

**YOUNG PEOPLE - EDUCATION EMPLOYMENT & TRANSITION  
THE AUSTRALIAN LONGITUDINAL SURVEY PROGRAM**

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**1. INTRODUCTION**

The Australian Longitudinal Survey (ALS) program began in the then Bureau of Labour Market Research. It is now the responsibility of the Economic and Policy Analysis Division (EPAD) of the Department of Employment, Education and Training (DEET). As originally designed, the program had two phases - a sample of long term unemployed youth registered with the Commonwealth Employment Service (CES sample), and a sample selected to represent the general population of young people (Youth Area Sample or YAS).

The CES sample was selected from the population of young people aged between 15-24 at 1 September 1984 who were registered with the CES as unemployed for at least two months on 1 August 1984. For efficiency and practicality reasons two stage sampling was used - 63 CES offices were selected nationally with probability proportional to size and then about 50 people were selected from each office. The selected people were interviewed in September 1984, and were subsequently interviewed in 1985, 1986 and 1987. The aim of this sample was to obtain information about the particular problems of the long term unemployed and their likely employment outcomes. Considerable information was obtained on family background, current living conditions, education history and aspirations, employment history, health and economic status from the interviews.

The YAS commenced with 9000 young people (aged 16-25 in 1985) selected by area sample methods to represent the general population of Australian young people not living in remote areas. The sample was interviewed in 1985, 1986, 1987 and

1988. See McRae (1984) and Kronenberg et al (1985) for details.

Following reviews in 1987 and 1988, changes were made to the program. Enumeration of the CES sample was discontinued after 1987. The YAS survey was continued but interviewing is done by telephone with a reduced set of questions, and people are no longer interviewed after the year in which they turn 25.

In 1989 a new cohort of 16-19 year olds was selected by area sample methods and interviewed. In 1990 this cohort was reinterviewed and a new sample of 16 year olds was added to the sample. The new sample were originally selected as 14 year olds by the Australian Council for Educational Research as part of their survey program. This process will continue for the next couple of years. The new survey is known as the Australian Youth Survey (AYS).

The present program structure resulted from the 1988 review, and reflects the Department's focus on the early and vital processes of schooling, school retention, post-school education and training, and the transition to work. Whilst the truncation of the sample at age 25 means that some of the long term outcomes will be unmeasured, it is the Department's view that the present program represents the best use of available resources. The use of the ACER sample for the yearly 'top up' of 16 year olds is important since it provides a standardised measure of 'ability', and permits an up to date measure of education transition processes.

## **2. ALS PUBLICATIONS, ANALYSES AND FUNDED RESEARCH**

A major priority of the ALS program is to encourage the analysis, publication and use of survey results.

The ALS section within DEET undertakes these tasks to the extent possible within limited resources. Two recent important publications are Kryger (1990) and DEET (1990). Both these publications deal with the Youth Area Sample.

The first consists of a series of tables exploring changes in the sample between 1985 and 1988. The second lists all known research papers based on ALS data and summarises each paper. Copies are held in all libraries and a limited number of copies are available from DEET.

External research using unit record data is encouraged. Unit record data are available from the Social Science Data Archive, Australian National University, and are normally provided in ASCII with an SPSS set up file if required. Researchers wishing to use SAS may find it more convenient to approach the ALS section directly.

External research is most often done within educational institutions. Some of it is funded by DEET through consultancy agreements. A major research program undertaken through the Centre for Economic Policy Research, Australian National University is now in its final stages. This has involved production of fourteen separate research papers, presented at a conference in Canberra in December 1990. These papers will be collected into a book to be jointly edited by Professor Bob Gregory, CEPR, and Tom Karmel, principal adviser, EPAD.

Copies of ALS publications are available on request. Enquiries regarding publications, data access or research funding for analysis of survey data should be directed to:

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### 3. SOME EXAMPLES OF DATA ANALYSIS IN THE ALS

The analysis of the ALS data by the ALS section continues as part of a formal publication program and in response to requests for topical analyses in relation to DEET programs. In order to illustrate our work, we would like to present the following three examples. These examples show the use of a range of techniques : simple tabular comparisons, log linear modelling and comparisons between surveys.

#### 3.1 Income and Employment Status of Higher Education Graduates

An important educational/economic issue is the return to the individual from 'investment' in higher education. The YAS database was chosen to investigate this issue, since the YAS sample was selected from the general population (unlike the CES sample) and a number of years data was available (unlike the AYS).

An experimental group and a control group were needed. The main experimental group for the study was chosen to be those who had completed a degree in the year preceding first interview (September 1985). This group was chosen because the survey spanned the years of their transition to employment and their early careers. The control group should be an equivalent group of non graduates. For our study 'equivalent' was defined in terms of age. The control group was those who were 21 or 22 years age at time of first interview (the modal age of the experimental group).

# Employment Status Comparison

The employment status histories of the two groups are given in Tables 1 and 2.

TABLE 1: 1985 HIGHER EDUCATION GRADUATES: EMPLOYMENT STATUS

Employment Status	Percent
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1985	
Employed	81.3
Unemployed	2.7
Not in Labour Force	16.1
1986	
Employed	93.8
Unemployed	2.7
Not in Labour Force	3.6
1987	
Employed	88.4
Unemployed	0.9
Not in Labour Force	10.6
1988	
Employed	90.2
Unemployed	1.8
Not in Labour Force	8.0
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TABLE 2 1985 NON GRADUATES: EMPLOYMENT STATUS

Employment Status	Percent
1985	
Employed	74.8
Unemployed	9.8
Not in Labour Force	15.4
1986	
Employed	77.6
Unemployed	8.2
Not in Labour Force	14.1
1987	
Employed	77.0
Unemployed	7.7
Not in Labour Force	15.3
1988	
Employed	77.3
Unemployed	6.6
Not in Labour Force	16.1

These tables show that the graduates cohort had a much better employment history than the non graduates cohort.

#### Income Comparison

Income is another important indicator of labour market success. This was investigated for the graduates and non graduates groups, subset to those who were in full time employment at all interviews 1985-1988. The focus on those in

full time employment was to exclude the effect of differential rates of employment and part time employment between the groups. The results are given in Tables 3 and 4.

TABLE 3 : 1985 HIGHER EDUCATION GRADUATES (EMPLOYED FULL TIME IN ALL YEARS) - AVERAGE WEEKLY WAGE

Year	Average Weekly Wage	Adjusted to 1985 Dollars
1985	323.30	-
1986	396.47	361.08
1987	444.73	378.49
1988	523.32	413.36

TABLE 4 : 1985 NON GRADUATES (EMPLOYED FULL TIME IN ALL YEARS) - AVERAGE WEEKLY WAGE

Year	Average Weekly Wage	Adjusted to 1985 Dollars
1985	303.39	-
1986	345.34	314.52
1987	375.45	319.53
1988	413.46	326.59

It should be noted that sample takes were quite small, hence caution is needed in interpreting the tables.

## Discussion

In general, higher education graduates clearly did better than their non-graduate counterparts, in terms of both employment and wage outcomes.

This example demonstrates the value of tabulation of comparisons in data analysis undertaken for people involved in policy work. The results are easily perceived by non statisticians. However this example also indicates the dangers of this technique. The control group is not truly equivalent to the experimental group since, being defined solely by age, it would probably contain people with lower ability than the graduates group. Hence the tables do not indicate the returns to graduates compared to what *would have happened to them if they had not proceeded to higher education*. To answer such a question some form of modelling would be needed.

### 3.2 Socio-Economic Characteristics of those Who Did Not Study Directly After Leaving School.

Another very important educational issue is the relationship of socio economic characteristics of young people with their propensity to undertake year 12 and/or post secondary studies. This was investigated using data from those in the YAS who had left school in 1988.



The explanatory socio-economic variables used were :

a. Mother's Education

- Post Secondary
- No Post Secondary

b. Father's Occupation when respondent was 14

- Managerial, Professional or Admin.
- Other Employed
- Not Employed

c. Respondent's Country of Birth

- Australia
- Rest

In addition, attainment of year 12 at school was included as a covariate when investigating participation in post secondary education.

Investigation of these relationships by tabulations ( the preferred method of our departmental audience ) proved to be impossible since the necessary cross tabulations were too complex to interpret. In view of this, the relationships among the variables were investigated using log linear modelling. Attainment of year 12 was modelled against the above variables, and participation in post secondary education was modelled against the above variables plus attainment of year 12.

The main results were:

- a) Father's occupation and mother's education were significantly associated with attainment of year 12. Country of birth was not found to be statistically significant.
- b) Father's occupation and attainment of year 12 were significantly associated with participation in post secondary education. Country of birth was statistically significant, but Mother's education was not.

The fact that mother's education was not significantly associated with post school education is surprising, given that it is associated with attending year 12 and people who attend year 12 have a significantly higher rate of participation in post school education. An explanation for this apparent anomaly was found when the interaction between mother's education and father's occupation was included in the post school education versus demographics model. This interaction term proved to be statistically significant which indicates that mother's education does have an effect on post school education, but this effect is different for different levels of father's occupation.

Children of *managerial* etc fathers, who had a mother with post secondary education, had a higher rate of participation in post secondary education than those children whose mothers did not have post secondary education. By contrast, for children of *not employed* fathers, those whose mothers had post secondary education had a *lower* rate of participation in post school education than those mothers had no post school education.

### Parameter Interpretation

The output from each logistic regression run includes parameter estimates.

For the statistician these parameter estimates are informative since they indicate the way each level of the explanatory variable 'affects' the response. Unfortunately because the logit of the responses is modelled the meaning of the parameters is rather opaque to the non statistician. For this reason, the parameters were used to calculate more readily interpretable 'synthetic' marginal probabilities of attending year 12 and attending post secondary education separately for each category of the explanatory variables (Table 5). These 'synthetic' probabilities were derived from the fitted models using the parameter associated with a particular value of one explanatory variable and parameters corresponding to 'average' values of the other explanatory variables.

TABLE 5

Category	Probability of attending Yr12	Probability of Post Secondary Study
<b>Mother's Education</b>		
No Post Secondary	.62	.76*
Post secondary	.70	.80*
<b>Father's Occupation</b>		
Admin, Professional, Managerial	.74	.85
Other Employed	.62	.74
Not Employed	.53	.70
<b>Country of Birth</b>		
Australia	.64*	.76
Other	.69*	.86
<b>Secondary Ed</b>		
Year 12	-	.82
Less than Yr 12	-	.70

\* These differences were not statistically significant(10%)

## **Discussion of the use of log linear modelling**

This example shows the value of using log linear modelling when analysing data for a non technical audience. It enables more complex relationships to be investigated than is possible with cross tabulations, including finding surprising effects such as the interaction effect described above. In addition statistical testing of effects is also an important outcome of modelling.

On the other hand, the presentation of the results is more difficult. Furthermore this particular log linear modelling approach treats one variable as the response variable and the other variables as explanatory variable (SAS 1985, p.170ff). However, actual causality cannot be inferred from the modelling results. This needs to be clearly explained when presenting results.

### **3.3 Unemployment Experience- CES samples**

The work, education and other experiences of the YAS sample between 1985 and 1988 was investigated by Kryger(1990). The CES sample (1984-1987) is currently being studied to produce a similar publication. As an example of the preliminary results, we would like to present the following table comparing some of Kryger's results for long term unemployed with the corresponding group in the CES.

TABLE 6

**Employment Characteristics Four Years After Selection By  
Selection Year Characteristics For Those Who Were Unemployed  
For At Least 14 Weeks In Selection Week**

Select	YAS				CES			
	Emp%	Unem	Nilf	N	Emp%	Unem	Nilf	N
<i>Sex</i>								
M	76	18	6	492	70	23	7	450
F	58	14	28	412	49	23	28	316
<i>Age</i>								
16, 17	73	14	13	274	54	29	17	145
18, 19	65	16	19	243	64	20	16	207
20, 21	60	21	19	165	60	25	15	192
22, 23	69	15	16	125	69	16	15	159
24+	71	14	14	97	66	29	13	63
<i>Educ</i>								
deg	85	4	11	27	93	0	7	14
other	74	12	14	106	78	10	11	96
<i>tert</i>								
Yr 12	80	10	10	143	71	13	16	119
Other	63	19	18	628	56	28	16	537
Total	68	16	16	904	62	23	16	766

### Interpretation

The CES sample has a lower level of employment after four years than the YAS sample of long term unemployed. Statistical testing confirmed that this difference is significant. One possible explanation is that it results from the different time intervals spanned by the two surveys. However this is not a satisfactory explanation since the time

periods 1984-87 and 1985-88 were both fairly similar in terms of movements in long term unemployed (see ABS 6203 1984-88).

Further examination of the table showed that the 16,17 year old group in the CES sample has a lower rate of representation in the CES sample compared to the YAS sample and a much lower rate of transition to employment after four years. Indeed if the 16,17 year group in the CES had the same rate of transition to employment as the same group in the YAS then the overall employed rate for the CES would be 66%. That is, most of the difference in the rate of transition to employment between the YAS and CES is due to the difference between the 16,17 year old groups. It appears that the 16,17 year old group has a reduced likelihood of registering with the CES than older age groups, but those who do register at the CES and fail to gain employment quickly are at risk of having significantly reduced employment in later years. This effect may be related to the recession in 1982/83.

#### 4. CONCLUSIONS

The above examples indicate that a range of analysis techniques can be appropriate when analysing data for policy makers. Sometimes simple tabulations (possibly between control and experimental groups) are appropriate. Mathematical modelling on the other hand is appropriate when more complex data relationships are being investigated. However considerable care is needed in the presentation of the results for a non technical audience.

Sometimes comparisons need to be made between different surveys conducted at different times. This can be difficult and may require additional information (such as the economic conditions at the different times).

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# AFFILIATION

The authors are employed by the Economic and Policy Analysis Division of the Department of Employment Education and Training. The views expressed in this paper are not necessarily those of the Department Education and Training.

