Schools Funding

SES Simulation Project:

Validation Report

A report on analyses to validate the outcomes of the Socioeconomic Status (SES) Simulation Project

May 1999

Department of Education, Training and Youth Affairs

Title *SES Simulation Project: Validation Report*

ISBN 0 642 23875 8

Library classification information

1. Authorship – Department of Education, Training and Youth Affairs

2. Subject – Schools funding, Socioeconomic status, Validation

Produced by J.S. McMillan Printing Group, Canberra (02) 6230 6200

Contents

Section 1 Introduction 1

Section 2 Comparison of schools' SES scores with ACER index based on LSAY data 3

Section 3 Comparison of schools' SES scores with AUSTUDY data 5

Section 4 Comparison of schools' SES scores with State means–tested allowances 8

Section 5 Comparison of separate primary and secondary level SES scores with 'whole school' scores 11

Graphs

Graph 1 NSW AUSTUDY recipients by schools' SES scores 6

Graph 2 Victorian AUSTUDY recipients by schools' SES scores 7

Graph 3 Education Maintenance Allowance recipients by schools' SES scores 8

Graph 4 School Card recipients by schools' SES scores 9

Graph 5 Student Assistance Scheme recipients by schools' SES scores 10

Tables

Table 1 Primary and secondary enrolments as a percentage of schools' total enrolments and as a percentage of samples used in the SES Project 11

Table 2 Primary, secondary and whole school SES scores 12

Section 1

Introduction

The *Schools Funding: SES Simulation Project Report* describes in detail the Socioeconomic status (SES) Simulation Project, conducted by the Department of Education, Training and Youth Affairs (DETYA) in 1998.

The Simulation, in which over 90% of non-government schools participated, was designed to test the validity and feasibility of an approach to funding non-government schools on the basis of the relative SES of school communities. An SES score for each school was produced, allowing relativities between schools to be compared.

Organisations representing groups of non-government schools and familiar with their operation, such as the Catholic Education Offices and Associations of Independent Schools in each State, and some national peak bodies, were invited to comment on the appropriateness of the SES scores and resulting relativities for their schools. The results of the SES Simulation were generally supported, with school representatives reporting that the SES scores and relativities accorded with their expectations and knowledge of their schools.

For very few schools, the SES scores produced in the Simulation were considered anomalous. A separate exercise has been undertaken to check the simulated SES scores for these schools, to see whether errors in the presentation of addresses, sampling or geocoding could explain the anomalous scores.

In addition, DETYA undertook or commissioned a series of separate and self-contained validation projects, to test whether a measure of the relative need of non-government school communities based on an SES approach using data gathered from the Census matched other measures of need. The comparison between the SES results and the current funding mechanism, the Education Resources Index (ERI) is made in detail in the *Schools Funding: SES Simulation Project Report* (pages 27 – 32). The ERI was intended to be a measure of a school's own resources. As the Report concludes, while there is some degree of correlation between schools' SES scores and ERI funding categories, there are numerous anomalies.

Testing of the validity of the outcomes of the SES Simulation was also carried out against other parental income and wealth measures. These included:

- a measure of the occupation, education and wealth of parents for schools involved in the Longitudinal Survey of Australian Youth (LSAY) conducted since 1978 by the Australian Council for Educational Research (ACER);
- a measure of parental means as assessed under the Commonwealth's Youth Allowance scheme (until 1998, AUSTUDY), available to students aged 16 and over; and
- a measure of family means as assessed for means-tested allowances provided to school

students by State governments in Victoria, South Australia and Tasmania. Each of these State government schemes applies a different approach to means-testing.

The results of these validation exercises are set out in Sections 2 to 4 of this report. In summary, all validate the SES Simulation results. Each separate exercise shows a clear correlation between the SES Simulation results and the measure with which the Simulation results are compared. These findings support the view that a Census based SES measure produces a good proxy for parental income, without the intrusiveness and administrative complexity inherent in measuring parental income more directly.

In addition to these tests, DETYA has undertaken further analysis of the SES Simulation results in respect of schools which offer both primary and secondary education. The outcomes of this analysis, which are presented in Section 5, confirm the soundness of both the sampling methodology used in the Simulation and the use of a 'whole school' SES score as the basis for funding.

Section 2

Comparison of schools' SES scores with ACER index based on LSAY data

The Longitudinal Surveys of Australian Youth (LSAY) programme is conducted on behalf of the Government by the **Australian Council of Educational Research (ACER)** and provides a key national resource for research and policy development in the fields of education and employment.

Through the LSAY programme, extensive information about young Australians' experiences as they move through education and into the labour force has been collected for the past 20 years. Groups of young people are surveyed on a regular basis, starting when they are in Year 9 and continuing until they are at least 25 years of age, with a new group added every three years. Data related to the social background of participants are also collected as part of the surveys in which both government and non-government school students participate.

Seventy-six non-government schools which participated in the 1995 LSAY survey also took part in the SES Simulation Project. As some of the background data collected directly from LSAY students' are similar to the data measured in the Simulation, it was suggested that a comparison of the two data sets would allow an assessment to be made about the degree of similarity between an index based on data collected from individuals (through a questionnaire) and a Census based SES index such as that used in the SES Project.

As the holders of the LSAY data, ACER was commissioned to undertake this analysis, ensuring that the confidentiality of schools and students' personal data was not breached. ACER constructed a composite index, based on data related to occupation, education and wealth. School-level measures of SES based on the index were formed as the average of the values for the students in each of the 76 schools' samples. As ACER has found that self-reports of family income and assets are unreliable and difficult to obtain in mail surveys, the wealth component used was an indirect measure based on household possessions. The occupation measure was generally based on the father's occupation and education was a composite measure for the family. The SES index used in the Simulation Project, *Index A(M)*, also includes occupation and education dimensions based on data from all households in schools' Census Collection Districts, whereas the income dimension is based on measures for both households and families with children.

When the rankings of schools produced on the LSAY index and the indexes tested in the SES Project are compared, the results indicate a high degree of correlation, 0.84 to 0.85 on two different measures, where a coefficient of 1.0 would indicate a perfect match. These results show that there is a high degree of correspondence between the Census-based index, *Index A(M)*, and the index that was independently developed using data from a

survey of individual students, supporting the proposition that Census-based indexes are valid measures of the SES of school populations. (Four different indexes were tested in the Simulation and the degree of correlation with the LSAY index was 0.85 for all four.)

ACER noted that a correlation coefficient of 0.85 is considered high by most standards in social research. It is to be expected however that the correlation coefficients between two indexes such as those investigated would be less than 1.0. There are several reasons for this, mostly as a consequence of the different purposes for which the indexes were constructed initially.

The index used in the SES Project was constructed as a measure of the socioeconomic composition of schools with an emphasis on the whole school. It was not intended to provide a measure of the socioeconomic status of each individual student in the sample. In LSAY, the index of socioeconomic status was constructed to provide a measure of the socioeconomic background of each Year 9 student in the sample so that this could be used in analyses of relationships with various educational and labour market outcomes. It was not constructed with the intention of producing an index of the socioeconomic composition of each school.

The fact that the correlation between the indexes is less than 1.0 may also be the result of the different student populations measured by the indexes. In the SES Simulation Project, the defined population was the whole school, whereas the LSAY survey targets small groups of Year 9 (secondary) students. Sampling and measurement errors, with either index, could further exacerbate this effect as could non-response to LSAY questionnaire data, which would result in a biased estimate of a school's average score (and the bias may differ between schools). For these reasons the observed values of the correlation coefficients reported tend to understate the validity of the SES Project *Index A(M)* as a measure of socioeconomic status of school populations.

ACER concluded that the high correlation between the two indexes compared in this project suggests that SES indexes based on Census data do reflect the SES of school populations and, specifically, that *Index A(M)* as applied in the SES Simulation Project, is a valid measure of the SES of schools.

Section 3

Comparison of schools' SES scores with AUSTUDY data

AUSTUDY

AUSTUDY, which was replaced by the Youth Allowance in mid-1998, was a Commonwealth programme which provided money to students 16 years of age and over who needed financial assistance to complete their full-time study. Around half a million secondary and tertiary students received AUSTUDY in 1998.

For secondary school students, most of whom were dependent on their parents and living at home, eligibility and the amount of assistance payable were dependent on the student's and their parents' income, the value of family assets, the family's actual means (in some cases) and whether the student lived at home.

The maximum annual allowance for students under 18 years of age (living at home) in 1998 was $3,791 (or about $145 per fortnight). To be eligible for the maximum payment, the student's parents' 1996/97 income, after adjustment for the number of dependent children, could not exceed $23,400 and the student's own 1997/98 income could not exceed $6,000. The maximum payment was reduced by $1 for every $4 extra earned by the parents and $1 for every $2 extra earned by the student until it reached the minimum annual allowance of $1,000 (about $38 per fortnight), at which point AUSTUDY was no longer payable. For a family with only one 16 to 17 year old dependent student (with personal income under $6,000 and living at home), AUSTUDY cut out when the parents' income reached $35,567.

To be eligible for AUSTUDY, a dependent student's family assets, excluding the family home and various other defined assets, could not exceed $407,250. In determining the value of assets, AUSTUDY took into account only 50% of the value of family farms and other businesses.

The income and assets of families in receipt of certain pensions, benefits or allowances from Centrelink (the Government agency which delivers a range of direct services, such as social security payments, to the public) were disregarded in the assessment of AUSTUDY entitlements. Income was also normally disregarded for the period for which a parent held a Health Care Card.

The actual means test was introduced to assess the need for AUSTUDY for students whose families were not PAYE taxpayers. Centrelink noted that "taxable income is often not a good indicator of a student's need for AUSTUDY, particularly when some families are able to legitimately minimise their taxable incomes through trusts, private companies and partnerships" *(AUSTUDY 1998 Information Book)*. Under the test, an Equivalent Family Income was calculated to compare the family's need for AUSTUDY with a comparable PAYE family.

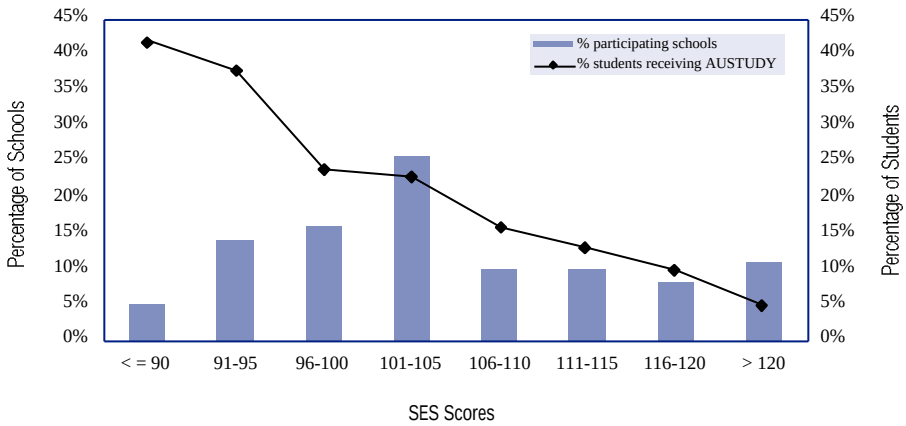
Although AUSTUDY for dependent 16 to 17 year old students was usually paid to parents, the allowance was part of students' taxable income.

Analysis of AUSTUDY data

As the SES Simulation ranked schools according to the relative capacity of their communities to financially support the school, it would be expected that schools with lower SES scores would have more students receiving income support through AUSTUDY than schools with high scores. The Department undertook an analysis to determine the extent to which this was true.

A strong correlation between the number of AUSTUDY recipients and schools' SES scores would indicate that the index used in the SES Project produced a valid measure of the SES of schools.

Graph 1 NSW AUSTUDY recipients by schools' SES scores



The Department analysed the percentage of students in receipt of AUSTUDY in New South Wales and Victorian non-government schools, on the basis that the situation in these large States would be similar for Australia as a whole. The analysis was based on 1997 AUSTUDY data and 1997 school enrolments. Only schools with secondary students were included in this analysis. School populations aged 16 and over were estimated on the basis of statistics included in the Australian Bureau of Statistics (ABS) publication, *Schools Australia*, for Year 10 students and on the assumption that all Year 11 and 12 students would be in this age group.

New South Wales

Ninety-three percent of NSW secondary schools (241 schools), in ERI funding categories 1 to 12, participated in the SES Project. Their SES scores ranged from 86 to 131.

Graph 1 illustrates the relationship between schools' SES scores and the percentage of students in receipt of AUSTUDY, and shows that as schools' SES scores increase, the percentage of AUSTUDY recipients decreases.

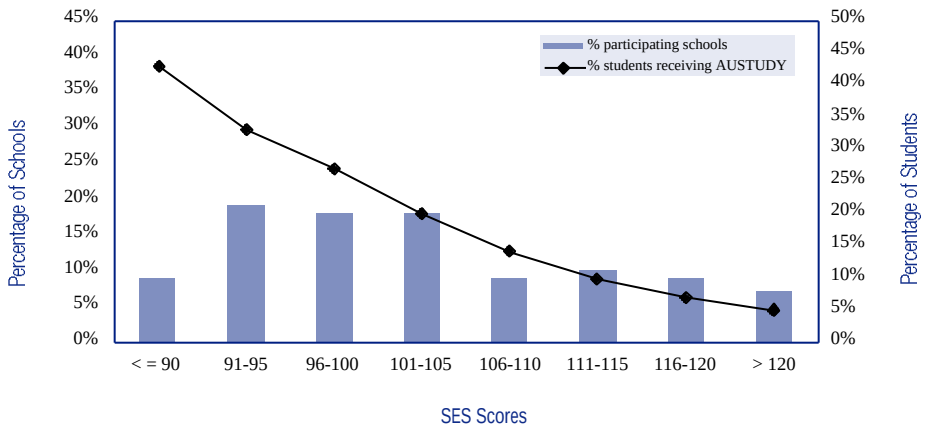
For example, 5% of schools (12 schools) had SES scores less than or equal to 90 and, at these schools, 42% of students aged 16 and over received AUSTUDY. At the other end of the SES spectrum, 11% or 27 schools had scores in excess of 120 and, at these schools, only 5% of the students received AUSTUDY.

Victoria

Eighty-five percent of Victorian secondary schools (176 schools), in ERI funding categories 1 to 12, participated in the SES Project. Their SES scores ranged from 83 to 128.

Graph 2 illustrates the relationship between schools' SES scores and the percentage of students in receipt of AUSTUDY, again showing that as schools' SES scores increase, the percentage of AUSTUDY recipients decreases.

Graph 2 Victorian AUSTUDY recipients by schools' SES scores



For example, 9% of schools (16 schools) had SES scores less than or equal to 90 and, at these schools, 43% of students aged 16 and over received AUSTUDY. In the higher SES ranges, 7% or 13 schools had scores in excess of 120 and, at these schools, only 5% of the students received AUSTUDY.

Conclusion

The above analysis shows that there is indeed a strong correlation between schools' SES scores and the percentage of students in receipt of income support under AUSTUDY (Youth Allowance) in both NSW and Victoria. Schools assessed through the SES Project as needing relatively more Commonwealth financial assistance have proportionally more students receiving income support through AUSTUDY than schools assessed as requiring less Commonwealth support. These findings support the validity of the rankings of schools produced by the SES methodology used in the Simulation Project.

Section 4

Comparison of schools' SES scores with State means-tested allowances

Three States – Victoria, South Australia and Tasmania – provide allowances to assist low income families with children in government and non-government schools. Eligibility for these allowances is based on parental means, assessed differently in each State. As with AUSTUDY, it would be expected that schools with lower SES scores would have more families receiving assistance under the means-tested State-based schemes than schools with high scores. The Department undertook an analysis to determine the extent to which this was true.

A strong correlation between the numbers of recipients of State assistance and schools' SES scores would indicate that the index used in the SES Project produced a valid measure of the SES of schools.

Victoria

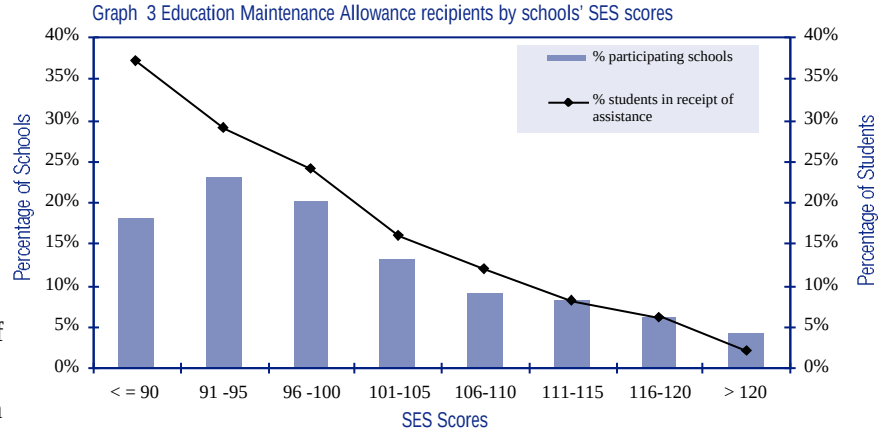
Victoria provides an ***Education Maintenance Allowance*** **(EMA)** for students under 16 years of age whose families receive a Commonwealth pension or hold a Health Care Card. Half the payment is made to the family and half to the school. In 1998, 16% of non-government school students received the EMA.

Eighty-nine percent of Victorian non-government schools participated in the SES Project. Their SES scores ranged from 77 to 128, while their ERI funding categories ranged from 1 to 12.

For the purpose of this analysis, to calculate the number of students in Victorian non-government schools who would be eligible to apply for the EMA, it was assumed that all students in Year 9 and below were under 16 years of age and those in Years 11 and 12 were 16 or over. An estimate was made of the number of students under 16 in Year 10 based on population tables contained in the ABS publication, *Schools Australia.*

Graph 3 illustrates that there is a strong relationship between schools' SES scores and the percentage of students under 16 years of age in receipt of EMA.

Graph 3 Education Maintenance Allowance recipients by schools' SES scores



Schools with low SES scores have the highest number of recipients and the number of recipients declines as the SES score of the school increases. For example, 104 schools (or 18% of schools) had SES scores less than or equal to 90. At these schools an estimated 37% of students under 16 received EMA. At the other end of the SES score range, 4% of

schools had SES scores greater than 120 and only 3% of students in receipt of EMA.

South Australia

South Australia has a State Government sponsored ***School Card*** scheme, with payments made to schools to assist with materials and service charges for students from low income families. The Ministerial Advisory Committee on Non-Government Schools in South Australia also uses School Card eligibility to direct additional needs-based funding to schools to assist families to meet tuition expenses.

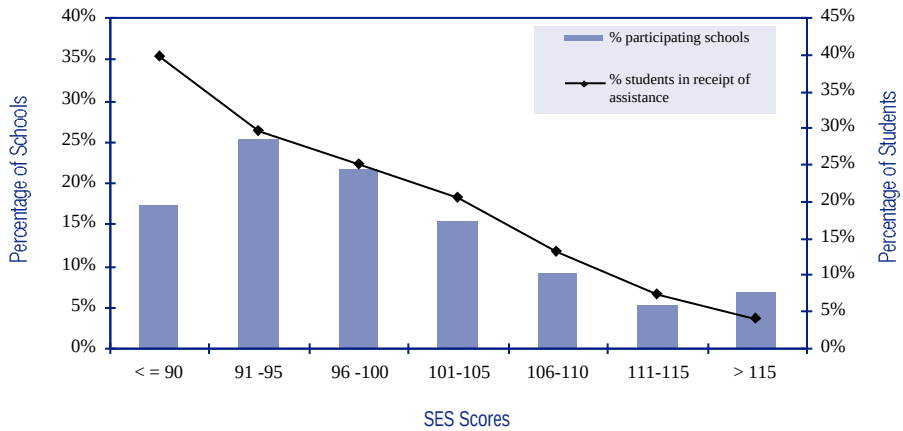
To be eligible for School Card assistance, families must be in receipt of the maximum Family Allowance, Sole Parent Pension or maximum Youth Allowance. In 1998, 23% of non-government school students received assistance under the School Card scheme.

Virtually all South Australian non-government schools participated in the SES Project. Their SES scores ranged from 74 to 119, while their ERI funding categories ranged from 1 to 12.

Graph 4 illustrates the very strong relationship between schools' SES scores and the percentage of students in receipt of School Card funding.

Schools with low SES scores have the highest number of School Card recipients and the number of recipients declines as the SES score of the school increases. For example, 33 schools (17% of schools) had SES scores less than or equal to 90. At these schools 40% of students were School Card holders. At the other end of the SES score range, 13 schools (7%) had SES scores greater than 115 and only 4% of students in receipt of assistance under School Card.

Graph 4 School Card recipients by schools' SES scores



Tasmania

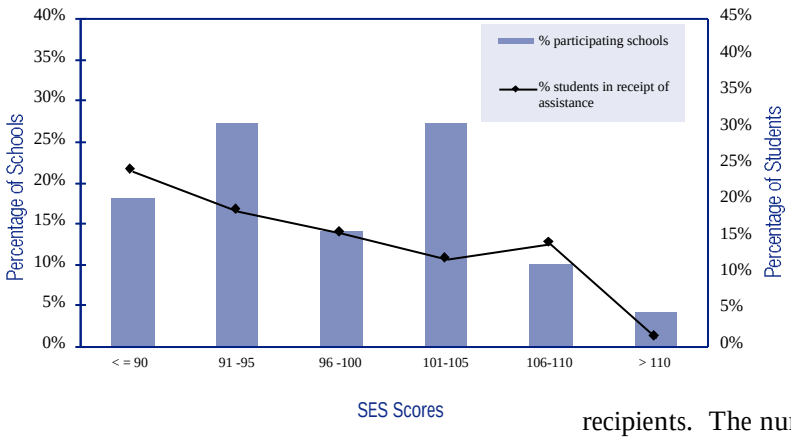
Tasmania's ***Student Assistance Scheme (STAS)*** provides assistance towards the costs of school books, materials and levies, with the benefit paid to the school. To be eligible for assistance, families must be in receipt of a Commonwealth pension, hold a Health Care Card or meet the requirements of an income test. This latter test, which is based on taxable income, allows some families from lower-middle income brackets to

qualify for assistance. In 1997, 13% of non-government students received STAS.

Seventy-seven percent of Tasmanian non-government schools participated in the SES Project. Their SES scores ranged from 80 to 113, while their ERI funding categories ranged from 3 to 11.

Graph 5 illustrates the relationship between schools' SES scores and the percentage of students in receipt of STAS funding. Generally, the lower a school's SES score, the higher the number of students in receipt of assistance.

Graph 5 Student Assistance Scheme recipients by schools' SES scores



For example, 9 schools (18% of schools) had SES scores less than or equal to 90. At these schools 24% of students were in receipt of STAS. At the other end of the SES score range, 2 schools (4%) had SES scores greater than 110 and only 1% of students in receipt of assistance.

An apparent anomaly occurs for schools with SES scores in the 106-110 bracket. One possible explanation for this could be the use of taxable income as an eligibility criterion. It is widely recognised that taxable income is not necessarily an accurate reflection of a person's or family's need for financial assistance when some families are legitimately able to minimise their taxable incomes through trusts, private companies and partnerships. This was the reason, for instance, why the Commonwealth introduced an actual means test to determine eligibility for AUSTUDY and, subsequently, Youth Allowance. Alternatively, the anomaly may be attributable to individual school choices regarding the extent to which the STAS programme is promoted within the school community, or may simply reflect the effect of dealing with a small sample group.

Conclusion

The comparisons of the three State means-tested support schemes show a clear correlation between the number of recipients of these allowances and schools' SES scores produced in the Simulation. Schools with low SES scores have the highest number of recipients. The number of recipients generally declines as the SES score of the school increases. These findings support the validity of the rankings of schools produced by the SES methodology used in the Simulation Project.

It is interesting to note that the South Australian School Card, which has the most stringent eligibility requirements of the three assistance schemes examined, and is therefore most likely to target only low income families, shows the highest degree of correlation with schools' SES scores. This provides a further indication that the SES methodology produces a good measure of the relative capacity of school communities to support their schools.

Section 5

Comparison of separate primary and secondary level SES scores with 'whole school' scores

For the purposes of Commonwealth funding, schools have always been considered as single entities regardless of the levels of education they offer - primary, junior secondary, senior secondary or a combination – or the number of campuses from which they operate.

A number of questions relating to the SES scores of schools offering both the primary and secondary levels of education were raised in the course of the SES Simulation Project. It was suggested that, if the two levels in a combined school had different SES scores, funding the school on the basis of an SES score for the whole school may result in a lower total amount of funding for the school.

The address data for a small number of combined schools which participated in the SES Project indicated whether the records were for primary or secondary students. This allowed DETYA, with the consent of the relevant school authorities, to undertake an analysis of the data for ten schools to compare separate primary and secondary level SES scores with the score based on the whole school and to examine the effects any differences might have on funding. As part of the analysis a check was also made of whether the sampling methodology used in the Project had produced a representative sample.

Accuracy of the sample

Schools were able to present their address data for the Project using any ordering format they chose - by grade levels, individual classes, alphabetically for the whole school, by postcode, etc. Analysis of the data for the 10 schools included in this exercise showed clearly that, regardless of how the schools' files were ordered, the random sampling undertaken to select 100 addresses for each school produced a representative sample in terms of the primary/secondary split in enrolments.

In one case, School I, the proportions of primary and secondary students in the sample matched exactly the school's enrolment profile and for half the schools, the variation between the sample and actual enrolments was less than 1%. Overall, the sample varied from actual enrolments by between 0.2% and 6.2%, with the variation for 7 of the 10 schools being below 2%. The proportions of primary and secondary students' addresses included in the schools' total enrolments and in the samples are set out in Table 1.

Table 1 Primary and secondary enrolments as a percentage of schools' total enrolments and as a percentage of samples used in the SES Project

	Primary		Secondary	
	Sample	Total Enrolments	Sample	Total Enrolments
SCHOOL	%	%	%	%
A	22.1	23.0	77.9	77.0
B	51.0	49.8	49.0	50.2
C	42.9	36.7	57.1	63.3
D	39.3	34.9	60.7	65.1
E	43.6	38.9	56.4	61.1
F	24.2	24.4	75.8	75.6
G	18.4	19.7	81.6	80.3
H	44.0	44.0	56.0	56.0
I	10.6	12.0	89.4	88.0
J	39.0	40.5	61.0	59.5

Table 2 Primary, secondary and whole school SES scores

SES scores - Index A(M)			
School	**Primary**	**Secondary**	**Whole school**
A	104	98	100
B	125	123	124
C	102	105	104
D	119	119	119
E	115	117	116
F	109	110	109
G	99	105	104
H	106	109	107
I	116	113	114
J	94	95	95

In the SES Project, in order to test the validity of using a sample rather than the full set of addresses, a total population analysis was undertaken for a group of 60 schools with enrolments greater than 100, and the results compared with the sample. There was a very high correlation – 0.9986 – between the scores obtained using sample data and full address data. On average, schools' SES scores varied by 0.1 points when the sample used for the Project and the full population analysis were compared, demonstrating that the use of a sample of 100 addresses produces reliable results. To further test these results, 50 random samples were taken for each of the 60 schools. When these scores were examined, the average difference between the samples and full population scores was only 0.03 points, showing that no matter how a random sample is taken, consistent results are obtained.

These results, along with the analysis above for combined schools, suggest that in the case of schools with multiple campuses, random sampling would also produce a sample which would reflect very closely the proportion of students at each campus. It would be a simple matter for this to be checked as part of the data input and sampling procedures under an SES funding model.

Primary and secondary level SES scores

Having confirmed that the samples used in the Simulation were representative of the make-up of the schools, separate SES scores were calculated for the primary and secondary levels of each of the 10 schools and compared with the scores obtained on the basis of the whole school. The scores are set out in Table 2.

On average, secondary level SES scores for the 10 schools were 0.5 points higher than primary level scores. For 6 of the 10 schools, the secondary level SES scores were higher than those for the primary level, with the difference ranging from 1 to 6 points. For 1 school, the primary and secondary scores were the same; and for 3 schools, the primary level scores were higher by between 2 and 6 points. As would be expected, the SES score for the combined school was, in every case, somewhere in the range between the primary and secondary level scores.

Conclusion

Schools receive different amounts of funding for their primary and secondary students. Linking different primary and secondary SES scores to different per capita funding rates would lead to some schools receiving slightly more funding than if they were funded according to a 'whole school' score, while other schools would receive slightly less funding.

The calculation of separate SES scores for parts of the same school would unnecessarily complicate an otherwise simple funding model and would disadvantage at least as many schools as it would advantage. It would also represent a fundamental shift in the Commonwealth's longstanding legislative practice of regarding each school as a single entity.