

# Confidence in universities: Australia 1984–1996\*

## Technical appendix: Measurement and methods

### Measurement

Measurement of **confidence in universities** is described in the text. Measurement of **confidence in other institutions** is by parallel questions in the same battery. The questions were asked the same way in both the 1984/85 and the 1996/97 survey.

Measurement of other variables used in the analyses is as follows. *Age* is measured in single years. *Male* is a dichotomous variable scored 1 for men and 0 for women. *Education* is measured as years of primary, secondary, and tertiary education completed. *Full-time* is a self coded question rather than one based on hours of work and is scored 1 for those reporting themselves as “working full-time for pay” and zero for those reporting themselves as “working part-time for pay”. *Government* worker is scored 1 for employees of local governments, state governments, or the Commonwealth government, and zero for others. The *self-employed* are scored 1, all others 0. *Occupational status* is measured by Kelley’s Worldwide Status Score, a measure of job quality ranging from 0 for the worst jobs to 100 for the best. *Income* is annual income from all sources, for both husband and wife. *Political party* is scored 1 for supporters of the Liberal/National Coalition and 0 for Labor. Two thermometer questions are favourability ratings from a low of 0 to a high of 100 for “equal opportunities for everyone to get ahead in life”, and “equal outcomes, so everyone gets the same income and standard of living regardless of their abilities or how hard they work”. *Church attendance* is the natural log of number of times attended per year. *Enjoy school* is a direct question “When you were 14, did you enjoy school?”, with answers “very much”, “somewhat”, “not much” and “not at all” scored respectively 100, 67, 33 and 0. *Enjoy year 12* is “If you had stayed on at school to year 12 (sixth form), do you think you would have enjoyed it? (If you did stay on, did you actually enjoy it?)”, with the same answer categories and scoring. Finally *enjoy university* was “And what if you went on to university do you think you would have enjoyed that?”, also with the same answer categories and scoring. Because universities heavily draw on a local student body, people in different localities may largely be reporting on different universities, so we include *state of residence* (measured as a series of dummy variables) in the model.

### Methods

Estimates are by ordered multinomial probit regression. This method allows for the possibility that the intervals between the answer categories are not equal in respondent’s minds, but is not as robust as OLS regression. In the present instance, the predicted values from the model estimated by the ordered probit and estimated by OLS correlate at .9935, so one need not be concerned about the possibility of non-robust estimates. Since the data are from a simple random sample without clustering, estimates of standard errors do not need to be adjusted for clustering. We present robust Huber/White standard errors because the ordinary standard errors on state of residence and year of survey, contextual variables, would not be correct; they are, in this analysis, nearly indistinguishable from ordinary standard errors (results available upon request).

*Model:* The ordered probit regression model posits an underlying continuous linear variable,  $y^*$ , that reflects respondents’ unobserved true scores plus an error term:

$$y^* = \sum b_j X_j + e$$

where the  $X_j$  are  $j$  observed independent variables, the  $b_j$  weights for them,

**Appendix Table 1**  
Social differences in confidence in universities: Ordered probit regression analysis. Australia, 1995/96; n = 2,316

Explanatory variables	<i>b</i>	Standard error	Standardised (XY std.)
<b>Panel 1: Simple model</b>			
<b>Education (years)</b>	<b>.051</b>	<b>.011</b>	<b>.15**</b>
<b>Age (years)</b>	<b>.008</b>	<b>.002</b>	<b>.13**</b>
Gender (male = 1, female = 0)	.022	.050	.01
NSW <sup>a</sup>	.063	.063	.03
<b>Victoria<sup>a</sup></b>	<b>.136</b>	<b>.065</b>	<b>.06*</b>
Queensland <sup>a</sup>	.065	.086	-.02
<b>Occupational status (low = 0 through high = 100)</b>	<b>.002</b>	<b>.001</b>	<b>.06*</b>
Political party (1 = Labor to 0 = Liberal/National)	.100	.052	.05
<b>Panel 2: Wider range of variables</b>			
<b>Education (years)</b>	<b>.038</b>	<b>.01</b>	<b>.11**</b>
<b>Age (years)</b>	<b>.008</b>	<b>.00</b>	<b>.12**</b>
Gender (male = 1, female = 0)	.113	.06	.06
NSW <sup>a</sup>	.053	.07	.02
Victoria <sup>a</sup>	.134	.07	.06
Queensland <sup>a</sup>	-.019	.10	-.01
Occupational status (low = 0 through high = 100)	-.001	.00	-.02
Political party (1 = Labor to 0 = Liberal/National)	.094	.06	.04
Government employee (1 = yes)	.002	.07	.00
Self-employed (1 = yes)	-.097	.09	-.03
<b>Family income (\$1000s)</b>	<b>.002</b>	<b>.00</b>	<b>.08**</b>
Full-time worker (1 = yes)	-.090	.06	-.04
Enjoy: Year 9 in school (0 to 100)	.000	.00	.00
Would (or did) enjoy: Year 12 (0 to 100)	.000	.00	.00
<b>Would (or did) enjoy: University (0 to 100)</b>	<b>.005</b>	<b>.00</b>	<b>.15**</b>
Church attendance	.016	.02	.03
<b>Sympathy: Equal opportunities (0 to 100)</b>	<b>.005</b>	<b>.00</b>	<b>.08*</b>
Sympathy: Equal outcomes (0 to 100)	-.001	.00	-.03
<i>Notes:</i> (a) Reference category: states other than NSW, Victoria and Queensland. * Significantly different from zero at $p < .05$ . ** Significantly different from zero at $p < .01$ .			
<i>Source:</i> International Social Science Surveys/Australia, 1995/96.			

and  $e$  is a normally distributed random error term.<sup>12</sup> Respondents are assumed to answer the survey question by choosing the answer category closest to their underlying position,  $y^*$ :

$$\text{Probability (Outcome} = i) = \Pr(\text{Cut}_{(i-1)} < y^* \leq \text{Cut}_i)$$

where  $i$  subscripts the response categories labelled by their endpoints (“cut-

ting points”). The coefficients  $b_j$  and the cutting points  $Cut_i$  are estimated simultaneously by maximum likelihood methods.

In our analysis we posit that  $y^*$ , respondents’ degree of confidence in universities, is a function of their education, age, sex, occupational status, party identification, job characteristics (government employee, self-employed, educational requirements of the job, family income, full-time employment), subjective feelings about education (enjoying year 9 in school, enjoying year 12, enjoying—or feeling that one would have enjoyed—university), church attendance, views on equal opportunities and equal outcomes, and state of residence:

$$\begin{aligned} y^* = & b_0 + b_1 \text{Education} + b_2 \text{Age} + b_3 \text{Gender} + b_4 \text{OccupStatus} + b_5 \text{Party} \\ & + b_6 \text{GovtEmployee} + b_7 \text{SelfEmployed} + b_8 \text{EducRequiredJob} \\ & + b_9 \text{FamilyIncome} + b_{10} \text{FullTime} + b_{11} \text{EnjoyYear9} + b_{12} \text{EnjoyYear12} \\ & + b_{13} \text{EnjoyUniversity} + b_{14} \text{ChurchAttend} + b_{15} \text{EqualOpportunities} \\ & + b_{16} \text{EqualOutcomes} + b_{17} \text{NSW} + b_{18} \text{Victoria} + b_{19} \text{Queensland} + e \quad (\text{Eq. 1}) \end{aligned}$$

The reduced model of the Appendix Table, Panel 1, includes only the first 5 variables. Variables 6 to 18 are potentially consequences of variables 1 to 5, so the reduced model gives the total effects of these variables, including both the direct effects of Panel 2 and the indirect effects through their impact on variables 6 to 17.

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