Effects of Family of Origin on Women's and Men's Workforce Involvement*

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Abstract

This report investigates the effects of family background on men's and women's labour force participation and on the number of hours that they work. It uses the largest dataset ever brought to bear on this topic in Australia, the combined set of 13 IsssA surveys conducted between 1984-2001 (IsssA-Pool) with over 26,000 cases.) Logistic regression and OLS models allow us to estimate the separate effects of a variety of aspects of family background. Parental education encourage participation of both men and women. The home literacy environment has effects above and beyond parental education. Maternal employment mainly affects participation of both daughters and sons. Father's occupational status (job quality) and supervisory status affects daughters' participation but not sons'. Paternal self-employment does not have significant long-term effects on daughters' or sons' labour supply. Nor does parental income. The number of siblings in the family of origin does not affect men's workforce involvement. Women with more brothers and sisters have slightly lower labour market participation rates, but those who take jobs put in the same number of hours as women from small families. Growing up with youthful or mature parents does not seem to matter to workforce involvement for men or women. Parental divorce reduces women's labour force participation decades later, but not men's. It leads to shorter hours of employment among women and men. Immigrant men have higher labour force participation in the first generation, but not the second. Immigrant women's patterns of workforce involvement do not differ from those of longer, established Australian women, on average. Neither an urban upbringing nor private schooling has any significant effect on the time that men or women devote to the labour market.

INTRODUCTION

Orientation

This paper examines influences of the family of origin on people's workforce engagement – whether they participate in the workforce at all and the extent of their participation. The key question is which, if any, aspects of our upbringing have long-term consequences for our labour market involvement as adults.

Prior research in this area is very limited, so hypotheses are necessarily based on analogies to related areas. There is a great deal of research on labour force involvement of women (e.g. Eccles 1984; Evans 1988a, 2000a) and some on men (e.g. Evans 1996a, 1999a; Kelley 2001), but very little concerning the long-term impact of family background (Evans 1996b).

We focus only on paid employment; there are emerging literatures on time devoted to caring for disabled and elderly family members (e.g. Evans 2002a) and on time spent volunteering (e.g. Evans and Kelley 2000) but they are beyond the scope of this paper.

Hypotheses and exploratory tools

Parent's education

The effects of parental education on workforce engagement have not been intensively studied, but it is reasonable to expect that it should have a positive total effect (since it tends to steer children onto paths that lead to more rewarding work), and the effects should be stronger for women than for men (because they are more likely to be choosing between housework and market work rather than between market work and leisure). But it is less clear what to expect concerning parents' education's direct effects on employment, so it seems best to treat that as an inductive issue, with the findings generating working hypotheses rather than testing them on this issue.

Parents' education is normally found to have significant total effects on occupational status in Australia and throughout the rest of the world (e.g. Crook 1995; Dronkers 1992; Harper and Haq 1997; Kalmijn 1994; Kelley 1973; Treiman and Yip 1989; Treiman and Ganzeboom 1990). Studies of childhood reading or book ownership tend to find that this has a total effect on occupational attainment (e.g. Crook 1997; Evans and Kelley 2002c).

By analogy, one might hypothesize that educated parents enhance their children's capacities for labour market participation. If so, then parents' education should have a positive effect on their offspring's labour supply as adults.

Maternal employment

Mother's employment per se seems to have little effect on children's stratification outcomes (Acock, Barker, and Bengtson 1982; Crook 1995), but it seems reasonable that it should be more consequential for work force involvement. Because work force involvement of husbands and wives tends to be positively correlated (Evans 1988; Evans and Kelley 1998), maternal employment probably indicates a strong pro-employment orientation in the family of origin, on average. That should increase the hours that both women and men devote to the labour market. Because working mothers provide role models for their daughters, the effects should be especially pronounced for women.

Father's occupational status

Father's occupational status has been abundantly demonstrated to have a large positive total effect on respondent's occupational status in Australia (e.g. Crook 1995, 1997; Kelley 1990), as it does throughout the world (Harper and Haq 1997; Kerckoff 1995; Treiman and Yip 1989; Treiman and Ganzeboom 1990). The effects of father's occupation on his children's occupational status is likely to be substantive and causal rather than being a proxy for some other process, as father's occupation has been shown to be highly consequential for a wide range of aspects of children's development (Bradley and Corwyn 2002). Moreover, research including family background measurement and detailed personality measurement has shown that the impact of father's occupation is independent of personality, and hence estimates of the effect of occupation in datasets lacking personality measures will experience no omitted variables problem relating to personality (Van Eijck and De Graaf 2001).

If father's occupational status generally enhances labour-market related capacities, then it should enhance men's and women's propensity to be in the labour force. Concerning hours of work, it seems reasonable to expect that there are positive total effects of father's occupational status on labour force participation and on hours of work for two reasons (a) the theoretical reason that children from high status homes are likely to learn to value the intrinsic aspects of work – the sense of accomplishment it gives, etc – and so are likely to be more deeply engaged in work than people to whom a job is just a means to an end, and (b)

the empirical reason that people in high status jobs tend to work longer hours (Evans 1996a; Kelley 2001), so part of the endowment from a father working in a high status occupation should be a tendency towards more labour force engagement.

Father's self-employment

So far as we have been able to discover, there is no prior research on the impact of father's self-employment during childhood on their offspring's subsequent labour supply. It seems reasonable to take as a working hypothesis the possibility that parental self-employment may endow girls and boys with orientations and skills that later enhance their workforce engagement as adults.

Parental income

A study using a contemporaneous measure of parents' income finds that the apparent effect of parents' income on children's education becomes insignificant when parents' education and occupations are taken into account (Orr 2000, see also Teachman et al 1997 and the other studies in Duncan and Brooks-Gunn 1997). The fact that parents' income (net of education and occupation) appears, in the studies so far including all the relevant measures, to have nil effects on children's stratification outcomes suggests that income plays little or no role among the ways that parents' resources of educational and occupational position influence their children's capacity to get ahead, but rather that they work through other channels such as the instilling of values and skills. Accordingly, it seems reasonable to expect that parents' income (while the respondent was growing up) will not affect offspring's workforce involvement.

Family size

The total effect of the number of siblings on status attainment is generally found to be negative (e.g. Kerckoff 1995; Marjoribanks 1989; Lehrer and Stokes 1985), so it might discourage labour supply. On the other hand, one might anticipate that large families tend to have a rather traditional division of labour, so they might especially orient their daughters to the home. That would mean lower rates of workforce participation and shorter hours of employment for daughters, but not especially for sons.

Divorce

Effects of divorce on educational attainment have drawn more attention than effects of parental divorce on children's labour market outcomes, but there is some sign, at least in the US, that daughters of divorce expect to spend more time in the workforce (Measell 1992). Accordingly, it seems reasonable to expect parental divorce to encourage women's involvement in the labour market, but the existing literature has little guidance concerning effects on men's labour supply. One argument would be that parental divorce makes men feel insecure about being able to hold on to assets, and so decreases the attractions of labour force involvement for them.

DATA, MEASUREMENT, MODELS, AND METHODS

Data

The analyses in this paper are based on data from the International Social Science Surveys/ Australia (IsssA). The IsssA regularly collects extensive and detailed survey data on large, representative national samples of Australians, beginning in 1984 and repeated most years since then.1 There are now over 26,000 cases and many hundreds of variables.

The IsssA surveys' particular strengths are that they offer:

- Individual level data on a very large number of variables simultaneously, facilitating multivariate analysis and enabling one explicitly to control for many sources of selectivity.

- Extensive measurement of public policy preferences, attitudes, and values, based on carefully pretested multiple-item scales for more reliable measurement.

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1 The first survey, then called the National Social Science Survey, was supported primarily by the Australian Research Grants Committee and research funds kindly provided by Don Aitkin, now vice-chancellor of the University of Canberra. Most, but not all, subsequent surveys through 1997 were mainly supported by the Research School of Social Sciences at the Australian National University. The IsssA is now core-sponsored by the Melbourne Institute of Applied Economic and Social Research, the University of Melbourne. It is designed as an omnibus survey, so it includes a public use component, original research components, and episodically includes modules sponsored by other organisations. Merging all the surveys into a pooled, user-friendly file with consistent variable definitions was sponsored by the ARC-Research Infrastructure and Equipment grant R19920093 to the Melbourne Institute.

- Extensive information on family background and on current labour force involvement.

- Cross-national comparisons on many variables, allowing one to discover what is unique to Australia; what is common to culturally similar nations such as Britain and the USA; and what holds for industrial nations generally.

- Historical depth, with many items appearing regularly since 1984.

- Panel components with some measures available for the same respondents at several points in time.

Details on collection strategies, representativeness, questionnaire and item non-response, and other features of the data are in Appendix A.

Population sampled

The population sampled by the IsssA consists of citizens of Australia who reside at the address which they have provided to the Electoral Office, who can read English sufficiently well to answer a self-completion questionnaire, and who are not too cognitively impaired to answer a self-completion questionnaire. For simplicity, we refer to this population as "Australians". The selection on citizenship should have little effect, since prior research shows that non-citizen immigrants differ from citizen immigrants principally in their duration of residence, with few or no differences in issues that would be more relevant to this report, namely marital status and stratification characteristics (Evans 1988b).

Models

The dependent variables of interest in this report are workforce participation, hours worked, self-employment, and occupational status, the measurement of which is discussed below in the section "Measurement of Dependent Variables". The measurement of the causal variables is discussed in "Appendix A". We estimate the models of workforce participation and hours worked separately for men and women because prior research and theory strongly indicate that the influences on these matters work differently by gender. This strategy is equivalent to estimating pooled models with all possible interactions of gender with all the other variables; our method tends to be slightly less efficient than the all-possible-interactions method, but is probably more robust.

In the case of occupational status, prior research has shown that the process of occupational attainment is essentially the same for men and women, so there is no need for the separate estimation.

To assist in navigation, the equations are numbered to match the table in which their estimates appear. For example, the estimates for equation 1.1 occupy Table 1.1, the parameter estimates for equation 1.2 are found in Table 1.5, and so on. Thus, whilst reading the tables, one can readily find the relevant equation by locating the matching equation number.

We aimed to develop a relatively inclusive model of effects of family background. It is much more comprehensive than other models currently available in the literature. Naturally no model contains everything one wants: this one is a compromise between the theoretical goal of inclusiveness and the practical goal of being able to include as many surveys as possible in order to achieve precise estimates.

All the variables in the family background models are causally prior respondent's own adult characteristics, so we estimate their total effects without including intermediate variables (e.g. Alwin and Hauser 1975). All the variables on the right hand side in the family background models are hypothesized to play a causal role in workforce participation and in hours worked.

Defining "Workforce_participation" to be estimated workforce participation (y-hat):

> *Eq. 1.1. Workforce_participation_men = f(Father's_occupation, Father_supervised, Father_self-employed, Parents'_education, Parents'_books, Number_of_Siblings, Foreign_born, Second_Generation, Parental_divorce, Maternal_employment, Private_schooling, Size_of_place).*

The findings in Table 1.1 come from this model estimated for men (so there is no gender variable in the model).

Because work is not an either/or proposition, people can engage in it for greatly varying amounts of time, so it makes sense also to investigate the effects of family background on the intensity of workforce participation, on hours worked. Defining "Hours_worked" to be estimated hours worked (y-hat):

> *Eq. 1.2. Hours_worked_men = f(Father's_occupation, Father_supervised, Father_self-employed, Parents'_education, Parents'_books, Number_of_Siblings, Foreign_born, Second_Generation, Parental_divorce, Maternal_employment, Private_schooling, Size_of_place).*

The findings in Table 1.2 come from this model estimated for men.

The corresponding models for women have exactly the same explanatory variables:

Eq. 1.3. Workforce_participation_women = f(Father's_occupation, Father_supervised, Father_self-employed, Parents'_education, Parents'_books, Number_of_Siblings, Foreign_born, Second_Generation, Parental_divorce, Maternal_employment, Private_schooling, Size_of_place).

Eq. 1.4. Hours_worked_women = f(Father's_occupation, Father_supervised, Father_self-employed,

Parents'_education, Parents'_books, Number_of_Siblings, Foreign_born, Second_Generation, Parental_divorce,

Maternal_employment, Private_schooling, Size_of_place).

The findings in Tables 1.3 and 1.4 come from these equations.

Methods

Estimation of equations with continuous dependent variables is by ordinary least squares. Estimation of equations with dichotomous dependent variables (workforce participation and self-employment) is by logistic regression, because the coefficient estimates are more efficiently done by this method than by OLS in the case of dichotomous dependent variables. OLS estimates tend to be highly robust across datasets and so are strongly preferred as exploratory methods in general.

RESULTS

This section focuses, first, on whether people are in the labour force – the traditional dichotomous in/out distinction. Second, to give a more nuanced view of the same basic issue, we focus on "intensity of employment" – on how many hours people work (counting 0 hours for those not in the labour force). The hours worked perspective is useful in picking up differences that are missed by the crude but traditional "in the labour force/ out of the labour force" distinction. Important among these is the difference between those (mainly men) who work long hours and those who work ordinary full-time hours; it is also important in picking up the distinction between part-time workers (mainly women) and full-time workers.

To model workforce participation, we use logistic regression, because that provides more accurate estimates than does ordinary least squares regression with a binary (dummy) dependent variable. In analysing hours of work, a continuous variable, we use OLS regression.

Men's workforce participation

Equation 1.1 in the Models and Methods section gives the model formally.

Men's workforce participation has traditionally been high throughout young adulthood and early middle age. However, as retirement age approaches differences increasingly emerge.

Maternal employment has a large and important effect on men's workforce participation in this logistic regression model (Table 1.1). According to these coefficient estimates, men whose mothers' worked extensively were over two and one half times as likely to be in the workforce as men whose mothers were housewives, all else equal. The effect is highly significant.

Table 1.1: Effects of family background on men's labour force participation: Logistic regresson estimates. Men, aged 25 to 64 with complete data on all variables N=4,948.[1]

	b	Std. Err.	Chi-sq	Sig.	exp(b)
Migrant: 1st generation	0.41	0.12	12.10	0.00	1.51
Migrant: 2nd generation	-0.07	0.17	0.20	n.s.	0.93
Urban at 14 (ln)	0.01	0.01	0.64	n.s.	1.01
Number of siblings	0.00	0.01	0.54	n.s.	1.00
Parent's education	0.09	0.02	20.65	0.00	1.09
Books in parents' home	0.00	0.00	4.53	0.03	1.00
Father's status	0.00	0.00	2.67	n.s.	1.00
Fathr supervises	0.09	0.13	0.54	n.s.	1.10
Parents income	0.22	0.12	3.44	n.s.	1.25
Father self-employed	-0.05	0.10	0.25	n.s.	0.95
Parents' age	-0.01	0.01	2.87	n.s.	0.99
Parents divorced	0.00	0.18	0.00	n.s.	1.00
Mother worked	0.97	0.16	36.76	0.00	2.63
Private school	-0.05	0.26	0.04	n.s.	0.95
(constant)	-1.21	1.24	0.95	n.s.	

[1] Chi-square = 127.96, 14 d.f.

Note that this is not an artefact of the expansion of maternal employment over time. Later tables will show that, unlike maternal employment, time does not have a positive effect. To take a closer look at this interesting and large effect, we re-ran the analysis separately for different age-groups and found that maternal employment has no effect on the workforce participation of young men or of men in early middle age. Instead, the effect maternal employment is large, but limited to prime middle age and later middle age (up to age 65). The sons of working mothers are much less likely to retire early. This is also a potentially important result because so few things seem effectively to counter the trend towards early retirement.

Father's employment characteristics are less consequential (Table 1.1). We were able to include measures of **father's self-employment**, **father's occupational status** (job quality), and **father's supervisory responsibilities**, but none of them has a significant effect on men's probability of workforce participation, net of the income they generate, in this model.

This is interesting because father's occupational status is known to be consequential in capacity building/ human capital formation, and supervisors and the self-employed tend to be highly work-committed so it was reasonable to expect that these characteristics would have encouraged workforce participation, but it seems, not to be the case, on average and all else equal.

Moreover, the fact that the regression coefficient for **income** generated by father's and mother's employment is not statistically significant even in this large sample, suggests that parental prosperity does not affect their sons' later workforce participation, on average, and all else equal (Table 1.1). This is evidence against the underclass hypothesis of poverty traps inherited from generation to generation.

Some non-economic features of family background also affect men's engagement in the workforce.

In particular, **parents' education** has a direct effect (completely independent of its effects on parents' employment and earnings) on their sons' later workforce participation in this model (Table 1.1). All else equal, the more highly educated the parents, the more likely are their sons to grow up to participate in the workforce, on average. This suggests that encouraging teenage mothers to pursue their own education could be an effective capacity-building strategy. Even aside from their education, parents who invest in **books** enhance their sons' capacities for labour force participation.

By contrast, the **number of siblings** has no statistically significant effect on men's workforce participation in this model (Table 1.1). This is contrary to the economic hypothesis that, net of all else, having smaller families enables parents to produce "higher quality" children – including a greater capacity for economic independence. In fact, big families and small families seem to be equally successful in enhancing their sons' capacity for engagement in the workforce.

Parents' age – that is, the mean age of the parents when the respondent was born – does not seem to matter to men's workforce participation in this model (Table 1.1). This is important, because there has been concern that early childbearing by some single mothers might be especially disadvantageous to their children. But the evidence here is that, aside from youthful parents' potentially low education, their age per se does not impair their sons' engagement in the workforce.

But the null finding also runs against the hope that rising ages at parenthood over the last couple of decades would lead to generally wiser and more mature parenting. At least in the area of son's later workforce experience, the statistically non-significant result suggests that there will be no measurable benefit.

Neither does **parental** divorce matter to men's workforce participation, according to this model (Table 1.1). When they grow up, the sons of divorce are just as likely to be engaged in paid work as are the sons of intact families, all else equal.

The **type of school** respondent attended does not significantly affect men's later propensity to participate in the workforce (Table 1.1). Thus, men who went to government schools are no less likely to be in the workforce than are men who went to private schools, all else equal.

Immigrant men are even more likely to be in the workforce than are men from long-established Australian families (Table 1.1).

This is a large effect, with immigrant men being about one and one half times as likely to be in the work force as are otherwise similar men whose parents were Australian born. It seems likely that this has more to do with their personal determination to succeed in Australia than with cultural traits they might bring, since **second generation** immigrant men are no more likely to be in the workforce than are men from long-established Australian families. Thus, all else equal, the immigrant advantage is large, on average, but evanescent.

Aside from the kinds of families who live there, **urban and rural** places do not seem to have any encouraging or discouraging effect on the later workforce participation of men who grew up there (Table 1.1).

Men's intensity of employment

Equation 1.2 in the Models and Methods section gives the model formally.

This model focuses on effects of the family of origin, asking whether conditions in the family of origin affect 'weekly hours of work among men with jobs years later when they are adults. To model hours of work, we use OLS regression, because hours of work approximates a well-behaved continuous variable, so OLS is justified.

In this model, **maternal employment** (a three item index averaging the extent to which respondent's mother worked when he was under school age, when he was age 6 to age 9, and when he was age 10 to age 14, details in measurement appendix) has a large, statistically significant effect on working men's intensity of employment, on how many hours they work,

on average, all else equal (Table 1.2). According to these estimates, men whose mothers' worked extensively will themselves work almost 4 more hours a week than men whose mothers were housewives. The effect is highly significant. This is a potentially important result, because it suggests that encouraging single mothers back into employment when their children reach school age (even if income support is still needed then) can encourage their sons' financial independence in adulthood.

To take a closer look at this interesting and large effect, we re-ran the analysis separately for different age-groups and found that maternal employment has no effect on the hours worked by young men or by men in early middle age. Instead, the effect maternal employment is large, but limited to prime middle age and later middle age (up to age 65). According to the estimates from these models, the sons of working mothers work longer hours in prime middle age and later middle age, all else equal, on average.

Table 1.2: Effects of family background on men's weekly hours of employment:OLS regresson estimates. Men, aged 25 to 64 N=9,281.[1]

Variable	b	s.e.	Standardized	t
Migrant: 1st generation	-0.33	0.60	n.s.	-0.55
Migrant: 2nd generation	-1.63	1.09	n.s.	-1.50
Urban at 14 (ln)	-0.10	0.07	n.s.	-1.35
Number of siblings	-0.05	0.03	n.s.	-1.71
Parent's education	0.48	0.11	0.07	4.45
Books in parents' home	0.00	0.00	0.03	2.44
Father's status	-0.01	0.01	n.s.	-0.64
Fathr supervises	1.38	0.72	n.s.	1.91
Parents income	1.12	0.73	n.s.	1.53
Father self-employed	2.44	0.61	0.05	3.99
Parents' age	-0.06	0.04	n.s.	-1.54
Parents divorced	-3.26	0.87	-0.05	-3.75
Mother worked	4.94	0.77	0.09	6.45
Private school	-0.21	1.67	n.s.	-0.13
(constant)	21.54	7.68		

[1] Adjusted R^2 = .02.

Father's self-employment has a significant positive effect on the hours that their sons work as adults (Table 1.2). The metric regression coefficient implies that when grown, the sons of self-employed fathers work about two and a half hours a week more than do otherwise comparable men reared in employee families.

By contrast, neither **father's occupational status** (job quality) nor **father's supervisory responsibilities** has a significant effect on men's weekly hours of employment in this model (Table 1.2). In other words, the sons of men at the bottom of the occupational hierarchy work just as long hours when they grow up as do the sons of men at the top of the ladder, all else equal. Similarly, the sons of non-supervisory workers work just as long hours as the sons of their fathers' supervisors, on average and all else equal.

Moreover, in this model the **income** generated by father's and mother's employment appears not to affecthow much work their sons do when they grow up, on average and all else equal (Table 1.2). It should be remembered that this is estimated rather than actual income so these results are less certain than for the other variables.

Some non-economic features of family background also affect men's work intensity.

In particular, in this model, **parents' education** has a statistically significant direct effect (completely independent of its effects on parents' employment and earnings) on their sons' later workforce participation (Table 1.2). The more highly educated the parents, the longer hours of work their sons do as adults. The metric regression coefficient suggests that each additional year of education the parents have raises their son's weekly hours of employment by about one half, so, for example, the difference between a man whose parents left school after year 8, and a man whose parents completed 4-year university courses, would amount to about 4 hours a week, all else equal. Even aside from their education, the statistically significant regression coefficient for the number of books in the house while respondent was growing up suggests that parents who invest in **books** enhance their sons' capacities for working longer hours.

By contrast, the **number of siblings** has no statistically significant effect on men's workforce time in this model (Table 1.1). This is contrary to the economic hypothesis that, net of all else, having smaller families enables parents to produce "higher quality" children – including greater diligence. In fact, the non-significance of the regression coefficient suggests that big families and small families seem to be equally successful in developing their sons' capacity for sustained effort.

In this model of men's weekly hours of employment, **parents' age** during respondent's childhood fails to have a statistically significant effect (Table 1.2).

This is important, because there has been concern that early childbearing by some single mothers might be especially disadvantageous to their children. But the evidence here is that, aside from parents' education, their age does not impair their sons' engagement in the workforce.

In this model, **parental divorce** has a substantial negative effect, on average, on the hours worked by men years later as adults, all else equal (Table 1.2). Men whose parents divorced (while the respondent was a child or young teenager) work 3.26 hours less a week, on average, than do comparable men from intact families, according to the metric regression coefficient.

This is larger than the difference between the sons of the self-employed and the sons of employees (2.44 hours), about the same size as the difference between sons of university graduates and men whose parents left school after year 8, and smaller than the difference between men whose mothers worked extensively and the sons of housewives (4.94 hours).

The **type of school** respondent attended does not significantly affect men's weekly hours of employment in adulthood, in this model (Table 1.2). This suggests that men who went to government schools are no less hard working than are otherwise similar men who went to private schools.

Immigrant men work the same hours as men from long-established Australian families, on average and all else equal (Table 1.2). Similarly, s**econd generation** immigrant men also work no more (and no less) than do otherwise similar men from long-established Australian families.

Aside from the kinds of families who live there, **urban** and rural places do not seem to have later effect on the weekly hours of work of men who grew up there. Size of place at age 14 -- our indicator or rurality/urbanicity of upbringing -- does not have a significant effect on employed men's weekly hours of work in this model (Table 1.2).

Women's workforce participation

Equation 1.1 in the "Models" section above gives the model estimated below in Tables 1.3 which forms the focus of this section.

Women's workforce participation has been more thoroughly studied than has men's, although there is still much to learn. Our analysis focuses on the post-education ages 25 to 64.

To model workforce participation, we use logistic regression, because that provides more accurate estimates of standard errors than does OLS regression with a binary (dummy) dependent variable.

In this model, **maternal employment** while a girl was growing up has a large and statistically significant effect on her later workforce participation (Table 1.3). According to these estimates, women whose mothers' worked extensively were about one and three quarters times as likely to be in the workforce as otherwise comparable women whose mothers were housewives. The effect is highly significant. This is a potentially important result, because it suggests that there is an intergenerational momentum to women's labour force participation.

Because of the special age pattern we found for men, we investigated it for women too, but found no sign of the concentration of this effect at a particular stage of the life cycle.

Instead, maternal employment seems to continue to encourage employment on the part of their daughters throughout the 25 to 64 age span we investigated here. Note that this is independent of the estimated income effect of maternal employment (which some have argued generates a kind of consumption treadmill with each generation feeling challenged to exceed the wealth of their parents).

Table 1.3: Effects of family background on women's labour force participation: Logistic regresson estimates. Women, aged 25 to 64 with complete data on all variables N=5,387.[1]

	b	Std. Err.	Chi-sq	Sig.	exp(b)
Migrant: 1st generation	-0.11	0.07	2.34	n.s.	0.89
Migrant: 2nd generation	-0.15	0.12	1.67	n.s.	0.86
Urban at 14 (ln)	0.01	0.01	1.85	n.s.	1.01
Number of siblings	-0.01	0.00	6.60	0.01	0.99
Parent's education	0.05	0.01	12.19	0.00	1.05
Books in parents' home	0.00	0.00	6.63	0.01	1.00
Father's status	0.00	0.00	4.62	0.03	1.00
Father supervises	0.27	0.09	9.66	0.00	1.31
Parents income	-0.03	0.08	0.14	n.s.	0.97
Father self-employed	0.13	0.07	3.28	0.07	1.14
Parents' age	0.00	0.00	0.42	n.s.	1.00
Parents divorced	-0.23	0.11	4.64	0.03	0.80
Mother worked	0.56	0.10	33.72	0.00	1.75
Private school	0.14	0.16	0.77	n.s.	1.15
(constant)	0.06	0.82	0.01	n.s.	

[1] Chi-square = 156.90, 14 d.f.

Father's employment characteristics have smaller effects in this model, but several of them are statistically significant (Table 1.3). **Father's occupational status** (job quality) fails to have a significant effect on his daughter's later likelihood of being in the workforce. By contrast, **father's self-employment** while a girl was growing up does affect her later probability of workforce participation. As adults, the daughters of self-employed fathers are 1.14 times as likely to be in the workforce as are the daughters of employees. Women's workforce participation is also affected by growing up in a family where the father had **supervisory responsibilities** in the workplace: there is a positive, statistically significant effect (Table 1.3). The daughters of supervisors are 1.31 times as likely to be in the workforce as are their peers whose fathers did not supervise other workers.

The estimated **income** generated by father's and mother's employment does not have a statistically significant effect on their daughters' later workforce participation, in this model (Table 1.3). It should be remembered that this null finding is based on estimated rather than measured income and so is subject to additional sources of random error, compared to the measured variables.

Some non-economic features of family background also affect women's engagement in the workforce.

In particular, **parents' education** has a small, significant direct effect (completely independent of its effects on parents' employment and earnings) on their daughters' later workforce participation in this model (Table 1.3). The more highly educated the parents, the more likely are their daughters to grow up to participate in the workforce. But the effect is not large. Even aside from their education, parents who fill their homes with **books** very slightly enhance their daughters' capacities for labour force participation.

By contrast, the **number of siblings** has a small, discouraging women's workforce participation (Table 1.3).

Parents' age during respondent's childhood does not seem to matter to women's labour market participation (Table 1.3) in this model. This result suggests that, aside from correlated differences (notably educational attainment), women who were raised by younger parents are just as likely to be in the workforce as are their peers who were raised by more mature parents.

Parental divorce substantially discourages women's workforce participation, in this model (Table 1.3). The exponent of the logistic regression coefficient suggests that, all else equal,

when they grow up, the daughters of divorce are only 80 per cent as likely to be engaged in paid work as are comparable daughters of intact families. This is a particularly striking result, because one might well have expected that the experience of parental divorce might make women especially chary of being out of the workforce and especially keen on maintaining and enhancing their hard won career prospects, but the facts suggest otherwise.

The **type of school** respondent attended does not significantly affect her later propensity to participate in the workforce, all else equal (Table 1.3).

The import of this finding is that women who went to government schools are no less likely to be in the workforce than are otherwise similar women who went to private schools.

In this model, **immigrant women** are not significantly more likely to be in the workforce than are otherwise similar women from long-established Australian families, on average, all else equal (Table 1.3). Nor do **second generation** immigrant women significantly differ from their longer established Australian peers. These, of course, are generalised results averaging across many different immigrant groups. Prior research using Census data with its lavish abundance of cases finds that there are many differences among rather narrowly defined immigrant groups (e.g. Evans 1984; Evans and Lukic 1998), but the absence of family background information in that data leaves us necessarily uncertain of the extent to which those differences would be found in data that had both enough cases and enough variables to examine them in detail.

Urban and rural origins do not seem to have any encouraging or discouraging effect on women's later workforce participation, aside from differences in the kinds of families who live there (Table 1.3).

Intensity of employment

Equation 1.2 in the "Models" section above represents the model of Table 1.4 in equation form.

Maternal employment affects how many hours women work, in this model (Table 1.4). Women whose mothers' worked extensively themselves work more than otherwise comparable women whose mothers were housewives, on average and all else equal. The effect is not huge, amounting to about 8 minutes a week, but that is its independent effect apart from many other influences. This reinforces the suggestion in Table 1.3 that there is an intergenerational momentum to women's labour force participation.

Table 1.4: Effects of family background on women's weekly hours of employment:OLS regresson estimates. Women, aged 25 to 64 N=9,626.[1]

Variable	b	s.e.	Standardized	t
Migrant: 1st generation	0.00	0.02	n.s.	0.00
Migrant: 2nd generation	0.01	0.03	n.s.	0.49
Urban at 14 (ln)	0.00	0.00	n.s.	0.34
Number of siblings	0.00	0.00	n.s.	-1.93
Parent's education	0.014	0.003	0.07	5.19
Books in parents' home	0.00	0.00	n.s.	1.42
Father's status	0.001	0.000	0.04	2.41
Fathr supervises	0.07	0.02	0.05	3.78
Parents income	-0.01	0.02	n.s.	-0.40
Father self-employed	0.02	0.01	n.s.	1.60
Parents' age	0.00	0.00	n.s.	-0.45
Parents divorced	-0.05	0.02	-0.03	-2.48
Mother worked	0.14	0.02	0.10	7.41
Private school	0.07	0.04	n.s.	1.79
(constant)	0.45	0.19		

[1] Adjusted R^2 = .03.

In this model, **father's occupational status** (job quality) during his daughter's childhood has a very small but significant effect on her later hours of employment as an adult, all else equal (Table 1.3). Note that this effect is independent of both parental education and income (as well as many other things), so it is something specific to father's location in the jobs hierarchy.

By contrast, **father's self-employment** during a women's childhood does not have a statistically significant effect on her later weekly hours of employment as an adult, in this model (Table 1.4).

Having a **father who supervised** at work while she was growing up has a very small, but clearly significant effect on a woman's working hours (Table 1.4). The metric regression coefficient suggests that the daughters of supervisors work about 4 minutes more a week than do their peers whose fathers did not supervise other workers, on average and all else equal.

In this model, the **income** generated by father's and mother's employment appears not to affect their daughters' later intensity of employment, all else equal (Table 1.4).

Some non-economic features of family background also affect women's engagement in the workforce.

Parents' education during respondent's childhood has a small direct effect (completely independent of its effects on parents' employment and earnings) on how much their daughters work after they grow up (Table 1.4).

The metric regression coefficient suggests that the more highly educated the parents, the longer hours their daughters work, on average and all else equal. But the effect is not large. Aside from parents' education, the abundance of **books** in the family home has no impact on daughters' later hours of work as an adult, in this model.

The **number of siblings** has no effect on women's hours of work (Table 1.4). This null finding suggests that women from large families and women from small families are equally likely to be working short, medium, or long hours, on average, all else equal.

Parents' age during respondent's childhood does not seem to matter to working women's hours of employment, in this model (Table 1.4).

Parental divorce leads, decades later, to shorter hours of employment, among women in the workforce (Table 1.4). The difference is small, amounting to around 3 minutes a week, but it is robust under a variety of sensitivity tests and small differences can add up to large gaps when cumulated over an entire career. The lifetime cost to workforce participants (and hence not incorporating the earnings forgone by staying out of the workforce) would amount to $1,560, assuming a 40 year work career and a $15/hour pay packet. That is not huge damage, although it is not a positive thing.

The **type of school** respondent attended does not have a statistically significant effect on women's hours of employment in this model (Table 1.4). This null effect suggests that women who went to government schools are employed just as many hours as are women who went to private schools, on average, all else equal.

Migration is irrelevant to the hours worked by women in the labour force. **Immigrant** women work no more and no less than do otherwise similar women from long-established Australian families (Table 1.4). Moreover, **second generation** immigrant women do not differ in their work intensity to a statistically significant extent from their longer established Australian peers, on average, all else equal.

Size of place during childhood fails to have a statistically significant effect on women's working hours, in this model. This results suggests that **urban or rural** origins do not seem to lead women to work longer hours of work, on average, all else equal (Table 1.4).

Otherwise comparable working women from farms, villages, country towns, regional cities and metropolitan areas all put in the same number of hours, on average.

SUMMARY

Here we summarise the results in terms of the causal variables (rather than organizing them by dependent variables as in the text). This gives a sense of the scope of the influence of the various causal factors.

- o Parental education
    - raises workforce participation for both men and women (Table 1.1 and 1.3)
    - increases hours worked for both men and women (Table 1.2 and 1.4)

- o Literacy environment: books in the parental home
    - raises workforce participation for both men and women (Tables 1.1 and 1.3)
    - increases hours worked by men (Table 1.2)
    - does not affect women's hours worked (Table 1.4)

- o Maternal employment
    - raises workforce participation for both men and women (Table 1.1 and 1.3)
    - increases hours worked fro both men and women (Tables 1.2 and 1.4)

- o Father's occupational status (job quality)
    - does not affect men's workforce participation or hours worked (Tables 1.1 and 1.2)
    - raises women's workforce participation and hours worked (Tables 1.3 and 1.4)

- o Whether father supervised other workers in his job
    - does not affect men's workforce participation or hours worked (Table 1.1 and 1.2)
    - raises women's workforce participation and hours worked (Table 1.3 and 1.4)

- o Whether father was self-employed
    - does not affect men's workforce participation (Table 1.1)
    - increases men's hours worked (Table 1.2)
    - raises women's workforce participation (Table 1.3)
    - does not affect women's hours worked (Table 1.4)

- o Parental income during childhood
    - does not affect men's or women's workforce participation or hours worked (Tables 1.1, 1.2, 1.3, 1.4)

- o Parents' age
  - does not affect men's or women's workforce participation or hours worked (Tables 1.1, 1.2, 1.3 and 1.4)

- o Parental divorce
  - does not affect men's labour force participation, but reduces women's (Table 1.1 and 1.3)
  - reduces hours worked for both men and women (Table 1.2 and 1.4)

- o Number of siblings
  - does not affect men's labour force participation, but reduces women's (Table 1.1 and 1.3)
  - does not affect men's or women's hours worked (Tables 1.2 and 1.4)

- o Private schooling
  - does not affect men's or women's labour force participation (Tables 1.1 and 1.3) or hours worked (Tables 1.2 and 1.4)

- o Being a migrant
  - raises men's labour force participation in the first generation, but not the second (Table 1.1)
  - does not affect women's workforce participation (Table 1.3)
  - does not affect men's or women's hours worked (Tables 1.2 and 1.4)

- o An urban upbringing (size of place)
  - does not affect labour market participation of men or women (Tables 1.1 and 1.3) or hours worked (Tables 1.2 and 1.4)

DISCUSSION

Parents' education has a positive effect on workforce participation and hours worked for both men and women. Above and beyond that, the number of **books** in the parental home matters, too: Men and women from bookworm homes and are more active in the labour market than are their peers from homes where no one ever cracks a book. That in turn suggests that programs to enhance home literacy, as well as possibly encouraging adult education might be worth considering for families receiving benefits as a way of enhancing the workforce engagement of the next generation.

The finding that **maternal employment** has a large and important effect on men's workforce participation a potentially important result, because it suggests that encouraging single parents back into employment when their children reach school age (even if income support is still needed then) can help prevent multi-generational welfare dependency.

In particular, the sons of working mothers are much less likely to retire early. This is also a potentially important result because so few things seem to effectively counter the trend towards early retirement.

The fact that **parents' income** does not have a statistically significant effect on probability of men's or women's workforce engagement nor on the intensity of their workforce engagement suggests that the offspring of poor parents work just as much as do the offspring of prosperous parents, all else equal. This is evidence against the underclass hypothesis of poverty traps inherited from generation to generation.

The fact that **parents' age** does not have a statistically significant effect on men's or women's workforce engagement in our models suggests that the capacity-reducing effect of teen motherhood on the next generation reflects low educational levels rather than age per se. To the extent that this is correct, early childhood reading programs and encouraging teenage mothers to pursue their own education could be an effective capacity-building strategy both for themselves and for the next generation. It also suggests, however, that there will be no special maturity bonus flowing on into enhanced capacities in the next generation from today's older ages at parenthood.

We find that what matters about a **father's occupation** to his daughter's future work career is how much education he brings to it. Neither the rank of his employment, nor the income it generates matters aside from that.

Parental divorce discourages women's labour market participation slightly, and also reduces the hours worked by both men and women. Other research shows that parental divorce leads to slightly lower educational attainments for their children (Evans, Kelley and Wanner 2001), so a question worth pursuing in future research is whether the negative effects of parental divorce on workforce engagement are all transmitted via reduced educational attainment, or whether they have some independent direct effects net of that.

The **number of siblings** slightly reduces women's workforce participation, according to our models (Table 1.3). It is possible that larger families of origin tend to encourage a taste for homemaking rather than paid employment.

Alternatively, it could be that those growing up in large families tend to "apprentice" in homemaking skills, and tend to make use of that investment as adults.

Rural and regional origins. Women reared in farms, villages, country towns, regional cities and metropolitan areas are all equally likely to participate in the work force and work equally long hours, all else equal.

APPENDIX A: DATA

This section provides more detail on the dataset.

A note on sample size

The IsssA, unlike most social surveys, is based on a simple random sample. This is the optimal type of sample for most purposes, and the type of sample implicitly assumed by most statistical packages, so ordinary standard errors based on it are correct and do not require the inflating factors that cluster samples do. Simple random samples such as the IsssA are more efficient than the cluster samples used in almost all face-to-face surveys.[2]

A reasonable rule of thumb for high quality cluster designs is that they are worth approximately two-thirds as much as simple random samples (NORC 1987: 435). Thus an IsssA sample of about 2,200 would provide as reliable information as a good cluster sample of around 3,300 cases.

Data collection procedures: IsssA

The IsssA surveys are from simple random samples of Australian citizens[3] drawn by the Electoral Commission from the compulsory electoral roll, a public document.[4] They are conducted by mail[5] using a minor modification of Dillman's (1993) Total Response Method.

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[2] Travel costs make simple random samples unaffordable for most face-to-face surveys.

[3] For the exact definition, see the section on "Population sampled", above.

[4] Most of the early surveys are repeated cross-sections (ie new samples drawn each time) but a few are panels (re-contacting previous respondents). Our current design is a permanent panel, augmented with some fresh respondents in each wave.

[5] The first survey was mainly face-to-face interviews, with only the most rural quarter of the sample contacted by mail. Comparison of the face-to-face interviews with mail samples suggests that there are no systematic differences (Bean 1991), and similar results have been reported for the US (Goyder 1985). Mail surveys may

First, a personally-addressed preliminary letter announces the survey; offers a free telephone contact number for queries; and provides information on how to decline to participate[6]. Then the survey booklet itself arrives in the post about two weeks later (together with its pre-paid return envelope and a further cover letter). These average around 64 pages, ranging from 32 to 84 pages, are attractively laid out, and are printed in black and white. The covers feature a map of Australia and are usually glossy white, with the map in a colour that varies from year to year[7]. For non-respondents, this is typically followed by four follow-up mailings, two with fresh copies of the questionnaire, over a 6 to 12 month period.[8]

The data entry process is too elaborate to cover in detail here, because it changes over time[9], but it is worthwhile giving a sketch of current practices. Because the IsssA relies almost entirely on closed-ended questions (because of their superior analytic properties), data processing is relatively straightforward. Upon receipt, the answers from the survey booklets

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be better than face-to-face or telephone surveys for sensitive issues, such as income, since there is no interviewer to create embarrassment (e.g. Babbie 1995: 272). Moreover, non-governmental surveys are more likely to detect participation in the gray economy and income derived from it. Probably the chief drawback to postal questionnaires is that because they are self-administered they are not suitable for questions requiring complex skip patterns (e.g. Babbie 1995: 272).

[6] For our surveys of 1984-85 through 1996-97, we did not use a preliminary letter, but rather a cover letter. The transition to a preliminary letter was at the suggestion of Malcolm Mearns, principal of Datacol Research on the grounds that it would be likely to boost response rates and that it would make refusals cheaper (because the preliminary letter costs only ordinary letter postage, and people who refuse at that stage are excised from the mailing list before the higher cost mailing of the questionnaire). Research is now in progress systematically to evaluate the impact of the preliminary letter.

[7] Our assessment indicates that colour makes no difference to response rates, but varying the colour helps to keep track of multi-year surveys and was an important mnemonic device for questionnaire designers trying to locate questions from earlier survey booklets. The electronic age has made the last issue less relevant, so if one were starting a survey today, one might well prefer to choose one permanent "signature" colour-scheme.

[8] In some years we have experimented with telephone follow-ups and various other alternatives for the last contact, which proved neither demonstrably better nor demonstrably worse than standard practice.

[9] The data from the first survey were coded and entered by Reark Research, the data from the 1986-87 and 1987-88 surveys were coded by research assistants at the Australian National University and entered by data processing personnel at the Australian National University's (former) Data Processing Unit, and the data from subsequent surveys are coded and entered by personnel at Datacol Research. Datacol Research also provides the foundational SPSS locating, identifying, and labelling variables.

are entered into a specialised computer program that flags out-of-range codes (usually keypunching errors), and has column location checks at the end of every page to guard against the keypuncher missing a question and thus punching answers to subsequent questions in the wrong fields, a problem sometimes known as "off-column" errors. Double answers (respondent circles two adjacent answer categories) are randomly assigned to one or the other answer (with special arrangements for a few unusual items). Experienced coders work with an automated occupation-coding program to transform open ended occupation questions into ABS 4-digit occupational codes. Experienced coders also convert open ended questions on industry educational qualifications into standard ABS codes. Throughout the data entry process, coders and data-entry personnel flag all confusing or unclear cases which are subsequently dealt with in problem-resolution sessions with experts. All personnel are carefully trained and supervised[10] to maintain high standards of data-quality. With these procedures, we estimate that the data entry errors are substantially less than one per thousand questions (based on a sample of questionnaires that were entered twice, with different personnel performing the two entries).

Non-response bias in surveys

Representativeness

A very important feature of samples is their representativeness, for it is on this basis that one can make generalisations to the large population which is a key goal of most survey research. Indeed, modern survey research textbooks generally emphasise that completion rates/ response rates are only of interest because a very low completion rate may be a symptom of non-representativeness (e.g. Babbie 1995: 262). The representativeness of IsssA achieved samples has been clearly established in prior research (Bean 1991; Sikora 1997), and analyses using IsssA data appear regularly in the world's leading sociology journals.[11]

Here, we take two approaches to the issue of representativeness (also sometimes known as survey response bias): (1) comparisons of IsssA survey results with the Australian Census, and (2) comparisons of prompt respondents with tardy respondents (who would have been non-respondents if not for our extensive follow-up procedures).

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[10] Including random checks.

[11] For example: Evans, Kelley, and Kolosi (1992); Kelley and De Graaf (1997); Kelley and Evans (1993, 1995).

Results for IsssA surveys conducted around the time of the 1991 Australian census show that the survey samples (1989-1993; 8234 cases) are representative of the population (Table A1).[12] Similar comparisons with the 2001 Census will be conducted in due course.

Table A1: Comparison of IsssA surveys with the census.

```
--------------------------------------------
                       Census 1991  IsssA 1989-93
--------------------------------------------
Gender
 Male                     49%          51%
 Female                   51%          49%
Age Groups
 18 - 24                  15%          11%
 25 - 34                  22%          21%
 35 - 44                  21%          23%
 45 - 54                  15%          17%
 45 - 64                  12%          14%
 65+                      16%          14%
Education: Age Left School
 Under 15/none            18%          18%
 15                       24%          23%
 16                       22%          23%
 17                       19%          21%
 18                       11%          11%
 19 and over              7%            3%
Employment Status
 Employed                 58%          65%
 Unemployed               7%            2%
 Not in labour force      36%          33%
Occupation of employed persons
 Managers & admin         14%          13%
 Professionals            14%          19%
 Para-professionals        8%          11%
 Tradespersons            14%          12%
 Clerks                   16%          16%
 Sales, service           13%          12%
 Plant & mchn operators    8%           7%
 Labourers                13%          10%
--------------------------------------------
```

Another line of insight into the representativeness question comes from comparisons of prompt respondents, who complete and return their questionnaires shortly after receiving them, with tardy respondents (who would be non-respondents had they not been contacted on multiple occasions).

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[12] More extensive comparisons show this as well (Bean 1991; Sikora 1997).

Note that our preliminary letter invites sample members to refuse if they do not wish to participate, and we do not re-contact anybody who refuses. So the non-respondents are people who have not indicated a desire not to participate. An analysis of characteristics of non-respondents compared to respondents is given below in the section on "Non-response".

Survey non-response: Completion rates

Completion rates are one of the data quality issues that greatly concern survey researchers, because of the possibility that non-respondents may differ systematically from respondents, yielding and unrepresentative achieved sample, and thereby violating the assumptions that justify generalization from a sample to a population (e.g. Donald 1960; Brownlee 1975; Miller 1991: 145-155; Babbie 1995: 262). Completion rates for the IsssA -- defined, following the International Crime Victimisation Survey [van Dijk, Mayhew, and Killias 1990] as completions divided by eligibles [refusals plus completions] -- range between 60 and 65 per cent. Potential respondents are defined as "eligible" if they are currently living at the address given in the electoral roll, able to read English, and not seriously ill. The main uncertainty has to do with the addresses, a proportion of which are out of date, erroneous, or unoccupied and so ineligible. Following van Dijk, Mayhew and Killias (1990) we define as ineligible addresses from which we have heard nothing after 5 or 6 contacts. The IsssA completion rate compares favourably with recent experience in Australia, the USA, and many other industrial nations. For example, the well-regarded International Crime Victim Survey averaged 41 per cent in 14 nations using a similar definition (van Dijk, Mayhew and Killias 1990).[13]

However, diligent pursuit of non-respondents is expensive. In the IsssA, as in other mail surveys (Dillman 1993), the great majority of the completions come within a month or two of entering the field[14]. But then things begin to get expensive. The IsssA typically sends a second questionnaire (expensive both in printing and in postage), followed by another reminder letter, followed by a third questionnaire, and often a final desperation contact of

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[13]   The ICVS is an appropriate benchmark because it offers the same definition of response rate in all the countries taking part, whereas in many other international surveys each country defines the response rate in a way that is customary for them, so the reports are not comparable.

[14] For example, the University of Hawaii estimates that on its impressive panoply of student surveys, 40 percent of responses are returned within two weeks of receipt (Babbie 1995: 280).

some sort. All this obtains relatively few responses. Much of the follow-up mail goes to "bad" addresses, mostly because the person we are seeking has moved house. So, much is spent, for little gain. At a rough guess, we spend two or three times more per completed questionnaire at this stage than at the first stage.

But is all this is worthwhile? Since the budget is fixed, an attractive alternative is to draw a bigger sample in the first stage, but then cut the pursuit of non-respondents short, dropping the third questionnaire (and possibly even the second). That would produce a larger sample within the same budget – of course, bigger samples are unequivocally better. The danger is that the "difficult" respondents who initially refuse our requests to participate and only complete the questionnaire months later are different from the "good" respondents who answer right away. So by giving up on those who initially refuse, we might get an un-representative sample. That would be unequivocally bad.

So a key question is whether "good" (and inexpensive) respondents differ systematically from "difficult" (and expensive) respondents and, by extension, from non-respondents (who are presumably like "difficult" respondents, but even more extreme). Good arguments can easily be made on both sides of this question,[15] but in the end the question is an empirical one, and is an important tool in the assessment of sample representativeness (Babbie 1995).

Are those who initially fail to complete the questionnaire, eventually answering only after many reminders, in fact different from "good" respondents? The logistic regression analysis in Table A2 suggests that, in the main, they are not. At a simple descriptive level, nothing we have measured is strongly correlated with initially not answering the survey (column 1), a finding confirmed by the logistic regression (columns 2 and 3).[16]

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[15] It might be that poorly educated respondents find our lengthy questionnaire daunting; or that the rich have no time for it; or that housewives find the focus on work uninteresting; or that right-wingers find it intrusive, or left-wingers find it threatening. Alternatively, it could be that none of these matter – that filling out a questionnaire depends on random things (such as happening to have some free time that week) or on things uncorrelated with the variables we are interested in (such as mood, personality, or co-operativeness).

[16] There are also statistical ways of getting some empirical leverage even on permanent non-response and adjusting for any resulting biases in the multivariate analysis (see Heckman 1979 and the literature flowing from that). But the cure often seems more dangerous than the disease, so conventional wisdom has generally turned against such corrections – a view with which we concur.

Demographic differences are minimal; status and political differences even smaller; and attitudinal differences negligible. There is only one statistically significant difference: younger people are very slightly more likely initially not to complete the questionnaire, all else equal.

Table A2. Analysis of non-response. Panel 1: Respondents who initially refused to complete the survey but eventually answered after many reminders (=1, all others=0). Panel 2: Item non-response (=number of individual questions not answered). Correlations (r), logistic regression coefficients (b), standardized partial regression coefficients estimated by OLS (beta), and significance tests. Australia IsssA 1994-95. N=1503.

	1. Initially refused to answer survey			2. Item non-response		
	r	logistic b	Wald χ^2	r	OLS beta	t
Male	-0.034	ns	0.45	-0.10	-0.07	-2.24
Age	-0.123	-0.02	12.91	0.11	ns	1.63
Parents' party	-0.014	ns	2.04	-0.04	ns	-1.12
Born in Australia	-0.026	ns	1.51	-0.05	ns	-1.35
Urban	0.012	ns	0.23	-0.01	ns	0.47
Education	0.017	ns	0.91	-0.13	-0.07	-2.08
Family income	0.001	ns	0.72	-0.07	ns	-0.40
Liberal or National Party	-0.013	ns	1.34	0.02	ns	1.33
In labor force	0.031	ns	0.01	-0.11	ns	-1.11
Catholic	0.023	ns	0.23	0.01	ns	-0.20
Christian belief (scale)	0.056	ns	1.23	0.04	ns	0.42
Pro-union (scale)	-0.003	ns	2.11	-0.01	ns	0.55
Govt regulate business (scale)	0.072	ns	0.99	0.00	ns	-0.43
Knowledge of science	-0.001	ns	1.04	-0.11	ns	-1.21
For genetically engineered food	0.001	ns	1.32	-0.08	ns	-1.59
Govt pay more on superannuation	0.036	ns	2.10	0.06	ns	1.23
Initially refused to answer survey	--	--	--	0.03	ns	1.20

ns – Not significantly different from zero, p<.05, two-tailed.

Item non-response

Item non-response is also a long-standing concern for survey analysts (e.g. Sudman 1983). Respondents' typically do not answer all the questions in a survey, and the concern is that those skipping an item are systematically different from those who do answer. On a few topics (for example, income) 10 percent or more may not answer, although generally item non-response tends to be closer to 5 percent in IsssA surveys[17]. There is a large statistical literature how to handle item non-response, with implications that turn largely on how distinctive the non-responders actually are (e.g. Joreskog and Sorbom 1989, chapter 1: 12-17; Little 1992:1229-31).

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[17] Item non-response is very low on some items, such as the goals for scientists in the 2001 survey where we have missing data under one per cent.

If they are very different, serious difficulties can arise in the analysis; conversely, if item non-response is more or less random with respect to the variables of interest, it is relatively easy to deal with.

So again it is an empirical question: how distinctive are those who do not answer particular questions? To get some insight on this, we selected some widely used items and counted how many each respondent failed to answer. A typical count, for eight demographic and background items in the 1994-95 IsssA is:[18]

```
No missing data, answered all       74%
Missed 1 question                   21%
Missed 2 questions                    4%
Missed 3 questions                    1%
Missed 4 questions                  0.4%
Missed 5 questions                  0.1%
Missed 6 or more questions            0%
                                    100%(1503 cases)
```

Thus, most people answered all these questions but 21 per cent skipped one, four per cent skipped two and a handful skipped more. We made similar counts for other sorts of questions, with similar results.

Who, then, are not answering? In all, there are no substantial differences between those who skip questions and those who do not,[19] at least for the variables we have measured: Most of the correlations are near zero. Multivariate analysis suggests that there are, however, a couple of significant, but small, differences. Men are a little less likely than women to skip questions, and the well-educated less likely than the poorly educated. Both differences are small, with a standardised effect of only -.07. Interestingly, there is no relation between skipping questions and being a tardy respondent – that is, no statistically significant link between item non-response and survey nearly-non-response. Instead, we suspect that doing a survey involves a two-stage decision process: first one decides whether or not to do the survey, then after that and quite independently, whether or not to answer each particular question.

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[18] Sex, age, parents' political party, place of birth, urban residence, education, family income, and party preference.

[19] Results on earlier IsssA data are similar (Bean 1991).

There seems to be a general tendency toward skipping questions in a survey, although not a strong one (Table A3). For example, those who tended to skip background items also tended to skip political attitude questions (r=.32), questions on science (r=.21), attitudes toward retirement income provisions (r=.31) and religious matters (r=.19). All these links are clear, but only moderately strong.

In some analyses, we have estimated the effects of item non-response using a variation of Heckman's (1979) method suggested by Kelley and Evans (1993:118-20) which uses nonresponse on related questions elsewhere in the questionnaire to give an independent indicator of the underlying propensity not to respond. However, our experience thus far is that these adjustments rarely make any practical difference.

In practice, we therefore generally use the pair wise present method for missing data, without any further adjustment. It is statistically preferable to the usual simple alternatives (Joreskog and Sorbom 1988, chapter 1: 12-17; Little 1992:1229-31).

Table A3. Correlations between initial refusal to complete the survey and non-response to particular items in the survey. Australia IsssA 1994-95. N=1503.

	Initially refused to complete the survey	Item non-response on:				
		Background items	Political attitudes	Attitudes to science	Attitudes toward retirement	Religious issues
Background items	0.06	1.00	0.32	0.21	0.31	0.19
Political attitudes	0.01	0.32	1.00	0.15	0.20	0.16
Attitudes to science	0.02	0.21	0.15	1.00	0.40	0.07
Attitudes to retirement	0.03	0.31	0.20	0.40	1.00	0.10
Religious issues	-0.03	0.19	0.16	0.07	0.10	1.00

Missing data on some specific questions have also been examined with reference to the question of whether they can be safely treated as missing at random (Table A4).

Table A4. Are missing cases missing at random? Selected variables.

Variable	Missing-at-random?	Source of evidence
Parents' political party	Yes	Kelley 2002 "Missing on parents' party." Australian Social Monitor 5(4): 67.
Political party	Probably	By analogy to "Parents' political party"

Measurement

General matters of question design

In general, scale types and formats matter little to the psychometric quality of questionnaire items, so long as the substance of the question is clear and respondents can tell which end is high and which is low (Sheatsley 1983), although the reliability of ratings drops if there are under 3 answer categories or more than 9 answer categories (Milkovich and Wigdor 1991: 3). As a result, 5 to 7 answer categories are often treated as ideal, although one may need to vary this for specific purposes, such as replication. Some degree of balance of topics is ideal to maintain respondent concentration (Sheatsley 1983). To enhance accuracy, the IsssA routinely assesses new factual questions qualitatively in terms of respondents' experience of their clarity and complexity.

Individual characteristics

Class and status variable

Family background on occupational status have of course been widely studied, most notably in the vast tradition of sociological research stemming from the Blau-Duncan paradigm (Blau and Duncan 1967; Featherman and Hauser 1978). Subsequent developments included class models (e.g. Erickson and Goldthorpe 1992; Wright 1985), models incorporating both class and status elements (e.g. Robinson and Kelley 1979), and many others. The Blau-Duncan paradigm led to a flowering of research unprecedented in sociology. Robust findings about stratification emerged first for the US (Blau and Duncan 1967; Duncan, Featherman and Duncan 1972) and soon afterward for many other countries, including Britain and Australia in the western industrial world (Broom and Jones 1969); Poland and Hungary in Eastern Europe (Zagorski 1984); and developing and even tribal societies (Kelley 1978). A Kuhnian (1962) "normal science" of social stratification was the outcome, with a strong traditional of increasingly elaborated findings in Australia (e.g. Broom, Jones, McDonnell, and Williams 1980; Crook 1997; Evans and Kelley 1991, 2002a, 2002c; Marks 1992; Partington 1995).

Our model is in the comprehensive tradition, incorporating both class and status aspects of family background. Objective class is measured by Kelley's extension of the Blau-Duncan model to include ownership and authority. It provides a more powerful and parsimonious model than the usual typological alternatives (Kelley 1990:350-56, 1992:23-34; Robinson and Kelley 1979).

SELF-EMPLOYED

Self-employment is measured by a direct question. **Father self-employed** is measured in the same way based on a question about father's work "when you were age 14".

```
SELFEQ    Self-employed
Value Label                Value     Percent
Private/govt/other          .0          87
Self-employed              1.0          13
                         Total         100
Mean           .132    Std dev         .339
Valid cases    20845
```

SUPERVISORS

Supervisor is based on a direct question about supervision and, for those who do supervise, a second question asking whether those supervised themselves supervise yet other workers. It is scored 1 for high level supervisors (viz, those who supervise other supervisors); 0.5 for low level supervisors (viz, those who supervise only ordinary non-supervisory workers); and 0 for everyone else. The importance of the distinction between high and low level supervisors has long been known (Robinson and Kelley 1979). **Father supervisor** is measured in the same way.

```
SUPER3Q    Supervises (0, 0.5, 1.0)
Value Label                Value     Percent
Not supervise               .0          61
Low level supervisor        .5          25
Higher supervisor          1.0          14
                         Total         100
Mean           .270    Std dev         .366
Valid cases    20438
```

In some analyses, we use a dichotomous version of supervision which scores both low and high level supervisors 1 and everyone else 0.

Owners are defined as the self-employed who also supervise (and so presumably have employees). They are scored 1; all others are scored 0. Most owners run very small businesses. **Father owner** is defined in the same way, based on direct questions about father's work "when you were 14".

```
OWN2Q     Big owner (=self-employed & supervise)
Value Label                Value     Percent
No                           0          95
Owner                        1           5
                         Total       100.0
Mean           .051    Std dev         .219
Valid cases    20669
```

P<small>ETTY BOURGEOISIE</small> (<small>SELF-EMPLOYED WITHOUT EMPLOYEES</small>)

Petty bourgeoisie are defined as the self-employed who do not supervise (and so presumably have no employees). They are scored 1 and all others 0. **Father petty bourgeoisie** is defined in the same way.

```
PBOURGQ   Petty bourgeiosie (self-emp, no employee
Value Label                 Value    Percent
No                              0        92
Petty Bourg                     1         8
                            Total       100
Mean            .082      Std dev        .274
```

G<small>OVERNMENT EMPLOYMENT</small>

Government employment is scored 1 for national, state and local government employees, and zero for everyone else. It is based on a direct question. **Father government employee** is defined in the same way.

```
GOVTQ      Government employee
Value Label                 Value    Percent
                                0        68
                                1        32
                            Total     100.0
Mean           .317      Std dev        .465
Valid cases   20845
```

E<small>DUCATION</small>

Education is years of schooling. In Australia, respondent's education was ascertained by a series of questions on years of primary and secondary schooling and details on highest educational qualification. These were coded into the Australian Bureau of Statistics' 3 digit educational code and recoded into usual years of schooling.

```
Mean         11.227     Std dev       2.962
Valid cases   26061
```

Mother's and father's education was measured by direct questions with 8 or 9 categories, and recoded into approximate years of schooling. In many analyses, we use **parents' education**, defined as mother's education if only that is known; or father's education if only that is known; or the average of the two if both are known.

For cross-national analyses, we take years of education as defined by the original ISSP or ISEA investigators, often with country-specific corrections and refinements using data on qualifications.

PRIVATE SCHOOLING

Private schooling is measured by a direct question asking whether respondent attended a government, religious, or secular private school for their secondary education. In many analyses, we distinguish private non-Catholic schools (mainly fee-paying) from all others, both government and Catholic (which generally have low or negligible fees).

```
PVTEDUCQ   Private (non-Catholic) secondary school
Value Label                  Value      Percent
Other                          .00        90.5
Private non-C                 1.00         9.5
                             Total       100.0
Valid cases   24537
```

BOOKS IN PARENTS' HOME

Books in parents' home, a good indicator of the family cultural orientation, was asked by a direct question. The reference period was when respondent was age 14.

```
BOOK14Q    # books in parents house (R age 14)
Value Label                    Value      Percent
                                  1           2
                                  2           5
                                  5           0
                                 10          11
                                 20          16
                                 50          23
                                100          19
                                200          13
                                500           8
                               1250           4
                              Total       100.0
Valid cases   25127
```

EARNINGS, FAMILY INCOME

Family Income is income from all sources for respondent and, if married, their spouse.

Earnings is income from respondent's main job.

All income figures are adjusted to the price levels of the year 2000, using the consumer price index.

We use the natural log of income for some analyses, as is usual in many contexts. This means that metric coefficients reflect percentage rather than absolute changes – for example, that one additional year of education increases earnings by (say) 9% rather than $1200 per year.

```
Variable        Mean      Std Dev  Label
EARNQ        23351.58    27990.21  Earnings (inflation adjusted to yr 2000)
FAMINCQ      47680.36    38822.45  Family income: (inflation adjusted to yr
LNEARNQ          6.50        5.21  ln earnings (inflation adjusted to yr 20
LNFINCQ         10.48         .80  ln family income: (inflation adjusted to
```

PARENTS' INCOME

We have no direct measure of **parents' income** because survey respondents are not generally able to provide reliable information on their parents' income. They do, however, provide reliable information on their parents' education, occupation, supervision, labour force participation and the like. We estimated parents' income from those known facts in the following way. (1) First, we estimated the impact of education, occupation. supervision, labour force participation and the like on the (log of) family income of contemporary families by OLS regression. (2) Next, we assumed that this relationship held equally in the past, and so predicted their parents' income on the basis of their parents' education, occupation, labour force participation, and the like. The resulting estimate is provides a plausible but by no means perfect proxy for family income, and we used this proxy in some analyses.

The estimating equation is:

```
Variable              B          SE B        Beta          T
EDUCQ            .025630       .003443     .161275       7.444
OCCSTATQ         .003600    3.9070E-04     .206906       9.215
SUPER3Q          .236724       .022586     .201801      10.481
SELFEQ           .017019       .033738     .013528        .504
OWN2Q            .103667       .042383     .065266       2.446
GOVTQ           -.065521       .018814    -.064779      -3.483
LNURBANQ         .006583       .002547     .045702       2.585
SEDXWRKQ         .031160       .001593     .343437      19.557
(Constant)     10.222974       .042726                 239.270
    Adjusted R Square     .37628
    Standard Error        .38213
    n=3247 varying somewhat with missing data
```

where SEDXWRKQ is a measure of the spouse's education and employment. Parents' income was then estimated from the corresponding equation for parents' characteristics, and adding a random component with mean zero and standard deviation equal to the standard error in the estimating equation:

```
P_LnIncQ = FAEDYR2Q* .025630 +FASTATQ * .003600 + FASUPR3Q * .236724
   + FaSelfEQ*.017019 + FaOwn2Q *.103667 +FaGovtQ* -.065521
   + LnUrb14Q *.006583 + mEdXWrkQ *.031160  +   10.222974
   + .38213 * NORMAL(1)
```

The result then reflects what parents' income would have been if they had lived under the economic conditions of 1984-2001, in year 2000 dollars. That will somewhat over-estimate parents' incomes (because of productivity growth in the interval between the reference year

for parents' characteristics and the survey date), but nonetheless put parents in roughly their correlative relative income rank. The distribution:

```
Variable        Mean    Std Dev  Label
P_LNINCQ       10.84        .47  Est parent ln income, R age 14 (w random)
```

An alternative would be to use a measure based on the possessions (house, car, VCR etc) which we have in several of our surveys. We did not do that because, other things being equal, older families are much less likely to have these possessions than younger families (cars, for example, were rare in the past and VCRs non-existent). Since age is linked to education and other key variables, that produces a serious bias.

Labour force participation, experience

IN LABOUR FORCE, SPOUSE IN LABOUR FORCE

Labour force participation and **spouse's labour force participation** were measured by direct questions. In some analyses, we use a dichotomous version (working versus all other); in others a version distinguishing not in labour force (=0), part-time (=0.5), and full-time (=1.0) or the equivalent in approximate hours worked (none=0; part-time=20; full-time=40). In other analyses, we distinguish those working long or very long hours (as defined below).

```
HOURS5Q   Hours worked: Tabular
Value Label               Value      Percent
Not working: 0-4           1.00       38.5
Part time: 5-34            2.00       14.4
Full time: 35-48           3.00       34.9
Long: 49-59                4.00        7.0
Very long: 60+             5.00        5.2
                          Total      100.0
```

MOTHER WORKED WHEN RESPONDENT WAS YOUNG

Mother worked was asked directly, in most surveys with three questions referring to key stages in respondent's life-cycle: when respondent was under school age (5 or under); when respondent was age 6 to 9; and when respondent was age 10 to 14. In many analyses, we averaged these three items to make a summary scale of mother's employment.

```
MOWKPREQ  Mother work when R age 0-5
Value Label               Value      Percent
Not working                 .00       76.0
Yes, Part time              .50        9.9
Yes, Full time             1.00       14.1
                          Total      100.0
Mean          .190     Std dev        .359
Valid cases   21800
```

```
MOWK6Q     Mother work when R age 6-9
Value Label                    Value     Percent
Not working                      .00       66.8
Yes, Part time                   .50       15.7
Yes, Full time                  1.00       17.5
                               Total      100.0
Mean            .253     Std dev          .387
Valid cases   17628

MOWK10Q    Mother work when R age 10-14
Value Label                    Value     Percent
Not working                      .00       60.7
Yes, Part time                   .50       17.2
Yes, Full time                  1.00       22.1
                               Total      100.0
Mean            .307     Std dev          .412
Valid cases   23026

MO_WORK$  Mother work when R young (scale averaging the items above)
Mean            .252     Std dev          .344
```

Occupational status scores

I assume that the true status of an occupation is intimately related to the education of incumbents (well educated people get the best jobs), to their income (high status jobs command larger rewards), and to the success of their children in the next generation (high status jobs provide resources that can be used to give children a head start in life). If so, and if Treiman's 14 categories (Treiman 1977) give groups of occupations with similar status, then it follows that a scoring scheme (applied to the 14 categories) that maximizes the correlation between them and education, or income, or occupation in another generation would reflect the true status of occupations in each group. This scoring scheme can be found from a canonical (or, equivalently, discriminate) analysis -- for example, Klatzky and Hodge's (1972) procedure using only occupation in two generations. Rather than relying on a single pair of variables, I prefer a variant of Duncan-Jones' procedure predicting respondent's occupation (treated as a set of dummy variables without assumptions about rank) from education, income, and father's occupation (also scored as a set of dummy variables without assumptions about rank). I applied this procedure to individual level data from 16 countries, obtaining entirely independent scores for each. As the resulting scores are invariant under a linear transformation, there is no natural unit nor zero point; I have therefore (arbitrarily but conveniently) normed them from a low of zero to a high of 100.

These results suggest that occupational status hierarchies are much the same throughout the world. Table B1 shows the (product-moment) correlations between hierarchies in 16 societies. The correlations are high, averaging 0.84. Indeed, this is slightly higher than the correlation Treiman found among prestige scores around the world (Treiman 1977). Furthermore, the similarity holds not just for western industrial societies but is equally apparent for the

developing societies of Latin America, Africa, and Asia; correlations between industrial and developing societies average 0.82. Poland, though communist, is little different from the rest of the world. By far the lowest correlations involve Finland but since the other three Scandinavian countries are in no way unusual and the Finnish sample is the smallest analyzed (N=345), we attribute this to sampling error.

Since occupational status is essentially the same throughout the world, it is reasonable to construct a single scale for use throughout the world. I did this simply by averaging the scores for each country and norming the result to range again from zero to 100. These worldwide status scores are given in the text above and graphically in the figure below:

For the world as a whole, higher professionals -- the traditional free professions -- are clearly at the top of the hierarchy. Administrators are well behind, closely followed by technical employees, with higher clerical and higher sales employees coming next. Then there is a distinct gap; below that, the bottom of the white collar hierarchy overlaps with skilled manual workers. Ordinary semi-skilled workers follow next, then unskilled, followed by farmers and farm labourers at the bottom. Note that the traditional white collar - blue collar is poor because of the overlap between the bottom of white collar and the top of blue and that farmers are very low in status, although of middling prestige.

Table B1. Correlations among socioeconomic status scores for 16 societies; decimals omitted.[1]

_____

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Industrial Nations															
1. USA															
2. Australia	82														
3. Denmark	86	91													
4. Finland	63	28	73												
5. Germany	90	89	91	63											
6. Britain	92	91	93	43	99										
7. Netherlands	93	84	96	61	84	91									
8. N. Ireland	79	53	81	60	75	92	87								
9. Norway	88	82	90	67	87	89	92	78							
10. Poland	84	87	91	89	89	86	89	99	98						
11. Sweden	91	91	97	69	99	99	95	79	99	94					
Developing nations															
12. Bolivia	94	87	94	84	91	96	99	87	94	92	95				
13. Kenya	92	90	84	44	83	79	88	97	96	94	94	99			
14. Malaysia	79	63	72	70	62	77	80	93	84	93	78	84	96		
15. Philippines	89	70	81	57	73	84	92	94	93	93	93	98	97	89	
16. Taiwan	82	69	69	78	51	65	84	88	82	78	76	98	93	82	92

_____

[1] Computed over occupational groups, not individual respondents.

Demographic variables

AGE, PARENTS' AGE

Age at the time of the survey is measured in years, based on date of birth.

Parents' age is the average age of respondent's mother and father when respondent was born. There is some evidence in other countries that older parents do a somewhat better job of raising their children than do younger parents

```
Variable      Mean    Std Dev  Label
AGEQ          44.25     16.00  AgeQ (at time of survey)
PNTAGEQ       29.58      6.22  Parents age when R born (mean).
```

SEX

Male is scored as a deviation from female: 1 for men and 0 for women.

```
MALEQ      MaleQ =1, female=0
Value Label                  Value     Percent
Female                         .00       50.5
MaleQ                         1.00       49.5
                            Total      100.0
```

MARRIED, DE FACTO, DIVORCED; PARENTS DIVORCED

Marital status was asked in a direct question. In most analyses we use it to distinguish three marital states: currently **married**, currently **de facto**, and everything else.

```
MARRIEDQ  Married (not defacto)
Value Label                  Value     Percent
No                             0         28
Yes                            1         72
                            Total       100
Valid cases    26126
```

```
DEFACTOQ  De facto (living together
Value Label                  Value     Percent
No                             0         95
Yes                            1          5
                            Total      100.0
Valid cases    25915
```

```
DIVORCEQ  Divorced or separated now
Value Label                  Value     Percent
No                            .00       93.2
Yes                          1.00        6.8
                            Total      100.0
```

Parental divorce is also measured by a direct question. This refers to whether or not your parents ever got divorced, including those who divorced and then married someone else, so many respondents with divorced parents would have spent part of their childhood in a family with a step-parent.

```
PNTDV14X  Parents get divorced
Value Label                     Value     Percent
No                                  0          90
Yes, Divorced                       1          10
                                Total         100
Valid cases    26467
```

NUMBER OF SIBLINGS

Number of siblings is derived from direct questions on number of brothers and number of sisters (save for one year when we asked brothers and sisters combined).

```
NSIBSQ     Number of siblings
Value Label                     Value     Percent
                                    0           5
                                    1          21
                                    2          25
                                    3          19
                                    4          11
                                    5           7
                                    6           4
                                    7           3
                                    8           5
                                Total         100
Valid cases    22754
```

URBAN RESIDENCE

Urban residence is the natural log of the approximate population size of the place of residence, based on a direct question. In some analyses, it is dichotomised, with urban areas (population 500,000 and over) scored 1 and all others 0.

```
LNURBANQ  ln size of city now
Value Label                     Value     Percent
Farm, property                   2.30          6
Village (under 1,000)            6.21          5
Town (to 20,000)                 9.26         17
Mid-sized city                  11.00         17
City (to 500,000)               12.61         13
Metropolitan (500,000+)         14.73         42
                                Total        100
Mean         11.709     Std dev        3.461
```

Urban residence at age 14 is measured similarly.

ETHNICITY AND MIGRATION

Place of birth is coded from a direct question into the ABS 4 digit code.

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