

Parental Occupation Coding

A report submitted to the

Performance Measurement and Reporting Taskforce
of the
Ministerial Council on Education, Employment Training and Youth Affairs

by

Dr Roger Jones

Quantitative Evaluation and Design Pty Ltd

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Executive Summary

In July 2001, the Performance Measurement and Reporting Taskforce (PMRT) commissioned the Australian Bureau of Statistics (ABS) to coordinate a study to test the feasibility of collecting parental occupation information on school enrolment forms. While the study concluded that it was feasible, it also found that the information provided by parents was not always sufficient to allow accurate coding. In addition, concerns were expressed, both in the report and subsequently, about the time-consuming and costly nature of the coding task involved when detailed occupation data is collected from parents, with some jurisdictions quite strongly opposed to anything other than the simplest coding possible.

In light of these concerns, the PMRT commissioned this consultancy to consider whether it would be possible to improve the accuracy of the coding of detailed occupation information by coding it to a higher level of aggregation of ASCO, and whether providing parents with a set of defined categories of occupation ('self-coding') would provide a satisfactory alternative to seeking detailed information. The findings will be used in conjunction with existing information along with views on the relative costs and benefits of the two alternatives, to reach a final decision on the appropriate approach.

Coding of detailed occupation data

Section 2 examines various options for the coding of detailed occupation data and the use of these data to derive a measure of student's socioeconomic status. It uses data from the recent Program for International Student Assessment (PISA) 2000 Survey of Students' Reading, Mathematical and Scientific Literacy Skills study of some 5,000 Australian students aged 15 years to examine the differences in average reading literacy scores by socioeconomic status.

The conclusions with regard to the coding of detailed occupation information to a higher level of aggregation of ASCO are:

- For the purpose of reporting outcomes against 3 or 4 categories of parental occupation status, occupation coded to the sub-major (2-digit) group level of ASCO would be adequate.
- The extent to which coding to this higher level of ASCO would simplify and improve the accuracy of coding cannot be fully assessed without further trials within schools of the coding process. Accuracy would undoubtedly improve and coding would be simplified somewhat, but only marginally.
- If coding relies on the use of the current ASCO coding system, there is little opportunity for simplifying the coding process. A modified coding system could perhaps be developed, but this would probably require a significant amount of development work. In either case, school staff would need to be trained in the use of the system.
- In terms of reducing the workload associated with occupation coding, major gains can only be achieved by implementation of a self-coded occupation question.

Other conclusions arising from these analyses are:

- The pattern of increasing literacy levels with increasing occupation status of either mother or father supports the use of highest parental occupation status as the appropriate measure of the student's socioeconomic position.
- The use of parents' last occupation to assign socioeconomic status to students whose parents are not currently employed gives a similar pattern of association between socioeconomic status and reading literacy scores to that obtained using current employment only.
- In the light of this latter finding, it is recommended that the PMRT consider changes to the occupation question used to collect parental occupation information, allowing those who were not working 'last week' to report previous employment. The intention is to include those parents who are unemployed, recently retired or marginally attached to the labour force without including occupations that they may have held many years previously.

The use of highest parental occupation status and the changes to the occupation question suggested above to include recent employment should go some considerable way towards reducing the level of unassigned cases experienced in the feasibility study.

At this stage, it appears premature to make a decision to assign missing socioeconomic status cases to the low status category. For comparisons of outcomes by SES, the aim of the reporting is to compare, both between SES classes and over time, the percentage of students within the category achieving the standard. We support the view expressed in the ACER report that it is better to exclude the missing cases from reporting by SES level or report their outcomes separately.

Recommendations for the collection and coding of detailed occupation data

If detailed parental occupation data is collected, it is recommended that:

- Occupation information is collected for both father/male guardian and mother/female guardian.
- Occupation information is coded to the 2-digit level of ASCO and assigned the appropriate average ANU4 score given in Table 2.6.
- Student's socioeconomic status is determined using highest parental occupation status as defined by the higher ANU4 score
- For the purpose of national reporting by socioeconomic status category, these scores be grouped further into 3, 4 or 5 broad categories as shown in Table 2.7
- Outcomes for students who cannot be assigned to a socioeconomic status category should be reported in a separate additional category.
- In order to reduce the number of students who cannot be assigned socioeconomic status on the basis of current employment, ask parents who are not currently employed to report previous occupation. A suggested question is:

What is the mother/guardian's (father/guardian's) occupation?

If she (he) is not currently in paid work but has had a job in the last 12 months or has recently retired, please give her (his) last occupation.

Please give full occupation description. For example:

- Nurse – indicate type of nurse; Teacher – indicate type of school or private; Instructor – indicate type of instruction given; Tradesman/woman – indicate trade qualification; Machine Operator – indicate type of machine
- For managers, indicate organization and/or main activity managed – for example, works manager, information systems manager, shop manager, sales department manager, bar manager
- For public servants, indicate official designation and main tasks performed
- For armed forces personnel, indicate rank and main tasks performed

If she (he) has not been in paid work in the last 12 months, put 'X' here

- In view of the (2-digit) level of occupation coding recommended, it is probable that the additional question seeking information on the tasks performed in the occupation could be excluded. This option could be examined using the data from the ABS feasibility study, by recoding on the basis of occupation title only and comparing the resulting allocation to broad SES categories with that obtained using the ASCO coding derived by the ABS.

Collecting self-coded occupation data

In Section 3, options for the collection of self-coded occupation data from parents are considered and a four group classification of occupations is presented. Based on data from the 2001 Census on the occupation distribution of parents of children aged 10-14 years living at home, the population distribution between categories is expected to be relatively even, with 23 per cent of students with a reported parental occupation in the low status category and 29 per cent in the high status category. In addition, using PISA 2000 data, the classification shows a very clear gradient in reading literacy scores, with average scores of 485, 507, 533 and 563 respectively from low to high socioeconomic status.

The four group classification of occupations presented in Appendix 4 has the required properties of grouping occupations that are relatively homogenous in regard to the preferred ANU4 socioeconomic status measure, dividing the student population on the basis of highest parental occupation status into classes of approximately equal size and, in consequence, shows a clear gradient in reading literacy performance with socioeconomic status.

Recommendations

If a self-coding occupation question is to be used to determine student's socioeconomic status, it is recommended that:

- Occupation information is collected for both father/male guardian and mother/female guardian.

- For the purpose of national reporting by socioeconomic status category, a four category grouping of ASCO (second edition) codes similar to that given in Appendix 4 is used as the basis for self-coding occupation descriptions.
- Student’s socioeconomic status is determined using highest parental occupation status as defined by the (ascending) order of these occupation groups.
- Outcomes for students who cannot be assigned to a socioeconomic status category are reported in a separate additional category.
- In order to reduce the number of students who cannot be assigned socioeconomic status on the basis of current employment, ask parents who are not currently employed to report previous occupation. A suggested question is:

What is the mother/guardian’s (father/guardian’s) occupation?
If she (he) is not currently in paid work but has had a job in the last 12 months or has recently retired, please give her (his) last occupation.

Please select the appropriate occupation group from the attached list and enter the group number here:

If she (he) has not been in paid work in the last 12 months, enter ‘X’

If you are not sure of the appropriate occupation group, please write in the full title of the occupation and describe the main tasks that she (he) performs in that job.

For managers, indicate organization and/or main activity managed – for example, works manager, information systems manager, shop manager. For public servants, indicate official designation. For armed forces personnel, indicate rank.

- Various approaches to the presentation of self-coding occupation groups should be developed, by consulting experts in questionnaire design, and pilot tested with relatively small groups of respondents, particularly those considered most likely to experience problems in allocating themselves to categories.
- A study involving parallel testing is required with both detailed occupation data and self-coded categorical data collected together so that the types and extent of the errors that arise from its use are known and their implications can be examined.
- Conducting such a study separated from the standard process of student enrolment would allow considerably more flexibility in timing. A study conducted through a small sample of schools (similar to that used in Victoria in the previous study providing occupation data on some 2,000 responding parents), with questionnaires distributed to parents using the standard procedures adopted by the schools, is suggested. More than one self-coding approach could be tested in this study if necessary, as well as testing the need for the question on tasks performed when occupation is coded to the sub-major (2-digit) level of ASCO (see Section 2 recommendations).

Parental Occupation Coding

1. Introduction

1.1 Background

In 1999-2000, a team from the Australian Council for Educational Research (ACER) was commissioned by the then National Education Performance Monitoring Taskforce (NEPMT) (now replaced by the Performance Measurement and Reporting Taskforce or PMRT) to develop an approach to defining socioeconomic status (SES) for the purpose of reporting student outcomes. Their report to the NEPMT (Marks et al, 2000) recommended that the measures of SES should be based on the characteristics of the parents of the student, and that the particular characteristics to be used should be parents' occupation and education, and family's Health Care Card status, with data on parents' occupation being used to derive a five or six category measure of social class and/or the ANU4 measure of occupational status (Jones and McMillan, 2001).

In July 2001, the PMRT commissioned the Australian Bureau of Statistics (ABS) to coordinate a study to test the feasibility of collecting parental information on school enrolment forms (ABS, 2002). While the study concluded that it was feasible to collect, capture and code parents' occupation data, it also found that the information provided by parents was not always sufficient to allow accurate coding to the 4-digit level of the Australian Classification of Occupations (ASCO) and consequently to the ANU4 scale. In addition, concerns were expressed, both in the report and subsequently, about the time-consuming and costly nature of the coding task involved when detailed occupation data is collected from parents, with some jurisdictions quite strongly opposed to anything other than the simplest coding possible.

In light of these concerns, the PMRT commissioned this consultancy to follow up on two aspects in relation to occupation. In broad terms, these relate to whether it would be possible to improve the accuracy of the coding of detailed occupation information by coding it to a higher level of aggregation of ASCO, and whether providing parents with a set of defined categories of occupation ('self-coding') would provide a satisfactory alternative to seeking detailed information and then coding it at school or system level. This information will be used in conjunction with existing information along with views on the relative costs and benefits of the two alternatives, to reach a final decision on the appropriate approach.

1.2 Project specifications

The original recommendation from ACER was to collect detailed occupation data which would then be coded to the 4-digit level of ASCO. Given the finding of the ABS feasibility study regarding the adequacy of information provided by parents on enrolment forms and State concerns about the detailed coding approach, the questions to be investigated via the current study are:

- to which other levels of ASCO could detailed occupation data be coded and what would be the implications for the accuracy of coding;
- to what extent would each of these alternatives simplify the coding task and reduce the time and cost involved;

- how best could this type of approach address the coding/reporting of those parents not currently employed;
- into which other ANU socioeconomic scales could the occupation data be translated to give a continuous measure of SES;
- alternatively, which ANU categorical SES scale(s) could be produced; and
- what would be the impact of these various alternatives on the reporting that would be possible, including any reduction to the flexibility of reporting compared with coding to ASCO-4 digit and ANU4 – that is, will the resulting scales detect differences in performance across the range of SES.

The second aspect of the consultancy relates to using self-coding as an alternative to collecting and coding detailed occupation information. Such an approach is already in use by the Victorian Department of Education and Training in its existing collection of enrolment data from parents, and the Higher Education Group of the Commonwealth Department of Education, Science and Training is considering a similar process in relation to its higher education statistical collection, though no decisions have been made (Jones, 2001).

The specific questions to be investigated in relation to self-coding are:

- if self-coding were to be used to collect data from the parents of school students, what would be the preferred categorisation of occupations and how would these categories be used in reporting student outcomes;
- what are the pros and cons associated with the existing Victorian approach, the proposed higher education approach, and any other existing or proposed approach;
- in particular what are the implications of these various approaches in terms of clarity and simplicity for collection from parents, comparability with other occupation classifications (notably ASCO), and the impact on reporting, including the reduction or otherwise in the flexibility of reporting compared with each other and with approaches based on the collection and later coding of detailed occupation data; and
- how this type of approach would address the coding/reporting of those parents not currently employed.

1.3 Outline of report

Section 2 examines various options for the coding of detailed occupation data and the use of these data to derive a measure of student's socioeconomic status. It uses data from the recent Program for International Student Assessment (PISA) 2000 Survey of Students' Reading, Mathematical and Scientific Literacy Skills (ACER, 2001) study of some 5,000 Australian students aged 15 years to examine the differences in average reading literacy scores by socioeconomic status.

The PISA 2000 study report uses a measure of socioeconomic status derived from coding parents' occupations to the International Standard Classification of Occupations (ISCO) and then converted to a socioeconomic status score called the International Socio-Economic Index (ISEI) developed by Ganzeboom and Treiman (1996). Using this measure, the association between reading literacy scores and measures of socioeconomic status based on mother's occupation, father's occupation and highest parental occupation are examined. In addition, since students were asked to report previous occupations if their parents were not currently employed, the effect of including previous occupation data to assign socioeconomic status is

explored. These results provide some guidance on two questions: first, whether highest parental occupation status should be used and, secondly, the treatment of cases with missing occupation data.

The ANU4 scale recommended by Marks et al (2000) in their report to the NEPMT is simply an Australian version of the ISEI, and the association between reading literacy and this measure of socioeconomic status are presented in Section 2.2.

Use of either of these scales fully does however require occupation data to be coded to a detailed level. To assess the feasibility of simplifying the occupation coding, the effect of coding occupation to only the major (1-digit) and sub-major (2-digit) group levels of ASCO are investigated in terms of the ability to distinguish differences in reading literacy. The findings from these analyses are presented in Section 2.3.

In Section 3, we turn to consideration of the alternative approach of providing parent's (or students) with a set of occupation categories for self-coding. A classification grouping occupations into four groups which are relatively homogenous in respect of their ANU4 status scores is considered the preferred option, giving approximately equal proportions of students in each of the categories and showing a clear gradient in average reading literacy scores with socio-economic status.

2. Options for coding detailed occupation data

In considering the categories to which occupation data should be coded, the essential concern is that some scaling of these categories can be derived which has “a clear rationale grounded in sociological theory” (Jones and McMillan, 2001) to support its use as a measure of socioeconomic status. The recent Program for International Student Assessment (PISA) 2000 Survey of Students’ Reading, Mathematical and Scientific Literacy Skills (ACER, 2001) study report, for example, uses a measure of socioeconomic status derived from information provided by the students on their parents’ occupations, coded to the International Standard Classification of Occupations (ISCO) and then converted to a socioeconomic status score called the International Socio-Economic Index (ISEI) developed by Ganzeboom and Treiman (1996). Results from this study show very clear gradients for reading, mathematical and scientific literacy with this socioeconomic status measure (ACER, 2001, Ch 8). Here we concentrate on reading literacy only.

2.1 ISCO and ISEI

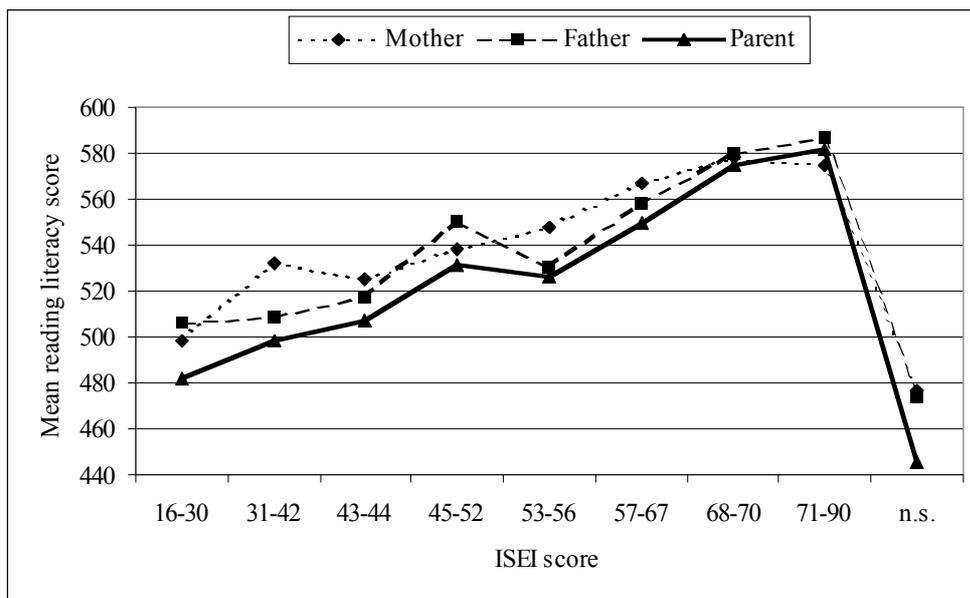
The results in Table 2.1 and Figure 2.1 showing the average (mean) reading literacy score for students by ISEI score category based on father’s occupation, mother’s occupation and highest parental occupation respectively. Reading literacy scores are standardized internationally to a mean of 500 and a standard deviation of 100, with a mean score for Australian students of 528. The data are weighted to adjust for variations in selection probabilities and non-response.

The ISEI score categories have been chosen here to give approximately equal proportions (12%) of students in each of the eight groups using highest parental occupation. In broad terms, the occupations associated with the higher ISEI scores (68 or more) include senior government officials, corporate managers, most professionals and specialist department managers in large enterprises, including higher military officers, with other department managers and professionals and some associate professionals making up the third highest group of ISEI scores (57-67). The occupations at the lower end of the ISEI scale, with scores below 45, include most clerks, sales and service workers, trades workers, plant and machine operators, and labourers. The high proportion of women with ISEI scores of 43-44 results from the inclusion here of nursing professionals, kindergarden teachers, social work associate professionals and shop assistants and demonstrators.

Table 2.1 Parent’s occupation distribution (per cent) and mean reading literacy score by ISEI category, PISA 2000

ISEI score	Occupation distribution (per cent)			Mean reading literacy score		
	Mother	Father	Parent	Mother	Father	Parent
16-30	17	25	12	499	506	482
31-42	7	19	11	532	509	498
43-44	16	4	10	525	517	507
45-52	14	11	14	539	551	532
53-56	10	7	12	548	531	526
57-67	10	9	13	567	559	549
68-70	7	8	12	578	580	575
71-90	4	8	10	575	587	582
n.s.	15	9	4	476	474	445
Total	100	100	100	528	528	528

Figure 2.1 Mean reading literacy score by ISEI score category, PISA 2000



Coding occupations to the ISCO version used in PISA 2000 and the associated ISEI scale values does show clear associations between achievement levels and socioeconomic status scores and could be considered as one option for occupation coding. Grouping into approximate quartiles of the student population using highest parental occupation gives average literacy scores of around 490, 520, 540 and 580 from low to high socioeconomic status group. Similarly, using three groups with ISEI scores ranging from 16-44, 45-56 and 57-90 accounts for 33, 26 and 35 per cent respectively of students, with average reading literacy scores in each category of around 495, 528 and 570 respectively. However, it is important to note that there is a wide range of literacy scores within each ISEI score category (see ACER, 2001, Figure 7.1).

The questions used in PISA to obtain information on parents' occupations are given in Appendix 1. Note that students were asked to report their parents' last main job if they were not working now, rather than just current occupation. However, questions 7 and 8 asked students to report whether their parents were currently working, and responses to these questions and the reported occupation data are examined in Table 2.2 to assess the effects of missing socioeconomic status scores.

If occupation coding is restricted only to those parents who are currently working, either full-time or part time, the percentage of students for whom fathers' occupation can be coded falls from 91 per cent to 80 per cent, while the percentage for mothers' occupation drops from 85 per cent to 66 per cent. The proportion of students with a derived highest parental occupation status score is then reduced from 96 per cent to 90 per cent.

Restricting the analysis of mean reading literacy scores by ISEI scale scores to those whose parents are currently employed does not, however, effect the pattern of association (Table 2.3). As shown by comparison of the results in Table 2.1 and Table 2.3, the mean scores by ISEI category are virtually identical when the socioeconomic status score is limited to those currently employed only, the only difference being an increase in the mean score of students with parents who were not currently working.

Table 2.2 Employment status of parents by occupation response, PISA 2000

Employment status	Occupation response			Total
	Not in labour force	Don't know	Occupation stated	
	Father			
Working FT	0.1	2.7	75.7	78.5
Working PT	0.0	0.5	4.4	4.9
Unemployed	0.2	0.3	2.9	3.4
Not in labour force	0.6	1.6	6.8	9.0
Not stated	0.0	3.1	1.0	4.1
Total	0.9	8.2	90.9	100.0
	Mother			
Working FT	0.1	1.3	39.9	41.3
Working PT	0.1	0.7	25.8	26.7
Unemployed	0.6	0.6	2.8	4.0
Not in labour force	6.7	3.0	15.2	25.0
Not stated	0.1	1.8	1.2	3.1
Total	7.7	7.4	85.0	100.0

Table 2.3 Parent's current occupation distribution (per cent) and mean reading literacy score by ISEI category, PISA 2000

ISEI score	Occupation distribution (per cent)			Mean reading literacy score		
	Mother	Father	Parent	Mother	Father	Parent
16-30	12	21	11	498	507	485
31-42	5	16	11	543	508	499
43-44	12	3	10	524	517	504
45-52	11	10	13	541	550	534
53-56	8	6	11	548	531	526
57-67	8	8	12	570	561	551
68-70	6	8	12	579	581	576
71-90	3	7	10	574	591	583
n.s.	34	20	10	505	499	480
Total	100	100	100	528	528	528

These results provide some guidance on two questions: first, whether highest parental occupation status should be used and, secondly, the treatment of cases with missing occupation data. In regard to the first question, it should be noted that the mean reading literacy scores in ISEI categories using parental occupation are generally lower than those for the corresponding categories derived using either mother's or father's occupation. The students who are moved up the socioeconomic scale when highest parental occupation status is used have, on average, higher reading literacy levels than those who remain. This is consistent with the pattern of increasing literacy levels with increasing occupation status of either mother or father, and thus supports the use of highest parental occupation status as a more appropriate measure of the student's socioeconomic position.

For example, in Table 2.3, 21 per cent of students have a father working in the lowest occupation status category with an ISEI score of 16-30, and the average reading literacy score for these students is 507. More than half of these students (12%) have a mother who works in a higher status occupation, and their average reading literacy score is 523, while the remainder (9%) of the students in this category have an average reading literacy score of 485.

Another 2 per cent of students whose father's are not currently employed have mothers employed in occupations in this category, and their average reading literacy score is also 485.

In regard to missing occupation data, the same pattern occurs when students are assigned occupation status on the basis of parents' previous employment. Using current employment only (Table 2.3), 10 per cent of students cannot be assigned a status score and their average literacy score is 480. Allowing most recent occupation to be used reduces the number of students with unassigned status to just 4 per cent, their average literacy score being a much lower 445. For those who are assigned, average literacy scores are, from low to high ISEI score category, 497, 484, 495, 539, 513, 549, 488 and 520 respectively. Comparison with Table 2.3 shows general agreement to those based on current employment except in the two highest ISEI score categories where the sample in each categories (0.4 per cent of students) is quite small. The use of parents' last occupation to assign socioeconomic status to students whose parents are not currently employed thus gives a similar pattern of association between socioeconomic status and reading literacy scores to that obtained using current employment only.

2.2 ASCO and ANU4

The ANU4 scale recommended by Marks et al (2000) in their report to the NEPMT is simply an Australian version of the ISEI. Developed by Jones and McMillan (2001) using 1996 Census data, it applies the same methods used to derive the ISEI to determine socioeconomic status scores for a collapsed ASCO classification of 117 occupation categories. It could then be expected that use of the ANU4 scale scores to determine occupation groupings would give similar, and perhaps even better, results to those obtained using the ISEI, showing clear associations between achievement levels and socioeconomic status scores.

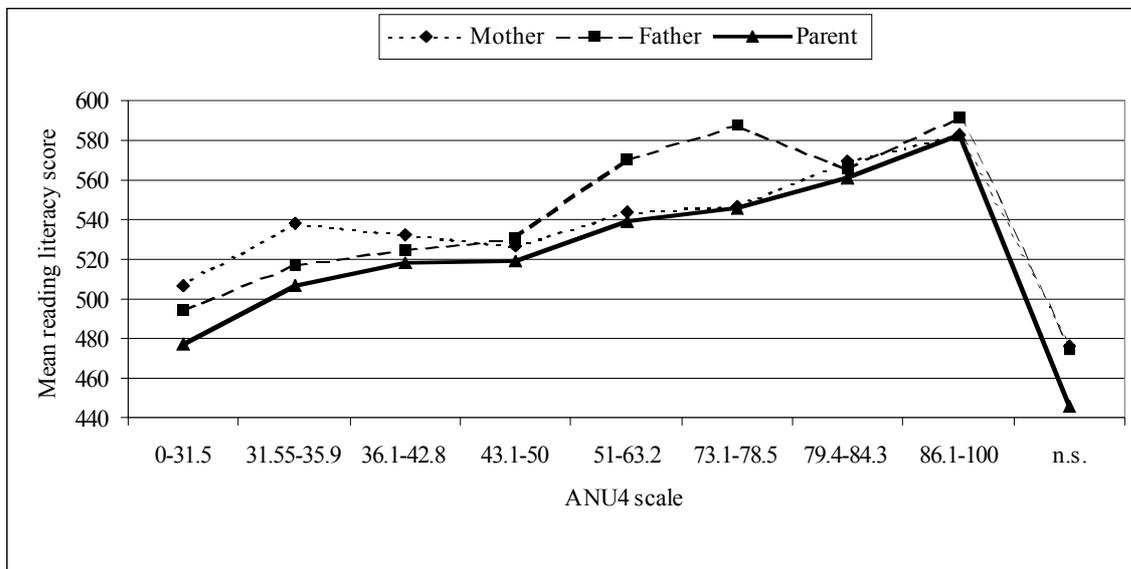
In order to assess the association between ANU4 categories and reading literacy, the parental occupation data in PISA 2000 has been recoded to ASCO categories. The PISA 2000 parental occupation data is coded directly to a modified version of ISCO, and while there are broad similarities between ISCO and ASCO there are also some significant differences (ABS, 1996). Nevertheless, despite these complications, we believe that the recoding provides a reasonable basis for assessing associations between the ANU4 scale and reading literacy scores at broad levels, although there are undoubtedly some errors in the ASCO coding obtained from recoding ISCO compared to what would be obtained with direct coding from occupation descriptions.

Table 2.4 and Figure 2.2 show average (mean) reading literacy score for students by ANU4 score category, with categories again chosen to give approximately equal proportions (12%) of students in each of the eight groups using highest parental occupation. On the ANU4 scale, the highest ranking occupations with scores of 79.4-100 are limited to science, engineering, health (excluding nursing), education and legal professionals, with Miscellaneous Specialist Managers (ASCO sub-major group 129) the only managerial category to be scored at this level (see Appendix 2). General managers and administrators (ASCO 111), resource managers (ASCO 121) and most other professionals are included in the third highest status grouping (scores of 73.1-78.5), while other specialist managers (ASCO 122 and 123), other professionals and associate professionals other than office managers (ASCO 3291), real estate (ASCO 3293), sales and service managing supervisors (ASCO 33) and other miscellaneous associate professionals (ASCO 39) comprise the fourth highest status grouping (scores of 51-63.2).

Table 2.4 Parent's occupation distribution (per cent) and mean reading literacy score by ANU4 category, PISA 2000

ANU4 score	Occupation distribution (per cent)			Mean reading literacy score		
	Mother	Father	Parent	Mother	Father	Parent
0-31.5	22	20	12	506	495	477
31.55-35.9	16	11	11	538	517	507
36.1-42.8	10	14	14	533	525	518
43.1-50	5	16	13	526	530	519
51-63.2	5	10	10	544	570	539
73.1-78.5	13	6	13	547	588	546
79.4-84.3	6	8	11	570	566	561
86.1-100	9	6	13	582	591	583
n.s.	15	9	4	476	474	445
Total	100	100	100	528	528	528

Figure 2.2 Mean reading literacy score by ANU4 score category, PISA 2000



The gradient of student's reading literacy score against father's occupation status score across these four categories is weak compared that that for mother's and highest parental occupation status, again adding support to the use of the latter as the more discriminating measure of student's socioeconomic status. As with the ISEI, grouping students into population quartiles using highest parental occupation status gives a very clear gradient in mean literacy scores, with values of around 490, 520, 540 and 570 from low to high quartile socioeconomic status.

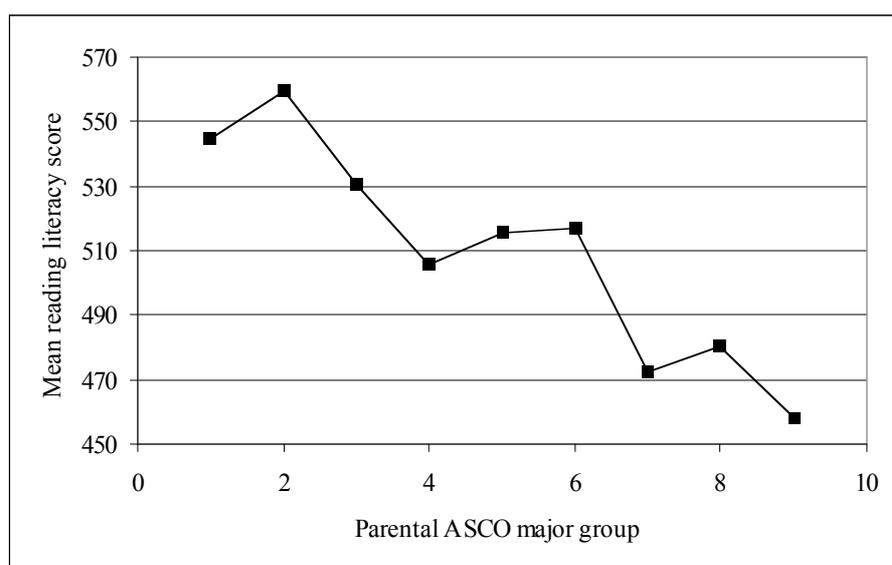
2.3 Coding to higher levels of ASCO

Use of either of these scales requires occupation data to be coded to a detailed level, 4-digit ASCO in the case of ANU4 and 4-digit ISCO in the case of ISEI. However, the ANU4 scale is a collapsed version of the full 340 4-digit categories of ASCO, with many categories defined at the 3-digit minor group level. To assess the feasibility of simplifying the occupation coding, the ANU4 scale is collapsed further to the major (1-digit) and sub-major (2-digit) group levels of ASCO. The effect of coding to these higher levels of ASCO are then assessed by examining their association with reading literacy, again using the PISA 2000 data. Throughout this section, in light of the findings above, highest parental occupation is used as the socioeconomic status measure.

Table 2.5 Highest parental occupation distribution (per cent) and mean reading literacy score by ASCO major groups, PISA 2000

ASCO major groups		Highest parental	Mean reading
Title	Code	occupation (%)	literacy score
Managers and administrators	1	19.7	545
Professionals	2	30.1	559
Associate professionals	3	11.1	531
Tradespersons and related workers	4	19.2	506
Advanced clerical and service workers	5	2.3	516
Intermediate clerical, sales and service workers	6	4.9	517
Intermediate production and transport workers	7	4.6	472
Elementary clerical, sales and service workers	8	3.0	481
Labourers and related workers	9	1.0	458
n.s.		4.2	445
Total		100.0	528

Figure 2.3 Mean reading literacy score by highest parental occupation in ASCO major groups, PISA 2000



The distribution of students and mean reading literacy scores by highest parental ASCO major group are given in Table 2.5 and graphed in Figure 2.3. Highest parental ASCO major group is determined simply on the basis of the lower major group code of mother's and father's occupation – ie managers and administrators have the highest status, followed by professionals, etc. The results do show a very clear gradient in mean reading literacy scores by major group categories grouped as (1 and 2), 3, (4, 5 and 6) and (7, 8 and 9), a pattern which corresponds very well with 'the formal education and/or training and previous experience usually required for entry to the occupation' criteria used to measure skill level in ASCO Second Edition (ABS, 1996).

The difficulty with this major group classification is shown by the distribution of students between categories in Table 2.5. Major groups 1 and 2 combined account for half of all students in the PISA 2000 study, while groups 7, 8 and 9 combined account for only 8.6 per cent of the sample. For the purpose of national reporting of students' outcomes, this uneven distribution of students may not be considered desirable. On the other hand, Marks et al (2000) did recommend a schema such as this as a measure of social class, and its simplicity would simplify the coding task and increase the accuracy of coding.

A more even distribution between categories should be achievable with occupations coded to the 2-digit level of ASCO, but it does not then seem appropriate to order these categories simply on the basis of their 2-digit code or to determine highest parental occupation status on that basis. The alternative suggested here is that an average ANU4 status score is derived for each 2-digit ASCO code which are then ranked on that basis. The results obtained using this approach are given in Table 2.6 and Figure 2.4. Note that some categories are not represented in the PISA 2000 data due to the differences between ISCO and ASCO and the difficulties of translating one to the other.

Figure 2.4 Mean reading literacy score by average ANU4 score of highest parental occupation in ASCO major sub-groups, PISA 2000

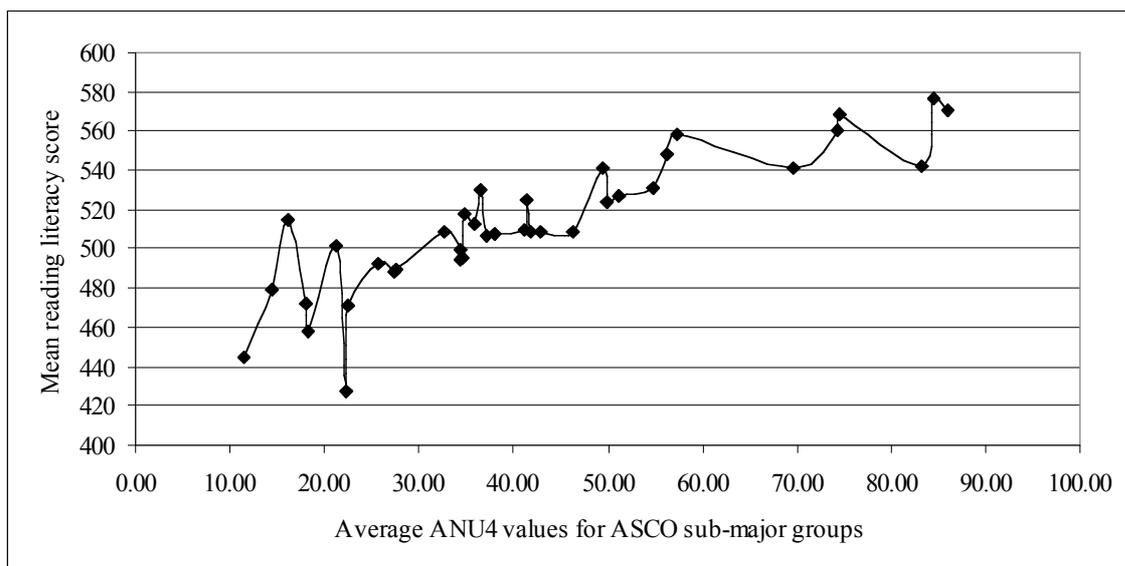


Table 2.6 Highest parental occupation distribution (per cent) and mean reading literacy score by ASCO sub-major groups, PISA 2000

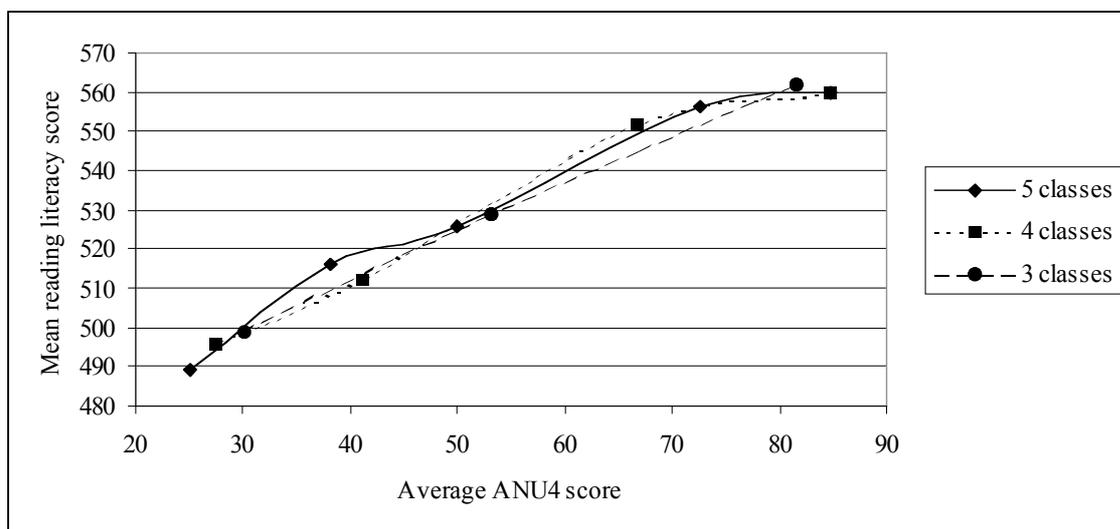
ASCO sub-major group		Average ANU4	Highest parental	Mean reading
Title	Code	score	occupation (%)	literacy score
Education professionals	24	85.92	11.5	570
Science, building and engineering professionals	21	84.57	3.2	577
Health professionals	23	83.32	9.9	542
Professionals nfd	20	74.84	0.0	
Business and information professionals	22	74.42	7.2	569
Social, arts and miscellaneous professionals	25	74.22	3.9	560
Specialist managers	12	69.57	7.0	541
Generalist managers	11	57.32	2.1	559
Science, engineering and related associate professionals	31	56.20	2.3	548
Managers and administrators nfd	10	55.24	0.0	
Business and administration associate professionals	32	54.81	2.2	531
Health and welfare associate professionals	34	51.22	0.3	527
Other associate professionals	39	49.97	1.3	524
Associate professionals nfd	30	49.54	0.1	541
Advanced clerical and service workers nfd	50	47.78	0.0	
Farmers and farm managers	13	46.33	4.8	509
Other advanced clerical and service workers	59	42.87	0.8	509
Electrical and electronic trades	43	41.78	2.3	508
Managing supervisors (sales and service)	33	41.41	4.9	525
Tradespersons and related workers nfd	40	41.20	0.5	510
Construction tradespersons	44	38.09	6.5	508
Mechanical and fabrication engineering tradespersons	41	37.18	2.3	507
Intermediate clerical workers	61	36.42	3.1	530
Intermediate sales and related workers	62	35.95	0.8	513
Secretaries and personal assistants	51	34.88	1.8	517
Elementary clerks	81	34.70	0.2	496
Intermediate service workers	63	34.49	2.8	495
Other tradespersons and related workers	49	34.35	3.0	499
Automotive tradespersons	42	32.59	0.7	508
Intermediate clerical, sales and service workers nfd	60	31.87	0.0	
Skilled agricultural and horticultural workers	46	28.36	0.0	
Elementary sales workers	82	27.65	3.3	489
Intermediate production and transport workers nfd	70	27.33	1.0	488
Elementary service workers	83	25.77	1.7	492
Elementary clerical, sales and service workers nfd	80	24.81	0.1	471
Other intermediate production and transport workers	79	22.52	1.5	427
Road and rail transport drivers	73	22.22	0.9	501
Food tradespersons	45	21.24	0.6	458
Cleaners	91	18.34	0.4	472
Intermediate plant operators	71	18.11	0.1	514
Intermediate machine operators	72	16.11	0.4	479
Other labourers and related workers	99	14.45	0.1	445
Factory labourers	92	11.43	4.2	445
Labourers and related workers nfd	90	5.13	0.0	
Not stated	n.s.		100.0	528

Figure 2.4 illustrates the variation in mean reading literacy scores across the full range of the ASCO sub-major group categories, but also illustrates that there is a clear trend in the scores with increasing ANU4 scale values. The results from grouping the occupation categories into 3, 4 and 5 broad classes are shown in Table 2.7 and Figure 2.5.

Table 2.7 Highest parental occupation distribution (per cent) and mean reading literacy score by groupings of ASCO sub-major groups, PISA 2000

ASCO sub-major group	Average ANU4 score	Highest parental occupation (%)	Mean reading literacy score
5 classes			
21,23,24	84.70	25	560
12,20,22,25	72.51	18	556
10,11,13,30,31,32,34,39,43,50,59	49.92	16	526
33,40,41,44,51,61,62,81	38.21	18	516
42,45,46,49,60,63,70-79, 82-99	25.01	19	489
4 classes			
21,23,24	84.70	25	560
10-12,20,22,25,30,31,32,34,39	66.87	27	552
13,33,40,41,43,44,50,59	41.15	22	512
42,46,49,51,60-99	27.41	23	496
3 classes			
20-25	81.48	36	562
10-13,30-39,40,43,50,59	53.08	29	529
41,42,44-49,51,60-99	30.02	31	499

Figure 2.5 Mean reading literacy score by average ANU4 score of highest parental occupation in groupings of ASCO major sub-groups, PISA 2000



2.4 Conclusions and recommendations

For the purpose of reporting outcomes against 3 or 4 categories of parental occupation status, these results strongly suggest that occupation coded to the sub-major (2-digit) group level of ASCO would be adequate. Indeed, the results for 3 classes in Table 2.7 (and Figure 2.3) suggest that a 3 category grouping defined by the ASCO major (1-digit) group level could be applied – group 1 comprising professionals, group 2 comprising managers and administrators and associate professionals, with the remainder in group 3.

The extent to which coding to this higher level of ASCO would simplify and improve the accuracy of coding cannot be fully assessed without further trials within schools of the coding process. Accuracy would undoubtedly improve somewhat, due simply to the fact that an incorrect 4-digit code within the correct minor group would no longer be an error, but these are relatively marginal effects. Similarly, coding would be simpler in those cases where choices between codes were in the same sub-major (2-digit) group level.

However, if coding relies on the use of the current ASCO coding system, there is little opportunity for simplifying the coding process. A modified coding system could perhaps be developed, but this might, and probably would, require a significant amount of development work. In either case, school staff would need to be trained in the use of the system.

In terms of reducing the workload associated with occupation coding, major gains can only be achieved by implementation of a self-coded occupation question. In this regard, the main finding here, that coding occupation to the sub-major (2-digit) group level of ASCO is sufficient to determine broad socioeconomic status classes, is extremely useful. There are only 35 sub-major groups, compared with 81 minor (3-digit) groups, 117 ANU4 status categories and 340 unit (4-digit) groups, and it may be possible to provide parents with descriptions of these 35 groups which allow them to self-code their occupation with reasonable accuracy. This possibility is considered in Section 3 below.

Other conclusions arising from these analyses are:

- the pattern of increasing literacy levels with increasing occupation status of either mother or father supports the use of highest parental occupation status as a more appropriate measure of the student's socioeconomic position; and
- the use of parents' last occupation to assign socioeconomic status to students whose parents are not currently employed gives a similar pattern of association between socioeconomic status and reading literacy scores to that obtained using current employment only.

In the light of this latter finding, it is recommended that the PMRT consider changes to the occupation question used to collect parental occupation information, should the approach of collecting detailed occupation data be followed, in order to reduce the number of students who cannot be assigned to socioeconomic status classes because their parents are not currently working. In the feasibility study conducted by the ABS, the question used followed standard ABS practice and asked only about 'the main job held *last week*', whereas PISA 2000, for example, asked 'If he/she is not working now, please tell us his/her last main job', although this question was directed at students rather than parents themselves.

An alternative suggested question is included in the recommendations below. The intention of the question is to include those parents who are unemployed, recently retired or marginally attached to the labour force without including occupations that they may have held many years previously. More attention is also given to the examples, the aim here being to try to encourage parents to give sufficient detail in their response to allow occupation to be coded accurately to the 2-digit level of ASCO with examples that illustrate the need for more extended descriptions of their job title. With more and better examples given, it is probable that the additional question seeking information on the tasks performed in the occupation could be excluded.

For those who still remain unassigned, either because their parents are not working or because the information is not provided, the evidence from PISA 2000 shows average reading literacy scores lower than any group with reported parental occupation. Since parental occupation was reported by students in this study, their low levels of reading literacy could possibly be a reason for the lack of response. At this stage, it appears premature to make a decision to assign these missing socioeconomic status cases to the low status category. The use of highest parental occupation status and the change to the occupation question suggested above to include recent employment should go some considerable way towards reducing the level of unassigned cases experienced in the feasibility study.

For comparisons of outcomes by SES category, there is no need to assign an SES level to those students for whom parental occupation is unknown or unstated. The aim of the reporting is to compare, both between SES classes and over time, the percentage of students within the category achieving the standard. We support the view expressed in the ACER report (Marks et al, 2000, Section 6.6.4) that it is “better to include unemployment as a component of a more general measure of socioeconomic disadvantage” and exclude the missing cases from reporting by SES level or report their outcomes separately.

Recommendations

If detailed parental occupation data is collected and student’s socioeconomic status is assigned using the ANU4 scale, it is recommended that:

- Occupation information is collected for both father/male guardian and mother/female guardian.
- Occupation information is coded to the 2-digit level of ASCO and assigned the appropriate average ANU4 score given in Table 2.6.
- Student’s socioeconomic status is determined using highest parental occupation status as defined by the higher ANU4 score
- For the purpose of national reporting by socioeconomic status category, these scores be grouped further into 3, 4 or 5 broad categories as shown in Table 2.7
- Outcomes for students who cannot be assigned to a socioeconomic status category should be reported in a separate additional category.
- In order to reduce the number of students who cannot be assigned socioeconomic status on the basis of current employment, ask parents who are not currently employed to report previous occupation. A suggested question is:

What is the mother/guardian’s (father/guardian’s) occupation?

If she (he) is not currently in paid work but has had a job in the last 12 months or has recently retired, please give her (his) last occupation.

Please give full occupation description. For example:

- Nurse – indicate type of nurse; Teacher – indicate type of school or private; Instructor – indicate type of instruction given; Tradesman/woman – indicate trade qualification; Machine Operator – indicate type of machine
- For managers, indicate organization and/or main activity managed – for example, works manager, information systems manager, shop manager, sales department manager, bar manager
- For public servants, indicate official designation and main tasks performed
- For armed forces personnel, indicate rank and main tasks performed

If she (he) has not been in paid work in the last 12 months, put 'X' here

- In view of the (2-digit) level of occupation coding recommended, it is likely that the additional question seeking information on the tasks performed in the occupation could be excluded. This option could be examined using the data from the ABS feasibility study, by coding on the basis of occupation title only and comparing the resulting allocation to broad SES categories with that obtained using the ASCO coding derived by the ABS.

3. Options for self-coding occupation

Self-coding occupation classifications have often been used in research in recognition of the significant difficulty and cost of obtaining and coding detailed occupation data. What cannot readily be determined is the accuracy of the data provided by parents using this self-coding approach compared with the collection of detailed occupation data. Such an assessment can only be made through parallel testing of the two approaches with both detailed occupation data and self-coded categorical data collected together, the detailed occupation data then being coded to the self-coded categories and the results compared.

Western *et al* (1998) conducted such a test on a small sample of 298 higher education students using a question with 53 fixed-choice response options. While they found that “responses were highly correlated” and “did not reveal any systematic biases”, less than half of the fixed-choice and open-ended responses resulted in cases being included in the same occupation status quintile. Further research to develop a smaller number of fixed-response options was recommended. While the subsequent report tested an 11 category occupation classification which achieved high response rates from students and included a recommended revised set of 8 fixed-response options, the reliability and validity of responses to that classification has not been tested (Jones, 2001). Similarly, the Victorian Department of Education and Training’s Student Enrolment Form collects information on parental occupation using a four category classification of occupations with extensive descriptions of the occupations to be included in each category, and while it also reports achieving high response rates, the accuracy of the response has not been verified.

In seeking to develop a self-coding occupation question to be used for the reporting of outcomes by socioeconomic status, various factors need to be taken into account. First, the categories must be defined in a manner that takes account of socioeconomic status, grouping occupations that are homogenous in regard to the preferred SES measure. Second, the population that is assigned to each category needs to be considered and estimated, to ensure a relatively even division of students between categories. Third, and most importantly, descriptions of the categories need to be developed which allow the target respondents to determine the appropriate category to which their occupation should be assigned. This is by far the most difficult task, with compromises being made between the detail of the descriptions provided and the effort expected of the respondents to sift through that detail to identify the correct category. Too little information and some respondents, perhaps many, will not be able to determine the correct category: too much information and some respondents, perhaps many, will not take the time to read through it with similarly inaccurate results.

There are in fact so many possible options to choose from and no clear criteria on which to make such a choice that any attempt to develop a self-coding occupation classification will be open to criticism and suggestions for improvement. No such classification will be perfectly accurate, nor is it necessary, but the classification must have face validity and reasonable levels of reliability to ensure consistency between its application at different times and with different populations, and it must have been parallel tested so that the types and extent of the errors that arise from its use are at least known and their implications can be examined. It may then be possible to implement some changes which eliminate some of these errors, or to conclude that the self-coding approach is simply impractical.

3.1 Proposed occupation classes for higher education students

In a report prepared for the Higher Education Group of the Department of Science, Education and Training (Jones, 2001), I recommended that ‘highest parental occupational status should be derived using occupations grouped according to the ANU4 occupational status scores’ and proposed a grouping of the ANU4 categories into eight broad occupation classes for self-coding by higher education students. The eight proposed classes, class titles and ANU4 category codes included in each class are shown in Table 3.1, with the recommended questions and detailed category descriptions given in Appendix 3.

Table 3.1 Eight occupation classes and component ANU4 categories proposed for self coding of parental occupation by higher education students

Occupation class	Class title	ANU4 category codes	Mean ANU4 score
1	Health, Education, Legal, Science, Building & Engineering qualified Professionals	9,10,11,12,19,21,23,24,25,26,29	88.63
2	Nurses/therapists; Social, Business, Computing, Media & Air/sea transport qualified Professionals	13,15,17,18,20,22,27,28,30	76.65
3	Elected & appointed officials; Senior management – public sector & large organisations	1,3,4,5,6,7,34,36	66.54
4	Artists; Associates/technicians; Police/ADF officers (non-commissioned); Sportspeople; & Business specialists	2,14,16,31,32,33,37,38,43,44,45,46	53.51
5	Farm, shop, office & hospitality Managers; Specialised clerks, sales & service workers; Mechanical engineering, electrical & communications Tradespeople	8,35,39,40,42,47,48,52,53,68, 69,73,78,79,80,88	42.84
6	Building/auto/arts/miscellaneous Tradespeople; Secretaries; Clerks; & Care workers	41,50,51,54,55,56,57,62,64,65,67,70,71,74,75,76,77,82,83,84, 103,106	35.48
7	Transport & service workers; Metal/textile/glass/wood/agriculture Tradespeople; Stationary plant operators; Skilled forestry/waterside/mining/construction workers; & Defence Forces (lower ranks)	49,60,61,63,66,72,81,85,86,87,89,92,98,99,102,104,105,107	28.64
8	Other service workers; Other machine operators; Factory/farm hands; & Labourers	58,59,90,91,93,94,95,96,97,100,101,108,109,110,111,112,113, 114,115,116,117	16.26

Source: Jones (2001), Table A2.2

These eight categories were derived following a trial survey of some 19,000 higher education students entering university for the first time in 2001 who were asked to code their parent/guardian’s occupation into one of 11 broad categories described in a manner similar to that of these eight categories (see Appendix 3). The results of this trial found that students had little difficulty in classifying parents’ occupation into one of the 11 categories, with just 6 per cent not stating father’s occupation and 3 per cent not stating mother’s occupation. A further 7 per cent indicating their father was not currently employed and 19 per cent reporting their mother was not employed. Nevertheless, it is again important to note that the accuracy of responses was not verified.

Using data from the 2001 Census on the occupations of parents of children aged 10-14 years living at home, Table 3.2 shows the distribution of children by highest parental occupation across these eight occupation groups.

Table 3.2 Parental occupation distribution (%) by 8 category occupation status measure for children aged 10-14 years, 2001 Census

Occupation class	Parental occupation (%)		Highest parental occupation (%)	
	Father	Mother	Total	Employed
1	5.6	5.8	9.9	12.7
2	4.5	6.7	9.0	11.5
3	8.6	2.8	8.7	11.1
4	7.0	3.4	7.7	9.9
5	10.8	9.9	13.3	17.0
6	8.7	13.5	12.2	15.6
7	8.0	8.9	8.8	11.2
8	11.2	7.0	8.6	11.0
Not working	12.4	36.0	19.4	
Not present	23.2	5.9	2.4	
Total	100.0	100.0	100.0	100.0

Notably, the Census shows 12 per cent of these children with a non-working father and 36 per cent with a non-working mother, 23 per cent with no father present and 6 per cent with no mother present, with the result that 19 per cent have no working parent present and 2 per cent have no parent present in their household. Similar results were identified using 1996 Census data (Jones, 2001). While the proportions for parents not present may overstate the proportions who normally do not live with their parent due to temporary absences, the percentage not working in the previous week are not dissimilar from those identified in the ABS feasibility study – in the sample of Victorian schools, for example, 16 per cent of responding fathers and 42 per cent of responding mothers reported that were not working or had occupation not stated.

Some comfort can however be drawn from the PISA 2000 data. As noted in Section 2.1, based on current employment only, 34 per cent and 20 per cent of students did not report mother's and father's occupation respectively with the result that 10 per cent could not be assigned highest parental occupation status (Table 2.3). Including past occupation reduced the level of missing occupation data by more than half, to 15 per cent for mothers, 9 per cent for fathers and 4 per cent for highest parental occupation (Table 2.1). The extension of the question to include recent previous employment and the use of highest parental occupation could then be expected to reduce the level of missing data to an acceptable level of around 10 per cent of students.

In deriving this classification for higher education students, it was thought that we were dealing with a group who were, on the whole, highly literate and thus able to cope with the sort of listing of occupations provided. Category headings were intended to guide them relatively quickly to the appropriate category where it was hoped that they would find the appropriate, or at least similar, occupation title. Keeping the listing to a single page was felt to be an important constraint, as much for its acceptance by university administrators as for the students. It appears less convincing as an option for use with the general population, at least in a single page, highly condensed, format.

3.2 A modified Victorian Department of Education and Training approach

The approach adopted by the Victoria Department of Education and Training (VDET) is not dissimilar to the approach above in that it also provides extensive listings of occupation titles with key words bolded to help guide the respondent towards the choice of an appropriate category. The layout of the listing is more “reader friendly”, and the listings of occupation titles more extensive, with the result that it extends over two pages.

Occupations have been grouped into four Family Occupation Status Groups based on ASCO, although it appears to be ASCO First Edition rather than the current Second Edition, with groupings which appear to be based on ANU3 status scores. Group 5, the highest status group, includes all managers and administrators other than miscellaneous general managers (ASCO 119) and farmers (ASCO 13), and all professionals other than artists and related professionals (ASCO 253). Group 4 includes these along with associate professionals, advanced and intermediate clerical, sales and service workers and elementary clerical and sales workers. Group 3 is entirely tradespersons, while Group 2 includes the remainder.

When compared to ANU4 status scores, the classification appears to have some occupations placed rather oddly. For example, welfare paraprofessionals are included in the highest category (Group 5) when they would seem to be more appropriately placed in Group 4 with other paraprofessionals. Given the order in which the categories are presented, this may not be too problematic, since Group 4 includes most other paraprofessionals. Group 4 includes all clerks and sales workers, consistent with the fact that ASCO First Edition had two major groups of Clerks and Sales and Personal Service Workers which were divided into three major groups in ASCO Second Edition reflecting Advanced, Intermediate and Elementary skill level requirements. While some of the changes made between ASCO First and Second Editions appear to have been taken into account, others have not.

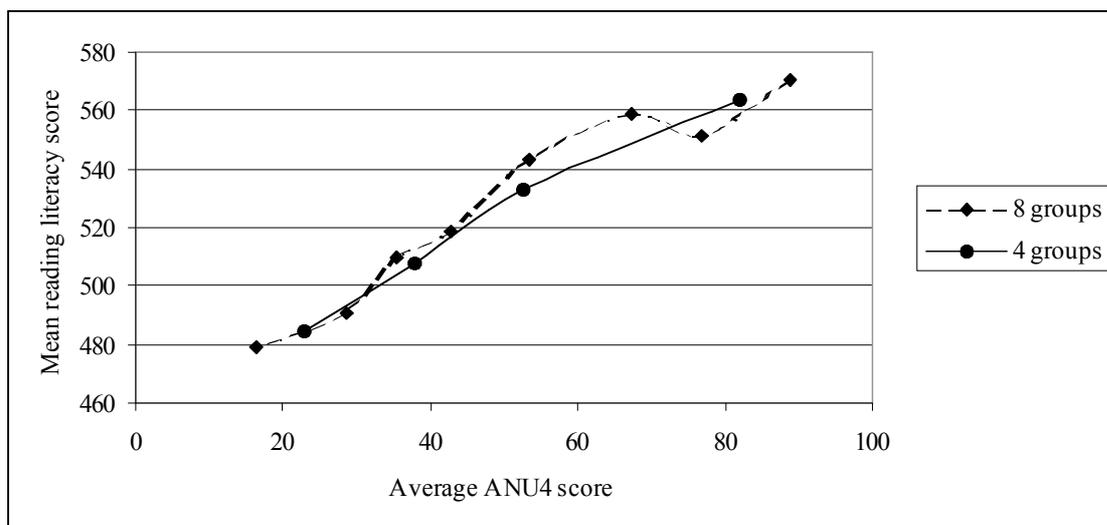
Rather than attempting to modify the VDET categories, an alternative grouping of the ANU4 scale categories has been derived and is given in Appendix 4, along with a listing of the ASCO Second Edition codes assigned to each of the 4 groups. Table 3.3 shows the distribution of children aged 10-14 years by highest parental occupation across these four occupation groups.

Table 3.3 Parental occupation distribution (%) by 4 category occupation status measure for children aged 10-14 years, 2001 Census

Occupation class	Parental occupation (%)		Highest parental occupation (%)	
	Father	Mother	Total	Employed
1	13.5	13.7	22.5	28.8
2	16.9	10.0	18.7	23.9
3	16.5	15.6	19.4	24.8
4	17.6	18.7	17.7	22.6
Not working	12.4	36.0	19.4	
Not present	23.2	5.9	2.4	
Total	100.0	100.0	100.0	100.0

In order to compare the degree to which this and the 8 category approaches detect differences in performance outcomes, the PISA 2000 data has again been used to derive average reading literacy scores for each category, giving the results in Figure 3.1.

Figure 3.1 Mean reading literacy score by average ANU4 score of highest parental occupation in 4 and 8 category groupings of ASCO, PISA 2000



The 4 category classification shows a very clear gradient in reading literacy scores, with average scores of 485, 507, 533 and 563 respectively from low to high socioeconomic status. The population distribution between categories is relatively even, with 23 per cent of students with a reported parental occupation in the low status category and 29 per cent in the high status category.

Other options for classifying occupations into 3 groups and 5 groups have been tried, but this 4 group classification is considered to be the best of these options in regard to the way in which categories are described and presented. Both 3 group and 5 group options, for example, result in divisions of the trades group of occupations that require extensive descriptions. And, as the results in Table 2.7 and Figure 2.5 show, there is very little difference between these options in regard to the differentiation of performance outcomes.

3.3 Other options

As was noted above, there are numerous possibilities that could be considered in developing a self-coding occupation classification. The results in Section 2 suggest one option in particular that is intermediate between the detailed 4-digit occupation coding required to strictly adhere to the ANU4 classification and the broad category approach of the two options above, namely the development of descriptions of the 35 sub-major (2-digit) level categories of ASCO. While this has not been attempted here, we believe that this approach has considerable merit and could be developed, by the ABS in particular.

For administrative collections, development of a self-coding occupation question at the sub-major level of ASCO would be an extremely useful tool, allowing direct comparisons to be made between administrative data and ABS collections by occupation groups and, if desirable, by socioeconomic status.

3.4 Conclusions and recommendations

The four group classification of occupations presented in Appendix 4 has the required properties of grouping occupations that are relatively homogenous in regard to the preferred ANU4 socioeconomic status measure, dividing the student population on the basis of highest parental occupation status into classes of approximately equal size and, in consequence, shows a clear gradient in reading literacy performance with socioeconomic status.

What remains unknown, and needs to be thoroughly tested if a self-coding approach is to be adopted, is the degree to which parents are able to self-code their occupation accurately to these categories. Such an assessment can only be made through parallel testing of the two approaches with both detailed occupation data and self-coded categorical data collected together. For the ABS feasibility study, there was some discussion of the need to retain the Family Occupation Status Group Code question as well as collecting detailed occupation data, but the question was dropped from the study forms on the grounds that it would be derived directly from the occupation data (ABS, 2002). Had it been retained, the study would have provided a parallel test of the accuracy of self-coding to the VDET classification and some general guidance on the feasibility of the self-coding option.

Parallel testing of the two approaches will require a second feasibility study to be undertaken, although it does not necessarily require questions to be inserted into school enrolment forms. In this case, parents need only provide information on their occupation, first by responding to the standard occupation questions (or the slightly modified version suggested in Section 2.4) and second, by self-coding their occupation into one of the occupation groups presented to them. The information collected through the open response occupation question will then need to be coded to ASCO2 and hence to the four group classification. The differences between the self-coded occupation group and the occupation group derived from detailed occupation data can then be identified and analysed, to determine the extent and type of misclassification, the effect that such errors may have on the reporting of outcomes, and possible modifications that could be made to improve the accuracy of self-coded data.

While there are some advantages of undertaking this feasibility testing in context, they are outweighed in our view by the unnecessary burden that this would impose on parents. In addition, conducting a study separated from the standard process of student enrolment allows considerably more flexibility in timing. The study should be conducted through a sample of schools, with materials distributed to parents using the standard procedures adopted by the schools, as in the previous feasibility study. A sample of 8 government schools similar to that used in Victoria in the previous study (providing occupation data on some 2,000 responding parents) should be sufficient. A covering letter explaining the purposes of the study and how their information would be used should accompany the questionnaire. The questionnaire itself would be limited to the collection of occupation data for both parents using the two approaches. Completed questionnaires would be returned to the study organizer for coding, data entry and analysis.

The format in which this four group classification of occupations has been presented here is however only one of many possible alternative approaches, and the presentation could undoubtedly be improved. Various approaches to the presentation of categories should be developed and piloted with relatively small groups of respondents, particularly those considered most likely to experience problems in allocating themselves to categories. The allocation of time and resources to this preliminary testing of the presentation of categories will be amply repaid by improved outcomes and better results in the more extensive parallel testing and subsequent implementation.

To illustrate this point, a second option for presentation of this classification to respondents is also shown in Appendix 4, in this case with the four groups subdivided into 10 response classes which can readily be combined to form the four major groups – classes 1 and 4 combined in Group 1, classes 2, 3 and 5 combined in Group 2, classes 6 and 7 combined in Group 3, and classes 8, 9 and 10 combined in Group 4. This option has fewer example occupations but has the advantage of being presented on a single page. Whether it would be a more or less effective presentation option can only properly be assessed through pilot studies initially and subsequent parallel testing.

Recommendations

If a self-coding occupation question is to be used to determine student’s socioeconomic status, it is recommended that:

- Occupation information is collected for both father/male guardian and mother/female guardian.
- For the purpose of national reporting by socioeconomic status category, a four category grouping of ASCO (second edition) codes similar in most respects to that given in Appendix 4 is used as the basis for self-coding occupation descriptions.
- Student’s socioeconomic status is determined using highest parental occupation status as defined by the (ascending) order of these occupation groups.
- Outcomes for students who cannot be assigned to a socioeconomic status category are reported in a separate additional category.
- In order to reduce the number of students who cannot be assigned socioeconomic status on the basis of current employment, ask parents who are not currently employed to report previous occupation. A suggested question is:

What is the mother/guardian’s (father/guardian’s) occupation?
If she (he) is not currently in paid work but has had a job in the last 12 months or has recently retired, please give her (his) last occupation.

Please select the appropriate occupation group from the attached list and enter the group number here:

If she (he) has not been in paid work in the last 12 months, enter ‘X’

If you are not sure of the appropriate occupation group, please write in the full title of the occupation and describe the main tasks that she (he) performs in that job.

For managers, indicate organization and/or main activity managed – for example, works manager, information systems manager, shop manager. For public servants, indicate official designation. For armed forces personnel, indicate rank.

- Various approaches to the presentation of self-coding occupation groups should be developed, by consulting experts in questionnaire design, and pilot tested with

relatively small groups of respondents, particularly those considered most likely to experience problems in allocating themselves to categories.

- A study involving parallel testing is required with both detailed occupation data and self-coded categorical data collected together so that the types and extent of the errors that arise from its use are known and their implications can be examined.
- Conducting such a study separated from the standard process of student enrolment would allow considerably more flexibility in timing. A study conducted through a small sample of schools (similar to that used in Victoria in the previous study providing occupation data on some 2,000 responding parents), with questionnaires distributed to parents using the standard procedures adopted by the schools, is suggested. More than one self-coding approach could be tested in this study if necessary, as well as testing the need for the question on tasks performed when occupation is coded to the sub-major (2-digit) level of ASCO (see Section 2 recommendations).

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Appendix 1

Parental occupation questions used in PISA 2000

Some of the following questions are about your mother and father (or those person(s) who are like a mother or father to you — for example, guardians, step-parents, foster parents, etc.).

If you share your time with more than one set of parents or guardians, please answer the following questions for those parents/step-parents/guardians you spend the most time with.

Q 7 What is your mother currently doing?

(Please tick only one box.)

- Working full-time for pay ₁
- Working part-time for pay..... ₂
- Not working, but looking for a job ₃
- Other (e.g. home duties, retired)..... ₄

Q 8 What is your father currently doing?

(Please tick only one box.)

- Working full-time for pay ₁
- Working part-time for pay..... ₂
- Not working, but looking for a job ₃
- Other (e.g. home duties, retired)..... ₄

Q 9 What is your mother's main job? (e.g., School teacher, nurse, sales manager)

If she is not working now, please tell us her last main job.

Please write in the job title. _____

Q 10 What does your mother do in her main job? (e.g., Teaches high school students, cares for patients, manages a sales team)

If she is not working now, please tell us her last main job.

Please use a sentence to describe the kind of work she does or did in that job.

*(If she has **never** worked, tick here and go to **Question 11**.)*

Q 11 What is your father's main job? (e.g., School teacher, carpenter, sales manager)

If he is not working now, please tell us his last main job.

Please write in the job title. _____

Q 12 What does your father do in his main job? (e.g., Teaches high school students, builds houses, manages a sales team)

If he is not working now, please tell us his last main job.

Please use a sentence to describe the kind of work he does or did in that job.

*(If he has **never** worked, tick here and go to **Question 13**.)*

Appendix 2

ANU4 occupational status categories and scores

ANU4 code	Indicative occupational title	ANU4 score	ANU4 rank	ANU4 Component ASCO2 codes
1	General managers	73.43	21	1100,111
2	Other generalist managers	49.95	36	119
3	Resource managers	73.10	23	121
4	Engineering and process managers	63.20	24	122
5	Sales and marketing managers	63.00	27	123
6	Other specialist managers	79.98	14	1200,129
7	Managers n.e.c.	55.24	33	1000
8	Farmers and farm managers	46.33	44	131
9	Natural science professionals	86.15	6	211
10	Architects and related professionals	83.63	10	2121,2122,2123
11	Engineers	83.77	9	2124,2125,2126,2127,2128
12	Other science and engineering professionals	83.37	11	2100,2120,2129
13	Accountants and related professionals	81.42	12	221
14	Sales and related professionals	62.02	29	222
15	Computing professionals	78.45	16	223
16	Human resource professionals	62.37	28	2291
17	Business and organisation analysts	76.43	17	2294
18	Other business professionals	79.38	15	2200,2290,2292,2293,2295,2299
19	Medical practitioners	100.00	1	231
20	Nursing professionals	75.32	18	232
21	Other health professionals (a)	94.49	4	2300,2380,2381,2382,2384,2385,2387,2392,2514
22	Other health professionals (b)	80.14	13	2383,2386,2388,2391,2393,2394,2399
23	Primary school teachers	84.52	7	2412
24	Secondary school teachers	89.72	5	2413
25	University teachers	95.66	3	2421
26	Other education professionals (a)	84.31	8	2400,2410,2414,2422,2492,2493
27	Other education professionals (b)	74.52	20	2411,2420,2490,2491
28	Social welfare professionals	73.21	22	251(exc 2514)
29	Legal professionals	96.03	2	2521
30	Other professionals (a)	74.84	19	2000,2500,252(exc 2521),2534,2535,2536,254(exc 2543)
31	Other professionals (b)	63.05	26	2530,2531,2532,2533,2537,2538,2539,2543
32	Medical and science technical officers	56.06	32	311
33	Building associate professionals	56.25	31	3100,312
34	Finance associate professionals	63.19	25	321
35	Office managers	46.55	43	3291
36	Other business associate professionals	58.88	30	3200,3290,3292
37	Real estate associate professionals	49.22	38	3293
38	Computing support technicians	54.58	34	3294
39	Shop managers	40.99	52	331
40	Restaurant and catering managers	39.61	57	3321
41	Chefs	32.05	77	3322
42	Other hospitality managers	40.55	54	3320,3323,3324,3325,3329

ANU4 occupation categories and scores (cont'd)

ANU4 code	Indicative occupational title	ANU4 score	ANU4 rank	ANU4 Component ASCO2 codes
43	Other sales and service managing supervisors	48.45	40	3300,339
44	Health and welfare associate professionals	51.22	35	3400,341,342,349
45	Police officers	48.51	39	391
46	Other associate professionals	49.54	37	3000,3900,399
47	Metal fitters and machinists	39.94	56	4112
48	Other mechanical engineering tradespersons	43.10	46	4100,411(exc 4112)
49	Fabrication engineering tradespersons	31.31	83	412
50	Motor mechanics	32.99	73	4211
51	Other automotive tradespersons	31.75	80	421(exc 4211)
52	Electricians	42.84	47	4311
53	Other electrical tradespersons	40.60	53	431(exc 4311)
54	Carpenters and joiners	39.51	59	4411
55	Painters and decorators	37.31	61	4421
56	Plumbers	40.43	55	443
57	Other construction tradespersons	35.89	64	4400,441(exc 4411),442(exc 4421)
58	Cooks	17.67	106	4513
59	Other food tradespersons	24.10	98	451(exc 4513)
60	Skilled agricultural workers (a)	28.45	86	4600,461,4621
61	Other horticultural workers (b)	28.32	87	462(exc 4621)
62	Printing tradespersons	35.00	69	491
63	Wood tradespersons	31.50	82	492
64	Hairdressers	32.80	74	493
65	Other tradespersons (a)	41.20	49	4000,4900,4940,4980,4981,4984,4985,4987,4988,4992,4999
66	Other tradespersons (b)	29.95	85	494(exc 4940),4982,4983,4986,4991
67	Secretaries and personal assistants	34.88	70	511
68	Bookkeepers	39.54	58	5911
69	Other advanced clerical workers	47.78	41	5000,591(exc 5911),599
70	General clerks	36.15	63	611
71	Keyboard operators	32.16	76	612
72	Receptionists	30.10	84	613
73	Accounting clerks	41.50	48	6141
74	Bank workers	35.45	67	6143
75	Other numerical clerks	39.11	60	6140,6142,6144,6145
76	Stock and purchasing clerks	31.76	79	6153
77	Other recording and despatching clerks	35.49	66	615(exc 6153)
78	Inquiry and admissions clerks	41.08	51	6191
79	Other intermediate clerical workers	46.74	42	6100,619(exc 6191)
80	Sales representatives	41.16	50	6211
81	Other intermediate sales workers	24.85	95	621(exc 6211)
82	Education aides	31.55	81	6310,6311
83	Children's care workers	35.39	68	6312
84	Special care workers	35.51	65	6313
85	Personal care and nursing assistants	25.87	94	6314

ANU4 occupation categories and scores (cont'd)

ANU4 code	Indicative occupational title	ANU4 score	ANU4 rank	ANU4 Component ASCO2 codes
86	Bar attendants	26.67	92	6322
87	Waiters	36.37	62	6323
88	Other intermediate service workers (a)	44.14	45	6390,6393,6394,6395,6396,6397
89	Other intermediate service workers (b)	31.87	78	6000,6300,6320,6321,6324,6391,6392,6399
90	Mobile construction plant operators	16.32	108	7111
91	Forklift drivers	7.19	115	7112
92	Intermediate stationary plant operators	26.22	93	712
93	Other intermediate plant operators	14.70	109	7100,7110,7119
94	Intermediate machine operators n.e.c.	21.00	101	7200
95	Intermediate textile machine operators	8.51	113	721
96	Miscellaneous intermediate machine operators	21.46	100	729
97	Truck drivers	14.01	110	7311
98	Bus, tram and train drivers	27.20	91	7312,7315
99	Car and delivery drivers	32.21	75	7313,7314
100	Other transport drivers	17.80	105	7310
101	Storepersons	19.01	103	7993
102	Other intermediate production & transport workers	27.33	90	7000,7900,791(exc 7993)
103	Elementary clerks	34.70	71	811
104	Sales assistants	27.40	89	821
105	Checkout operators and cashiers	24.53	97	8291
106	Other elementary sales workers	33.69	72	8200,829(exc 8291)
107	Guards and security officers	27.58	88	8311
108	Other elementary service workers	24.81	96	8000,831(exc 8311)
109	Labourers n.e.c.	5.13	116	9000
110	Cleaners	18.34	104	911
111	Factory labourers	12.35	111	9200,921
112	Product packagers	9.64	112	922
113	Mining, construction and related labourers (a)	17.06	107	9910,9916,9917,9918,9919,9922
114	Mining, construction and related labourers (b)	7.64	114	9912,9913,9914,9915
115	Agricultural and related labourers	0.00	117	992(exc 9922)
116	Kitchenhands	19.54	102	9931
117	Miscellaneous labourers	22.73	99	9900,9911,993(exc 9931),999

Notes: (a) indicates higher ANU3 score at 4-digit level in ASCO (first edition); (b) indicates lower ANU3 score at 4-digit level in ASCO (first edition).

n.e.c. means 'not elsewhere classified'

ASCO2 codes are unit group (4-digit) and minor group (3-digit) categories, or minor group excluding one component unit group included elsewhere (eg. 993(exc 9931)).

Source: Jones and McMillan (2001) and the Australian mirror site for the Integrated Public Use Microdata Series (IPUMS) international project at <http://ipumsi.anu.edu.au/scaleasco.phtml>

Reproduced from Jones (2001)

Appendix 3
Recommended questions for higher education
students' socio-economic status measures

Source: Reproduced from Jones (2001), Appendix 3.

Please answer the following questions for BOTH parents or guardians. If you normally live with only ONE parent or guardian, please answer for that parent/guardian only.

	Father/male guardian	Mother/female guardian
1. Does your parent/guardian have a university qualification?	Yes No Not sure	Yes No Not sure
2. Has your parent/guardian obtained any <u>other</u> post-secondary educational qualification, such as a professional, trade, technical or other vocational certificate?	Yes No Not sure	Yes No Not sure
3. <i>Last week</i>, did you parent/guardian have a full-time or part time job of any kind? (<u>including</u> casual/temporary work or unpaid work in a family business but <u>excluding</u> other unpaid work)	Yes No Not sure	Yes No Not sure
4. IF YES: What was your parent/guardian's occupation in that job? Please choose the appropriate code (1 to 8) from the list on the next page. The list groups occupations into 8 broad categories and gives examples of the occupations in each category.	Occupation category (one code only) _____	Occupation category (one code only) _____
If you are not sure of the appropriate category code, please write in the full title of their occupation.	Occupation title _____ _____	Occupation title _____ _____

1. Health, Education, Legal, Science, Building & Engineering qualified Professionals

- GP, specialist, dentist, pharmacist, optometrist, physiotherapist, chiropractor, veterinarian, psychologist, medical officer
- University professor/lecturer/researcher, teacher in primary/secondary school/TAFE/special ed/ESL, education officer
- Barrister, solicitor, attorney, legal officer
- Professional scientist, architect, surveyor, civil/electrical/mechanical/mining engineer, engineering technologist

2. Nurses/therapists; Social, Business, Computing, Media & Air/sea transport qualified Professionals

- Registered nurse, therapist, radiographer, dietitian, podiatrist, occupational health professional
- Private teacher, pre-primary/kindergarten teacher, social/welfare/community worker, counsellor, minister of religion
- Social scientist, urban/regional planner, librarian, archivist, records manager, curator, interpreter/translator
- Management consultant, accountant, tax agent, auditor, economist, statistician, mathematician, actuary, valuer
- Computer systems analyst/administrator, software engineer, systems programmer
- Film/television/radio/stage producers & directors, newspaper editor/journalist, publisher/author
- Aircraft pilot, flight officer, flying instructor, air traffic controller, ship's captain/officer/pilot

3. Elected & appointed officials; Senior management – public sector & large organisations

- MP, elected representative, trade union secretary, judge, magistrate, commissioner, coroner
- Senior executive in government, industry, commercial, or other large organisations
- Senior manager (Section head) in public service, regional director, health services manager, school principal, dean
- Specialist manager - finance/engineering/production/personnel/industrial relations/public relations/sales and marketing
- Senior commissioned officers in Defence Forces/police/fire service
- Bank manager, finance/investment/insurance broker, project manager

4. Artists; Associates/technicians; Police/ADF officers (non-commissioned); Sportspeople; & Business specialists

- Musician, actor, dancer, painter, potter, media presenter, photographer, designer
- Medical/science/building/engineering/computing support technician or associate professional
- Enrolled nurse, paramedic/ambulance officer, welfare officer, dental associate, library technician
- Police officer, senior fire fighter, senior NCO (Defence Forces), safety inspector (building, health)
- Sportsman/woman, coach, trainer, sports official, manager of sports/recreation facility
- Owner/manager of construction, import/export, wholesale, manufacturing, transport, real estate/property business
- Marketing/advertising, technical sales, customer services, personnel, industrial relations specialist, retail buyer

5. Farm, shop, office & hospitality Managers; Specialised clerks, sales & service workers; Mechanical engineering, electrical & communications Tradespeople

- Owner/manager farm, shop, office, restaurant/caterer, licensed club, hotel/motel, caravan/camping park
- Bookkeeper, accounting clerk, loans officer, court reporter, desktop publisher, insurance agent/assessor, auctioneer
- Library assistant, hospital admitting clerk, personnel clerk, government inspector (customs, tax, licences, transport, water)
- Sales representative, inquiry officer, customer service officer, travel/tourism agent, flight attendant, travel steward
- Prison officer, casino worker, beautician, undertaker, fitness instructor
- Mechanical engineering tradespeople - metal fitter/machinist, tool/instrument maker, aircraft maintenance, locksmith
- Electrical, electronic equipment, refrigeration, air conditioning and communications tradespeople

6. Building/auto/arts/miscellaneous Tradespeople; Secretaries; Clerks; & Care workers

- Building tradespeople - carpenter/joiner, plasterer, bricklayer, tiler, stonemason, painter, plumber, signwriter
- Motor mechanic, automotive repairer, shipwright, boat builder/repairer
- Performing arts support tradespeople - sound/lighting technician, sound recorder, camera operator, make-up artist
- Printing, furniture and bedding trades, chef, florist, jeweller, hairdresser, firefighter
- Chemical/petroleum/gas/power generation plant operator
- Secretary, personal assistant, keyboard operator, office/bank/insurance/payroll clerk, other clerical workers
- Child care worker, education aide, aged/disabled person care worker, nursing assistant

7. Transport & service workers; Metal/textile/glass/wood/agriculture Tradespeople; Stationary plant operators; Skilled forestry/waterside/mining/construction workers; & Defence Forces (lower ranks)

- Public transport driver, courier, delivery van driver, guard, security officer
- Hospitality staff, waiter, receptionist, dental assistant, veterinary nurse
- Sales assistant, checkout supervisor/operator, cashier, motor vehicle/parts salesman
- Textile, clothing, leather, glass, wood, metal working trades
- Horse trainer, wool/hide/skin classer, greenkeeper, nurseryman, seafarer, fishing hand
- Stationary plant operator (engine, boiler, crane, engineering production system, pulp/paper mill)
- Forestry worker, waterside worker, mining/drilling worker, scaffolder, steel erector, concreter
- Other members of the Defence Forces (ranks below senior NCO)

8. Other service workers; Other machine operators; Factory/farm hands; & Labourers

- Food preparation - butcher, smallgoods maker, baker, miller, confectioner, cook, kitchen hand/assistant
- Cleaner, caretaker, usher, porter, laundry worker, housekeeper, home improvements installer
- Production/processing machine operator, sewing machinist, photographic developer/printer
- Truck driver, mobile plant operator, fork lift driver, garbage collector, freight/furniture handler, storeman

- Factory hands, process workers, product packagers, farm hands, labourers in construction/railway/mining/communications

Appendix 4

A four group classification of occupations

Group 1: Elected officials, senior executives/managers and professionals

Elected officials [parliamentarian, mayor, alderman/woman, trade union secretary, board member]

Senior executives/managers head large organisations or departments within them.

Business [chief executive, managing director, company secretary, finance director, chief accountant, personnel/industrial relations manager, research and development manager]

Media [newspaper editor, film/television/radio/stage producer/director/manager]

Public sector [public service manager (Section head or above), regional manager, hospital/health services/nurse administrator, school principal, faculty head/dean, library/museum/gallery manager, research laboratory/facility manager, police/fire services Commissioner]

Defence Forces [Commissioned Officer]

Professionals generally have degree or higher qualifications and professional experience in government, private industry or own business.

Health [GP or specialist, registered nurse, dentist, pharmacist, optometrist, physiotherapist, chiropractor, veterinarian, psychologist, therapy professional, radiographer, podiatrist, dietitian]

Education [school teacher, university lecturer, VET/special education/ESL/private teacher, education officer]

Law [judge, magistrate, barrister, coroner, solicitor, lawyer, legal officer]

Engineering [architect, surveyor, chemical/civil/electrical/mechanical/mining/other engineer]

Science [scientist, geologist, meteorologist, metallurgist]

Computing [IT services manager, computer systems designer/administrator, software engineer, systems/applications programmer]

Business [management consultant, business analyst, accountant, auditor, policy analyst, actuary, valuer]

Social [social/welfare/community worker, counsellor, minister of religion, economist, urban/regional planner, sociologist, librarian, records manager, archivist, interpreter/translator]

Air/sea transport [aircraft pilot, flight officer, flying instructor, air traffic controller, ship's captain/officer/pilot]

Group 2: Other business managers/professionals and associate professionals

Other business managers.

Farm/business owner/general manager [crop and/or livestock farmer/farm manager, stock and station agent, building/construction, manufacturing, mining, wholesale, import/export, transport business manager]

Specialist manager [works manager, engineering manager, sales/marketing manager, purchasing manager, supply/shipping manager, customer service manager, property manager]

Financial services manager [bank branch manager, finance/investment/insurance broker, credit/loans officer]

Retail sales/services manager [shop, post office, restaurant, real estate agency, travel agency, betting agency, petrol station, hotel/motel/caravan park, sports centre, theatre/cinema, gallery, car rental, car fleet, railway station]

Other professionals.

Artist/Writer [editor, journalist, author, media presenter, photographer, designer, illustrator, musician, actor, dancer, painter, potter, sculptor]

Sportsperson [sportsman/woman, coach, trainer, sports official]

Associate professionals generally have diploma/technical qualifications and support professionals.

Medical, science, building, engineering, computer technician/associate professional

Health/welfare [enrolled nurse, community health worker, paramedic/ambulance officer, massage therapist, welfare/parole officer, youth worker, dental hygienist/technician]

Legal [police officer, prison officer, government inspector, examiner or assessor, occupational/environmental health officer, security advisor, private investigator, debt collector, law clerk, court officer, bailiff]
Business/administration [recruitment/employment/industrial relations/training officer, marketing/advertising specialist, market research analyst, technical sales representative, retail buyer, office manager, project manager/administrator, mail supervisor, other managing supervisors]
Defence Forces [senior non-commissioned officer]
Other [library assistant, museum/gallery technician, research assistant, proof reader]

Group 3: Trades and advanced/intermediate clerical, sales and service staff

Tradesmen/women generally have completed a 4 year Trade Certificate, usually by apprenticeship. All tradesmen/women are included in this group.

Advanced/intermediate clerical, sales and service staff.

Recording clerk [bookkeeper, bank clerk, PO clerk, statistical/actuarial clerk, investment accounting clerk, accounts/claims/audit clerk, payroll clerk, personnel records clerk, registry/filing clerk, betting clerk, production recording clerk, stores/inventory clerk, purchasing/order clerk, freight/transport/shipping clerk/despacher, bond clerk, customs agent/clerk]
Inquiry/admissions clerk [customer inquiry/complaints/service clerk, hospital admissions clerk]
Office assistant [secretary, personal assistant, desktop publishing operator, switchboard operator]
Sales representative [company sales representative (goods and services), auctioneer, insurance agent/assessor/loss adjuster, market researcher]
Carer [aged/disabled/refuge care worker, child care assistant, nanny]
Service staff [meter reader, parking inspector, postal delivery worker, courier, travel agent, tour guide, flight attendant, fitness instructor, casino dealer/gaming table supervisor]

Group 4: Other occupations

Other clerical, sales and service staff.

Sales staff [sales assistant, motor vehicle/caravan/parts salesperson, checkout operator, cashier, bus/train conductor, ticket seller, service station attendant, car rental desk staff, street vendor, telemarketer, sales demonstrator, shelf stacker]
Office staff [typist, word processing/data entry/business machine operator, receptionist]
Hospitality staff [hotel service supervisor, receptionist, waiter, bar attendant, kitchenhand, fast food cook, usher, porter, housekeeper]
Assistant/aide [trades' assistant, school/teacher's aide, dental assistant, veterinary nurse, nursing assistant, museum/gallery attendant, home helper, salon assistant, animal attendant]

Machinery operators.

Driver or mobile plant operator [car, taxi, truck, bus, tram or train driver, driving instructor, courier/deliverer, forklift driver, streetsweeper driver, garbage collector, bulldozer/loader/grader/excavator operator, farm/horticulture/forestry machinery operator]
Production/processing machine operator [engineering, chemical, petroleum, gas, water, sewerage, cement, plastics, rubber, textile, footwear, wood/paper, glass, clay, stone, concrete, etc production/processing machine operator]
Other machinery operator [photographic developer/printer, industrial spray painter, boiler/air-conditioning/ refrigeration plant, railway signals/points, crane/hoist/lift, bulk materials handling machinery]

Other occupations.

Defence Forces [other ranks (below senior NCO) without trade qualification not included above]
Other agriculture, horticulture, forestry, fishing, mining worker [farm overseer, shearer, wool/hide classer, farm hand, horse trainer, nurseryman, greenkeeper, gardener, tree surgeon, forestry/logging worker, miner, seafarer/fishing hand]
Other worker [labourer, factory hand, storeman, guard, cleaner, caretaker, laundry worker, trolley collector, car park attendant, crossing supervisor]

ASCO2 codes by socio-economic status group

Group 1: Elected officials, senior executives/managers and professionals

	1100	Generalist managers nfd
111		General managers and administrators
	1200	Specialist managers nfd
121		Resource managers
129		Miscellaneous specialist managers
	2000	Professionals nfd
21		Science, building and engineering professionals
	2200	Business and information professionals nfd
221		Accountants, auditors and corporate treasurers
223		Computing professionals
	2290	Miscellaneous business and information professionals nfd
	2292	Librarians
	2293	mathematicians, statisticians and actuaries
	2294	Business and organisation analysts
	2295	Property professionals
	2299	Other business and information professionals
23		Health professionals
24		Education professionals
	2500	Social, arts and miscellaneous professionals nfd
251		Social welfare professionals
252		Miscellaneous social professionals
	2534	Journalists and related professionals
	2535	Authors and related professionals
	2536	Film, television, radio and stage directors
	2540	Miscellaneous professionals nfd
	2541	Air transport professionals
	2542	Sea transport professionals

Group 2: Other business managers/professionals and associate professionals

	1000	Managers and administrators nfd
119		Miscellaneous generalist managers
122		Engineering, distribution and process managers
123		Supply and distribution managers
13		Farmers and farm managers
	222	Sales, marketing and advertising professionals
	2291	Human resources professionals
	2530	Artists and related professionals nfd
	2531	Visual arts and crafts professionals
	2532	Photographers
	2533	Designers and illustrators
	2537	Musicians and related professionals
	2538	Actors, dancers and related professionals
	2539	Media presenters
	2543	Occupational and environmental health professionals
3		Associate professionals except
	3322	Chefs
	5	Advanced clerical and service workers except
51		Secretaries and personal assistants
	5911	Bookkeepers
	6100	Intermediate clerical workers nfd
619		Miscellaneous intermediate clerical workers except
	6191	Inquiry and admissions clerks

Group 3: Trades and advanced/intermediate clerical, sales and service staff

- 3322 Chefs
- 4 Tradespersons and related workers **except**
 - 4513 **Cooks**
 - 46 **Skilled agricultural and horticultural workers**
 - 4991 **Defence Forces members not elsewhere included**
 - 51 Secretaries and personal assistants
 - 5911 Bookkeepers
 - 611 General clerks
 - 614 Intermediate numerical clerks
 - 615 Material recording and dispatching clerks
 - 6191 Inquiry and admissions clerks
 - 6211 Sales representatives
 - 6312 Children's care workers
 - 6313 Special care workers
 - 639 Miscellaneous intermediate service workers **except**
 - 6391 **Dental assistants**
 - 6392 **Veterinary nurse**
 - 6399 **Other intermediate service workers**
 - 811 Elementary clerks

Group 4: Other occupations

- 46 Skilled agricultural and horticultural workers
 - 4513 Cooks
 - 4991 Defence Forces members not elsewhere included
 - 6000 Intermediate clerical, sales and service workers nfd
 - 612 Keyboard operators
 - 613 Receptionists
 - 6200 Intermediate sales and related workers nfd
 - 6210 Intermediate sales and related workers nfd
 - 6212 Motor vehicle and related products salespersons
 - 6213 Retail and checkout supervisors
 - 6300 Intermediate service workers nfd
 - 6310 Carers and aides nfd
 - 6311 Education aides
 - 6314 Personal care and nursing assistants
 - 632 Hospitality workers
 - 6391 Dental assistants
 - 6392 Veterinary nurse
 - 6399 Other intermediate service workers
- 7 Intermediate production and transport workers
- 8 Elementary clerical, sales and service workers **except**
 - 811 **Elementary clerks**
- 9 Labourers and related workers

An alternative presentation format

1. Senior executives/management in public sector & large business organisations

- MP, elected representative, trade union secretary, judge, magistrate, commissioner, coroner
- Senior executive/manager in industry, commercial, media or other large organisations
- Senior manager (Section head) in public service, regional director, health services manager, school principal, dean
- Commissioned officers in Defence Forces, police/fire services Commissioner

2. Other business managers

- Bank manager, finance/investment/insurance broker, credit/loans officer
- Owner/manager of farm, construction, import/export, wholesale, manufacturing, transport, real estate business
- Specialist manager - finance/engineering/production/personnel/industrial relations/public relations/sales/marketing
- Retail sales/services manager - shop, petrol station, restaurant, club, hotel/motel, cinema, theatre, gallery

3. Writers, artists and professional sportspersons

- Journalist, publisher/author, musician, actor, dancer, painter, potter, media presenter, photographer, designer
- Sportsman/woman, coach, trainer, sports official

4. Qualified professionals (generally with degree/higher qualifications)

- Health, education, legal, science, engineering, computing professionals
- Social scientist, urban/regional planner, librarian, archivist, records manager, curator, interpreter/translator
- Management consultant, accountant, tax agent, auditor, economist, statistician, mathematician, actuary, valuer
- Aircraft pilot, flight officer, flying instructor, air traffic controller, ship's captain/officer/pilot

5. Qualified technicians/associate professionals (generally with degree/diploma qualifications)

- Health, education, legal, science, engineering, computing technicians/associate professionals
- Enrolled nurse, paramedic/ambulance officer, dental technician, library technician
- Senior NCO (Defence Forces), police officer, prison officer, welfare/parole/court officer, senior fire fighter, safety inspector (building, health), security advisor
- Business/administration - recruitment/employment/industrial relations/training officer, marketing/advertising specialist, technical sales representative, retail buyer, office manager, project manager/administrator, other managing supervisors

6. Tradespeople (generally with a 4 year Trade Certificate, usually by apprenticeship)

7. Advanced/intermediate clerical, sales and service staff

- Office/bank/payroll/accounting clerk, bookkeeper, insurance agent/assessor, auctioneer
- Admissions/personnel/inquiry/customer service clerk, government inspector (customs, tax, licences, transport)
- Secretary, personal assistant, court reporter, desktop publisher, library assistant
- Sales representative, travel/tourism agent, flight attendant, travel steward, postal delivery/courier, casino worker, beautician, undertaker, fitness instructor
- Child care worker, education aide, aged/disabled person care worker

8. Sales, office, hospitality and other assistants

- Sales assistant, checkout operator, cashier, motor vehicle/parts salesman, other sales staff
- Typist, keyboard operator, receptionist, dental assistant, veterinary nurse, education aide, nursing assistant
- Hospitality industry staff, waiter, bar staff, porter
- Trades assistant, gallery attendant, salon assistant, home helper, housekeeper, cook, kitchenhand,

9. Drivers and machinery operators

10. Other occupations

- Other members of the Defence Forces (ranks below senior NCO without technical/trades occupation)

- Factory hands, process workers, product packagers, labourers in construction/railway/mining/communications
- Farm oversear, shearer, wool/hide classer, farm hand, horse trainer, nurseryman, greenkeeper, gardener, tree surgeon, forestry/logging worker, seafarer/fishing hand
- Cleaner, caretaker, usher, laundry worker, car park attendant, storeman