline Project suggests the need for the refinement and an extension of this capacity.

One of the apparent weaknesses of the existing arrangements for recording, reporting and analysing behaviour related to academic performance is that the *educational* rationale for their application is not made explicit, even though the manuals describing how the systems can be used appear to be of a high standard. The Pipeline Project findings suggest that the DET has the means of making both case management and the monitoring of student progress outstanding strengths of the government school system.

Some of the suggestions for action made in this report are deliberately couched in broad terms: further consideration is required if any of the suggestions is to be transformed into an action plan. They also call for the pooling of the experience and expertise found among principals and experienced teachers.

Following through on these suggestions will require both a reframing of priorities, and the development of a sophisticated understanding of the nature of student unproductive behaviour and its relationship to student performance. Improving information systems, proposed in this report, will only have a positive impact if the *particular* information needed to guide decisions is placed in the hands of staff members with the training, understanding and time to put it into effect. Promoting academic engagement will only improve student outcomes if the strategies that might work can be integrated into the ongoing work of schools. Urging parental support of students will only yield positive results if schools have the capacity to mobilise parental commitment.

There is no simple checklist of things to do in order to improve student behaviour and performance. Educators at all levels of the school system should be wary of 'experts' who claim to have all the answers packaged into some new program. In the end, the likelihood of success remains an individual school's overall capacity - measured not only by their financial and staffing resources, but also by their shared commitment to make a significant difference in tandem with their power to change what needs to be changed.

References

Achenbach, T. M. (1991). *Integrative guide for the 1991 CBCL/4-18, YSR, and TRF profiles*. Burlington, VT: University of Vermont.

Achenbach, T. M., Howell, C. T., McConaughy, S. H., & Stanger, C. (1995). Six-year predictors of problems in a national sample: 111. Transitions to young adult syndromes. *Journal of the American Academy of Child and Adolescent Psychiatry, 34(5),* 658-669.

Ainley, J., & Fleming, M. (2003). *Five years on: Literacy advance in the primary years*. East Melbourne: Catholic Education Commission of Victoria.

Angus, M., Olney, H., & Ainley, J. (2007). *In the balance: the future of Australia's primary schools.* Canberra: Australian Primary Principals Association.

Arbuckle, C., & Little, E. (2004). Teachers' perceptions and management of disruptive classroom behaviour during the middle years (years five to nine). *Australian Journal of Educational and Developmental Psychology, 4,* 59-70.

Australian Institute of Health and Welfare, (2007). *Australia's welfare 2007.* Cat No. 93. Canberra: AIHW.

Audas, R., & Willms, J. D. (2001). *Engagement and dropping out of school: A life-course perspective.* Applied Research Branch. Canada: Human Resources Development Canada.

Bast, J., & Reitsma, P. (1998). Analyzing the development of individual differences in terms of Matthew effects in reading: Results from a Dutch longitudinal study. *Developmental Psychology, 34(6),* 1373-99.

Bernstein, S., & Rulo, J. H. (1976). Learning disabilities and learning problems: Their implications for the juvenile justice system. *Juvenile Justice, 2,* 43-47.

Broidy, L. M., Tremblay, R. E., Brame, B., Fergusson, D., Horwood, J. L, Laird, R. et al. (2003). Developmental trajectories of childhood disruptive behaviors and adolescent delinquency: A six-site, cross-national study. *Developmental Psychology, 39(2),* 222-245.

Burstall, C. (1978). The Matthew effect in the classroom. *Educational Research,* 21(1), 19-25.

Campbell, S. B. (1994). Hard-to-manage preschool boys: externalizing behavior, social competence and family context at two-year follow-up. *Journal of Abnormal Child Psychology,* 22(2), 147-166.

Clay, M. (1985). *The early detection of reading difficulties*. Auckland: Heinemann.

Cooper, H., Nye, B., Charlton, K., Lindsay, J., & Greathouse, S. (1996). The effects of summer vacation on achievement test scores: A narrative and meta-analytic review. *Review of Educational Research,* 66(3), 227-68. (www.jstor.org/stable/1170523?seq=1).

Corno, L., & Mandinach, E. B. (2004). What we have learned about student engagement in the past twenty years. In D. M. McInerney & S. Van Etten (Eds.), *Big Theories Revisited* (pp 299-328). Charlotte, N.C: Information Age Publishing, Inc.

Debarbieux, E. (2003). School violence and globalisation. *Journal of Educational Administration,* 41, 6, 582-602.

Department for Education and Skills. (2006). *Making good progress. How can we help every pupil make good progress at school?* Sherwood Park, Nottingham: DfES Publications.

Dion, K. (1972). Physical attractiveness and evaluation of children's transgressions. *Journal of Personality Social Psychology,* 24, 207-13.

Doddington, C., Flutter, J., & Rudduck, J. (2001). Exploring and explaining 'dips' in motivation and performance in primary and secondary schooling. *Research in Education*, 61, 29-38

Doherty, G. (1997). *Zero to six: The basis for school readiness*. Ottawa: Human Resources Development Canada.

Ensminger, M. E., & Slusarcick, A. L. (1992). Paths to high school graduation or dropout: A longitudinal study of a first-grade cohort. *Sociology of Education*, 65 (*April*): 95-113.

Farrington, D. P., Loeber, R., & Van Kammen, W. B. (1990). Long-term criminal outcomes of hyperactivity-impulsivity-attention deficit and conduct problems in childhood. In L. Robbins & M. Rutter (Eds.), *Straight and devious pathways from childhood to adulthood* (pp. 62-81). New York: Cambridge University Press.

Feinstein, L. (2003). Inequality in the early development of British children in the 1970 cohort. *Economica*, 70, 73-97. (www.jstor.org/stable/3548818).

Feinstein, L., & Brynner, J. (2004). The importance of cognitive development in middle childhood for adult socio-economic status, mental health and problem behavior. *Child Development*, 75(5), 1329-1339.

Fergusson, D. M. & Horwood, L. J. (1989). Estimation of method and trait variance in ratings of conduct disorder. *Journal of Child Psychology and Psychiatry*, 30, 365-378.

Forster, M. (2004). *Taking account of developmental progression in years 11 and 12*. Paper prepared for the Curriculum Council of Western Australia. Victoria: Australian Council for Educational Research.

Galton, M., Gray, J., & Rudduck, J. (1999). *The impact of school transitions and transfers on pupil progress and attainment*. Research Report 131. London: Department for Education and Employment.

Galton, M., Hargreaves, L., Comber, C., Wall, D. & Pell, A. (1999). *Inside the primary classroom: 20 years on*. London: Routledge.

Georgiou, S. N., Christou, C., Stavrinides, P., & Panaoura, G. (2002). Teacher attributions of student failure and teacher behaviour toward the failing student. *Psychology in the Schools*, 39(5), 583-595.

Gonczi, A. & Riordan, G. (2002). Measuring and reporting on discipline and student suspensions in NSW government schools. Sydney: University of Technology Sydney.

Gray, J., Schagen, I., & Charles, M. (2004). Tracking pupil progress from key stage 1 to key stage 2: how much do the 'route' taken and the primary school attended matter? *Research Papers in Education*, 19(4), 389-413.

Greenwood, C. R., Horton, B. T., & Utley, C.A. (2002). Academic engagement: Current perspectives on research and practice. *School Psychology Review*, 31(3), 328-349.

Hargreaves, L. & Galton, M. (2002).*Transfer from the primary classroom: 20 years on*. London: Routledge.

Hill, P. W., Holmes-Smith, P., & Rowe, K. J. (1993). *School and teacher effectiveness in Victoria: Key findings from phase 1 of the Victorian Quality Schools Project*. Melbourne: The University of Melbourne, Centre for Applied Educational Research.

Hinshaw, S. P. (1992). Externalizing behavior problems and academic underachievement in childhood and adolescence: Causal relationships and underlying mechanisms. *Psychological Bulletin*, 111(1), 127-55.

Hyde, N., & Robson, G. (1984). *A study of student suspensions*. *Discussion Paper No. 21*. Perth: Education Department of Western Australia.

Kagan, J. (1998). *Three seductive ideas*. Cambridge: Harvard University Press.

Lee, V. E., & Smith, J. B. (1995). Effects of high school restructuring and size on early gains in achievement and engagement. *Sociology of Education*, 68, 241-270.

McCain, M., & Mustard, J. F. (1999). *Reversing the real brain drain: Early years study final report*. Toronto: Children's Secretariat.

McConaughy, S. H. (2001). The Achenbach system of empirically based assessment. In J. J. W. Andrews, D. H. Saklofske & H. L. Janzen (Eds.), *Handbook of psychoeducational assessment: Ability, achievement and behavior in children* (pp. 289-324). New York: Academic Press.

McGee, R., Partridge, F., Williams, S. M., & Silva, P. A. (1991). A twelve-year follow up of preschool hyperactive children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 224-232.

McGee, R., Williams. S., & Silva, P. A. (1988). Slow starters and long-term backward readers: A replication and extension. *British Journal of Educational Psychology*, 58, 330-337.

McKinney, J. D. (1989). Longitudinal research on the behavioural characteristics of children with learning disabilities. *Journal of Learning*, 22(3),141-150.

Marks, G. N., McMillan, J., & Hillman, K. (2001). *Tertiary entrance performance: The role of student background and school factors*. Longitudinal Surveys of Australian Youth (Research Report No. 22). Victoria: Australian Council for Educational Research.

Ministerial Council on Education, Employment, Training and Youth Affairs. (2008). National report on schooling in Australia, 2007, Preliminary Paper, National benchmark results reading, writing and numeracy, years 3, 5 and 7. http://www.mceetya.edu.au/mceetya/2007_benchmarks_release,24495.html

MCEETYA (2008). Principles and protocols for the collection and national reporting of MCEEYA key performance measures for schooling in Australia. Retrieved from www.mceetya.edu.au/verve/_resources/Protocols_for_Collection_Reporting_of_KPMs.pdf

Moffitt, T. E. (1993). Adolescence-limited and life-course persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100(4), 674-701.

National Research Council (2004). *Engaging schools: Fostering high school students' motivation to learn*. Washington, DC: The National Academies Press.

Newmann, F., Wehlage, G., & Lamborn, S. (1992). The significance and sources of student engagement. In F. Newmann (Ed.), *Student engagement and achievement in American secondary schools* (pp11-39). New York: Teachers College Press.

Offord, D. R., Boyle, M. H., Yvonne, A., Racine, M. A., Fleming, J. E., Cadman et al. (1992). Outcome, prognosis, and risk in a longitudinal follow-up study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31(5), 916-923.

Ofsted (1999). *Standards and quality of education* 1997/98 (The annual report of the Chief Inspector of Schools). London: HMSO.

Ofsted (2005). *Managing challenging behaviour*. HMI 2363. London: Ofsted.

Ogbu, J. U. with the assistance of Davis, A. (2003). Academic Disengagement in Shaker Heights. *In Black American students in an affluent suburb: A study of academic disengagement* (pp.12-32). New Jersey: Lawrence Erlbaum Associates, Publishers.

Organisation for Economic Co-operation and Development. (2007a). *PISA 2006: Science competencies for tomorrow's world. Volume 1:Analysis*. Paris: OECD.

Organisation for Economic Co-operation and Development. (2007b). Students with disabilities, learning difficulties and disadvantages: politics, statistics and indicators. Paris: OECD.

Reed, H. B. (1927). *Psychology of elementary school subjects*. Boston: Ginn and Company.

Richman, M., Stevenson, J. & Graham, P. J. (1982). *Preschool to school: A behavioural study*. London: Academic Press.

Robbins, L., & Rutter, M. (Eds.). (1990). *Straight and devious pathways from childhood to adulthood*. New York: Cambridge University Press.

Robson, G., Angus, M., & McDonald, T (2008). BM&D: *An evaluation of the behaviour management and discipline strategy* 2001-2007. Perth: Edith Cowan University.

Rowe, K. J., & Rowe, K. S. (1999). Investigating the relationship between students' *attentive-inattentive* behaviors in the classroom and their literacy progress. *International Journal of Educational Research*, 31,1-117.

Rowling, L., Vince Whitman, C., & Biewener, M. (2009). *Report of major findings: International survey of principals concerning emotional and mental health and well-being*. Newton, MA: International Association of Child and Adolescent Mental Health and Schools and the International Confederation of Principals.

Rudduck, J., Berry, M., Demetriou, H., & Goalen, P. (2003). Managing the institutional and personal transitions – developing the work in schools. In M. Galton, J. Gray, J. Rudduck, M. Berry, H. Demetriou, J. Edwards, P. Goalen, L. Hargreaves, S. Hussey, T. Pell, I Schagen, & M. Charles (Eds.), *Transfer and transitions in the middle years of schooling* (pp7-14): *Continuities and discontinuities in learning*. Research Report 443. London: Department for Education and Skills.

Rutter, M., Giller, H., & Hagell, A. (1999). *Antisocial behaviour by young people*. Cambridge: Cambridge University Press.

Rutter, M., Tizard, J., & Whitmore, K. (1970). Reading retardation and antisocial behaviour – the nature of the association. In *Education, health and behaviour* (pp240-255). London: Longman.

Schagen, S., & Kerr, D. (1999). Bridging the gap? The national curriculum and progression from primary to secondary school. Slough: National Foundation for Educational Research.

Schonfeld, I. S., Schaffer, D., O'Connor, P., & Portnoy, S. (1988). Conduct disorder and cognitive functioning: Testing three causal hypotheses. *Child Development*, 59, 993-1007.

Seltzer, M., Choi, K., & Thum, Y. M. (2003). Examining relationships between where students start and how rapidly they progress: Using new developments in growth modeling to gain insight into the distribution of achievement within schools. *Educational Evaluation and Policy Analysis*, 25(3), 263-286.

Shaw, D. S., Gilliom, M., Ingoldsby, E. M., & Nagin, D. S. (2003). Trajectories leading to school-age conduct problems. *Developmental Psychology*, 39(2), 189-200.

Shaywitz, B. A., Holford, T. R., Holahan, J. M., Fletcher, J. M., Stuebing, K. K., Francis, D. J., & Shaywitz, S. E. (1995). A Matthew effect for IQ but not for reading: Results from a longitudinal study. *Reading Research Quarterly*, 30(4), 894-906.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, 85(4), 571-581.

Stanger, C., Achenbach, T. M., & Verhulst, F. C. (1997). Accelerated longitudinal comparisons of aggressive versus delinquent syndromes. *Development and Psychopathology*, 9, 43-58.

Stanley, F., Richardson, S., & Prior, M. (2005). Children of the lucky country?: how Australian society has turned its back on children and why children matter. Sydney: Pan McMillan.

Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, 21(4), 360-407.

Starch, D. (1918). *Educational measurements*. New York: The Macmillan Company.

Tremblay, R., Pihl, R., & Dobkin, P. (1994). Predicting early onset of male antisocial behaviour from preschool behaviour. *Archives of General Psychiatry*, 51, 732-739.

UK Department for Education and Science (1989). *The Elton Report* (1989): *Enquiry into discipline in schools*. London: HMSO.

Verhulst, F. C., Eussen, M. L., Berden, G. F., Sanders-Woudstra, J., & van der Ende, J. (1993). Pathways of problem behaviors from childhood to adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry*, 32(2), 388(9).

Victorian Curriculum and Assessment Authority (2008). *On demand testing*. Retrieved from http://www.vcaa.vic.edu.au/prep10/aim/ondemand/types.html

Walberg, H. J., & Tsai, S. L. (1983). Matthew effects in education. *American Educational Research Journal*, 20(3), 359-73.

White, J., Moffitt, T. E., Earls, F., Robins, L. N., & Silva, P. A. (1990). How can we tell? Preschool predictors of boys' conduct disorder and delinquency. *Criminology*, 28(4), 507-535.

Wilkin, A., Moor, H., Murfield, J., Kinder, K. & Johnson, F. (2006). *Behaviour in Scottish schools*. Edinburgh: Scottish Executive Social Research.

Williams, S., & McGee, R. (1994). Reading attainment and juvenile delinquency. *Journal of Child Psychology and Psychiatry*, 35(3), 441-459.

Wolf, M. (2007). Proust and the squid: the story and science of the reading brain. New York: Harper Collins Publishers.

Zubrick, S. R., Silburn, S. R., Gurrin, L., Teoh, H., Shepherd, C., Carlton, J. et al. (1997). *Western Australian Child Health Survey: Education, health and competence*. Perth, WA: Australian Bureau of Statistics and the TVW Telethon Institute for Child Health Research.

Appendices

Appendix 3.1: Student Behaviour Checklist (Yellow Form)

School:								Year Level:						
Teacher:								Date: MAY, 2008						

PP ID NO.	STUDENT SURNAME	FIRST NAME	PLEASE INDICATE WITH A TICK ✓ WHICH (IF ANY) OF THE FOLLOWING CATEGORIES OF UNPRODUCTIVE CLASSROOM BEHAVIOURS ARE EXHIBITED BY EACH STUDENT *A tick should be recorded if you believe these behaviours are impeding the academic progress of the student or other students in their class*											
			Aggressive	Non-compliant	Disruptive	Inattentive	Erratic	Impulsive	Unmotivated	Unresponsive	Unprepared	Irregular attendance	Other

Appendix 3.2: Pipeline Project September Review (Blue Form)

Pipeline Project: September Review, 2008

Please answer the following questions regarding **all students** who are in your class, and also participating in the Pipeline Project in 2008.

School:		Teacher's name:			Class:		Subject (if applicable):

Student Background Information

Student's Name

Question	Description
5.	With reference to the Western Australian benchmark (BM) for NUMERACY, this student appears to perform ...
6.	With reference to the Western Australian benchmark (BM) for LITERACY, this student appears to perform ...
7.	Has this student's behaviour changed since the checklist was completed in May?
8.	If the student is continuing to exhibit unproductive behaviour(s), which behaviour has been the most dominant since May?
9.	For the students noted by you in no. 8, to what extent does their unproductive behaviour contribute to this academic under-performance?
10.	Overall, does the student appear to enjoy doing the schoolwork you assign?

PP ID No.	Surname	First Name	1. ESC / Inclusion?	2. ESL	3. Formal diagnosis?	4. Suspended	below BM	slightly above BM	well above BM	below BM	slightly above BM	well above BM	no change	better	worse	(8)	none	very little	consider-able	severe	nearly always	often	Some-times	almost never
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐
			No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	No ☐ Yes ☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐	☐	☐	☐

Appendix 3.3: Transition from Year 7 to Year 8

As noted in Chapter 4, the 2005 Year 6 cohort progressed from Year 7 to Year 8 at the beginning of 2007. At this critical transition point, parents make a decision whether to enrol their child at the nearest local high school or look further afield.

Clearly many parents from the Pipeline primary schools exercised their choice and enrolled their child in a government or non-government school, other than the designated Pipeline high school. In some cases, geography and public transport may have been factors. So also are the high school's curriculum and reputation likely to have influenced their choice. Altogether, 64 per cent of the cohort opted to attend non-Pipeline high schools. This represents a high rate of attrition.

Analyses of the 2006 WALNA test data from 2006, when the students were in Year 7, indicate that students who attended their 'local' Pipeline high school were more likely to perform at a lower level on the WALNA tests than students who attended other high schools after finishing their primary education in 2006. Table Y shows that average difference reading performance in 2006, prior to making the transition, between Pipeline and non-Pipeline schools was statistically significant.
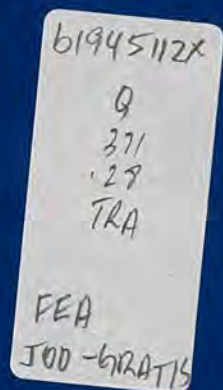
Tables

Table Y: Reading performance of students on 2006 WALNA tests of students in Year 7 according to whether they attended the local cluster high school or another high school

Attended	N	Mean	Std Deviation
Pipeline high schools	169	409.23	72.74
Other high schools	303	445.33	76.94

Difference in means is statistically significant at $p < .01$

Table Z shows a statistically significant difference for numeracy between the two groups.

Table Z: Numeracy performance of students on 2006 WALNA tests of students in Year 7 according to whether they attended the local cluster high school or another high school

Attended	N	Mean	Std Deviation
Pipeline high schools	171	448.26	68.72
Other high schools	303	476.42	82.30

Difference in means is statistically significant at $p < .01$

The pattern of differences is confirmed by the reports of classroom teachers of the performance of students in their class while in Year 7.

Teachers rated the Year 7 students in September according to whether the students were performing below the benchmark standard, around the benchmark standard or above the standard in terms of their literacy and numeracy performance. For each performance area, the students attending their local cluster schools were considered by their teachers to be performing below the standard (Chi-Square, $p < .05$). This result corroborates the official WALNA result which the teachers did not have access to when they made these judgments.

Not only were they more likely to be performing at a lower standard but they were also more likely to be performing below their capacity. Thirty-five percent of students attending cluster schools were considered by teachers to be under-performing, whereas only 24 per cent of students attending other schools were identified as under-performers. The Chi-Square was significant at $p < 0.5$.

Teachers were asked to rate the extent to which they perceived students to be enjoying their set work. Students who went on to attend their local Pipeline high schools were less likely to be considered to be enjoying their set work in Year 7 than those moving to other schools (Chi-Square was significant at $p < .01$). Of the former 36.4 per cent 'nearly always' enjoyed their work whereas for the latter group slightly more than half (52.4 per cent) were rated by their teachers to be enjoying their set work.

The overall differences between the two groups can be summarised in Table A below. It is clear that there has been a 'leakage' during the transition of more able and better behaved students to schools outside their immediate geographic intake area.

Table A: Year 7 differences in 2006 among students bound for local Pipeline high schools and other high schools

Year 7 results	Attended local Pipeline high schools in 2007 (n = 169)	Attended 'other' high schools in 2007 (n = 303)
WALNA Reading performance	Mean = 409	Mean = 445
WALNA Numeracy performance	Mean = 448	Mean = 476
Behaviour having high negative impact	28%	16%
Judged to be under-performing	35%	24%
Enjoying school work	36%	52%

This result was an unintended outcome. Nevertheless the movement of students from school to school can have a huge impact on a school's capacity to deliver a quality curriculum. Schools that draw more able and well-behaved students actually gain a real resource. Those that lose these students suffer a real loss that makes their job so much harder. It is clear that these trends should be closely monitored as they could well explain why schools unexpectedly perform better or worse than expected.