School socio-economic composition and student outcomes in Australia: Implications for educational policy

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It is established that the socio-economic status (SES) of individual students is strongly associated with academic achievement but less is known about this relationship when both student and school socio-economic status are considered. To examine these associations at a finer grain, with the intent of informing educational funding policy, we subjected Australia's 2003 PISA data set to secondary analysis to better understand the reading and mathematics achievement of students with varying SES, across a range of school SES groupings. Our descriptive analyses show that increases in school SES are consistently associated with increases in students' academic performance, and that this relationship holds regardless of individual students' SES. In Australia, the socio-economic profile of the school matters substantially in terms of academic achievement. We discuss the implications of these findings in the context of the current discussion around federal school funding policies, with particular attention given to the association of school composition with student achievement.

Introduction

National educational policy analysis and evaluation are complex endeavours that demand empirical data-gathering efforts that are of appropriate scale and high quality but mounting such data-gathering efforts can be resource- and time-intensive. As an alternative, perhaps under-utilised, strategy, this paper describes a retrospective secondary analysis of an existing large-scale data set that potentially adds value to educational policy evaluation. Specifically, as a member of the Organisation for Economic Co-operation and Development (OECD), Australia participates in the Programme for International Student Assessment (PISA) that assesses the literacy of 15-year-old students in reading, mathematics and science. PISA is administered on a cyclical three-year schedule that began in 2000 with a focus on reading, followed in 2003 with a focus on mathematics and 2006 with a focus on science. The PISA surveys have made an important departure from other international assessments by decoupling the instruments from school curricula; rather, the assessment instruments are based on holistic definitions of discipline-specific literacies—the skills and knowledge deemed necessary for personal and

working life in industrialised countries with 21st-century economies—in the core learning areas of reading, mathematics and science (OECD, 2004). PISA data sets are housed and managed by the Australian Council for Educational Research (ACER) and it is the 2003 data set that is the subject of our secondary analysis here.

Australia's Commonwealth government has begun consideration of applying a so-called 'socio-economic status (SES) model' within its policies guiding school funding. For the current study, we suggest that the secondary analysis of extant large-scale data sets can provide important input to the discussion of Commonwealth school funding policy by shedding light on previously obscured or possibly unexamined relationships. In particular, it is already well established in the educational research literature that the socio-economic status of individual students is strongly associated with educational achievement as measured by standardised assessment systems, whether local, national or international. In addition, various international studies have shown that the aggregated socio-economic profile of a school is also positively associated with students' academic achievement (OECD, 2004; Rumberger & Palardy, 2005; Sirin, 2005).

On the other hand, less is known about the nature of these relationships when both individual student and school socio-economic status are disaggregated. To uncover these finer-grained associations, we subjected Australia's 2003 PISA data set to retrospective secondary analysis to better understand the reading and mathematics literacy performance of secondary school students from different SES backgrounds, across a variety of school SES strata. This analysis therefore contributes to our understanding in two important ways. First, from a methodological perspective, the study demonstrates the process and potential usefulness of a secondary analysis approach using a large-scale dataset as a contributor to national policy evaluation. Secondly, the study adds value from a substantive perspective in shedding light on a key policy question currently facing the Commonwealth: specifically, the findings presented will add to data-informed decision-making around the appropriate federal funding of public education, as well as the use of public funds in the support of independent and Catholic systems of schooling across Australia. In these two ways, this secondary analysis demonstrates a strategy that holds potential for optimising the value of public policy evaluation through the enhanced use of extant large-scale, high-quality data sets in the consideration of important national policy questions.

Socio-economic status and student outcomes

School socio-economic composition is a strong predictor of student academic achievement in many countries (OECD, 2004; Rumberger & Palardy, 2005; Sirin, 2005). Although studies in numerous countries have shown that the socio-economic profile of schools is positively associated with achievement, our understanding of how this may vary across groups of students, schools, or national contexts remains incomplete. As with class size (American Educational Research Association, 2003) it is likely that the association between school SES and achievement varies with student background (family) characteristics, institutional or sectoral arrangements, or national contexts.

For school SES, previous studies have examined variations in the association between school composition and achievement for students from different racial and socio-economic backgrounds. For example, four decades ago, Coleman and colleagues (1966), found that lower SES African-American students benefited from attending a racially integrated school, whereas the achievement of their middle-class white peers did not differ. More recent studies have suggested that the association between achievement and school SES is strong for all students (Caldas & Bankston, 1997; OECD, 2004; Tate, 1997), but many of these have not disaggregated students by SES to show conclusively that the association is similarly strong for all students.

Similarly, the relationship between individual students' SES and academic achievement is well established (Jencks et al., 1972; Marjoribanks, 1979; Noel & de Broucker, 2001; OECD, 2004). This association has been shown to be strong and positive; typically, higher student-level SES is associated with stronger educational outcomes, on average. For example, in a meta-analysis of 74 studies examining SES and academic achievement, Sirin (2005) confirmed that student-level SES is one of the strongest correlates of academic performance. Higher SES students typically have higher scores on standardised achievement tests and are more likely to complete secondary school and university than their peers from lower SES backgrounds (Blossfeld & Shavit, 1993; Willms, 1999).

Despite these established understandings, questions remain. In particular, our understanding of how academic achievement varies when profiled in the context of both student-level and school-level SES remains incomplete. Some studies suggest that the association between achievement and school SES is stronger for lower SES students than for their higher SES peers (Kahlenberg, 2001; Thrupp, 1995), while others posit that the association is similar across the full range of student-level SES (OECD, 2004; Rumberger & Palardy, 2005). Here, we examine this tripartite association for disaggregated groups of students and schools—our aim being to shed light at a finer grain and thereby better inform policy making around federal school funding. We have two main questions:

- to what extent is the association between school SES and student achievement consistent for all students regardless of their individual SES?
- to what degree does student achievement increase in a linear fashion as school SES increases (that is, is the relationship essentially linear, or does it depart from linearity, perhaps suggesting that the relationship tapers off as school SES increases or conversely, that there are thresholds that must first be crossed before the strongly positive relationship between SES and academic performance is seen)?

Method

Our methodological approach is similar to that recently used to compare the effectiveness of private and public schooling across student SES groups in the USA and Chile (Lubienski & Lubienski, 2005; Matear, 2006), and to examine the disaggregated relationship among individual and school SES and achievement in Australia (Perry & McConney, in press).

Specifically, we used secondary analysis of the 2003 PISA data set for Australia. Within this secondary analysis, we drew on disaggregated descriptive statistics and graphical representations to compare the literacy performance of secondary students in two subject areas (reading and mathematics) across various student SES backgrounds, and across a range of school SES profiles. Our aim is not to show the extent to which school SES explains variation in student achievement, which has already been done in the primary analyses of PISA. Rather, our aim is to show how the association between school SES and student performance varies for different students and across different schools in a simple but powerful way that is meaningful to policy-makers and readers without advanced statistical expertise.

As noted above, PISA is a major international assessment of 15-year-olds' literacy performance in three subject areas: mathematics, reading and science (problem-solving was also included in the 2003 round) developed by the OECD as an assessment of students' ability to apply their skills and knowledge in particular subject areas and to communicate their findings when they do so. The objective of PISA is to support member countries' educational systems in the development of the skills and knowledge necessary for personal and working life in industrialised countries. PISA therefore assesses students' literacy in the three subject areas rather than achievement tied to a specific curriculum to which students may have been exposed in school. Test questions derive from hypothetical situations or problems that students could reasonably be expected to encounter in their adult lives (OECD, 2004).

For the 2003 PISA round, all OECD member countries and 11 partner (or non-OECD countries) participated. In total, the sample from the member countries included more than 250,000 students, increasing to more than 275,000 students with the inclusion of those from partner countries. Each country's sample is drawn to be statistically representative of the total number of students enrolled in different types of schools (for example, private or public, college, preparatory or vocational schools) and locations (for example, urban or rural). The Australian sample included 312 schools and just over 12,500 students representative of the population of 15-year-old students across the country. The sample statistics generated from this dataset are therefore representative of the Australian population of 15-year-old secondary students, and subgroups within that population.

PISA's measure of student-level SES is a composite index of the following variables: highest parental occupational status, highest parental educational attainment (years of education), and economic and cultural resources in the home. PISA has named this variable ESCS (economic, social and cultural status), and each participating student completes a questionnaire that allows an individual ESCS score to be assigned.

To calculate aggregated school-level SES, we averaged the ESCS scores of every student who participated in PISA from a given school. We hasten to underline that PISA is designed for administration to 15-year-old students. This means that in no case did we have the individual ESCS for *every student* in a given school participating in PISA 2003. For the 321 schools that comprised the Australian data,

the size of the student group ranged from a low of 5 students to a high of 61 students. Importantly, 305 (95%) of the 321 schools participating for Australia had student groups of more than 20, with the average student group size being about 39 students. We have termed this measure of school-level SES 'mean school-group SES' and consider it a relatively stable *proxy measure*, given the absence of the latter variable in the Australian data set.

Briefly, the methodology we used in computing reading and mathematics achievement means across student and school SES bands was as follows:

(1) The Australian subset (about 12,500 students) was extracted from the 2003 PISA data housed at the Australian Council for Educational Research (ACER).
(2) We constructed student-wise average literacy performance scores in reading and mathematics using the sets of 'plausible values' for these subjects provided in the data set.
(3) Using the individual student SES variable (called ESCS in PISA), we sorted the data set according to SES and divided the data set into five parts, based on student SES.
(4) Again using the individual SES variable, as well as the unique school identifier variable (321 schools in the Australian data set), we computed a 'mean school-group SES' variable and added it to the data set.
(5) We determined the quintile cut-points on this mean school-group SES variable.
(6) Each student therefore carried average scores in reading and mathematics literacy performance, individual SES, unique school identifier and mean SES of the school group to which he/she belonged.
(7) The overall Australian data set was cut into quintiles, based on individual student SES (these subgroups each contained about 2,500 students and are the five rows represented in tables 1 and 2).
(8) Each of the five groups thus formed was further disaggregated into five subgroups using the quintile cut-scores associated with the mean school-group SES variable.
(9) These procedures left us with 25 subgroups organised by individual SES and by mean school-group SES; these subgroups ranged in size from a low of 88 students to a high of 1,212 students.
(10) We computed the group-wise mean scores in reading and mathematics for each of these 25 subgroups, which are given by subject in tables 1 and 2.

Empirical findings

As portrayed in tables 1 and 2, the aggregated SES of the school group matters. Put another way, the SES school context in which the students find themselves is strongly associated with academic performance, on average. For example, as shown in Table 1, for the typical student in the first SES quintile, being part of a high SES school group versus a low SES school group is associated with a difference of about 57 points (0.6 of a standard deviation) in reading achievement.

For readers interested in a statistical yardstick for appraising the magnitude of the differences among school-group means within individual student SES quintiles, we have also provided the standard errors associated with each student-level SES quintile. The commonly used standard error of the mean is a yardstick for judging how much the value of any sample mean may vary from sample to sample taken from the same distribution. It can be used to compare an observed mean to a hypothesised value (for instance, one can conclude the two values are statistically different if the ratio of the difference to the standard error is less than –2 or greater than +2).

For the current case, we are of the view that the more relevant question is how much *the difference between any pair of means*, drawn from a common source, might vary if repeated sampling had been possible. We have therefore provided the standard error associated with sample-mean differences for each of the five quintiles based on individual student SES. Differences greater than two standard errors indicate statistically meaningful disparity between that pair of means. For example, within the first student SES quintile, first quintile schools have significantly lower mean scores than fourth and fifth quintile schools, but their mean difference compared with second and third quintile schools is not significant. Nonetheless, the main purpose of Table 1 (and Table 2) is not to test hypotheses about each mean difference, but rather to examine the overall patterns of mean difference across the two tables.

In mathematics, as depicted in Table 2, for the typical student in the first SES quintile, being part of a high SES school group versus a low SES school group is also associated with a difference of about 57 points (0.6 of a standard deviation). It is also evident that the pattern of association between increases in average performance and increases in school-group SES holds consistently across the quintiles

Table 1 Mean reading scores by individual student SES and school-group mean SES for PISA 2003 Australia

Individual student SES (ESCS)	*School-group SES*					*Standard error of sample–mean differences*
	1st quintile	*2nd quintile*	*3rd quintile*	*4th quintile*	*5th quintile*	
1st quintile	*n* = 984	*n* = 690	*n* = 490	*n* = 231	*n* = 88	
	458.8	466.0	471.5	503.3	516.0	12.8
2nd quintile	*n* = 591	*n* = 681	*n* = 596	*n* = 425	*n* = 195	
	486.2	496.0	503.5	531.3	543.9	9.6
3rd quintile	*n* = 416	*n* = 492	*n* = 639	*n* = 568	*n* = 348	
	498.1	504.2	515.1	541.7	560.9	8.6
4th quintile	*n* = 213	*n* = 377	*n* = 516	*n* = 682	*n* = 693	
	520.3	525.1	529.8	557.2	577.2	9.1
5th quintile	*n* = 99	*n* = 199	*n* = 362	*n* = 602	*n* = 1212	
	547.8	543.0	549.4	576.1	601.7	10.9

Table 2 Mean mathematics scores by individual student SES and school-group average SES for PISA 2003 Australia

Individual student SES (ESCS)	*School-group SES*					*Standard error of sample–mean differences*
	1st quintile	*2nd quintile*	*3rd quintile*	*4th quintile*	*5th quintile*	
1st quintile	*n* = 984	*n* = 690	*n* = 490	*n* = 231	*n* = 88	
	458.8	459.8	475.3	497.9	515.8	12.3
2nd quintile	*n* = 591	*n* = 681	*n* = 596	*n* = 425	*n* = 195	
	485.5	494.9	505.0	529.4	546.4	9.8
3rd quintile	*n* = 416	*n* = 492	*n* = 639	*n* = 568	*n* = 348	
	495.4	501.3	513.6	538.5	562.2	8.8
4th quintile	*n* = 213	*n* = 377	*n* = 516	*n* = 682	*n* = 693	
	521.6	521.1	530.5	554.8	575.0	9.5
5th quintile	*n* = 99	*n* = 199	*n* = 362	*n* = 602	*n* = 1212	
	543.1	535.4	545.9	570.9	599.5	11.7

based on individual student SES. For example, as seen in Table 1, for mid-SES students the difference in average reading achievement associated with being in a low SES school group as compared to a high SES school group is about 63 points (or about 0.7 standard deviation units). For high SES students, the difference in average reading performance associated with being in a low SES school group as compared a high SES school group is 54 points (0.6 of a standard deviation). As portrayed in Table 2, similar comparisons in mathematics yielded differences of 67 (for mid-SES students) and 56 points (for high-SES students), respectively.

Furthermore, consistent with other research—as we previously knew—individual student SES also matters. For example, as depicted in Table 1 in the case of reading, the difference between the average low SES student in a low SES school and the average high SES student in a similar school is about 90 points, or just about one standard deviation. For school groups in the mid-SES range, the reading achievement difference between the average low SES student and the average high SES student moderates somewhat to about 78 points, or 0.8 standard deviations, but for high SES school groups the difference in average reading achievement again stretches to 86 points, or close to one standard deviation.

These patterns of substantial difference in average achievement associated with changes in individual student SES are also observed for mathematics. For example, in mathematics the difference between the typical low SES student and the typical high SES student, both in mid-SES school groupings, is 71 points. Similar to the case for reading, the observed difference in mathematics achievement between the average high SES student and the average low SES student, both in high SES school groupings, is about 84 points.

Our purpose in systematically disaggregating these data has also been to provide a finer-grained portrait of the relationships among individual student and

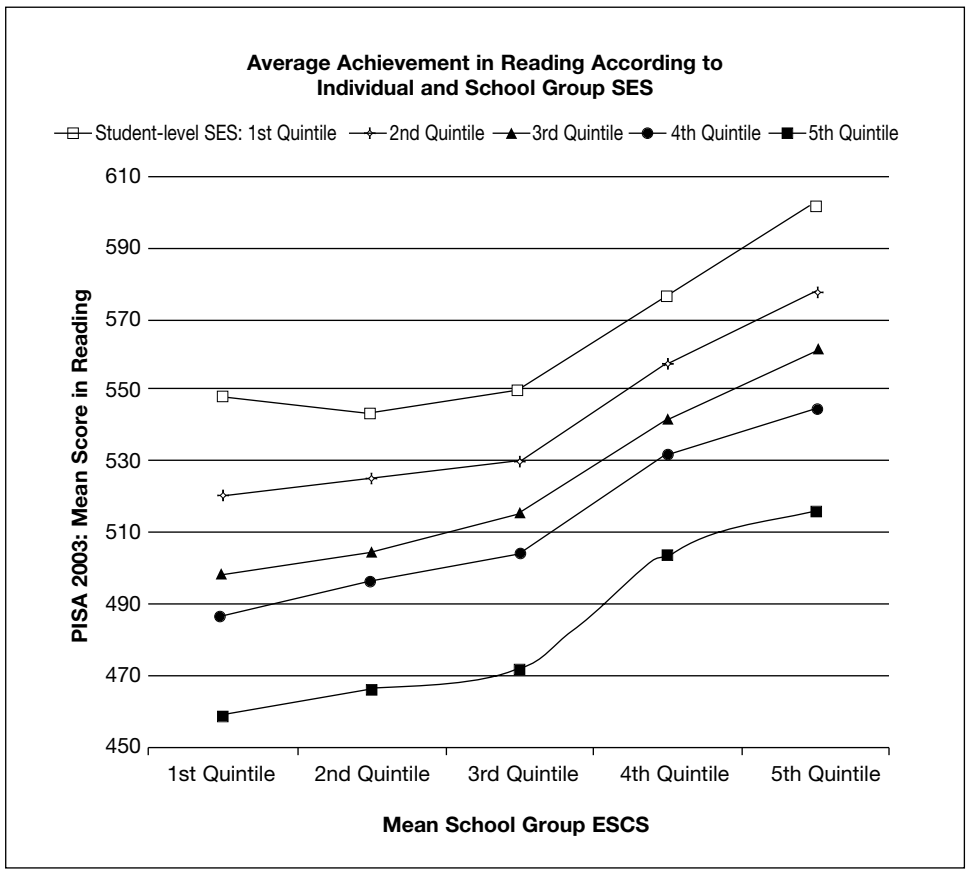

Figure 1 Average literacy performance in reading by individual student and school-group SES for PISA 2003 Australia

school SES and academic literacy performance, including such issues as whether there are evident 'school SES thresholds' that must first be crossed before the positive relationship between SES and academic performance is seen, and whether observed patterns continue to be strongly positive across the entire range of student and school-group SES. Figures 1 and 2 are provided to offer tentative answers to these questions.

First, from these two figures the strength and consistency of the association between mean school-group SES and academic literacy performance across the quintiles representing individual student SES, as well as across reading and mathematics, are remarkable. In no case is there overlap among the lines representing the academic literacy performance of different SES cohorts across the two subjects. In other words, for both reading and mathematics, literacy performance as measured by PISA almost universally increases steadily and consistently as school SES increases, for each of the five student-level SES quintiles.

Secondly, consistently across the two subjects, but perhaps most notably in reading, there does appear to be something like a school-group SES threshold—

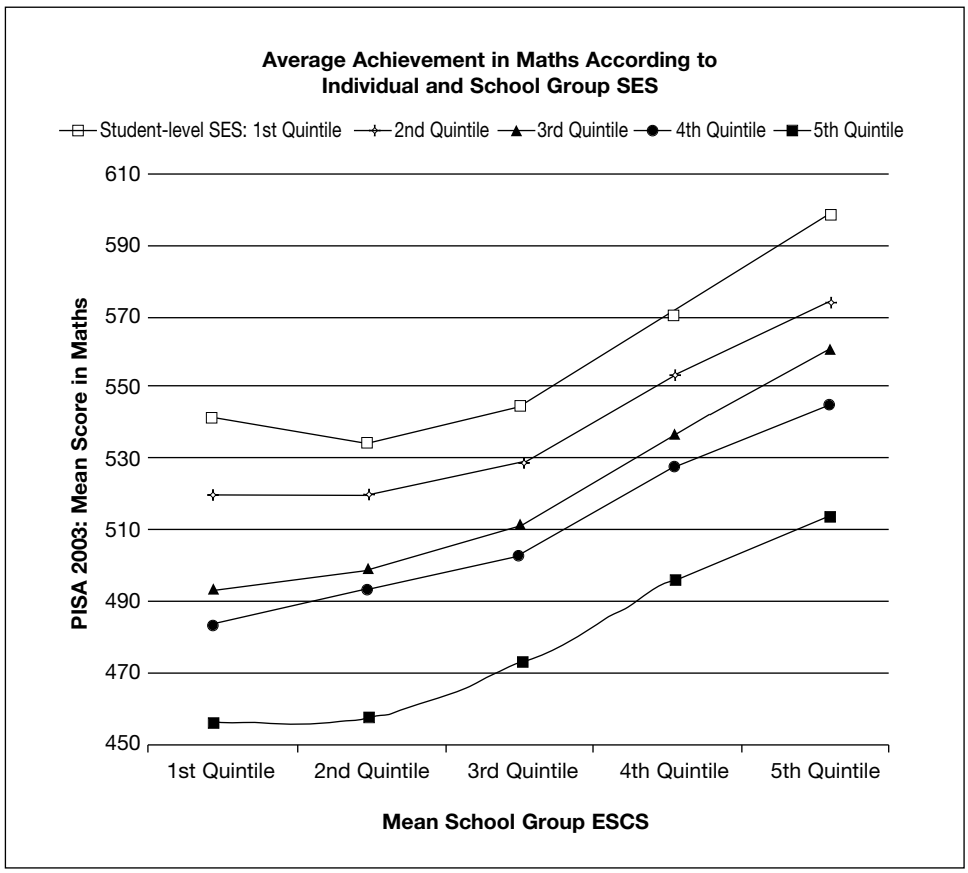

Figure 2 Average literacy performance in mathematics by individual student and school-group SES for PISA 2003 Australia

located at around the third school-group SES quintile—below which the relationship between school-group SES and academic attainment is positive but quite moderate, and beyond which the relationship becomes strongly positive. For the Australian sample, this may reflect the transition from lower- and middle-SES public schools to more affluent private or public schools.

Thirdly, we point out the phenomenon evident in both reading and mathematics for students in the highest individual SES quintile (represented by the uppermost line in each chart). These lines show that for students in this highest SES cohort, there is a small but noticeable fall-off in average academic performance when comparing second (and sometimes third) quintile school group performance against first quintile school group performance; we refer to this phenomenon as 'the hockey stick' and note that it appears for no other quintile in the data set. Although we know that the size of the group of high SES students in the lowest SES school groups is small in comparison to other groups, and suspect that the higher mean scores obtained simply reflect that relatively smaller size group, we cannot confirm this suspicion from these data alone.

Overall, the message resulting from our retrospective secondary analysis of the 2003 PISA data set for Australia is clear and consistent. As detailed in tables 1 and 2 and portrayed by figures 1 and 2, the aggregated SES of the school-group matters substantially. Put another way, the SES context in which students find themselves is strongly and consistently associated with academic performance, across all student SES groupings. Similarly, and in concert with what was previously known, it is also the case that individual student SES matters greatly in the Australian context. For the core subjects of reading and mathematics, higher individual student SES is positively associated with higher academic literacy performance on average, and this patterning was consistently observed across all five school-group SES quintiles.

Educational policy implications

The Australian educational system can be characterised as relatively equitable and effective, with high levels of school choice and privatisation (Perry, 2009; Thomson, Cresswell & De Bortoli, 2003). As many previous studies about school socio-economic composition and student achievement have been conducted in the USA, studies of other national contexts can illuminate the ways in which educational policies and structures influence the relationship. From an education policy point of view, understanding which students are most affected by school composition can help to shape policy options. For example, if high SES students are relatively immune to the influence of school SES, then there is no policy disincentive to fostering the socio-economic integration of schools. If, on the other hand, low SES students are strongly influenced by school SES, then policies need to take that into account.

The findings from our secondary analysis of the Australian PISA 2003 data are clear; all students—regardless of their personal SES—benefit strongly and relatively equally from schooling contexts in which the SES of the school-group is high. Our findings similarly show that all students, regardless of their individual SES, perform considerably less well on measures of academic achievement in school contexts characterised, in the aggregate, as low on the SES continuum. Thus, the segregation of schools according to SES provides further benefits for students whose economic circumstances allow attendance at high SES schools, and also further handicaps students who lack this advantage. That is, schooling that is segregated by SES is most likely to benefit students who are already educationally privileged, but harm students who find themselves at educational disadvantage, associated with low SES backgrounds. Rather than mitigating or mediating educational inequity, school segregation exacerbates it. For the equitable educational benefit of all students, therefore, schools with large concentrations of students with low SES backgrounds are disadvantageous to those students. Educational policies that work against the segregation of students and schools based on SES could be vigorously pursued on the simple basis that they are likely to achieve better and more equitable educational outcomes for all, rather than for an economically privileged few. For these reasons, a strong consensus exists among educational researchers and policy-makers that the minimisation of school segregation based on

SES should be a central outcome of educational policy (Lamb, 2007; Oakes, 2000; OECD, 2004, 2005; Orfield, 1996; Willms, 1999).

While reducing school socio-economic segregation is not an easy task, a number of innovative approaches have been tried by schools and districts in different countries. No single approach will dramatically reduce segregation but taken together they have the potential to make a meaningful impact. The first group of approaches relates to reducing real or perceived differences in quality between high and low SES schools. This means paying attention to the inputs and resources available to schools. The second group of approaches relates to providing incentives to attract high SES students to lower SES schools.

One way to minimise differences in quality between low and high SES schools is to adopt a funding model that provides similar resources to all schools, and additional funding to schools with high needs (e.g., schools that are located in rural and remote areas, that enrol a high percentage of students with learning disabilities or that serve a high percentage of students with disadvantaged social backgrounds). Funding models used in New Zealand and the UK minimise differences in educational resources between schools. In these countries, all private and public schools are entitled to the same funding based on the number and type of students they enrol as long as they do not charge student fees. Schools that charge fees relinquish their right to receive public funds. This funding model provides an equitable distribution of resources to schools but also promotes diversity and choice within the educational system. Such a model is also simpler and more transparent than the current funding model in Australia, which commentators have described as opaque and overly complex (Dowling, 2008). This model could also be politically feasible to implement since it would save many families thousands of dollars in school fees without compromising the quality of education on offer at their schools. The main 'losers' in this model would be high-fee independent schools that are currently receiving public funds and the families whose children attend them. Without Commonwealth funding, it is likely that fees at these schools would increase to maintain the same quality of education provision. Fees at such schools in the USA and UK are significantly higher than in Australia, at least in part because they do not receive any public funds.

Another way to reduce differences among schools is to ensure that core curricular and programmatic offerings are relatively similar across all schools. Marks, Creswell and Ainley (2006) have shown that the educational advantage that high SES students enjoy is mediated primarily through the curriculum that they receive. High-SES students are likely to attend schools that have rigorous and demanding academic programs oriented toward university entrance exams. Currently, high-quality academic programs tend to be concentrated in private schools and in public schools in higher SES communities (Edwards, 2006; Lamb, Hogan & Johnson, 2001). Rather than maintain this financially and geographically selective access to high-quality academic programs, making such programs available to all students regardless of their financial resources or place of residence could improve educational opportunities for lower SES students. Increased funding to lower SES schools could be used to support in-service

training of teachers in these programs, recruit experienced and successful teachers or subsidise program costs.

Increased investment to lower SES schools could be used to help them introduce or improve programs that will make them more attractive to higher SES families. Such programs could include high-quality university preparatory programs, intensive or immersion foreign language programs, and specialised curriculum such as the International Baccalaureate program. Another approach is to establish partnerships between low SES secondary schools and local universities to permit able students to enrol in university classes free of charge. Yale University, for example, has such partnerships with low SES schools in New Haven, Connecticut—the seventh poorest city in the continental USA (see Yale University, 2008). Similarly, some lower SES school districts in the USA have been able to attract higher SES students by providing financial incentives upon graduation. For example, the Kalamazoo Promise, an initiative 'funded into perpetuity by a small group of anonymous donors' (Kalamazoo Promise, 2010), provides scholarships to graduates of the Kalamazoo public school district in Michigan to attend any of the 15 public universities in the state, including the prestigious University of Michigan.

While balanced school compositions can be facilitated by making lower SES schools more attractive to higher SES families, we also acknowledge that all students who are struggling in school require extra support and resources, regardless of the school that they attend. We agree with other researchers who have called for increased support to students who are falling behind their peers academically (Lokan, Greenwood & Cresswell, 2001). But, based on our findings, we also believe that policy measures should target schools and school funding to reduce the association between school SES and student achievement.

Conclusion

Many of the measures we have recommended here, such as increased funding to low SES schools, are consistent with the policies of the current federal Labor government. We support the stance that low SES schools in all sectors (that is, government, Catholic and independent) need to be better supported. The socio-economic composition of schools has a significant influence on all children's academic performance. For the benefit of most children and the larger society, balanced school socio-economic composition should be a primary aim of educational policy, and should be used as a criterion against which other policies are evaluated. Reducing socio-economic school segregation is not only equitable but also effective. For example, the association between school SES and student achievement is lower in Canada and Finland than in Australia, and both countries outperform Australia on PISA (OECD, 2004). As these countries show, reducing socio-economic school segregation and differences among schools promotes higher overall achievement for all students without decreasing the achievement of high-performing students. Reducing school socio-economic segregation does not mean that other foundational objectives, such as diversity and choice, should be ignored. Rather, they should be pursued in ways that do not reduce the educational opportunities and outcomes of students from socially disadvantaged backgrounds.

Keywords

reading achievement | mathematics achievement | socioeconomic background
funding formulas | policy analysis | evaluation

References

American Educational Research Association. (2003). Class size: Counting students can count. *Research Points*, *1*(2), 1–4.

Blossfeld, H.-P., & Shavit, Y. (1993). Persisting barriers: Changes in educational opportunities in thirteen countries. In Y. Shavit & H.-P. Blossfeld (Eds.), *Persistent inequality* (pp. 1–24). Boulder, CO: Westview.

Caldas, S. J., & Bankston, C. III. (1997). Effect of school population socioeconomic status on individual academic achievement. *Journal of Educational Research*, *90*(5), 269–277.

Coleman, J., Campbell, E., Hobson, C., McPartland, J., Mood, A., Weinfeld, F., & York, R. (1966). *Equality of educational opportunity*. Washington, DC: US Government Printing Office.

Dowling, A. (2008). Towards a national school funding model. *Research Developments*, *19*(2), 1–5.

Edwards, D. (2006). *Competition, specialisation and stratification: Academic outcomes of the government school system in Melbourne, Australia*. Paper presented at the Comparative Education Society in Europe conference, Granada, Spain.

Jencks, C., Smith, M., Acland, H., Bane, M. J., Cohen, D., Gintis, H., et al. (1972). *Inequality: A reassessment of the effect of family and schooling in America*. New York: Basic Books.

Kalamazoo Promise. (2010). Retrieved from www.kalamazoopromise.com

Kahlenberg, R. (2001). *All together now: Creating middle-class schools through public school choices*. Washington, DC: Brookings Institution.

Lamb, S. (2007). School reform and inequality in urban Australia: A case of residualising the poor. In R. Teese, S. Lamb & M. Duru-Belat (Eds.), *Education and inequality* (pp. 1–38). (Vol. 3.) Dordrecht: Springer.

Lamb, S., Hogan, D., & Johnson, T. (2001). The stratification of learning opportunities and achievement in Tasmanian secondary schools. *Australian Journal of Education*, *45*(2), 153–167.

Lokan, J., Greenwood, L., & Cresswell, J. (2001). *The PISA 2000 survey of students' reading, mathematical and scientific literacy skills: How literate are Australia's students?* Melbourne: Australian Council for Educational Research.

Lubienski, S. T., & Lubienski, C. (2005). A new look at public and private schools: Student background and mathematics achievement. *Phi Delta Kappan*, *86*(9), 696–699.

Marjoribanks, K. (1979). *Families and their learning environments: An empirical analysis*. London: Routledge and Kegan Paul.

Marks, G. N., Cresswell, J., & Ainley, J. (2006). Explaining socioeconomic inequalities in student achievement: The role of home and school factors. *Educational Research and Evaluation*, *12*(2), 105–128.

Matear, A. (2006). Equity in education in Chile: The tensions between policy and practice. *International Journal of Educational Development*, *27*(1), 101–113.

Noel, S., & de Broucker, P. (2001). Intergenerational inequities: A comparative analysis of the influence of parents' educational background on length of schooling and literacy skills. In W. Hutmacher, D. Cochrane & N. Bottani (Eds.), *In pursuit of equity in*

education: Using international indicators to compare equity policies (pp. 277–298). Dordrecht: Kluwer Academic.
Oakes, J. (2000). The distribution of knowledge. In R. Arum & I. R. Beattie (Eds.), *The structure of schooling: Readings in the sociology of education* (pp. 224–234). Mountain View, CA: Mayfield Publishing.
Organisation for Economic Co-operation and Development. (2004). *Learning for tomorrow's world: First results from PISA 2003*. Paris: Author.
Organisation for Economic Co-operation and Development. (2005). *School factors related to quality and equity: Results from PISA 2000*. Paris: Author.
Orfield, G. (1996). *Dismantling desegregation: The quiet reversal of Brown v. Board of education*. New York: New Press.
Perry, L. (2009). Characteristics of equitable systems of education: A cross-national analysis. *European Education*, *41*(1), 79–100.
Perry, L., & McConney, A. (in press). Does the SES of the school matter? An examination of socioeconomic status and student achievement using PISA 2003. *Teachers College Record*.
Rumberger, R. W., & Palardy, G. J. (2005). Does segregation still matter? The impact of student composition on academic achievement in high school. *Teachers College Record*, *107*(9), 1999–2045.
Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, *75*(3), 417–453.
Tate, W. F. (1997). Race-ethnicity, SES, gender, and language proficiency trends in mathematics achievement: An update. *Journal for Research in Mathematics Education*, *28*(6), 652–679.
Thomson, S., Cresswell, J., & De Bortoli, L. (2003). *Facing the future: A focus on mathematical literacy among Australian 15-year-old students in PISA 2003*. Melbourne: Australian Council for Educational Research.
Thrupp, M. (1995). The school mix effect: The history of an enduring problem in educational research, policy and practice. *British Journal of Sociology of Education*, *16*(2), 183–203.
Willms, J. D. (1999). Quality and inequality in children's literacy: The effects on families, schools, and communities. In D. P. Keating & C. Hertzman (Eds.), *Developmental health and the wealth of nations: Social, biological, and educational dynamics* (pp. 72–73). New York: Guilford Press.
Yale University. (2008). *Partnerships*. Retrieved 11 January 2010 from http://www.yale.edu/onhsa/youth_partnerships.htm

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