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Deriving Measures of Engagement in Secondary Education from the National Schools Statistics Collection

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DERIVING MEASURES OF ENGAGEMENT IN SECONDARY EDUCATION FROM THE NATIONAL SCHOOLS STATISTICS COLLECTION

Peter D. Rossiter and Christopher J. Duncan

ABSTRACT

In recent issues of *Schools, Australia* (ABS cat. no. 4221.0), the Australian Bureau of Statistics (ABS) has acknowledged shortcomings in the 'headline' measure of student retention in post-compulsory secondary education – 'apparent retention rates'. The identified quality issues raise concerns about the ability of the statistics to accurately measure grade progression or retention in secondary schools, and hence their continued relevance for policy analysis.

In this paper, we seek to promote the wider and better-informed use of the significant repository of education statistics provided by the annual National Schools Statistics Collection. We propose an expansion of the descriptive and analytical statistics published in *Schools, Australia* – including more accurate measures of retention and grade progression – and advocate a more prominent stance on advising upon the appropriate usage of the published statistics.

1. INTRODUCTION

Secondary education has evolved significantly in recent years. Students are expected, even compelled, to stay at school longer. Schools focus increasingly upon connecting students with the expanding vocational education sector, rather than focussing solely on the higher education sector. Secondary education is becoming more accessible to students in remote and disadvantaged regions, and facilities for students with special physical and emotional needs are expanding. Flexible workloads permit students to combine education and employment. Moves to standardise curricula and assessment procedures make it easier for students to move between jurisdictions without penalty. Increasing numbers of private schools, culturally-oriented schools and special-focus schools encourage and accommodate the diversity of skills and interests in the school-age population.

All of these issues merit individual measurement and analysis. They also have the potential to impact profoundly on measures of engagement in secondary education.

In the education literature, the concept of 'engagement' has many dimensions, extending beyond the physical involvement of the student (as measured, for example,

by enrolments, attendance and the completion of educational objectives) to encompass concepts such as psychological attachment and motivational drive.

By this standard, our modest objective in this paper is to encourage better measurement and analysis by reviewing current and potential measures of student involvement obtainable from *administrative* data sources. In the process we hope to accurately reflect the changing educational context and provide some pointers to feasible enhancements of the existing suite of national measures.

The provision of school education in Australia is the responsibility of numerous state and federal government departments and statutory authorities. In Section 2, we explain the involvement of the Australian Bureau of Statistics (ABS) in the collection of education statistics, and hence our motivation to play a role in regularly reviewing and improving upon those statistics for which the ABS has responsibility.

The National Schools Statistics Collection (NSSC) is the product of a collaborative arrangement between Australian education authorities and the Australian Bureau of Statistics, designed to bring together consistent and comparable statistics on primary and secondary education in Australia. We believe the NSSC is currently the most authoritative source of data on student involvement in secondary education. Details of the collection are provided in Section 3.

However, while the NSSC has produced considerable advances in the collection of statistics (especially through the development of uniform classifications, concepts and standards), it appears that the collected data remain under-utilised. This may be attributable in part to the rather low-key approach adopted for promotion of the database in the *Schools, Australia* publication (ABS cat. no. 4221.0).

We believe that the NSSC *is* a valuable repository of data, and we present some initial ideas for revamping the presentation of the data and better utilising the data to inform education analysis and policy-making. In doing so, we seek to distinguish between

- 'descriptive statistics' and 'analytical statistics';
- 'composition' measures and 'transition' measures; and
- concepts such as 'participation', 'retention' and 'progression'.

Without wishing to be overly prescriptive, we apply the term 'descriptive statistics' to simple objective measures (and transformations of measures) which dissect and summarise the raw data. We apply the term 'analytical statistics' to more complex constructs, designed to indirectly measure, impute or evaluate activities that have not been objectively measured or observed. We note that many of our 'analytical statistics' are effectively descriptive in nature, while others imply a comparative ranking or ordering.

Our proposed suite of 'descriptive' and 'analytical' measures is documented in Sections 4–8. In Boxes A–E, we introduce proposed 'headline' measures of participation, retention and progression. In the accompanying discussion, we suggest feasible extensions of the 'headline' measures, while acknowledging limitations and advising on appropriate usage. Included in our proposed suite of measures is a recommended replacement for the current 'apparent retention rates'.

Section 9 summarises the progress we have made and proposes directions for the future.

The Statistical Appendix to this paper contains illustrative data for all states and territories of Australia. Whenever such statistics are compiled in this way, there is an unhealthy temptation to interpret them as 'performance indicators'. We encourage readers to heed the caveats provided in the paper, and consider carefully whether the rates and proportions presented are appropriate for this purpose.

2. THE ROLE OF THE AUSTRALIAN BUREAU OF STATISTICS

School education in Australia is primarily administered at the state and territory level, and the majority of education statistics are collected by education departments and non-government education authorities for their own administrative purposes. These administrative statistics provide the core of the National Schools Statistics Collection (NSSC), which is compiled annually by the Australian Bureau of Statistics (ABS) on behalf of the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA).

The Ministerial Council, comprising government Ministers from all States and Territories and the Federal Minister for Education, Science and Training, is responsible for negotiating, developing and monitoring education policies at the national level, and for determining the scope and format of national reporting on education issues. This latter function is largely delegated to the Council's Performance Measurement and Reporting Taskforce (PMRT).

At MCEETYA's behest, the National Centre for Education and Training Statistics (NCETS) within the ABS collaborates with state and territory education authorities to produce nationally consistent and comparable education statistics which are capable of supporting and informing national policy debates. To meet this objective, the role of the ABS necessarily extends beyond the collection and dissemination of statistics to the development of national classifications, concepts and standards.

Of course the Australian Bureau of Statistics also has an independent charter to collect and disseminate statistics on key social and economic activities such as education, and has a professional interest in ensuring that published statistics are meaningful and relevant to all potential users. In addition to the annual Schools Collection and the quinquennial Census of Population and Housing, the ABS conducts regular surveys of Australian households to expand our knowledge of all education-related activities.

In July 2000, the National Education and Training Statistics Unit (NETSU) was established within NCETS to promote the development of education and training statistics in Australia. NETSU is jointly funded and governed by the ABS, the federal Department of Education, Science and Training (DEST) and state and territory education and training departments. These stakeholders are represented on the NETSU Management Board, which works closely with the ABS to determine the work program and priorities of NETSU. The Board also provides expert feedback and review of the Unit's work.

In 2004, the NETSU Management Board expressed reservations about the quality of the 'apparent retention rates' published in *Schools, Australia* (ABS cat. no. 4221.0). 'Apparent retention rates' are the most prominently publicised measures derived from the National Schools Statistics Collection, and have been used for many years to assess

the performance of the country's secondary education systems. A background investigation was requested, and two critical issues emerged:

- 'Apparent retention rates' do not provide an accurate and consistent measure of grade progression or retention, raising concerns over their usefulness for comparing performance within and across jurisdictions.
- 'Successful completion' of Year 12 is no longer the dominant focus of education policy. At the jurisdiction level and nationally, policies are being developed to promote a broader range of education and training options and opportunities for secondary school students.

Consequently, many policy analysts will modify the published statistics to correct for local peculiarities and perceived inadequacies.

This presented a challenge. How should the ABS address issues of 'fitness for purpose' for a statistic that has such a high public profile – not only among education analysts and policy-makers but also in the wider community?

The NETSU Management Board identified a follow-up of the review as a priority and provided valuable assistance to the process by contributing supplementary data and feedback from the jurisdictional perspective.

In February 2005, the ABS publicised the review of 'apparent retention rates' in the *Schools, Australia* publication and the accompanying article provided a comprehensive list of the specific quality concerns identified in the background investigation. The impact of (international and interstate) migration and alternative educational pathways on the rates were among the more important issues raised.

Subsequently, the ABS has determined that a more accurate measure of the 'apparent retention rate' concept is possible. However, the underlying concept of grade progression is not amenable to accommodating part-time students, repeating students or re-entry students. These students may, however, be included under a broader definition of retention.

Reservations persist, however, regarding the quality of retention and progression measures for Indigenous students. Also, the validity of transition measures at the sector level (government versus non-government schools) remains questionable. In this context, the ABS queried whether a more comprehensive set of participation measures might remove much of the perceived demand for transition estimates.

In this paper, we outline an integrated suite of measures designed to address these multiple perspectives of student *participation*, *retention* and *progression*.

3. THE NSSC DATABASE

The National Schools Statistics Collection (NSSC) is a primary source of essential data on Australia's schools, students and teaching staff. We may characterise the NSSC database as a collection of annual 'snapshots', recording counts of the numbers of schools, students and teachers in Australia on the prescribed annual census dates. These counts may be dissected, as applicable, into various categories:

- Jurisdiction (States and Territories);
- School category or 'sector' (Government, Non-government);
- School size (based on enrolment numbers);
- Level of education (Primary, Secondary);
- Year of education or 'grade' (Pre-year 1, Year 1, …, Year 12);
- Attendance status (Full-time, Part-time);
- Sex (Females, Males, Persons);
- Age (on 1 July of the reference year); and
- Indigenous status (Indigenous, Non-Indigenous).

While the NSSC database is extensive, it is by no means definitive. The need to maintain the consistency and comparability of statistics provided by *all* jurisdictions can preclude the collection of relevant statistics when one or more jurisdictions are unable to comply. Similar considerations can affect the degree to which the statistics may be cross-tabulated. A pertinent example is the absence of information on the ages of part-time students.

Perhaps more importantly, the scope of the NSSC does not extend to the collection of statistics which are necessary to fully explain the *changes* which occur between successive annual 'snapshots'. Examples of such statistics include counts of

- students who complete or terminate their secondary education;
- students who decide to repeat a year of education;
- students who alter their attendance status; and
- students who arrive from interstate or overseas

during the interim period. Without data on these *transitions*, users of the NSSC data cannot properly validate or explain apparent trends in school attendance or engagement.

Recognising these limitations, the compilers of the *Schools, Australia* publication have sought to add value to the raw NSSC data by publishing a limited number of derived 'analytical' measures – most notably, 'participation rates' and 'apparent retention rates'.

The calculation of participation rates involves merging the NSSC data with estimates of the resident Australian population, compiled independently by ABS demographers. This combination adds a significant new perspective to the NSSC data.

The 'apparent retention rate' measure seeks to track the engagement of cohorts of students over time. This is an important analytical perspective, which has been widely accepted by users. Although changes in education (and Australian society generally) have called into question the validity and relevance of this particular measure, there remains considerable scope for extracting relevant information from the NSSC by similarly reorganising and juxtaposing the raw data.

In our view, the range of derived 'analytical' measures currently presented in the publication is too limited to adequately explain current trends in the data. Also, while we have specific concerns about the derivation of 'apparent retention rates', we are perhaps more concerned about the degree of public prominence accorded to such a narrowly-focussed concept. We are particularly worried that this may be indicative of widespread misunderstanding and inappropriate use of the measure.

In the following Sections, we explore ways in which the NSSC database may be better utilised and interrogated to inform education policy-makers and analysts. Specifically, we propose a suite of 'descriptive' and 'analytical' measures which give insights into the *composition*, *participation*, *retention* and *progression* of students in secondary education. These measures are calculated directly from the NSSC database, supplemented only by ABS population estimates.

In related work, the ABS is identifying and compiling additional indicators on the education, training and employment experiences of young Australians who have completed their period of compulsory school education. We shall refer to this initiative as the "Suite of Measures" project in the remainder of this paper.

4. STUDENT NUMBERS

A key attribute of the NSSC is its comprehensive national focus. Perhaps only the quinquennial Census of Population and Housing provides comparable national data on the engagement of young Australians in education.

While the NSSC is promoted as a 'census' of Australian schools and school students, the precise scope of the collection is difficult to define and is subject to annual revision. Some scope aspects which are of relevance to our derived measures include the following:

1. Student counts are inclusive of Full Fee-Paying Overseas Students (FFPOS), whose 'Australian Resident' status may be ambiguous. These students are not separately enumerated in the NSSC, and estimation of their numbers from immigration statistics is complicated by the fact that many students alter the duration of their stay. This is relevant as we wish to contrast student numbers with the Estimated Resident Population (ERP) of the same age and sex. We expect that non-resident FFPOSs will represent only a very minor inconsistency.

2. Some institutions included within the NSSC are fundamentally different from the majority in terms of the courses offered and students enrolled. In particular, institutions which cater predominantly for mature age students or have a substantially vocational focus tend to straddle the scope boundary. Where the enrolments at these institutions reflect an atypical age–grade composition or full-time/part-time mix, or perhaps where the institution employs different assessment criteria, there is potential to distort the aggregate statistics. There are also instances where large 'atypical' institutions move in and out of scope of the NSSC over time, adding further to the pitfalls of aggregate analysis.

3. Special schools, catering primarily for students with significant physical and/or emotional needs (either permanent or temporary), are a further case in point. The majority of students attending such institutions are 'ungraded'. This is problematic for identifying whether these students are *progressing* in their education. As the majority of students with physical and emotional limitations or special needs are actually accommodated within the regular school system, and not separately enumerated, it is difficult to arrive at a consistent statistical treatment for these students.

Perhaps the most important point here is that the aggregate statistics for a jurisdiction do not *necessarily* characterise the 'typical' student, nor reflect accurately the changes over time in 'typical' student behaviour.

The NSSC exists to enable analysts and policy-makers to make comparisons of the national education system over time and across jurisdictions. However, many factors can influence and distort these temporal and spatial comparisons. A key issue in recent years has been the evolution of alternative pathways in post-compulsory education – most notably vocational education and training and opportunities for part-time secondary study. These alternatives encourage students to remain in (or return to) school, while simultaneously drawing students away from the former policy objective of successfully completing full-time secondary studies. As such pathways are not uniformly available to all Australian students, it can be difficult to appreciate their impact when comparing measures of school participation across jurisdictions.

Within every jurisdiction's education system there are peculiarities which hinder comparison with the statistics of other jurisdictions. Perhaps the most pervasive influences are the legislative restrictions and administrative guidelines on the ages and conditions for commencing and leaving school. These conditions significantly determine differences in the age–grade composition of school students between jurisdictions and consequently have a direct impact on measures of retention. Changes to legislation can also introduce abrupt changes or spurious trends to the time series statistics.

Other factors which may contribute to a lack of comparability between jurisdictions, include:

- the geographical dispersion of both students and institutions between urban, rural and remote localities within the jurisdiction;
- whether the jurisdiction operates a 'college' system for Years 11 and 12;
- inconsistencies in the specification of full- and part-time workloads; and
- the degree to which assessment occurs continuously or focuses on key examinations.

Such factors can significantly influence students' decisions regarding post-compulsory education, and may explain the timing of decisions to alter, discontinue or resume their involvement in secondary education.

Note that some of the factors we have identified above do not necessarily characterise the entire education system within a jurisdiction. In some instances, these same factors can define significant differences between the government and non-government sectors within the same jurisdiction.

An important factor influencing comparisons over time (and across jurisdictions) is the rate of change in the underlying population, resulting mostly from interstate and international migration. As an example, 'apparent retention rates' are inflated for

high-growth jurisdictions, because new migrants are continually added to the reference cohort over time.

A key point arising from the above discussion is that comparisons between jurisdictions must acknowledge or allow for a wide range of 'structural' differences. Similar differences may apply in government / non-government school sector comparisons. Changes to structural factors can also distort inter-temporal comparisons.

In designing our proposed suite of derived 'analytical' measures, therefore, it is imperative that we

- indicate whether, in our opinion, the statistics provide a valid and appropriate basis for comparison between jurisdictions;
- understand the true nature of all explicit and implicit comparisons arising from the presentation of our measures; and
- provide adequate information to users on known limitations and caveats.

5. COMPOSITION MEASURES

The first task in reporting on the NSSC is to provide an overview – for example, the numbers of students identified within the scope of the collection, sorted into broad categories such as jurisdiction, school characteristics (sector, level and year of education) and student characteristics (sex, age, attendance and Indigenous status), and contrasted with the numbers obtained from the collections of previous years.

Expressed differently, the objective is to describe the composition of the national school system and identify significant changes or trends over time. Where necessary, this description should acknowledge diversities among the jurisdictions.

We observe that the compilers of the *Schools, Australia* publication have been intentionally frugal in the allocation of tables to this objective, and there exists considerable scope to present the raw data in a more informative manner. There are perhaps three approaches that could be taken:

1. Redesigning the cross-tabulations presented;
2. Presenting transformations of the raw data – such as percentage shares, averages, indexes, growth rates, etc.; and
3. Using graphical techniques.

The key to extracting information is often to conduct a directed search – that is, an interrogation of the database designed to extract answers to specific questions. Of course a process of consultation may be required to achieve consensus on the optimal set of questions to pose. We argue in favour of this approach as we are concerned that users are not currently finding answers to important questions, and may be unaware of the potential of the NSSC to provide answers.

We present a small number of examples to demonstrate our point.

Example 1: What do we know about the drift from government schools to non-government schools?

Table 6 of *Schools, Australia* provides the only relevant data. With the aid of a calculator, we can deduce relevant facts such as

- The respective growth rates of the government and non-government sectors over the past five or ten years;
- The states which have the highest and lowest proportions of students in the non-government sector;
- The states which have experienced the highest and lowest proportional shift to the non-government sector during the past five or ten years.

While we are able to answer these questions from the available data, the answers might be obtained more readily from a table of transformed statistics (e.g. percentage shares) or from a carefully designed graph.

We cannot deduce from the information provided in table 6 whether the drift is stronger for primary students or secondary students, or for males or females. In fact, we cannot even deduce whether individual students are changing sectors, or whether successively younger cohorts of students exhibit a stronger preference for non-government education. These questions could, however, be addressed by alternative presentations of the raw data.

Example 2: What do we know about part-time students?

From table 16 in the *Schools, Australia* publication, we may deduce that the number of part-time students in Australia has remained virtually unchanged for 10 years, almost half of all part-time students live in South Australia and Queensland, and the majority of graded part-time students are enrolled in Year 12. From data provided in the table, we could also conduct a provisional analysis of trends in part-time school education in all jurisdictions. However, we would have to extract unpublished data to discover that 97% of part-time students are enrolled in the government sector, 60% are female and more than 50% are aged 19 years or over.

Example 3: What do we know about age–grade distributions?

Differences in the age–grade distribution of students are a plausible (partial) explanation for differences in 'apparent retention rates'. This is briefly acknowledged by table 19 of the publication which presents the age–grade distributions at national level for Indigenous and non-Indigenous students. However whether or not significant differences actually exist between Indigenous and non-Indigenous age–grade distributions is unlikely to be recognised by most readers. The raw numbers provided are not readily converted into the information that users are seeking from the data.

We know that retention tends to be higher among younger students (partly due to compulsory attendance requirements). This suggests *ceteris paribus* that measures of grade progression will tend to be higher for jurisdictions having a younger mix of students in each grade. The publication provides no jurisdiction level information on age–grade distributions (although the accompanying Data Cubes partially address this shortcoming).

Changes in school entry conditions at the Year 1 or Pre-Year 1 level (e.g. recent changes in Queensland) can have transitory and permanent effects on age–grade distributions. The transitory effects are generally restricted to the first student cohorts affected by the change, and may initially feature large fluctuations in enrolments. As

these cohorts age, they will most likely introduce an altered age distribution to each subsequent grade they enter. Of course it will be twelve or more years before the full effects are introduced. (See footnote (c) to table 10 of the publication, for example.)

We have already noted the lack of age–grade information, but it is also virtually impossible to track any temporal effects on student enrolments of legislative changes or policy initiatives. This is because the presentation of data over time in the *Schools, Australia* publication does not readily support the tracking of 'cohort' effects.

Of course the ideal table for tracking cohort effects contains annual data corresponding to single years of age or single years of education (grades). Useful information however can be obtained by simply ensuring some conformity between the reference years presented and the range of ages or grades to be examined.

As an example, the tabulation of aggregate data for *Secondary schools* for the reference years 1980, 1985, 1990, 1995, 2000, 2003, 2004, 2005 (as in table 7 of the publication) does not support the tracking of cohort effects. An alternative selection of reference years – 1985, 1989, 1993, 1997, 2001, 2002, 2003, 2004, 2005 – does.

The most important feature of the alternative scheme is that the inclusion of five single years (2001–2005 in the example) allows the student intake cohort to be monitored for all years as the students move through their secondary education (defined here as Years 8 through 12). The spacing for earlier years recognises that the Year 8 students of 1997 and the Year 12 students of 2001 are effectively from the same cohort.

This focus on cohort effects will also be important to our subsequent discussion of *retention* and *progression* measures – where it will be important for the presentation of the raw data to support and enhance understanding of the 'analytical' measures.

Tables A.1–A.5 in the Statistical Appendix provide a general overview of the numbers and characteristics of Australian secondary students in 2005. However, the tables have not been designed to meet the information standards discussed in this Section, and are not intended to be illustrative of future publication layouts.

6. PARTICIPATION MEASURES

The first of our proposed 'analytical' statistics are the *participation* measures.

The purpose of participation measures is to move the focus of composition measures from the sub-population of persons who are within scope of the NSSC (i.e. school students) to *all* Australian residents of similar age.

To compute participation measures, the data from the NSSC and the supplementary demographic data must be conformable (or at least nearly so). We address this issue by separately considering the key dimensions of the data:

- The benchmark population statistic in Australia is the *Estimated Resident Population*. As noted earlier, not all school students are Australian residents. Students from overseas who enter Australia on a short-term visa (less than 12 months) are not considered Australian residents, although they *are* counted in the NSSC. As we are unlikely to obtain detailed accurate and reliable data on the numbers of such students, we simply note that their impact on our participation measures is likely to be negligible.
- Jurisdiction boundaries for the NSSC conform closely to those underlying ERP estimates. The main differences arise from the treatment of the smaller Australian Territories. The NSSC adds the statistics for Jervis Bay to those for the Australian Capital Territory and Norfolk Island to New South Wales. We do not have ERP estimates for these combined jurisdictions, and consequently the participation measures for the ACT and NSW may be very slightly overstated. We do not have school statistics for the Indian Ocean Territories of Christmas Island and the Cocos (Keeling) Islands.
- Some school students attend school in a different jurisdiction from the jurisdiction in which they reside (e.g. students in Canberra/Queanbeyan, Albury/Wodonga, Coolangatta/Tweed Heads). This is unlikely to have any noticeable impact on participation measures for the larger jurisdictions. In the case of the ACT, however, the effect is highly visible.
- Age is defined almost consistently since Age on 1 July (NSSC) aligns very closely with the ERP reference date of 30 June. We find it useful to use the concept of *Financial Year of Birth* to define both student and population cohorts. As an example, a student aged 14 years on the NSSC reference date of 1 July 2005 is assigned a financial year of birth of 1990–91.
- The reference date for demographic data (30 June) does not necessarily align well with the NSSC census date (first Friday in August), but it may be argued that the NSSC census date is simply set for administrative convenience and that the data collected are representative of the full school year.

Our proposed 'headline' measure of student participation is the *School Participation Rate* (*SPR*).

A. SCHOOL PARTICIPATION RATES

Definition:

School Participation Rates (*SPR*s) measure the proportion of Australian residents of a specified age who are enrolled in school on a specified reference date.

Derivation:

$$SPR(a, y) = \frac{SN(a, y)}{ERP(a, y)} \times 100\%$$

where

$SN(a, y)$ = Number of school students aged a years in year y

$ERP(a, y)$ = Estimated resident population aged a years in year y

Details:

- We propose calculating *SPR*s for single years of age, ranging from $a = 14$ years – 19 years.
- Numbers of students are determined at the NSSC census date in calendar year y, student ages are as at 1 July in year y, and the ERP is estimated at 30 June in year y.
- Student numbers include both full-time and part-time students.
- School Participation Rates should be calculated for both females and males within all jurisdictions and nationally.

Note that the 'school age participation rates' which currently appear in *Schools, Australia* are *full-time* participation rates. By including both *full-time* and *part-time* students, the *SPR* is a more inclusive measure of student participation.

Table B.1 in the Statistical Appendix reports experimental estimates of *SPR*s for all jurisdictions in 2005.

As suggested by the definition, *SPR*s are essentially composition measures, providing point-in-time information on the engagement of young Australians. In this context, several decompositions of the *SPR* will be of interest:

1. SPR by attendance status:

$$SPR(a,y) = SPR^{FT}(a,y) + SPR^{PT}(a,y)$$

where $SPR^{FT}(a,y)$ and $SPR^{PT}(a,y)$ denote the rates of participation in full-time and part-time school education respectively. (See table B.2 in the Statistical Appendix.)

2. SPR by school category or sector:

$$SPR(a,y) = SPR^{G}(a,y) + SPR^{NG}(a,y)$$

where $SPR^{G}(a,y)$ and SPR^{NG} denote the rates of participation in government and non-government school education respectively. (Acknowledging some heterogeneity within the non-government sector, a further breakdown to examine participation in the Catholic and Independent non-government sectors may be warranted.) (See tables B.3 and B.4 in the Statistical Appendix.)

3. SPR by year of education or grade:

$$SPR(a, y) = \sum_{g} SPR(a, g, y)$$

where $SPR(a,g,y)$ denotes the proportion of Australian residents of age a years who are enrolled in grade g in year y. Typically Australians within the age range considered (14–19 years) will be distributed over all secondary grades and some primary grades.

There is increasing policy interest in compiling measures of school participation for Indigenous Australians. For such measures we will require reliable estimates of the Indigenous population. We will also require that Indigenous persons be identified consistently and exhaustively within both the NSSC and the Population Census (the benchmark for the annual demographic estimates). We are not confident that sufficiently consistent and reliable data exist at the jurisdiction level, but propose to investigate the possibility of computing male and female Indigenous participation measures at the national level. The ABS is currently working collaboratively with jurisdictions to address a range of issues which may be responsible for an under-count of Indigenous students.

In rural and remote areas, participation rates in the upper secondary grades may be affected by the absence or relative inaccessibility of schools which provide this level of education. At present, the NSSC data does not facilitate the analysis of data at a regional level, but this may be feasible in future.

School Participation Rates drop rapidly from almost 100% at age 14 (an age at which education is compulsory) to almost 0% at age 19 (an age by which the majority of Australians have either completed or terminated their secondary education).

The rate of decline in the *SPR* with age is determined by the average age at which students within the jurisdiction terminate their secondary school education. This, in turn, may be driven by the range of alternative education and employment pathways available to students. Both of these factors suggest strongly that comparisons of *SPR*s between jurisdictions will often be invalid, as higher *SPR*s do not necessarily indicate superior educational outcomes.

'Non-participation in school' encompasses labour force participation, vocational education and training and higher education. It also includes the largely unidentified proportion of the population who are not engaged in either education or the labour market. The 'Suite of Measures' project currently being developed by the ABS is intended to supplement *SPR*s by filling the gaps in our knowledge of the educational and labour market engagement of Australians aged 15 years and over.

Although we have noted that care must be exercised in comparing the numerical values of *SPR*s, there are circumstances where these may validly be compared:

- Differences in female and male *SPR*s from the same jurisdiction can indicate an imbalance in the educational and vocational opportunities provided to males and females (e.g. apprenticeships and traineeships have traditionally attracted more males than females). Such insights could not be obtained from the raw NSSC data alone.
- *SPR*s might validly be compared between jurisdictions whose education systems are assessed to be very similar. Alternatively, differences in *SPR*s might be postulated to arise as the consequence of identified differences in education systems. Clearly both types of case study have inherent dangers for inexperienced practitioners.
- Comparisons of age-specific *SPR*s over time within a jurisdiction can provide valid performance measures for monitoring policy-driven objectives (e.g. student retention beyond the statutory leaving age). In this case we compare outcomes for successive student intake cohorts. As these cohorts participate within essentially the same education system, differences in their *SPR*s may be attributed either to policy innovations or changing economic circumstances and opportunities.

Users should be wary of attributing significance to small differences in *SPR*s. The compilation of ERP estimates by single year of age is a complex exercise in demographic analysis, and the resulting estimates should not be assumed to be exact. Indeed there is an annual revision cycle employed in the production of ERP estimates

between quinquennial Population Censuses. These revisions reflect adjustments to migration and mortality statistics, with overseas migration having the dominant impact on the school age population. Furthermore, every five years ERP is rebased to the latest Census data, resulting in revisions to ERP for the previous five years. It is important to note however that any errors present in the published ERP estimates do not take the form of random fluctuations, and hence ERP estimates should retain a strong consistency between one period and the next.

For further information on the quality issues associated with ERP estimates, please refer to the Explanatory Notes in *Population by Age and Sex, Australian States and Territories* (ABS cat. no. 3201.0).

One of the more important perspectives on participation rates is to track the participation of 'common birthyear' cohorts of students over time. Cohorts are conveniently defined by their (financial) year of birth. For example, persons born in 1990–91 will be aged 12 in reference year y=2003, 13 in 2004, 14 in 2005, etc.. By tracking individual cohorts we can identify at what age students choose to leave school and perhaps assess the impact of their accumulated experiences upon this decision. The *retention* measures presented in the following section are intended to provide further insights into cohort-specific *SPR*s.

7. RETENTION MEASURES

In this section we examine analytical measures of retention which focus upon single birthyear cohorts of school students.

Our proposed 'headline' measure of retention is the *Apparent Continuation Rate* (*ACR*).

B. APPARENT CONTINUATION RATES

Definition:

Apparent Continuation Rates (*ACR*s) measure the proportion of a birthyear cohort of school students who do *not* leave school between one year and the next.

Derivation:

$$ACR(a, y) = \frac{SPR(a, y)}{SPR(a-1, y-1)} \times 100\%$$

where a denotes age, or equivalently,

$$ACR(b, y) = \frac{SPR(b, y)}{SPR(b, y-1)} \times 100\%$$

where b denotes financial year of birth, observing that students aged a–1 in year y–1 and a in year y belong to the same birthyear cohort, b.

Details:

- We propose calculating annual *ACR*s for single years of age, ranging from $a = 15$ years – 19 years.
- Both full-time and part-time students are included in this measure.
- *ACR*s should be calculated for both females and males within all jurisdictions.
- *ACR*s for 'persons' are derived as a weighted sum of female and male *ACR*s. Similarly, *ACR*s for Australia are derived as a weighted sum of the *ACR*s from all states and territories. In both cases, the weights used in the calculation reflect the composition of the reference cohort of students in year y–1.

We have employed the label "apparent continuation rate" (*ACR*) to avoid confusion with the currently published "apparent retention rate" (*ARR*) measures. In our opinion, our age-specific *ACR* measure provides a more inclusive and relevant

measure of "retention" than the current *ARR* – which we prefer to classify as a "progression" measure (see next Section).

We continue to use the adjective "apparent" to indicate that we are computing an *indirect* measure of retention. We noted in Section 3 that the NSSC does not collect data on student *transitions*. Hence we cannot discover precisely how many school students would appear on both the list of students aged a–1 in year y–1 *and* the list of students aged a in year y.

In a world without migration and death and where re-entry to the school system is not permitted, this lack of *transitions* data would present no obstacle, as retention could be accurately deduced by calculating the simple ratio:

$$RR(a,y) = \frac{SN(a,y)}{SN(a-1,y-1)} \times 100\%$$

where $SN(a,y)$ denotes the number of school students aged a years in year y.

The assumptions underlying this naïve measure are not dissimilar to those behind the "apparent retention rates". However, we believe it is possible to achieve a significant improvement in accuracy without sacrificing the simplicity and transparency of the naïve measure.

The measure we propose – a ratio of school participation rates – represents a modification of the naïve estimate to allow for population changes arising from migration and deaths. This can be seen by expanding and rearranging the formula (from Box B) as follows:

$$\begin{aligned} ACR(a,y) &= \left\{ SPR(a,y) / SPR(a-1,y-1) \right\} \times 100\% \\ &= \left\{ \frac{SN(a,y)}{ERP(a,y)} \Big/ \frac{SN(a-1,y-1)}{ERP(a-1,y-1)} \right\} \times 100\% \\ &= \left\{ \frac{SN(a,y)}{SN(a-1,y-1)} \Big/ \frac{ERP(a,y)}{ERP(a-1,y-1)} \right\} \times 100\% \\ &= RR(a,y)/\gamma \end{aligned}$$

where γ adjusts for net growth in the underlying reference population.

Under the assumption that the proportion of school students is similar among migrants and non-migrants of the same age and sex, and that death affects students and non-students alike, we believe our population adjustment to be plausible. Note that we are effectively calculating a retention measure for students *who do not leave their jurisdiction* between NSSC census dates. (We may also postulate that *ACR*s measure the likelihood of retention among departing migrants if, hypothetically, they had remained within the jurisdiction.)

However, our population correction addresses only one of the two identified flaws in the naïve measure. We must still consider the possibility that some (non-migrant) school students counted in year y were not school students in year y–1. For the most part, such students will be 're-entry' students, although students who move to a school within the jurisdiction whilst continuing to reside in a different jurisdiction must also be considered. The effect of these students is always to inflate the *ACR*.

Where data on the numbers of re-entry students and cross-border students are available, we would recommend calculating an appropriate adjustment factor. In the absence of such data, we must assess the likely magnitude of the bias introduced by these students before recommending use of these measures.

We cannot produce meaningful estimates of retention where the birthyear cohort experiences a significant inflow of re-entry and cross-border students between NSSC census dates.

Fortunately, for most jurisdictions and most age-groups, we consider the likely bias to be minimal.

Re-entry students impact almost exclusively on the older age-groups (18 years plus), and retention measures for these ages must always be treated sceptically. While older students terminating their school education greatly outnumber the re-entry students – i.e. the flow of students is predominantly one-way – bias results from the fact that the number of re-entry students is 'high' relative to the number of continuing students for these older age-groups.

We believe the ACT is the only jurisdiction in which retention measures are likely to be significantly distorted by the impact of cross-border students.

Table C.1 in the Statistical Appendix provides experimental estimates of age-specific Apparent Continuation Rates for all jurisdictions in 2005.

In our discussion of School Participation Rates, we recommended decomposing the *SPR* by attendance status (full-time and part-time), school sector (government and non-government) and grade. It is therefore appropriate to investigate whether retention measures based on these decompositions are likely to be sensible and practical. Following our discussion above, we must base our decision upon two considerations:

1. Are the population effects (migration, death) likely to impact uniformly on the component groups (full-time and part-time students / government students and non-government students)?

We have not studied this problem, but would be prepared to accept this as a reasonable assumption.

2. Are any of the component groups likely to experience a significant inflow of (non-migrant) students?

In this case, we must consider not only re-entry and cross-border students, but also those students who cross definitional boundaries (i.e. of attendance status and school sector) between one year and the next.

The majority of part-time school students are either former full-time students who have modified their workload, or re-entry students. Both cases account for 'large' annual inflows to the reference cohort, and therefore it is not practical to derive *apparent continuation* measures for part-time students. On the other hand, we speculate that part-time students rarely convert back to a full-time workload. Hence, for jurisdictions and age cohorts where the overall *ACR* for *all* students is deemed acceptable, we consider it will be reasonable to compute measures of retention for *full-time* school attendance. (We shall revisit full-time *ACR*s later in our discussion of *progression* measures.)

Table C.2 in the Statistical Appendix provides experimental estimates of Apparent Continuation Rates for *full-time* school students for all jurisdictions in 2005.

In many jurisdictions we find a net movement of students from the government school system to non-government schools. Where this is the case, it will generally be inappropriate to compute *ACR*s for the non-government sector. It may, however, be reasonable to compute *ACR*s for government education in cases where it can be established that the flow of students is almost exclusively from the government sector to the non-government sector – but not where there are significant (offsetting) movements in the other direction.

Table C.3 in the Statistical Appendix provides experimental estimates of Apparent Continuation Rates for students attending government schools for all jurisdictions in 2005. At this time, we leave decisions regarding the appropriateness of these measures to the informed reader.

Like *SPR*s, *ACR*s are essentially 'descriptive'. In general, they do not necessarily measure degrees of success or failure against a performance objective (i.e. 100% does not necessarily denote an optimal outcome). Nor can *ACR*s always be compared meaningfully between jurisdictions without qualification and explanation.

Only by integrating *ACR*s with other transition measures can we form a view of whether or not the education system is delivering desired outcomes. For example, by adding the *ACR* to a measure of the proportion of the reference cohort who successfully complete Year 12 we may deduce that the residual proportion leave school without obtaining this qualification.

In general, these supplementary transition measures cannot be extracted from the NSSC database, and the 'Suite of Measures' project has been set up to locate other sources of such information.

While there is certainly potential interest in an age × grade breakdown of retention measures, our *apparent* retention measure is generally incapable of providing this information. This is because the students from grade g–1 in year y–1 will be dispersed between grade g–1 (predominantly part-time and repeating students) and grade g in the following year, and indistinguishable from the students of adjacent birthyear × grade cohorts. That is, we cannot define a suitable numerator for our *ACR* calculation as the grade in which students are enrolled in year y is generally not relevant to our concept of retention. (The subgroup of *full-time* students who progress from grade g–1 in year y–1 to grade g in year y will be discussed further in the section on *progression* measures.)

However, rather than considering an age × *single* grade breakdown of retention measures, let us consider the cohort of students from birthyear b enrolled in all grades up to but not including grade g. In the following section we demonstrate that it is feasible to compute a limited number of meaningful *ACR*s which have a grade dimension. Furthermore, as these *ACR*s are defined by both age and grade, they are potentially more comparable across jurisdictions than the purely age-specific *ACR*s introduced earlier.

C. APPARENT CONTINUATION RATES – GRADE COHORTS

Definition:

This variant of Apparent Continuation Rates (*ACR*s) measures the proportion of a birthyear cohort of school students, enrolled in grades up to but not including a specified grade, who do *not* leave school between one year and the next.

An important (converse) application of this measure is that it can help to identify the proportion of a birthyear cohort of school students who withdraw from school without enrolling in or completing the specified grade.

Derivation:

$$ACR(a, g^*, y) = \frac{\sum_{g \le g^*} SPR(a, g, y)}{\sum_{g < g^*} SPR(a-1, g, y-1)} \times 100\%$$

where a denotes age, and g^* denotes the specified grade, or equivalently,

$$ACR(b, g^*, y) = \frac{\sum_{g \le g^*} SPR(b, g, y)}{\sum_{g < g^*} SPR(b, g, y-1)} \times 100\%$$

where b denotes financial year of birth, observing that students aged a–1 in year y–1 and a in year y belong to the same birthyear cohort, b.

Details:

- We propose calculating annual *ACR*s for single years of age, and grades ranging from g^* = Year 10 – Year 12.
- Both full-time and part-time students are included in this measure.
- *ACR*s should be calculated for both females and males within all jurisdictions.
- *ACR*s for 'persons' and Australia are calculated as weighted sums of component *ACR*s, as previously described in Box B.

For these measures to be useful, we must be able to assume that almost all students identified in the numerator (year y) belong to the reference cohort defined by the denominator (year y–1). Generally this assumption may only be safely applied to cases where the reference cohort comprises the younger students in the age–grade profile (i.e. students aged 13 and 14 years in Year 9, or 14 and 15 years in Year 10, etc.). For older age cohorts, the numerator will pick up a higher proportion of repeating, part-time and re-entry students who have the same birthyear but are not members of the reference cohort. In practice, this restriction is not a significant drawback, as the majority of school students are to be found in the younger age cohorts.

The following table lists the age–grade cohorts for which our proposed retention measure is likely to be informative:

Cohort	*Year y–1 (denominator)*	*Year y (numerator)*
1	Students aged 14 years in grades 9 & under	Students aged 15 years in grades 10 & under
2	Students aged 14 years in grades 10 & under	Students aged 15 years in grades 11 & under
3	Students aged 15 years in grades 10 & under	Students aged 16 years in grades 11 & under
4	Students aged 15 years in grades 11 & under	Students aged 16 years in grades 12 & under
5	Students aged 16 years in grades 11 & under	Students aged 17 years in grades 12 & under

Table C.4 in the Statistical Appendix provides experimental estimates of these Apparent Continuation Rates, by grade cohort for all jurisdictions in 2005.

Two of the identified cohorts (cohorts 2 and 4) are in fact indistinguishable from their corresponding age-specific cohorts, since there are effectively no 14 year old students in grade 11 or 15 year old students in grade 12. It is, however, informative to describe the cohorts as above because the grade cohort definition emphasises the years of secondary education attained by the student.

By contrasting the *ACR*s for cohorts 1 and 2 (or 3 and 4) we can deduce whether retention rates are influenced by the number of years of education attained. Is a 15 year old student in grade 10 more likely to continue than a 15 year old student who has already completed grade 10? Comparison of cohort 5 with the age-specific *ACR* for students aged 16 years in year y–1 is less informative, as many of these students will complete their secondary education between year y–1 and year y. This is especially so in jurisdictions where the average age of students in each grade is lower.

Caution should be exercised in contrasting cohorts 2 and 3 (or 4 and 5), however. As the students in the younger cohort are more likely to be enrolled in a lower grade, it would be incorrect to attribute differences purely to age effects.

Cohort comparisons between jurisdictions must also be treated cautiously where the grade distributions for a specified age-group are likely to vary greatly. In all jurisdictions, however, the majority of 14 year olds are enrolled in grade 9, 15 year olds in grade 10, etc., and hence we suggest that most comparisons will be reasonable.

Perhaps the most practical application of this *ACR* variant is to discover the stage at which students withdraw from school. From the *ACR* for cohort 3, for example, we may estimate the proportion of 15 year olds leaving school before proceeding to Year 11:

$$\text{Withdrawal rate} = \left[100 - ACR(a = 16, g^* = 11, y)\right]\%.$$

Such information is potentially valuable in developing profiles of alternative educational pathways.

In the following section, we introduce a further class of measures which may be compared usefully across jurisdictions – the *progression* measures.

8. PROGRESSION MEASURES

Within the context of our suite of 'analytical' measures, 'progression' has a very precise meaning. It refers to the successful transition of full-time school students from one grade to the next within the standard time-frame of one grade per year. This is the experience of the majority of school students.

We propose two 'headline' measures of progression – *Apparent Progression Rates* (*APR*s) and *Apparent Grade Progression Rates* (*AGPR*s).

D. APPARENT PROGRESSION RATES

Definition:

Apparent Progression Rates (*APR*s) measure the proportion of a birthyear cohort of full-time school students who progress from one specified grade to the next between annual NSSC collections.

Derivation:

$$APR(a,g,y) = \frac{SPR^{FT}(a,g,y)}{SPR^{FT}(a\text{–}1,g\text{–}1,y\text{–}1)} \times 100\%$$

where a denotes age, and g denotes grade, or equivalently,

$$APR(b,g,y) = \frac{SPR^{FT}(b,g,y)}{SPR^{FT}(b,g\text{–}1,y\text{–}1)} \times 100\%$$

where b denotes (financial) year of birth, observing that students aged a–1 in year y–1 and a in year y belong to the same birthyear cohort, b.

Details:

- We propose calculating annual *APR*s for single years of age, ranging from a = 13 years – 18 years, and grades g = Year 9 – Year 12.
- Only full-time students are included in this measure.
- Apparent Progression Rates should be calculated for both females and males within all jurisdictions.
- *APR*s for 'persons' and Australia are calculated as weighted sums of component *APR*s, as previously described in Box B.

The formula used to derive *APR*s is clearly analogous to the *ACR* formula, applied to a specific subgroup of students and employing a narrow interpretation of retention. As for *ACR*s, we use the descriptor 'apparent' to emphasise the indirect nature of our measure, and our inability to restrict our calculation exclusively to the students from our chosen reference cohort – *viz*. full-time students in grade g–1 in year y–1 who were born in (financial) year b.

APR estimates are likely to be more accurate for the dominant age cohorts within each grade (i.e. ages a = 13–15 years in grade g = 9, ... , ages a = 16–18 years in grade g = 12). Table D.1 in the Statistical Appendix provides experimental estimates of selected Apparent Progression Rates for all jurisdictions in 2005.

Repeating and re-entry students are usually found in the older age cohorts of each grade, and their numbers are greater in the higher grades. As a result, *APR*s frequently exceed 100% for these cohorts, and we do not recommend presentation of these estimates. In some jurisdictions, the youngest age cohort is very sparsely populated (e.g. less than five percent of the grade population), and apparently anomalous *APR*s can arise from the impact of small numbers of young migrants and students who make accelerated progress in their studies. Where these *APR*s are clearly providing unreliable estimates of *actual* progression rates, we would also recommend their exclusion.

In promoting *APR*s as comparative indicators, we make the subjective assumption that higher *APR* values are superior to lower values. Certainly we maintain that it is more desirable for students to make normal progress in their education than to withdraw completely from education or repeat grades. However jurisdictions which have policies designed to encourage part-time secondary study and non-school based vocational education and training programs may argue that choosing to follow these educational alternatives should not be equated with failure to progress.

We do not dispute these concerns, but put forward the following responses:

- The term "progress" is not intended to convey a value judgement regarding alternative education pathways. However, most jurisdictions still choose to target high rates of Year 12 completion.
- As more than 98% of Australian secondary school students are enrolled full-time, it is entirely appropriate to propose a comparative indicator that pertains exclusively to full-time students.
- The limitations of the NSSC database make it impossible to identify which part-time students belong to a given reference cohort, or to distinguish successful part-time students from repeating part-time students. Hence there is no practical way in which we could modify the *APR* measure to include successful part-time students.

- The *SPR* and *ACR* measures presented in previous sections acknowledge and highlight the contribution of part-time education options, and may usefully supplement the *APR* measures in providing a comprehensive overview of educational outcomes – where this is deemed necessary.

While we are satisfied that *APR*s are meaningful comparative indicators, the sheer number of age × grade *APR*s restricts their usefulness for comparing outcomes across jurisdictions. For this purpose, we propose our second 'headline' measure of progression – *Apparent Grade Progression Rates* (*AGPR*s).

E. APPARENT GRADE PROGRESSION RATES

Definition:

Apparent Grade Progression Rates (*AGPR*s) measure the proportion of full-time school students who progress from one specified grade to the next between annual NSSC collections.

Derivation:

$$AGPR(g, y) = \sum_b w_b \, APR(b, g, y)$$

where

$$w_b = \frac{\text{Number of FT students from birthyear cohort } b \text{ in grade } g\text{–}1 \text{ in year } y\text{–}1}{\text{Number of FT students in grade } g\text{–}1 \text{ in year } y\text{–}1}$$

and $\sum_b w_b = 1$

Details:

- We propose calculating annual *AGPR*s for grades g = Year 9 – Year 12.
- Only full-time students are included in this measure.
- Apparent Grade Progression Rates should be calculated for females, males and persons within all jurisdictions and nationally.

Whereas most previous measures in our suite have focused on students' ages, and especially the age at which students complete or terminate their secondary education, the *AGPR* focuses on the number of years of education attained by students.

Each secondary grade comprises 2–3 dominant age cohorts of full-time students, with perhaps several older age cohorts accommodating mainly the small numbers of repeating and re-entry students. *AGPR*s are computed by weighting together the *APR*s of the component birthyear cohorts within each grade.

We have already noted the potential for many age cohorts (especially the older age cohorts) to report *APR*s which exceed 100%. Clearly such *APR*s are seriously flawed as measures of *actual* progression. We must then assume that their inclusion in the calculation can only introduce bias, and consider ways in which this bias may be minimised. We propose two (not necessarily mutually exclusive) strategies:

1. By restricting our calculation to the dominant age cohorts within each grade, we may use the best quality estimates, and sacrifice little in coverage (*restricted cohorts calculation*) [1];

2. The non-dominant cohorts in each grade generally have a very low weight in the calculation, and only contribute significantly when the cohort *APR* is extraordinarily large. By constraining the component *APR*s to be no greater than their theoretical maximum of 100%, we can minimise the damaging impact of these cohorts (*constrained APR calculation*).

Our preferred approach is to restrict the calculation to the three (3) dominant age cohorts (ages a = 13–15 years in grade g = 9, ... , ages a = 16–18 years in grade g = 12) and employ the *constrained APR* approach for these cohorts where applicable.

When the *constrained APR* approach is employed, choosing the number of age cohorts to include becomes only a secondary consideration, as almost identical outcomes result from the decision to use three, four or five cohorts. Alternatively, if we choose to restrict the *AGPR* calculation to three age cohorts, then the decision regarding the constrained *APR* calculation becomes likewise almost redundant. It is this convergence of results which guided our choice of methodology.

We emphasise that our *AGPR* measures should strictly be viewed as upper bounds for the 'true' grade progression rates – predominantly because we cannot fully remove the impact of repeating and re-entry students. However, we are confident that our proposed derivation will provide sufficiently accurate estimates of the 'true' rates to be useful comparative indicators.

We are aware that a wide range of legislative and structural factors will influence the *AGPR* measures for each jurisdiction. Fluctuating economic conditions and employment opportunities also play a significant role. Ryan and Watson (2006) provide a comprehensive discussion of the influence of jurisdiction effects on 'apparent retention rates' which is also very pertinent in the context of *AGPR*s.

While acknowledging these factors and effects, we do not believe they invalidate the information content of the *AGPR* measures – i.e. how far full-time students are progressing in their secondary education. They do, however, impact upon the status of the measures as 'performance indicators'.

1 When restricting the number of birthyear cohorts employed in the *AGPR* calculation, it is necessary to re-scale the subset of weights, w_b, so that they again sum to unity.

Some discussants have expressed reservations regarding application of the *constrained APR* methodology to *APR* estimates which are subject to error or revision. We acknowledge that ERP estimates *are* subject to revision, and that a degree of scepticism is warranted regarding the precision of ERP estimates at the single year of age × sex level for smaller jurisdictions. Our understanding is that these reservations pertain to the potential for downward bias in *AGPR* estimates due to the asymmetric treatment of errors.

We would contend that

- the concurrent application of the *restricted cohorts* approach minimises the impact of the *constrained APR* methodology, and
- the remaining *APR* estimates already have a substantial upward bias which is extremely unlikely to be offset by this procedure.

Hence we are satisfied that application of the *constrained APR* methodology will deliver an improvement in accuracy, and therefore we retain confidence in our proposed methodology.

An unresolved issue for us at this stage concerns the treatment of 'ungraded' students. There are no obstacles to the inclusion of 'ungraded' students in measures of participation and retention. However, the absence of grade information would naturally preclude these students from progression measures.

It might be argued, however, that the majority of ungraded students are full-time students of special schools who are progressing within the limitations of their physical or emotional disabilities. We suggest that their treatment in progression measures should probably reflect the grading accorded students with similar needs and disabilities attending regular secondary schools. If, for example, the majority of these students remain with their similarly-aged classmates from year to year, and are assigned a nominal grade accordingly, then we would recommend applying a consistent approach for students at special schools.

In our experimental *AGPR* estimates we have, in fact, chosen to impute grades for 'ungraded' full-time students based upon their age and the age–grade profile of their jurisdiction. We believe the impact of this decision to be quite neutral on the overall statistics, with the potential benefits of proving more inclusive and consistent. However, we remain open to alternative suggestions, and accept that further investigations may be appropriate.

Table D.2 in the Statistical Appendix provides experimental estimates of Apparent Grade Progression Rates for all jurisdictions in 2005. These estimates have been calculated using our preferred methodology as described above. Imputed grades have been used to include 'ungraded' students in the calculations.

As an alternative to presenting the single year *AGPR*s, we suggest it may be more informative to track the progress of single birthyear cohorts of students from grade 8 through to grade 12 by tabulating the sequence:

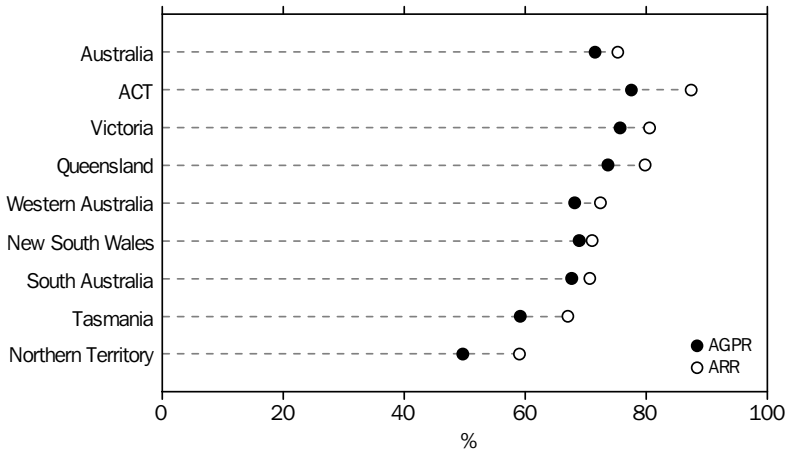
Grade 8–9 $AGPR = AGPR(9,y-3)$;
Grade 8–10 $AGPR = AGPR(9,y-3) \times AGPR(10,y-2)$;
Grade 8–11 $AGPR = AGPR(9,y-3) \times AGPR(10,y-2) \times AGPR(11,y-1)$;
Grade 8–12 $AGPR = AGPR(9,y-3) \times AGPR(10,y-2) \times AGPR(11,y-1) \times AGPR(12,y)$.

Experimental estimates of these cumulative *AGPR*s have been included in table D.3 of the Statistical Appendix.

The Grade 8–12 *AGPR*s provide an estimate of the proportion of full-time students who progress successfully from grade 8 to grade 12. This is the same concept that the currently published 'apparent retention rates' purport to measure. We consider our proposed derivation to be considerably more accurate, and recommend that it replace the existing measure.

Figure 8.1 contrasts our experimental Grade 8–12 *AGPR*s with the 'apparent retention rates' published in *Schools, Australia 2005*.

8.1 Comparison of Grade 8–12 AGPRs and Grade 8–12 Apparent Retention Rates, 2005



We suggest that the sizable discrepancies evident in figure 8.1 provide a convincing argument for continuing development of the new measures.

The disparities in figure 8.1 clearly vary widely across jurisdictions – not only because of varying migration patterns but also perhaps due to the varying jurisdictional biases present in the 'apparent retention rates'. We note further that our detailed experimental estimates (not included here) also display considerable variation in the impact of the new methodology upon male and female progression measures (at the jurisdiction level). Comparisons of progression measures over time are likewise affected.

9. CONCLUSION

In this paper, we have proposed an expansion of the descriptive and analytical statistics published in *Schools, Australia* (ABS cat. no. 4221.0). Our motivation has been to promote wider and more informed use of the significant repository of education statistics provided by the annual National Schools Statistics Collection.

Our interest was prompted initially by criticism of the quality of published 'apparent retention rate' measures. We quickly became concerned that many users appeared to be attributing to the measures a degree of accuracy and validity which could not be supported by their method of derivation. We also observed that users were interested in several variations on the concept of 'retention', suggesting the need to devise a range of explicitly-defined retention and progression measures.

The first of our recommended strategies is to review the current presentation of NSSC data from the perspective of important policy issues. Many issues might be addressed by simply reorganising the data or presenting simple transformations of the raw data. All statistics must be accompanied by essential caveats and advice on usage.

Participation rates play an important role by placing school attendance within the wider context of all education and labour market opportunities facing young Australians. We would contend that the majority of education policy issues can be substantially addressed by the informed use of participation rates. Our proposed School Participation Rates should provide the foundation for a more comprehensive collection of participation measures – as envisaged by the 'Suite of Measures' project.

Our proposed measures of retention and progression essentially compare and report on the way participation rates *change* over time, both within and between individual cohorts of students (defined by birthyear and/or grade).

Some of our proposed 'analytical' measures may fulfill the role of comparative or 'performance' indicators – most do not. There are many 'structural' reasons why measures differ between jurisdictions. In presenting our measures it will be important to avoid layouts that promote inappropriate comparisons between jurisdictions.

An important future direction for this work is to combine all relevant information extracted from the NSSC database with alternative sources of education, training and employment information, and investigate suitable options for dissemination to potential users. These tasks fall within the objectives of the ongoing 'Suite of Measures' project currently being undertaken by the ABS.

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STATISTICAL APPENDIX

The tables in this Statistical Appendix have been included to provide readers with a realistic perspective of the measures described in this paper.

The raw data have been extracted from the National Schools Statistics Collection (NSSC) database for 2005 and earlier years, supplemented by information provided by individual jurisdictions and ABS demographic data. Nevertheless, the data and derived estimates in this Statistical Appendix should be regarded as experimental and treated with caution. If quoted, the estimates should be attributed to the authors of this paper rather than the Australian Bureau of Statistics.

Measures have been included for all states and territories in the expectation that many readers will have a working knowledge of the statistics of their own jurisdiction, and may therefore relate more readily to this form of presentation. However, we emphasise that the resulting tables have been designed purely for brevity of presentation, and encourage readers to consider whether implied comparisons between jurisdictions are appropriate.

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A.1 SECONDARY STUDENTS, By attendance status and grade, 2005

	Grade 8	*Grade 9*	*Grade 10*	*Grade 11*	*Grade 12*	*Total*
All students						
New South Wales	88,866	89,615	85,986	70,989	62,987	398,443
Victoria	65,960	66,514	62,009	60,654	52,010	307,147
Queensland	57,384	56,637	55,742	49,046	42,830	261,639
South Australia	19,936	19,716	19,870	21,489	17,989	99,000
Western Australia	28,577	28,212	29,113	26,630	21,719	134,251
Tasmania	6,756	6,917	6,611	5,472	5,711	31,467
Northern Territory	3,372	2,969	2,599	2,896	1,805	13,641
ACT	4,923	4,949	4,836	4,842	4,219	23,769
Australia	275,774	275,529	266,766	242,018	209,270	1,269,357
Full-time						
New South Wales	88,866	89,615	85,986	69,907	61,476	395,850
Victoria	65,911	66,409	61,812	59,515	50,489	304,136
Queensland	57,258	56,266	54,907	47,768	41,526	257,725
South Australia	19,912	19,666	19,751	18,600	14,215	92,144
Western Australia	28,558	28,202	29,104	25,219	20,329	131,412
Tasmania	6,756	6,917	6,604	5,135	4,185	29,597
Northern Territory	3,257	2,829	2,501	2,216	1,522	12,325
ACT	4,923	4,949	4,833	4,836	4,152	23,693
Australia	275,441	274,853	265,498	233,196	197,894	1,246,882
Part-time						
New South Wales				1,082	1,511	2,593
Victoria	49	105	197	1,139	1,521	3,011
Queensland	126	371	835	1,278	1,304	3,914
South Australia	24	50	119	2,889	3,774	6,856
Western Australia	19	10	9	1,411	1,390	2,839
Tasmania			7	337	1,526	1,870
Northern Territory	115	140	98	680	283	1,316
ACT			3	6	67	76
Australia	333	676	1,268	8,822	11,376	22,475

Experimental estimates – Rossiter & Duncan (2006)

A.2 SECONDARY STUDENTS, By category of school, attendance status and grade, 2005

	Grade 8	*Grade 9*	*Grade 10*	*Grade 11*	*Grade 12*	*Total*
			GOVERNMENT			
All students						
New South Wales	56,166	56,967	54,002	43,875	38,414	249,424
Victoria	40,040	40,409	37,112	36,414	30,155	184,130
Queensland	37,036	37,056	36,420	31,074	25,969	167,555
South Australia	12,460	12,412	12,568	14,290	11,846	63,576
Western Australia	17,216	17,193	17,807	16,633	13,182	82,031
Tasmania	4,675	4,760	4,636	3,908	4,422	22,401
Northern Territory	2,250	2,016	1,770	2,465	1,431	9,932
ACT	2,578	2,627	2,643	3,040	2,590	13,478
Australia	172,421	173,440	166,958	151,699	128,009	792,527
Full-time						
New South Wales	56,166	56,967	54,002	42,816	37,069	247,020
Victoria	39,997	40,308	36,947	35,303	28,709	181,264
Queensland	36,913	36,690	35,588	29,797	24,731	163,719
South Australia	12,436	12,362	12,449	11,489	8,405	57,141
Western Australia	17,197	17,183	17,798	15,222	11,807	79,207
Tasmania	4,675	4,760	4,629	3,573	2,901	20,538
Northern Territory	2,135	1,876	1,672	1,793	1,152	8,628
ACT	2,578	2,627	2,643	3,037	2,557	13,442
Australia	172,097	172,773	165,728	143,030	117,331	770,959
Part-time						
New South Wales				1,059	1,345	2,404
Victoria	43	101	165	1,111	1,446	2,866
Queensland	123	366	832	1,277	1,238	3,836
South Australia	24	50	119	2,801	3,441	6,435
Western Australia	19	10	9	1,411	1,375	2,824
Tasmania			7	335	1,521	1,863
Northern Territory	115	140	98	672	279	1,304
ACT				3	33	36
Australia	324	667	1,230	8,669	10,678	21,568

Experimental estimates – Rossiter & Duncan (2006)

A.2 SECONDARY STUDENTS, By category of school, attendance status and grade – *continued*

	Grade 8	*Grade 9*	*Grade 10*	*Grade 11*	*Grade 12*	*Total*
	NON-GOVERNMENT – INDEPENDENT					
All students						
New South Wales	12,077	12,089	11,905	10,584	9,460	56,115
Victoria	11,147	11,370	11,134	11,536	10,607	55,794
Queensland	9,923	9,576	9,564	9,157	8,587	46,807
South Australia	3,503	3,434	3,515	3,628	3,206	17,286
Western Australia	5,440	5,411	5,618	4,986	4,308	25,763
Tasmania	869	941	855	747	608	4,020
Northern Territory	716	565	478	253	210	2,222
ACT	791	759	707	549	500	3,306
Australia	44,466	44,145	43,776	41,440	37,486	211,313
Full-time						
New South Wales	12,077	12,089	11,905	10,569	9,377	56,017
Victoria	11,147	11,366	11,111	11,524	10,562	55,710
Queensland	9,920	9,571	9,561	np	np	46,743
South Australia	3,503	3,434	3,515	3,568	2,960	16,980
Western Australia	5,440	5,411	5,618	4,986	4,297	25,752
Tasmania	869	941	855	np	np	4,016
Northern Territory	716	565	478	253	206	2,218
ACT	791	759	707	546	491	3,294
Australia	44,463	44,136	43,750	41,347	37,034	210,730
Part-time						
New South Wales				15	83	98
Victoria		4	23	12	45	84
Queensland	3	5	3	np	np	64
South Australia				60	246	306
Western Australia					11	11
Tasmania				np	np	4
Northern Territory					4	4
ACT				3	9	12
Australia	3	9	26	93	452	583

Experimental estimates – Rossiter & Duncan (2006)

np: Not available for publication, but included in totals.

A.2 SECONDARY STUDENTS, By category of school, attendance status and grade – *continued*

	Grade 8	*Grade 9*	*Grade 10*	*Grade 11*	*Grade 12*	*Total*
	NON-GOVERNMENT – CATHOLIC					
All students						
New South Wales	20,623	20,559	20,079	16,530	15,113	92,904
Victoria	14,773	14,735	13,763	12,704	11,248	67,223
Queensland	10,425	10,005	9,758	8,815	8,274	47,277
South Australia	3,973	3,870	3,787	3,571	2,937	18,138
Western Australia	5,921	5,608	5,688	5,011	4,229	26,457
Tasmania	1,212	1,216	1,120	817	681	5,046
Northern Territory	406	388	351	178	164	1,487
ACT	1,554	1,563	1,486	1,253	1,129	6,985
Australia	58,887	57,944	56,032	48,879	43,775	265,517
Full-time						
New South Wales	20,623	20,559	20,079	16,522	15,030	92,813
Victoria	14,767	14,735	13,754	12,688	11,218	67,162
Queensland	10,425	10,005	9,758	8,815	8,260	47,263
South Australia	3,973	3,870	3,787	3,543	2,850	18,023
Western Australia	5,921	5,608	5,688	5,011	4,225	26,453
Tasmania	1,212	1,216	1,120	817	678	5,043
Northern Territory	406	388	351	170	164	1,479
ACT	1,554	1,563	1,483	1,253	1,104	6,957
Australia	58,881	57,944	56,020	48,819	43,529	265,193
Part-time						
New South Wales				8	83	91
Victoria	6		9	16	30	61
Queensland					14	14
South Australia				28	87	115
Western Australia					4	4
Tasmania					3	3
Northern Territory				8		8
ACT			3		25	28
Australia	6		12	60	246	324

Experimental estimates – Rossiter & Duncan (2006)

A.3 SCHOOL STUDENTS, By attendance status and age, 2005

	12 years	*13 years*	*14 years*	*15 years*	*16 years*	*17 years*	*18 years*	*19 years*	*20 years*	*>20 years*
All students										
New South Wales	90,234	89,768	89,991	86,171	71,963	61,427	14,051	1,956	481	1,275
Victoria	67,037	66,625	67,249	65,531	59,673	52,458	14,778	1,771	376	1,297
Queensland	56,423	56,706	56,360	52,210	45,624	27,324	3,105	637	187	1,207
South Australia	20,137	20,238	20,167	19,897	18,168	14,242	2,781	799	348	4,162
Western Australia	27,979	28,173	28,729	26,974	22,589	12,203	1,245	367	189	2,483
Tasmania	6,758	6,864	6,946	6,866	6,007	4,507	1,721	249	134	1,453
Northern Territory	3,174	3,061	2,924	2,764	2,152	1,480	410	141	45	657
ACT	4,790	4,914	4,987	4,880	4,693	4,187	1,273	115	15	3
Australia	276,532	276,349	277,353	265,293	230,869	177,828	39,364	6,035	1,775	12,537
Full-time										
New South Wales	90,234	89,768	89,991	86,168	71,836	60,871	13,300	1,676	414	466
Victoria	67,020	66,554	67,150	65,336	59,283	51,900	14,380	1,607	298	221
Queensland	56,383	56,559	55,987	51,527	44,688	26,703	2,929	554	131	408
South Australia	20,134	20,220	20,122	19,767	17,587	13,041	2,027	473	177	535
Western Australia	27,979	28,173	28,729	26,906	22,501	12,088	1,146	268	98	204
Tasmania	np	6,859	np	6,851	5,861	4,251	1,512	148	67	377
Northern Territory	3,144	2,980	2,820	2,645	1,994	1,351	340	102	23	93
ACT	np	4,911	np	4,880	4,688	4,136	1,253	115	15	3
Australia	276,440	276,024	276,731	264,080	228,438	174,341	36,887	4,943	1,223	2,307
Part-time										
New South Wales				3	127	556	751	280	67	809
Victoria	17	71	99	195	390	558	398	164	78	1,076
Queensland	40	147	373	683	936	621	176	83	56	799
South Australia	3	18	45	130	581	1,201	754	326	171	3,627
Western Australia				68	88	115	99	99	91	2,279
Tasmania	np	5	np	15	146	256	209	101	67	1,076
Northern Territory	30	81	104	119	158	129	70	39	22	564
ACT	np	3	np		5	51	20			
Australia	92	325	622	1,213	2,431	3,487	2,477	1,092	552	10,230

Experimental estimates – Rossiter & Duncan (2006)

np: Not available for publication, but included in totals.

A.4 SCHOOL STUDENTS, By category of school and age, 2005

	12 years	*13 years*	*14 years*	*15 years*	*16 years*	*17 years*	*18 years*	*19 years*	*20 years*	*>20 years*
Government										
New South Wales	58,344	56,459	57,324	54,099	43,996	37,114	8,807	1,391	377	1,143
Victoria	42,562	40,325	40,965	39,527	35,258	30,325	8,636	1,176	306	1,237
Queensland	39,182	36,717	36,861	33,554	28,320	16,480	2,038	445	152	1,121
South Australia	13,534	12,795	12,730	12,621	11,241	8,592	2,007	643	309	4,006
Western Australia	18,716	16,993	17,672	16,418	13,266	7,106	823	287	159	2,460
Tasmania	4,763	4,718	4,795	4,780	4,262	3,108	1,288	227	131	1,444
Northern Territory	2,339	2,145	1,994	1,929	1,656	1,126	321	135	42	635
ACT	2,593	2,597	2,596	2,658	2,769	2,581	830	110	15	3
Australia	182,033	172,749	174,937	165,586	140,768	106,432	24,750	4,414	1,491	12,049
Independent										
New South Wales	11,468	12,285	12,088	11,919	10,690	9,243	2,532	368	86	109
Victoria	9,865	11,398	11,410	11,347	11,224	10,354	3,393	492	59	39
Queensland	8,034	9,723	9,552	9,243	8,789	5,615	708	140	23	65
South Australia	3,027	3,511	3,462	3,525	3,465	2,919	437	79	24	111
Western Australia	4,142	5,433	5,382	5,214	4,608	2,591	301	np	np	np
Tasmania	840	888	928	902	805	650	208	np	np	np
Northern Territory	428	523	558	478	295	191	44	np	np	np
ACT	686	796	764	723	616	497	138			
Australia	38,490	44,557	44,144	43,351	40,492	32,060	7,761	1,169	225	365
Catholic										
New South Wales	20,422	21,024	20,579	20,153	17,277	15,070	2,712	197	18	23
Victoria	14,610	14,902	14,874	14,657	13,191	11,779	2,749	103	11	21
Queensland	9,207	10,266	9,947	9,413	8,515	5,229	359	52	12	21
South Australia	3,576	3,932	3,975	3,751	3,462	2,731	337	77	15	45
Western Australia	5,121	5,747	5,675	5,342	4,715	2,506	121	np	np	np
Tasmania	1,155	1,258	1,223	1,184	940	749	225	np	np	np
Northern Territory	407	393	372	357	201	163	45	np	np	np
ACT	1,511	1,521	1,627	1,499	1,308	1,109	305	5		
Australia	56,009	59,043	58,272	56,356	49,609	39,336	6,853	452	59	123

Experimental estimates – Rossiter & Duncan (2006)

np: Not available for publication, but included in totals.

A.5 SECONDARY STUDENTS, By grade and age, 2005

	12 years	*13 years*	*14 years*	*15 years*	*16 years*	*17 years*	*18 years*	*19 years*	*20 years*	*>20 years*
Grade 8										
New South Wales	1,875	67,638	18,999	332	22					
Victoria	938	42,702	21,622	672	22	4				
Queensland	20,400	34,699	2,232	46	7					
South Australia	994	16,381	2,505	56						
Western Australia	11,713	16,291	519	48	3		3			
Tasmania	23	3,584	3,114	35						
Northern Territory	497	2,345	449	66	11	4				
ACT	39	3,538	1,329	17						
Australia	36,479	187,178	50,769	1,272	65	8	3			
Grade 9										
New South Wales		1,931	68,694	18,551	388	44				7
Victoria		1,004	43,875	20,947	623	45	4	np	np	13
Queensland		19,906	34,117	2,461	65	9	9	6	9	55
South Australia		1,092	16,266	2,294	64					
Western Australia		11,468	16,100	620	21		3			
Tasmania		15	3,762	3,118	22					
Northern Territory		276	2,182	441	40	7		np	np	19
ACT		54	3,573	1,300	22					
Australia		35,746	188,569	49,732	1,245	105	16	np	np	94
Grade 10										
New South Wales			1,992	65,548	17,372	747	162	42	31	92
Victoria			1,149	42,402	17,371	906	116	20	3	42
Queensland			19,991	32,432	2,679	259	73	48	13	247
South Australia			1,365	16,183	2,139	160	23			
Western Australia			12,110	16,164	742	79	17			np
Tasmania			32	3,657	2,883	39				
Northern Territory			260	1,884	384	39	4	np	np	25
ACT			70	3,491	1,251	24				
Australia			36,969	181,761	44,821	2,253	395	np	np	np
Grade 11										
New South Wales				1,730	52,648	13,996	1,397	421	113	684
Victoria				1,486	40,459	16,335	1,440	301	78	555
Queensland				17,271	27,985	2,878	476	93	39	304
South Australia				1,364	14,854	2,220	375	195	107	2,374
Western Australia				10,142	13,500	1,220	288	150	81	1,249
Tasmania				56	3,062	2,112	115	43	27	57
Northern Territory				356	1,539	399	98	55	29	420
ACT				72	3,357	1,296	103	13		np
Australia				32,477	157,404	40,456	4,292	1,271	474	np
Grade 12										
New South Wales					1,533	46,640	12,492	1,493	337	492
Victoria					1,195	35,168	13,218	1,448	294	687
Queensland					14,888	24,178	2,547	490	126	601
South Australia					1,111	11,862	2,383	604	241	1,788
Western Australia					8,323	10,904	934	217	108	1,233
Tasmania					40	2,356	1,606	206	107	1,396
Northern Territory					178	1,031	308	82	13	193
ACT					63	2,867	1,170	102	15	np
Australia					27,331	135,006	34,658	4,642	1,241	np

Experimental estimates – Rossiter & Duncan (2006)

np: Not available for publication, but included in totals.

The youngest age-group within each grade includes counts of all younger students – e.g. the 15 years age-group for Grade 11 includes all Grade 11 students aged 15 years *and under*.

B.1 SCHOOL PARTICIPATION RATES, By age, 2005

	14 years	*15 years*	*16 years*	*17 years*	*18 years*	*19 years*
New South Wales	97.1	93.8	79.1	68.2	15.6	2.1
Victoria	99.5	98.1	90.0	78.8	22.0	2.6
Queensland	98.3	92.7	82.2	50.0	5.7	1.1
South Australia	99.6	97.8	89.0	69.9	13.5	3.7
Western Australia	99.5	93.5	78.3	42.3	4.3	1.2
Tasmania	98.7	99.9	86.3	66.8	25.2	3.7
Northern Territory	88.9	89.9	74.8	49.2	14.0	4.9
ACT	111.8	109.9	104.3	94.3	25.7	2.2
Australia	98.5	95.2	83.5	64.8	14.2	2.1

Experimental estimates – Rossiter & Duncan (2006)

B.2 SCHOOL PARTICIPATION RATES – FULL-TIME EDUCATION, By age, 2005

	14 years	*15 years*	*16 years*	*17 years*	*18 years*	*19 years*
New South Wales	97.1	93.8	79.0	67.6	14.8	1.8
Victoria	99.3	97.8	89.4	78.0	21.4	2.3
Queensland	97.7	91.5	80.5	48.9	5.4	1.0
South Australia	99.3	97.2	86.1	64.0	9.8	2.2
Western Australia	99.5	93.2	78.0	41.9	3.9	0.9
Tasmania	98.7	99.7	84.2	63.0	22.1	2.2
Northern Territory	85.8	86.0	69.3	44.9	11.6	3.5
ACT	111.7	109.9	104.2	93.1	25.3	2.2
Australia	98.3	94.8	82.7	63.5	13.4	1.8

Experimental estimates – Rossiter & Duncan (2006)

B.3 SCHOOL PARTICIPATION RATES – GOVERNMENT SECTOR, By age, 2005

	14 years	*15 years*	*16 years*	*17 years*	*18 years*	*19 years*
New South Wales	61.8	58.9	48.4	41.2	9.8	1.5
Victoria	60.6	59.1	53.2	45.6	12.9	1.7
Queensland	64.3	59.6	51.0	30.2	3.7	0.8
South Australia	62.8	62.1	55.1	42.2	9.7	3.0
Western Australia	61.2	56.9	46.0	24.6	2.8	1.0
Tasmania	68.1	69.6	61.3	46.0	18.9	3.4
Northern Territory	60.6	62.7	57.6	37.5	11.0	4.7
ACT	58.2	59.9	61.5	58.1	16.7	2.1
Australia	62.1	59.4	50.9	38.8	9.0	1.6

Experimental estimates – Rossiter & Duncan (2006)

B.4 SCHOOL PARTICIPATION RATES – NON-GOVERNMENT SECTOR, By age, 2005

	14 years	*15 years*	*16 years*	*17 years*	*18 years*	*19 years*
New South Wales	35.2	34.9	30.7	27.0	5.8	0.6
Victoria	38.9	38.9	36.8	33.3	9.2	0.9
Queensland	34.0	33.1	31.2	19.9	1.9	0.3
South Australia	36.7	35.8	33.9	27.7	3.8	0.7
Western Australia	38.3	36.6	32.3	17.7	1.4	0.3
Tasmania	30.6	30.4	25.1	20.7	6.3	0.3
Northern Territory	28.3	27.2	17.2	11.8	3.0	0.2
ACT	53.6	50.0	42.7	36.2	8.9	0.1
Australia	36.4	35.8	32.6	26.0	5.3	0.6

Experimental estimates – Rossiter & Duncan (2006)

C.1 APPARENT CONTINUATION RATES, By age, 2005

	14–15 years	*15–16 years*	*16–17 years*	*17–18 years*	*18–19 years*
New South Wales	96.2	85.3	85.4	22.7	13.4
Victoria	97.6	93.4	87.2	27.4	11.5
Queensland	94.1	89.7	60.2	11.0	18.0
South Australia	99.0	91.8	78.7	19.6	26.3
Western Australia	94.1	84.5	54.1	10.2	25.2
Tasmania	100.2	87.7	75.4	36.7	19.3
Northern Territory	96.2	87.4	68.7	27.6	29.3
ACT	99.2	97.1	90.0	27.4	9.6
Australia	96.2	88.9	77.0	21.7	14.7

Experimental estimates – Rossiter & Duncan (2006)

Age ranges indicate (age of student in 2004)–(age of student in 2005).

C.2 APPARENT CONTINUATION RATES – FULL-TIME EDUCATION, By age, 2005

	14–15 years	*15–16 years*	*16–17 years*	*17–18 years*	*18–19 years*
New South Wales	96.2	85.1	84.8	21.7	12.2
Victoria	97.5	93.0	86.8	26.9	10.7
Queensland	93.3	88.7	59.8	10.6	16.4
South Australia	98.5	89.5	74.5	15.8	23.0
Western Australia	93.9	84.3	53.8	9.5	19.7
Tasmania	100.0	85.8	72.8	34.3	14.3
Northern Territory	93.8	83.0	67.1	24.8	24.9
ACT	99.2	97.1	89.0	27.2	9.7
Australia	96.0	88.2	76.3	20.8	13.0

Experimental estimates – Rossiter & Duncan (2006)

Age ranges indicate (age of student in 2004)–(age of student in 2005).

C.3 APPARENT CONTINUATION RATES – GOVERNMENT SECTOR, By age, 2005

	14–15 years	*15–16 years*	*16–17 years*	*17–18 years*	*18–19 years*
New South Wales	94.8	83.1	83.3	23.1	15.2
Victoria	96.8	91.2	84.0	27.4	13.1
Queensland	92.3	87.2	58.2	12.0	19.2
South Australia	98.3	88.7	75.2	23.5	28.9
Western Australia	92.7	80.4	52.8	11.7	29.9
Tasmania	100.9	88.4	73.4	40.8	23.6
Northern Territory	98.0	97.9	68.0	27.8	33.4
ACT	99.0	107.3	91.6	29.1	13.2
Australia	95.1	86.7	74.7	22.6	17.1

Experimental estimates – Rossiter & Duncan (2006)

Age ranges indicate (age of student in 2004)–(age of student in 2005).

C.4 APPARENT CONTINUATION RATES – GRADE COHORTS, By grade and age, 2005

	Grade in 2004				
	< Grade 10	*< Grade 11*		*< Grade 12*	
	14–15 years	*14–15 years*	*15–16 years*	*15–16 years*	*16–17 years*
New South Wales	96.3	96.2	85.2	85.3	87.3
Victoria	96.5	97.6	93.2	93.4	88.4
Queensland	96.5	94.1	89.7	89.7	87.6
South Australia	98.6	99.0	91.9	91.8	83.9
Western Australia	98.5	94.1	85.6	84.5	84.6
Tasmania	99.9	100.2	87.8	87.7	76.4
Northern Territory	93.0	96.2	93.6	87.4	75.0
ACT	98.9	99.2	97.2	97.1	91.3
Australia	96.8	96.2	89.0	88.9	86.9

Experimental estimates – Rossiter & Duncan (2006)

"< Grade 10" denotes "all grades up to but not including Grade 10".

Age ranges indicate (age of student in 2004)–(age of student in 2005).

D.1 APPARENT PROGRESSION RATES, By grade and age, 2005

	12–13 years	*13–14 years*	*14–15 years*	*15–16 years*	*16–17 years*	*17–18 years*
Grade 8–9						
New South Wales	99.0	99.9	96.4			
Victoria	190.8	100.0	95.0			
Queensland	100.4	99.0	100.1			
South Australia	105.9	99.3	99.5			
Western Australia	101.2	99.0	105.3			
Tasmania	149.7	101.3	99.1			
Northern Territory	56.8	93.5	94.7			
ACT	104.5	101.2	97.7			
Australia	101.6	99.6	96.4			
Grade 9–10						
New South Wales		98.4	96.2	95.8		
Victoria		181.2	97.0	93.9		
Queensland		99.0	95.7	110.0		
South Australia		110.8	97.9	97.7		
Western Australia		99.8	97.9	122.3		
Tasmania		103.2	100.6	96.5		
Northern Territory		90.8	89.5	102.0		
ACT		121.1	99.5	99.7		
Australia		101.0	96.7	96.4		
Grade 10–11						
New South Wales			90.1	81.8	79.4	
Victoria			197.4	92.2	89.7	
Queensland			88.3	86.6	102.2	
South Australia			101.7	89.0	96.0	
Western Australia			87.3	83.7	145.0	
Tasmania			121.1	77.4	71.0	
Northern Territory			111.4	85.4	105.1	
ACT			117.7	96.1	103.7	
Australia			91.1	86.2	87.1	
Grade 11–12						
New South Wales				89.7	88.3	85.3
Victoria				104.0	86.2	79.7
Queensland				89.5	85.1	81.5
South Australia				79.1	75.5	86.2
Western Australia				82.9	80.2	75.1
Tasmania				78.4	75.9	81.7
Northern Territory				53.1	66.7	80.5
ACT				94.2	85.0	80.2
Australia				87.0	84.8	82.1

Experimental estimates – Rossiter & Duncan (2006)

Grade ranges indicate (grade of student in 2004)–(grade of student in 2005).

Age ranges indicate (age of student in 2004)–(age of student in 2005).

D.2 APPARENT GRADE PROGRESSION RATES, By grade, 2005

	Grade 8–9	*Grade 9–10*	*Grade 10–11*	*Grade 11–12*
New South Wales	99.2	96.2	81.5	87.7
Victoria	98.3	96.1	91.6	84.7
Queensland	99.4	97.0	87.9	86.4
South Australia	99.4	98.0	90.5	77.0
Western Australia	99.4	98.7	85.7	81.0
Tasmania	99.6	98.4	74.8	78.1
Northern Territory	88.5	91.0	89.2	66.8
ACT	99.4	99.6	97.1	83.7
Australia	99.1	97.1	87.0	84.6

Experimental estimates – Rossiter & Duncan (2006)

Grade ranges indicate (grade of student in 2004)–(grade of student in 2005).

D.3 APPARENT GRADE PROGRESSION RATES – CUMULATIVE, By grade, 2005

	Grade 8–9	*Grade 8–10*	*Grade 8–11*	*Grade 8–12*
New South Wales	99.2	95.4	77.7	69.0
Victoria	98.3	95.4	87.7	75.7
Queensland	99.4	96.2	84.7	73.7
South Australia	99.4	97.1	87.6	67.7
Western Australia	99.4	98.0	84.2	68.2
Tasmania	99.6	97.8	73.8	59.2
Northern Territory	88.5	79.8	68.3	49.7
ACT	99.4	99.4	95.4	77.6
Australia	99.1	96.3	83.8	71.6

Experimental estimates – Rossiter & Duncan (2006)

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