

## OVERCOMING THE ODDS 2:

Where are the top-performing  
disadvantaged secondary schools?

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# Overcoming the Odds 2: Where are the top-performing disadvantaged secondary schools?

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**CIS** Education  
Program



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## Executive Summary

- Students from disadvantaged social backgrounds perform worse academically on average than more advantaged students, both in Australia and overseas. However, some students and schools from lower socio-economic backgrounds are successful.
- Australia has considerably fewer high-achieving disadvantaged secondary schools than high-achieving disadvantaged primary schools.
- Only 3 Australian secondary schools are both disadvantaged and high-achieving. These schools do not receive more funding than other similarly disadvantaged schools.
- In contrast, 21 Australian primary schools are both disadvantaged and high-achieving.
- In the local areas of these high-achieving disadvantaged primary schools, the secondary schools are not high-achieving.
- The particular challenges facing disadvantaged secondary schools can be partly explained by the following:
  1. 'The Matthew Effect': the tendency for differences in student achievement in the early years of school to grow into larger differences towards the end of secondary school, unless rectified in early schooling. This means it is especially difficult for secondary schools to ensure that disadvantaged students who have fallen behind will catch up to their peers.
  2. Many students attending a local high-achieving primary school do not attend the secondary school in their area.
  3. School discipline problems are especially prevalent among disadvantaged secondary schools, compared to disadvantaged primary schools or more advantaged secondary schools.
  4. Direct instruction — an evidence-based teaching practice, where new content is explicitly taught in sequenced and structured lessons — appears to be less common at disadvantaged secondary schools compared to more advantaged schools.
- School systems should focus on early literacy and numeracy in order to help disadvantaged students, to ensure that they do not fall behind. Secondary schools should prioritise identifying underachieving students when they enrol.
- For parents, the implication is that choice of primary school is just as important as — if not more important than — choice of secondary school for their child's academic success. This is seemingly counterintuitive when choosing schools, as many parents send their child to the local primary school but then invest significantly more in a secondary school.

# Introduction

There is a negative relationship between student socio-economic disadvantage and academic achievement, both in Australia and in every country in the world. However, there are still many disadvantaged schools and students who 'overcome the odds' and are high-achieving. This is shown by the results of all the international and Australian standardised tests.

Inequity of education outcomes can be mitigated, but not eliminated. Targeted school spending on disadvantaged students cannot close the average achievement gap. Australian schools already receive significantly more taxpayer funding if they are disadvantaged. Approximately 25% of all government funding for schools is allocated on the basis of student and school disadvantage, up from about 11% in 2009.<sup>1</sup> Between 2007-08 and 2016-17, real government funding per-student increased by 14%, including an increase of 11% in government schools.<sup>2</sup> Nevertheless, during this time Australia's education results have stagnated or declined on

international assessments, and there is no evidence of improvement in education equity.

Australia spends more per-student as a dollar amount than the OECD average — and several top-performing countries on international tests, such as Japan and Finland — after adjusting for purchasing power parity (taking into account cost differences between countries).<sup>3</sup> There is little evidence that a further funding increase by itself would substantially boost results in Australia.

Academic results can differ significantly between schools, despite them having similar levels of funding and disadvantage. This indicates that improving outcomes for disadvantaged students is not just a question of how much money is spent but also how it is spent.

Previous CIS research investigated the policies and practices of high-achieving disadvantaged primary schools, and found these high-achieving schools did not have more funding than other similarly disadvantaged schools (see Box 1).<sup>4</sup>

## Box 1: High-achieving disadvantaged primary schools in Australia

21 high-achieving disadvantaged primary schools were identified, with the intention of investigating the common practices and policies leading to higher literacy and numeracy outcomes for disadvantaged students.

Nine schools agreed to participate in the research project. These were visited by a researcher, involving interviews with school principals and staff, and observations of literacy and numeracy lessons.

Six common themes were found across the nine primary schools:

1. *School discipline.* Based on high expectations, a clear set of consistently applied classroom rules, and a centralised school behaviour policy.
2. *Direct and explicit instruction.* New content is explicitly taught in sequenced and structured lessons. Includes clear lesson objectives, immediate feedback, reviews of content from previous lessons, unambiguous language, frequent checking of student understanding, demonstration of the knowledge or skill to be learnt, and students practising skills with teacher guidance.
3. *Experienced and autonomous school leadership.* Stable, long-term school leadership, and principal autonomy to select staff and control school budgets.
4. *Data-informed practice.* Using data from teacher-written, NAPLAN, and PAT assessments to improve teaching, track student progress, and facilitate intervention for underachieving students.
5. *Teacher collaboration and professional learning.* Collaboration among teachers and specialist support staff to cater for the often complex needs of disadvantaged students. With a focus on teacher professional learning; involving peer observations, mentoring, and attending practical professional development activities which help refine literacy and numeracy instruction.
6. *Comprehensive early reading instruction.* Including five necessary elements of reading instruction: Phonemic awareness, Phonics, Fluency, Vocabulary, and Comprehension.

These six consistent themes indicate how disadvantaged primary schools could improve significantly, without necessarily requiring more taxpayer funding.



The common themes identified were consistent with previous research on high-achieving schools, both primary and secondary. But despite the similarities, primary and secondary schools can face different challenges. Table 1 sets out the applicability of the themes above to disadvantaged secondary schools.

Table 1: Common themes from high-achieving primary schools applied to disadvantaged secondary schools

Themes of high-achieving primary schools	Applicability to secondary schools
School discipline.	Some evidence school discipline is more of a challenge in secondary schools, and especially in disadvantaged secondary schools. See section below on school discipline.
Direct and explicit instruction.	Some evidence direct instruction is practised less in disadvantaged secondary schools. See section below on direct instruction.
Experienced and autonomous school leadership.	Principals in disadvantaged primary and secondary schools tend to have similar tenures, <sup>5</sup> and principal autonomy usually varies by school system rather than by stage of school. <sup>6</sup>
Data-informed practice.	No evidence prevalence is different in secondary schools.
Teacher collaboration and professional learning.	No evidence prevalence is different in secondary schools.
Comprehensive early reading instruction.	Not applicable.

## High-achieving disadvantaged secondary schools in Australia

Most of the high-achieving disadvantaged schools in Australia are primary, based on analysis of the Index for Community Socio-Educational Advantage (ICSEA) scores and the National Assessment Program – Literacy and Numeracy (NAPLAN) results.<sup>7</sup>

Disadvantaged schools are classified as those from the lowest quartile of ICSEA scores, and high-achieving schools are classified as those that consistently perform above the national average on NAPLAN tests, for the three-year period 2015-2017.

24 high-achieving disadvantaged schools were identified: 21 of them were primary (based on Years 3 and 5 NAPLAN results) and only 3 secondary (based on Years 7 and 9 NAPLAN results), out of a total of 8,145 schools for which all the data was available, as set out in Table 2. The high-achieving disadvantaged secondary schools do not receive more funding than other similarly disadvantaged schools.

Table 2: Number of Australian schools in high-achieving and disadvantaged categories

	Primary	Secondary	Total
<b>Disadvantaged</b>	1,481	555	2,036
<b>High-achieving and Disadvantaged</b>	21	3	24
<b>All schools</b>	5,927	2,218	8,145

Year 7 NAPLAN results are not necessarily a reasonable indicator of a secondary school's success, as students will have only been at the school for a few months before sitting the tests, so the school has only limited opportunity to make an impact. Therefore, the analysis was repeated based only on Year 9 results, but this increased the number of high-performing secondary schools by only 1, from 3 to 4 (2 of which were from the group of 3 found using both Years 7 and 9 results).

The only overlap between the top-performing disadvantaged primary and secondary schools was one combined independent school, which was high-achieving on both primary and secondary measures.

For the other 20 high-achieving disadvantaged primary schools, there was no high-achieving secondary school in the local area, after taking into account the overlap in primary and secondary school catchment areas. And the high-achieving secondary schools did not have high-achieving primary schools in the local area.

There are many possible explanations for the substantial difference in number between primary and secondary schools that are in both the high-achieving and disadvantaged categories.

In particular, there is evidence for the following four factors:

1. 'The Matthew Effect': the tendency for differences in student achievement in the early years of school to grow into larger differences towards the end of secondary school, unless rectified in early schooling. This means it is especially difficult for secondary schools to ensure that disadvantaged students who have fallen behind will catch up to their peers.
2. Many students attending a local high-achieving primary school do not attend the secondary schools in their area.
3. School discipline problems are especially prevalent among disadvantaged secondary schools, compared to disadvantaged primary schools or more advantaged secondary schools.
4. Direct instruction — an evidence-based teaching practice, where new content is explicitly taught in sequenced and structured lessons — appears to be less common at disadvantaged secondary schools compared to more advantaged schools.

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## 'The Matthew Effect'

The well-established education phenomenon known as 'The Matthew Effect' — named after a passage from the Gospel of Matthew about a widening gap between those who have more and those who have less — states that differences in student achievement in the early years of school tend to grow into larger differences by the end of secondary school, unless rectified in early schooling.

There are two datasets that cover Australian students in both primary and secondary schools, to allow for a comparison: the NAPLAN standardised tests in Years 3, 5, 7, and 9; and the international Trends in International Mathematics and Science Study (TIMSS) standardised tests in Years 4 and 8.

A 2016 analysis of NAPLAN results by the Grattan Institute found evidence for the Matthew Effect, based on nationwide differences between Years 3 and 9.<sup>8</sup> The spread of student achievement more than doubled between Years 3 and 9. Low-achieving students, students of parents with low education, and students from low socio-economic areas all tend to decline in performance relative to the rest of the national student cohort. Similarly, another Grattan Institute analysis in 2018 found that prior achievement explains much of the variance in student progress measured

by NAPLAN tests (but ICSEA scores explain more of the variance, with the exception of student progress in numeracy between Years 7 and 9).<sup>9</sup>

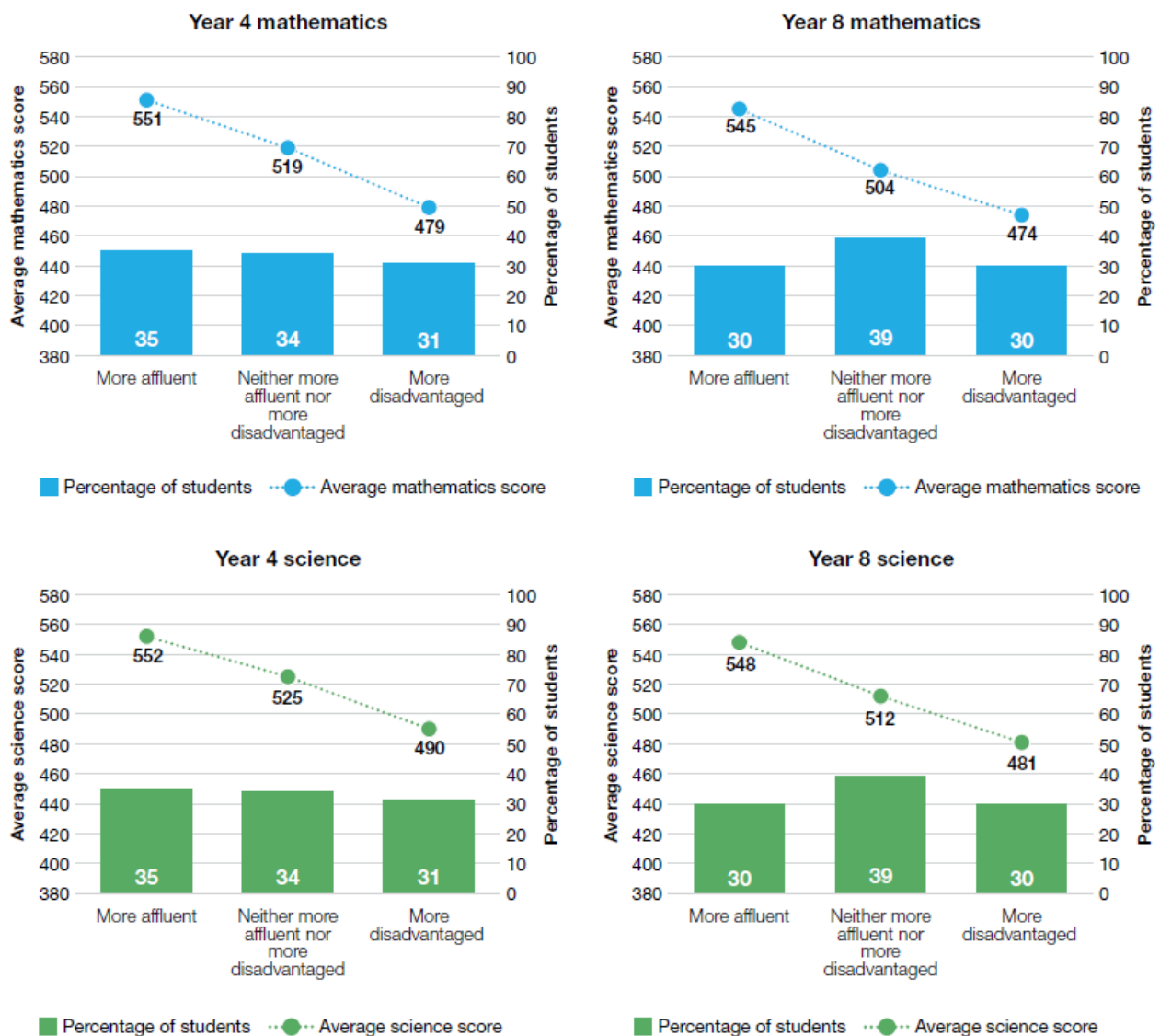
A 2019 longitudinal study found that children identified with speech and language concerns in early childhood achieved significantly lower NAPLAN results in Years 3, 5, and 7.<sup>10</sup>

However, the TIMSS data provide a less clear picture. TIMSS data include academic achievement (as measured by standardised Years 4 and 8 maths and science tests) and school socio-economic background (as reported by school principals). Figure 1 is a diagram by the Australian Council for Educational Research (ACER) illustrating the association between school disadvantage and student performance.<sup>11</sup>

The effect of disadvantage on student performance appears to be similar for primary and secondary schools. The average difference in science performance between more disadvantaged and more affluent schools is 72 points in Year 4 and 71 points in Year 8, while for maths the difference is 62 points in Year 4 and 67 points in Year 8. Based on this data, there is no apparent difference between primary and secondary schools in terms of the effect of social disadvantage on student achievement.



Figure 1: School disadvantage and student TIMSS performance



A limitation of this TIMSS data is that it is based on principal self-reports, which means responses between principals are not always necessarily comparable.

Outside Australia, there is also a large body of research indicating the existence of the Matthew Effect.

A 2017 comprehensive meta-analysis of effect sizes of over 250 influences on student achievement found that prior ability and prior achievement substantially influence student performance.<sup>12</sup> Prior ability and prior achievement were found to have effect sizes of 0.98 and 0.58 respectively (compared to the average influence effect size of 0.4).

A longitudinal study has found that maths ability in kindergarten predicts maths, science, and reading scores in Year 8.<sup>13</sup> Furthermore, prior achievement is the best predictor longitudinally of maths scores for 15 year-old students on PISA tests.<sup>14</sup> Academic achievement in Year 9 had been found to be partly

predicted by achievement in Year 7 in several subjects.<sup>15</sup> In addition, there is evidence that most students who are below academic benchmarks in a range of subjects in Year 8 do not catch up by the end of high-school, and students who are below benchmarks in Year 4 do not catch up by Year 8, especially for schools in lower socio-economic areas.<sup>16</sup>

However, in both Australia and overseas, there appears to have been little research on why this is the case; or if and how secondary schools in particular (since they will tend to be most impacted by the Matthew Effect) can overcome entrenched student disadvantage.

There is some evidence from the US that effective schools can overcome student social disadvantage, especially in elementary schools but also in some middle schools.<sup>17</sup>

A 2017 meta-analysis on academic interventions for disadvantaged elementary and middle school students

found that for many interventions, the effects were different in middle school than for elementary school — indicating that secondary schools may have a special challenge to overcome student disadvantage.<sup>18</sup> The study found it is possible to significantly improve outcomes for disadvantaged students (but not close the gap between disadvantaged and advantaged students entirely) with certain interventions; such as tutoring, feedback and progress monitoring, and cooperative learning.

The Matthew Effect highlights the importance of effective literacy and numeracy instruction in the early years of school. School systems should prioritise identifying students who are falling behind in early years, so underachieving students can be helped before they fall further behind. This is a more effective and cost-effective way of helping disadvantaged students than intervening in secondary school after waiting for them to increasingly underachieve.

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## Many high-achieving students may not attend local secondary schools

Many students who attend a local primary school do not attend the local secondary school, and this includes at least some high-achieving primary school students. There several likely reasons for this.

Selective government schools are all secondary, which means high-achieving disadvantaged primary school students may attend a selective school instead of their local secondary school. However, given that selective government schools tend to have very few disadvantaged students according to the ICSEA methodology,<sup>19</sup> selective schools may not be a

major factor in why there are so few high-achieving disadvantaged secondary schools.

A significantly higher proportion of students attend non-government secondary schools (40.6%) than non-government primary schools (29.7%).<sup>20</sup> This means many students at government primary schools will attend a non-government secondary school. This would include at least some high-achieving students from disadvantaged backgrounds who attend top-performing government primary schools.

### **Box 2: Should education policy focus on having more high-achieving students attend government secondary schools?**

One suggested (but not evidence-based) response to high-achieving students not attending local schools is to reduce selective government schools and the non-governments school sector, to ensure that high achievers can positively influence student cohorts at disadvantaged secondary schools.<sup>21</sup>

However, even if selective and non-government schools were to close down, this would likely mean that more high-income families would move to areas with the best-performing government schools (with a possible side-effect of raising local house prices), and hence social stratification between schools would not be substantially reduced. It is also likely that there would be greater demand from parents for private tutoring. Arguably, school choice for parents actually reduces community residualisation, because parents do not have to leave neighbourhoods if they are not satisfied with the quality of the local government primary or secondary school.

This also raises a moral question: ultimately, whose responsibility is it to improve a low-performing local government school? Does the responsibility lie with the parents of potentially high-achieving students to keep them at a low-performing school to lift the average, instead of moving to a high-performing school? Or is it rather the responsibility of the school system to ensure an adequate minimum standard, regardless of who chooses to attend local schools? Given school systems exist to serve all parents and their children — and are funded by parents through taxation — common sense would suggest the onus is on school systems to raise the achievement of disadvantaged students.

In any case, there is no clear relationship between the proportion of students attending non-government schools and the impact socio-economic status has on student outcomes. Australia has more than double the proportion of students attending non-government schools (34%)<sup>22</sup> compared to the OECD average (16%).<sup>23</sup> Despite this, education inequity in Australia is not substantially different to the international average, and if anything appears to be lower.

An OECD 2018 report on education equity found that socio-economic status explained 11.7% of the variation in Australian students' science performance, based on 2015 PISA results.<sup>24</sup> This was lower than the OECD average of 12.9%, and that of Singapore (the top-performing country on all PISA and TIMSS tests) with 16.8%. Among the most disadvantaged quarter of Australian students, 12.7% are in the top quarter of science achievement, compared to the OECD average of 11.3% and Singapore's 9.5%.

Secondary schools also tend to have many more students than primary schools. Secondary schools have an average number of approximately 600 student enrolments, double the average of about 300 students for primary schools.<sup>25</sup> This means secondary schools will tend to have several primary schools or

'feeder' schools in the local area. Therefore, even if a primary school is high-achieving and all top-performing students attend the secondary school in their area, the local secondary school may still not be high-achieving, as it will have student cohorts from lower-achieving schools.

## School discipline in disadvantaged secondary schools

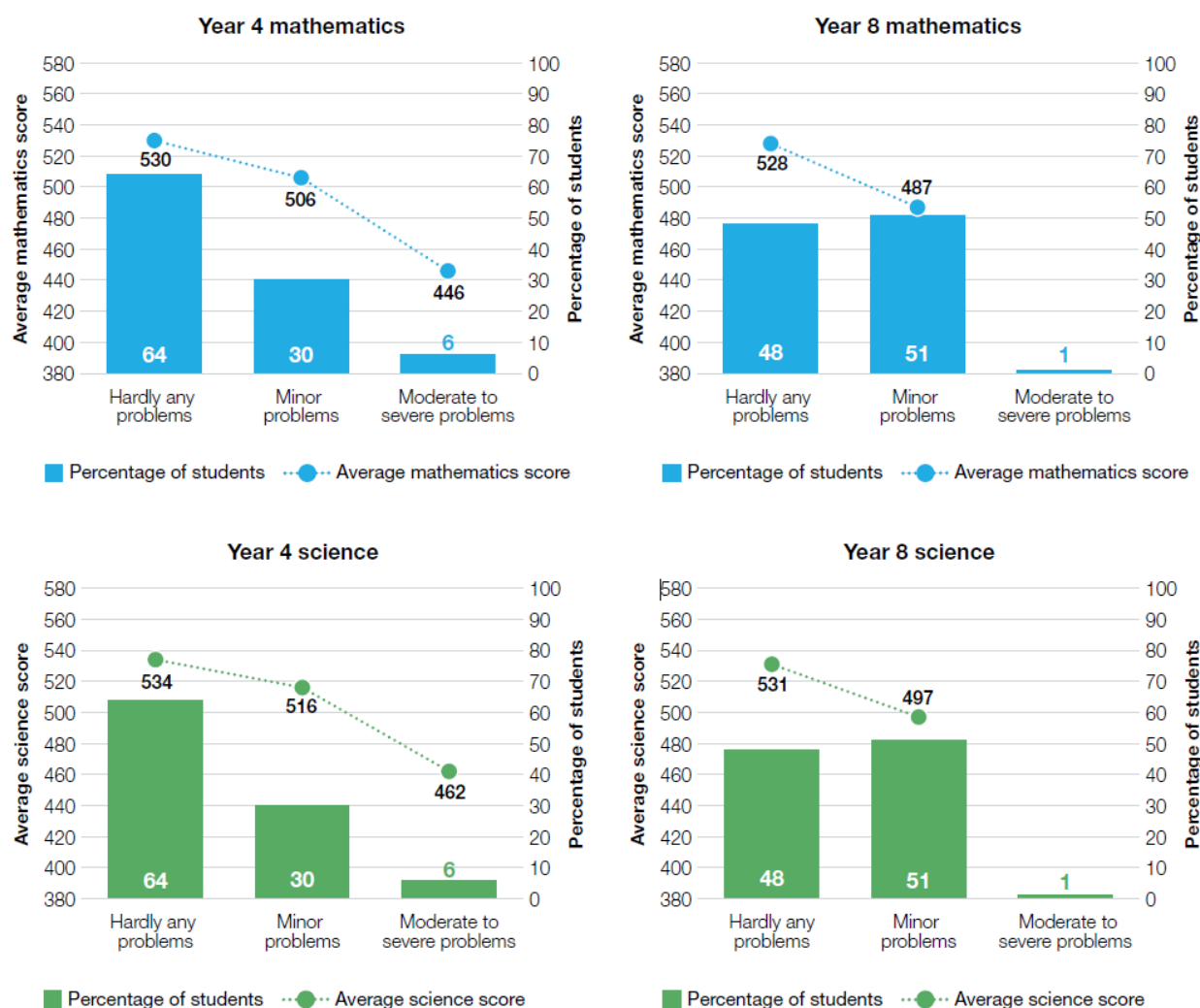
There is some evidence that student misbehaviour is more widespread and has a larger negative effect on student achievement in secondary schools than in primary schools.

TIMSS reported on school principals' descriptions of school discipline, in both Year 4 (primary) and Year 8 (secondary), in the categories of: hardly any

problems, minor problems, or moderate to severe problems.

Figure 2 is a diagram by ACER illustrating the percentage of students at schools in each category of discipline problems as reported by principals, and the average maths and science scores in Years 4 and 8.<sup>26</sup>

Figure 2: School discipline and student TIMSS performance.



Australian schools are more likely to have school discipline problems in secondary than in primary (64% of primary students are in schools where the principal reported hardly any problems, compared to 48% of secondary students).

This is also true internationally: in Year 4, 60% of students are in schools with hardly any problems, compared to 43% of students in Year 8.<sup>27</sup>

An exception to this trend relates to schools with moderate to severe problems in Australia: 6% of primary students attend a school with moderate to severe problems, compared to only 1% of secondary students. However, given that this only affects such a small proportion of students in both primary and secondary, a strong conclusion cannot be drawn on this basis.

School discipline problems are strongly associated with lower academic achievement, across subjects and year levels. But student misbehavior appears to have a larger negative effect on student achievement in secondary school than in primary school. In Australia, the difference in average student scores between schools with hardly any problems and schools with minor problems is 24 points for maths and 18 points for science in Year 4; but in Year 8, the difference is 41 points for maths and 34 points for science.

The same pattern (but to a lesser degree) is observed with the international average, where the difference in average student scores between schools with hardly any problems and schools with minor problems is 15 points for both maths and science in Year 4; but in Year 8, the difference is 22 points for maths and 23 points for science.<sup>28</sup>

Again, the TIMSS data is limited insofar as it is based only on the self-reporting of school principals.

The Programme for International Student Assessment (PISA) tests maths, science, and reading only for 15-year-olds, and so cannot be used to compare primary and secondary discipline. But the PISA school disciplinary climate index (based on students' reports of disruption in class) indicates Australia has one of the worst school systems in the OECD for student behaviour.<sup>29</sup> The PISA data also show school discipline is significantly worse on average in schools with higher proportions of disadvantaged students,<sup>30</sup> and that there is a significant positive association between having a classroom climate conducive to learning and the proportion of disadvantaged students who are high-achieving.<sup>31</sup>

There is also some evidence that Australian teacher education degrees are leaving new teachers underprepared to manage the classroom. According to the 2018 OECD Teaching and Learning International Survey (TALIS), less than half (45.2%) of Australian secondary teachers report being "well prepared" or "very well prepared" to manage the classroom after completing their teacher training — which is lower than the international teacher average of 60.2%.<sup>32</sup> The result should be interpreted with caution, as differing expectations of teachers across countries may impact the comparability of their survey responses. Nevertheless, the TALIS findings are consistent with several Australian studies indicating that many new teachers are not adequately equipped with evidence-based classroom management strategies from their teacher education degrees.<sup>33</sup>

A policy focus on building positive school cultures, setting high expectations, and ensuring teachers are equipped to manage student misbehavior, would be especially beneficial for disadvantaged secondary students.

# Direct instruction in disadvantaged secondary schools

Direct instruction is a teaching method involving the explicit teaching of new content in sequenced and structured lessons. This includes clear lesson objectives, immediate feedback, reviews of content from previous lessons, unambiguous language, frequent checking of student understanding, demonstration of the knowledge or skill to be learnt, and students practising skills with teacher guidance.

There is a considerable and growing body of research indicating the considerable benefits of direct instruction, including for disadvantaged students, across all subjects and non-academic indicators.<sup>34</sup> The OECD recently concluded that teacher-directed instruction is positively associated with PISA science results, in almost all countries — including Australia — regardless of school funding, school disciplinary climate, and student socio-economic background.<sup>35</sup>

However, according to PISA data, direct instruction is significantly less common in disadvantaged secondary schools compared to more advantaged schools in Australia.<sup>36</sup> The PISA index of teacher-directed instruction measures the extent to which direct instruction is used in lessons (a higher positive number indicates more teacher-directed instruction, with the OECD average index being 0.00). The index is based on 15 year-old students' reports of how much teachers explain and demonstrate ideas, have a whole-class discussion, and discuss student questions. In Australia, schools in the lowest socio-economic quarter have an average index of 0.18, compared to 0.40 for schools in the highest socio-economic quarter, and this difference of 0.22 is statistically significant.<sup>37</sup>

This suggests that greater use of effective direct instruction in Australian secondary schools could significantly improve academic outcomes for disadvantaged students.

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## Conclusions

Social disadvantage has a substantial effect on both primary and secondary student achievement. But compared to disadvantaged primary schools, there are significantly fewer disadvantaged secondary schools consistently achieving above the national average on NAPLAN tests. And in lower socio-economic areas where the local primary school is high-achieving, the local secondary school is not high-achieving.

It is more difficult — but not impossible — for disadvantaged secondary schools to 'overcome the odds' and be high-achievers. This is partly explained by the Matthew Effect: students who have fallen behind in primary school are much harder to help by the time they reach secondary. There is also evidence that school discipline is a larger challenge for disadvantaged secondary schools, and direct instruction could be utilised more.

These findings highlight both the importance of the early years of schooling and the particular challenges faced by disadvantaged secondary schools.

The implication for parents is that choice of primary school is especially important. This is arguably counterintuitive, as many parents may send their child to the local school by default, and then invest more in their education in secondary school. But given the importance of effective early literacy and numeracy instruction, choice of primary school is just as important as — if not more important than — choice of secondary school.

The policy implication for school systems is to focus on effective instruction in the early years, and identify students who are falling behind as soon as possible. It is also vital that secondary schools identify struggling students when they enrol — such as through the New South Wales government's 'Best Start Year 7' program<sup>38</sup> — and put in place evidence-based literacy and numeracy intervention programs to help them.

Expecting all underachieving students to catch up in secondary school is not an evidence-based or cost-effective approach. Early identification and intervention are necessary to ensure fewer disadvantaged students finish school without basic literacy and numeracy skills.

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## Related works

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