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

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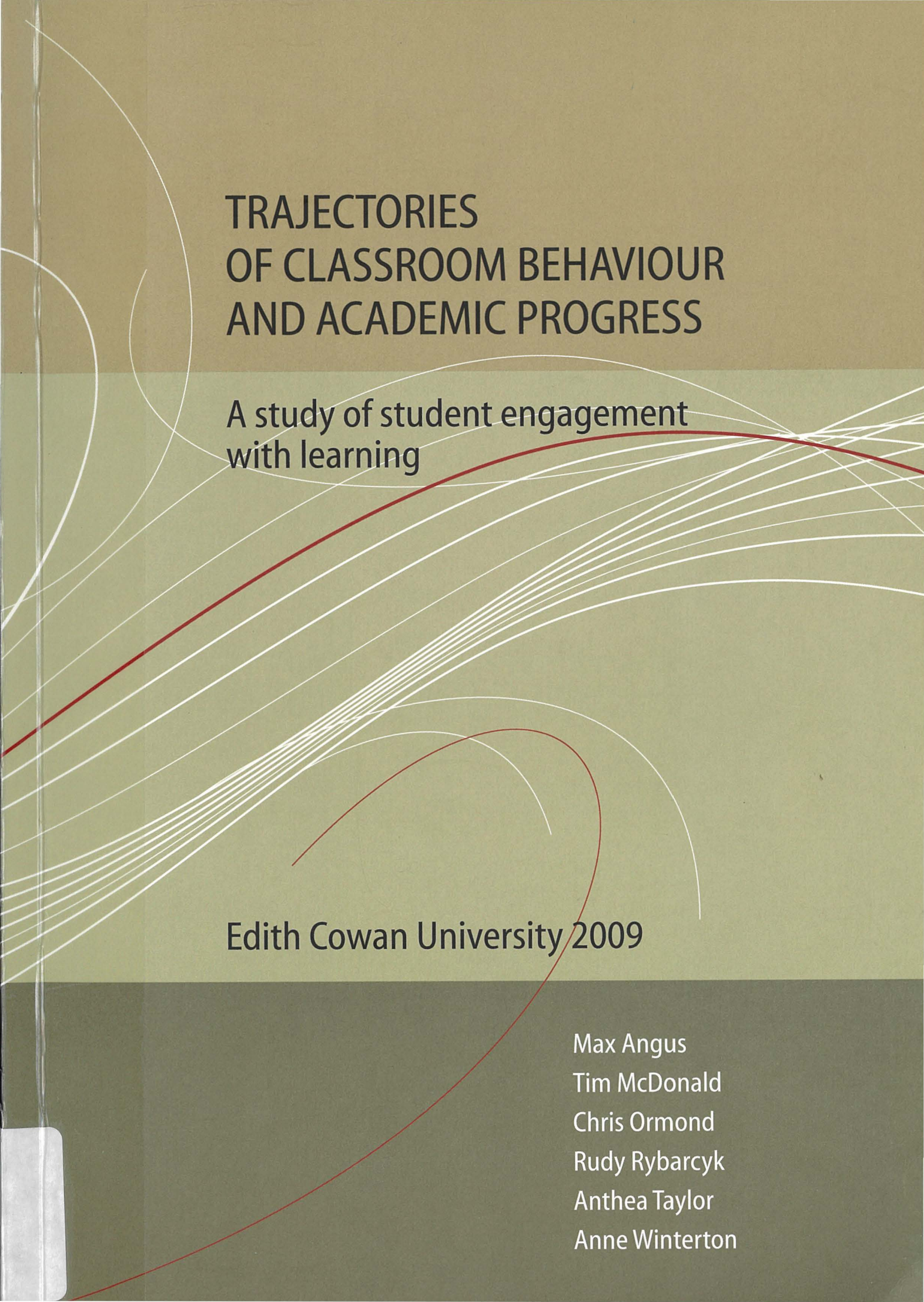
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TRAJECTORIES OF CLASSROOM BEHAVIOUR AND ACADEMIC PROGRESS

A study of student engagement
with learning

Edith Cowan University 2009

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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

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The study was managed by Anne Winterton and Fiona Naumann. Rudy Rybarczyk acted as the schools' liaison officer and facilitated communication between team members and school staff.

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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 per cent 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 than 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. Moffitt (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), Moffitt 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. (Moffitt, 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 through 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 than 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, 1997; 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. Moffitt (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 to 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 through 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.