The Roles of Schooling and Educational Qualifications in the Emergence of Adult Social Exclusion

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Centre for Analysis of Social Exclusion

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Editorial Note

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Acknowledgements

Abstract

In order to assess the roles of schooling and educational qualifications in the emergence of adult social exclusion, a series of detailed regression models were explored separately for men and women for each of a wide range of indicators of adult disadvantage at both ages 23 and 33, including experience of unemployment, being in receipt of non-universal benefits, low income, low occupational class, living in social housing, and a high malaise score, as well as ever being a lone mother; a number of other measures were considered at age 23, such as experience of not being in education or employment for 16 to 23, early parenthood, or at age 33, such as lacking a telephone or cigarette smoking.

The core strategy for assessing these issues was to consider successive blocks of characteristics, ordered by their increasing proximity to the level of qualifications and the adult outcomes. Thus, we began by considering a cluster of variables that represent the parental background of the survey members, including measures of childhood poverty, of father's social class, parental housing tenure, parental education, and experience of family disruption. The second block of variables included reports of mother's and father's interest in their child education, filtered through the observational lens of a teacher, and on the child's behaviour

attributes, observed through a parental lens. Once selected terms had been added to the initial model for parental background, the resultant model was then used as an anchor for considering a third wave of potential characteristics for inclusion, which included summaries of educational test scores and of frequent school absences at ages 7, 11, and 16, and of three different reports of contact with the police by age 16. These terms were then also locked into the next model and reported qualification levels were then considered for inclusion.

Two dominant patterns emerge from the examination of the wide range of outcomes considered.

➢ Firstly, educational qualifications show a clear and strong relationship to every single adult measure of disadvantage at ages 23 and 33 and both for men and women, which is generally stronger at age 33 than at age 23. This strong relationship emerges net of controls for a wide range of childhood factors, which includes measures of parental interest in education, results of educational test scores, and indications of frequent school absences.

➢ Secondly, the childhood precursor that most frequently remains a clear predictor of negative adult outcomes, net of all the other factors considered is childhood poverty.

A number of other important findings emerge:

➢ Mother's interest in schooling is more salient for women, whilst father's interest matters more for men;

➢ Low parental interest in schooling, frequent absence from school, and low educational test scores are all quite influential on subsequent disadvantage, even net of qualification levels;

➢ Early contact with the police is a better indicator of anti-social behaviour than frequent absences from school in relation to adult outcomes for men, but absences are more influential for women.

Specific continuities in exclusion also emerge:

➢ The father being in Social Classes IV or V remains a clear predictor of male survey members also being in these Classes at ages 23 and 33, net of all the other factors considered;

➢ Growing up in social housing shows a similar specific legacy of being in social housing for both men and women at ages 23 and 33;

➢ Childhood behaviour indicators most specifically relate to adult malaise.

1.   Introduction

The focus of this paper is on pathways into adult social exclusion, as indicated by a number of measures of disadvantage at age 23 and age 33 taken from the National Child Development Study of the British birth cohort born in March 1958. We draw upon an extensive range of summary indicators covering childhood background and experience (Hobcraft 1998) and some intermediate outcomes, which include elements relating to schooling and education, and explore the associations of the adult outcomes with these. We then ask how far the introduction of information on the level of qualifications attained provides further leverage in accounting for negative adult outcomes.

The core strategy for assessing these issues is to consider successive blocks of characteristics, ordered by their increasing proximity to the level of qualifications and the adult outcomes. Thus, we begin by considering a cluster of variables that represent the parental background of the survey members, including measures of childhood poverty, of father's social class, parental housing tenure, parental education, and experience of family disruption. Each of these measures summarises experience across each of the three childhood waves of the NCDS, at ages 7, 11, and 16, and can also include information collected at birth.

We then explore the strength of the relationship of these background characteristics to each of the adult outcomes, separately by gender. We choose, for purposes of parsimony, to use forwards stepwise selection procedures for our regression models (usually logistic models) with a stringent entry criterion probability of one in 10,000 and removal of any terms that become insignificant at that level. The resulting model is then used as a starting point in judging whether terms in the next block of characteristics should enter the model, using the same selection criteria.

The second block of variables includes reports of mother's and father's interest in their child's education, filtered through the observational lens of a teacher, and on the child's behaviour attributes, observed through a parental lens. Once selected terms have been added to the initial model for parental background, the resultant model is then used as an anchor for considering a third wave of potential characteristics for inclusion, which include summaries of educational test scores and of frequent school absences at ages 7, 11, and 16, and of three different reports of contact with the police by age 16. These terms

are then also locked into the next model when reported qualification levels are considered for inclusion, using the same stepwise procedure.

Finally, again for each outcome by gender, we also fit a stepwise model where all of the characteristics are allowed to compete on an equal footing, rather than in a sequential hierarchy that privileges earlier background characteristics – this results in a more parsimonious model.

By adopting this modelling strategy, we ensure that the initial sequence of models is strictly hierarchical, which incidentally simplifies statistical testing, but has the main advantage of posing questions about how far the more proximate elements of the hierarchy add explanatory power to the models. For example, do we gain additional information about adult outcomes from adding educational test scores to the parental background? Perhaps less predictable is whether knowledge of educational qualifications tells us more than the results of the sequence of educational test scores, evidence on frequent school absences, and all of the other childhood circumstances considered.

Other authors have recently used sequential approaches with a fairly rich range of childhood background variables in the analysis of adult economic outcomes (e.g. Gregg and Machin 1998 for the NCDS, and Feinstein 2000 for the 1970 Birth Cohort Study). Our approach is distinguished by several features, including consideration of a wider range of economic outcomes and the inclusion of many non-economic outcomes (as also in Hobcraft 1998 and Hobcraft and Kiernan 1999); moreover, the handling of the sequencing is different, as is the treatment of missing data and the combination of childhood measures across several waves of the survey.

The final non-blocked model provides answers to a different set of questions about whether the earlier characteristics in the sequence still prove important correlates of adult outcomes despite knowledge of the subsequent qualification levels obtained. Thus, we can better answer whether childhood poverty or parental social class etc. are still strong predictors of adult disadvantage, even when we have more direct information about the educational performance of the survey member. Our final, more parsimonious, models more rigorously address this type of question, even though the gradual attenuation of earlier characteristics is apparent in the sequential hierarchical models.

One advantage of considering a wide range of adult outcomes is that we can then search for commonalities between the outcomes and ask which of our extensive range of explanatory variables are of general importance and whether there are also specific continuities of intergenerational transmission, such as living in social housing,

measures of poverty, and social class. Moreover, we can also explore the extent to which relationships change between ages 23 and 33. For example, do qualifications become more important later in adulthood? Or do childhood factors gradually become less salient? A further dimension to be examined is the extent to which there are gender differences in the relationships of childhood circumstances and intermediate factors to the adult outcomes.

2.   The Adult Outcomes and Social Exclusion

As yet, there is no widely accepted measurement construct of social exclusion. The concept is a fuzzy one, although it is clear that it covers a range of factors that encompass poverty, but also go beyond purely economic dimensions to perhaps include physical and mental health, support networks, and engagement with civil society. Even if we did have a clear conceptual definition, its translation into a measurement construct would involve complications and some new instruments. Among the difficult issues are those of combining various indicators into one (or more) measures of social exclusion (see Hobcraft, forthcoming and Burchardt, Le Grand and Piachaud, 1999). Moreover, our work here is constrained by what has been measured in the NCDS in 1981 and 1991, when the cohort members were aged 23 and 33 respectively, before social exclusion had become a major concern in Britain.

Our solution is thus pragmatic and consists primarily of considering each outcome separately, which proliferates models and does not formally investigate the extent to which a common model might capture much of the variation among the different outcomes. On the other hand, there is no clearly established criterion for combination of the measures and we thus feel justified in exploring correlates of aspects of social exclusion to improve our understanding. Moreover, earlier work suggests that forcing common antecedent structures is unhelpful because different aspects of social exclusion often seem to have divergent inter-linkages (see Hobcraft 1998 and Burchardt *et al* 1999) Towards the end of the paper we do consider a combination of a number of the differing adult outcomes through an equally weighted summation, rather than some more complex factor analytic or structural equation model approach.

There are relatively few measures of exclusion or disadvantage that are comparable at ages 23 and 33 from the NCDS, but we consider several which are drawn from a larger project on continuity and change

in adult social exclusion that I am undertaking, as part of a broad research agenda on life-course and intergenerational transmission of social exclusion.

Occupational class is one of the most studied inter- and intra-generational continuities and we have chosen to consider the Registrar General's Social Class categories IV and V as indicative of possible social exclusion, as this indicator is available at ages 23 and 33 (as well as during childhood), despite some of the well-known methodological shortcomings. We supplement this measure with the more refined Hope-Goldthorpe classification VII of the unskilled at age 33, where the revised CASOC (Computer-Assisted Standard Occupation Coding) measures are available. Of course, these occupational class measures suffer from the usual drawbacks that they often reflect past occupation or ascribe a partner's occupational group, especially for women. In addition, we have used the employment histories collected at ages 23 and 33 to generate indicators of those survey members who experienced 12 or more months of unemployment between ages 16 and 23 and between ages 23 and 33 respectively. Finally, the retrospective labour force histories from the survey at age 23 were also used to generate an indicator of whether the survey member spent 24 or more months between ages 16 and 23 neither in employment or education. This last measure has greater interpretation problems for women than men, because the survey instrument did not differentiate spells out of the labour force by status as housewife or mother.

At age 23 we were also able to identify those survey members who were in social housing in their own right (although the tenure for those living with parents was regrettably not ascertained); this measure is thus comparable with the measure at age 33, by which time tenure status is largely self or partner determined, and avoids cross-contamination with the parental measures from the childhood surveys. In the welfare domain, we were also able to identify survey members who were in receipt of non-universal benefits (e.g. excluding the statutory child allowance) at age 23 or at age 33.

Measures of income are available in both surveys, although those used are not strictly comparable between the surveys. At age 23 we have identified those whose family equivalised income was in the lowest quartile. A clear problem with this measure is one of parental contamination for those who were still living with their parents, thus ensuring too great a continuity with childhood poverty. At age 33 we have used different measures for men and women. For men we have identified those whose earnings were in the lower quartile, whereas for

women who are far less frequently employed we have taken those in the lowest quartile of household income (not equivalised since such a measure was not currently available to us).

As an indicator of mental health we took scores of seven or higher on the Malaise Inventory of 24 items of symptoms such as irritability, anxiety, depressed mood or psychosomatic illness as indicative of being at high risk of depression at ages 23 and 33 (Rutter *et al* 1976; Rodgers *et al* 1999).

Especially for women, social exclusion is often linked to demographic outcomes (see, for example, Hobcraft and Kiernan 1999, for clear links of early motherhood to indicators of social exclusion at age 33, net of a wide range of childhood measures). For both men and women, we take early parenthood (before age 23) as being indicative of future social exclusion, although there is evidence that men underreport early childbearing, especially outside marriage. Moreover, because the burden of lone parenthood falls almost exclusively on women and carries much greater risks of exclusion from economic activity and greater constraints on leisure time than does dual parenthood, we have also included indicators of whether the female respondents had ever been lone parents by the time of the surveys at ages 23 and 33. A sharper time focus would be preferable, especially since all who reported this status at age 23 should (but do not) report it at age 33. Our final demographic indicator is whether women had had an extra-marital birth by age 33; again, earlier work and evidence of underreporting by men make this indicator only suitable for women.

Lastly, we include two further indicators taken from the survey at age 33. The first is lack of a telephone in the household, which is an indicator of exclusion in a direct sense of being cut off from emergency services and relatives and friends, as well as an indirect indicator of poverty. This indicator is becoming less salient with the widespread use of mobile phones, even among the poor, but nevertheless proves a useful discriminator here. The second is related to physical health and indicates whether the survey member smoked cigarettes at the time of the survey at age 33.

As mentioned in the introduction, there is some interest in examining overall measures of social exclusion. To illustrate this issue, we have chosen to summarise those indicators that are available at both ages 23 and 33 in the simplest possible way. For men, we simply take the sum of the binary variables indicating social class IV or V, social housing, benefit receipt, unemployment of a year or more, low income, and malaise. For women, we add ever being a lone parent to the list.

Clearly, this list is far too dominated by economic indicators to be an ideal measure of the broader construct of social exclusion. (For an exploration of some of the interconnections among the outcomes at age 33, see Hobcraft forthcoming).

The proportions experiencing each of the adult outcomes and the sample sizes for which information on each outcome is available are shown in Table 1.

Table 1: Proportions experiencing each outcome by sex (per cent) and sample sizes

Outcome	Per cent experiencing				Number of cases			
	Age 23		Age 33		Age 23		Age 33	
	Men	Women	Men	Women	Men	Women	Men	Women
LABOUR FORCE								
Social Class IVandV	22	21	16	23	4899	5022	5441	5463
H-G Class VII			19	19			5441	5463
Unemployed 12+m	11	9	12	7	6267	6270	5606	5799
No job/educ. 24+m	6	22			6153	6100		
WELFARE AND INCOME								
Social housing	11	18	14	17	6057	6114	4984	5430
Any benefits	16	16	14	21	6259	6263	5529	5730
Low income	21	29	25	26	5888	6024	4704	3959
MENTAL HEALTH								
Malaise	6	16	7	12	6267	6270	5573	5768
DEMOGRAPHIC								
Early Parent	15	29			6265	6270		
Ever lone mother		8		19		6270		5713
Extra-marital birth				12				5628
OTHER								
No telephone			8	7			5530	5729
Cigarette smoker			33	33			5575	5776

Note: see text for full description of adult outcomes

3. Childhood variables

In order to make the examination of childhood characteristics manageable and to lower the impact of missing information at some of the childhood waves, we have used the summary indicators devised for

an earlier study (Hobcraft 1998). The basic idea behind these summary measures is to take the available information at each of the NCDS childhood waves (ages 7, 11, and 16), supplemented where appropriate by information from the first wave at the birth of the survey member and summarise this. Partial information from one or two waves is used where it is missing at the other waves and those individuals for whom the measure is not available at any of the childhood waves are retained in the analyses as a 'missing' category. In addition to helping minimise the impact of partially missing information, a major advantage of this approach is that we can obtain an indication of the intensity of disadvantage (or advantage) during childhood. Hobcraft (1998) gives details of the approach, along with summaries of the indicators used to construct the measures.

This study uses two new summary indicators, one concerning frequent absences from school and the other a much simpler combination of the very limited information on whether the survey member's parents left school at the minimum leaving age (a third new summary of fathers unemployment/ sickness status over the childhood surveys was omitted after exploratory analysis showed few clear associations with the adult outcomes).

Other authors have shown the clear association of school absences at age 16, often labelled truancy, with subsequent economic outcomes (e.g. Gregg and Machin 1998; Dustmann et al 1997). Further exploration shows that the various measures of school absences at ages 7 and 11, although less extensive and less sharply defined than the measures at age 16, are also clearly associated with negative adult outcomes and do add explanatory power over and above the information available at age 16. Table 2 shows summary information on these indicators at ages 7, 11, and 16. At age 7 the proportions are those for whom teachers reported 'frequent short absences', who show greater subsequent adult social exclusion than those reported as having 'long absence'. At age 11, the teacher reported 'frequent absences' and at age 16 we have again taken teacher's reports, but this time on 'truancy', combining those for whom this 'applies' with those for whom it 'certainly applies'.

Table 2: Basic information on school absences and derived summary measure(per cent)

	Frequent short absences Age 7	Frequent absences Age 11	Truancy Age 16	Summary of school absences	Per cent for those with outcomes at age 33 (N=11405)
Yes	5.2	6.3	13.3	All 3 No	45.2
No	72.0	67.7	53.4	1 or 2 No; 0 Yes	33.0
Missing	22.8	26.0	33.3	1+ Yes; 1 or 2 No	17.7
				1+ Yes; 0 No	2.6
Total	100	100	100	All missing	1.5

These three measures of school absences were combined into a summary measure with categories: all three reports were of no (frequent) absences; one or two reports were of no absences and there was no report of absences (i.e. there were one or two missing responses); one or two reports were of absence, but one or two were of non-absence; one or more reports were of absences and none were of no absences, although some could be missing; all reports were missing. Table 2 also shows the distribution of respondents across these categories.

The information on parental school leaving age is much simpler and is summarised in Table 3. That on the mother was collected at the birth of the survey member, whilst that on the father was not collected until the age seven interview. The great majority of both parents left school at the minimum school leaving age. The combined measure has the following groupings: both parents stayed on at school; one stayed on and the other either left at the minimum age or did not have the relevant information; one or both left at the minimum age and neither reported staying on, although one could have had missing information; neither had information. The distribution of respondents on this composite variable is also shown in Table 3.

From our earlier study, similarly constructed summary indicators were available covering experience at ages 7, 11, and 16 for (see Hobcraft 1998 for full details):

➤ childhood poverty, as measured by 'experience of financial difficulties' at ages 7, 11, and 16 and by 'free school meals' at ages 11 and 16;

➤ social class of origin, concentrating on three broad groupings of non-manual, skilled manual, and semi- and unskilled manual for

the father at the birth of the survey member and the two paternal grandfathers;
➢ social class of father, similarly grouped;
➢ housing tenure, distinguishing local authority, owner-occupier, and other;
➢ parent's school leaving age, as above;
➢ experience of family disruption, including birth outside marriage, experience of care, divorce, and remarriage;
➢ behavioural measures based on several scale items, taken to represent
  ♦ aggression,
  ♦ anxiety, and
  ♦ restlessness;
➢ teacher's reports of mother's and of father's interest in the survey member's schooling, distinguishing very interested and low interest from intermediate groups;
➢ frequent absences from school, as above;
➢ three reports of contact with the police by age 16, two from teachers and one from parents;
➢ educational test scores, distinguishing lower and upper quartile scores from intermediate ones;

Table 3: Basic information on parents' school leaving age and derived summary variable (per cent, base=18558)

	Mother left school at minimum age	Father left school at minimum age	Summary of parents' school leaving age	Per cent for those with outcomes at age 33 (N=11405)
Yes	70.1	58.1	Both stayed on	10.3
No	23.4	17.7	One known to stay on	24.6
Missing	6.5	24.3	One or both left; neither known to stay	62.2
Total	100	100	Both missing	2.8

In total, these summary variables in their full form generate over 60 categories and about 50 dummy variables, which makes for severe problems in presenting results and can result in extremely unparsimonious models. After a great deal of exploratory work,

drawing on extensive earlier experience and on fitting stepwise forward selection models to the outcomes considered here, we decided to restrict the categories for these childhood variables to those which repeatedly showed significant relationships with the adult social exclusion outcomes. We thus reduced the number of dummy variables being considered to the 26 childhood items shown in Table 4.

Table 4: Proportions with each childhood characteristic and with qualification levels by sex, for samples with age 23 and 33 outcomes (per cent)

Characteristic	Age 23		Age 33	
	Men	Women	Men	Women
PARENTAL BACKGROUND				
Some Childhood Poverty	21.9	22.9	21.2	22.7
Fairly Poor in Childhood	10.9	11.5	10.7	11.4
Any Social Class 4 or 5	30.2	30.2	29.6	29.8
Fewer than 2 Non-manual	69.6	70.8	69.1	70.3
Any Local Authority Tenure	45.1	45.8	43.5	44.9
Fewer than 2 Owner-Occupier	59.5	60.3	58.7	60.2
One or both parents left school at MLA, neither stayed	63.5	63.0	62.4	62.1
Born out of Wedlock	2.8	3.3	2.7	3.3
Ever in Care	2.1	2.0	2.2	1.9
Family disruption (Care, Out-of-wedlock, divorced parents)	10.3	10.9	10.3	11.1
INDIVIDUAL BEHAVIOUR				
Any high aggression score	24.4	16.0	23.5	15.9
Fewer than 2 low aggression scores	64.2	51.9	63.5	52.3
Any high anxiety score	29.9	30.1	29.8	30.0
Any high restlessness score	24.0	18.0	23.5	18.0
All behavioural measures missing	1.9	1.8	2.0	1.7
PARENTAL INTEREST IN EDUCATION				
Father's interest in schooling low 2/3 occasions	8.6	7.2	8.1	6.9
Father's interest in schooling ever low	30.3	27.6	28.8	27.1
Mother's interest in schooling ever low	27.7	24.6	26.3	24.1
Mother's interest in schooling high once or less	69.2	65.9	67.7	65.3
Mother's interest in schooling missing on all	2.8	2.7	3.1	2.6

Table 4 continued

TEST SCORES, POLICE, and SCHOOL ABSENCE				
Any contact with police	13.5	4.5	12.8	4.5
Any frequent absences from school	22.5	19.7	21.0	19.6
2/3 Test scores in lowest quartile	18.1	16.4	16.9	15.7
Any Test score in lowest quartile	35.2	33.0	33.4	31.7
Fewer than 2 test scores in highest quartile	77.3	81.0	76.8	80.5
All test scores missing	1.5	1.3	1.6	1.5
QUALIFICATIONS AT 23 FROM AGE 23 SURVEY				
No qualifications	25.7	29.8		
Below O level	31.1	34.2		
Below 5 O levels	43.5	58.8		
Below A level	59.1	70.9		
A level and below	81.0	82.0		
Below degree	89.1	90.7		
QUALIFICATIONS AT 23 FROM AGE 33 SURVEY				
No qualifications at age 23 from age 33 survey			12.2	14.1
Below O level			23.7	28.0
Below A level			54.5	64.4
A level and below			75.8	75.8
Below degree			84.0	86.1
Missing information			7.1	6.0
NUMBER OF CASES	6267	6270	5606	5799

A further point to note is that we treat the ordered categories for these childhood variables as a hierarchy and, for example, the 22 per cent of men aged 23 who had experienced some childhood poverty includes the 11 per cent who had been fairly poor during childhood. The use of such 'hierarchical' dummy variables permits easier testing of whether the effects of two adjacent groups are statistically indistinguishable and leads to slightly more parsimonious models, in addition to building in a clear recognition of the ordering of the categories.

As can be seen from Table 4, there are few gender differences in childhood experience, with the clear exceptions that the boys were more aggressive, more restless, and much more likely to have had contact with the police. There are a few other weaker gender differences: both

mothers and fathers were slightly more interested in boys' education, boys were slightly more likely to have had frequent school absences, and boys educational test scores were more often in the extreme upper and lower groups.

The proportions of survey members in the different categories vary widely and a few small ones (born out of wedlock, experience of care, and all information missing on behaviour, mother's interest in schooling and educational test scores, and for girls contact with the police) are far less likely to meet statistical significance criteria.

4. Educational Qualifications

A central concern is with examining the strength of association of adult social exclusion measures with educational qualifications. We have used different measures for examining outcomes at ages 23 and 33, but have tried to keep these fairly comparable. The main rationale for using separate measures is simply to avoid having too many missing values: we have chosen to use a measure collected at age 23 when examining outcomes at that age and information collected at age 33 for the age 33 outcomes.

At age 23, we have used the recoded information on highest qualification achieved according to the then 'new' GHS (General Household Survey) classification, but have collapsed the quite detailed grades into the five hierarchical categories shown in Table 4. Given the small difference between the proportions with no qualifications and with below O level qualifications, we might expect these to be close substitutes in our models, as proves to be the case. There is some doubt concerning the treatment of missing values in this measure, since there are suggestions that they may have ended up incorrectly classified as having no qualifications.

At age 33, information was collected about qualifications before age 23 and up to the time of the survey. Again, there are complications arising from the overlapping histories. We have used a coding of the qualifications before age 23, so as to maintain as much comparability as possible with the age 23 models. However, there are striking differences in the proportion recorded as having no qualifications between the two measures. The age 23 classification shows 28 per cent with no qualification, compared with only 13 per cent from the age 33 survey. The discrepancy is much reduced when we look at the proportions below O level, but still large (33 per cent in age 23 survey and 26 per cent

for the age 33 survey). These differences require further investigation, but are in part attributable to three possible causes: missing values being coded as no qualifications in the age 23 file (this is a common problem with coding of NCDS variables); difficulties in dealing with low level qualifications and the timing of the advent of CSEs and GCSEs; and problems of correctly identifying the age 23 break point in the educational careers up to age 33. We have been reassured to find that the broad pattern of results is fairly robust to differing specifications of the qualification variables: we have explored models for outcomes at age 23 using qualification classifications at age 33 and *vice-versa*; we have also used highest qualification at age 33.

5.   Results

Our main results are summarised in a series of Tables (A1 to A14), which all have a common format and derive from the same sequence of logistic regression models fitted to each of the adult social exclusion outcomes separately by gender and at ages 23 and 33 (where appropriate).

A detailed example
We begin by considering Table 5 in some detail, so as to familiarise the reader with the approach used. The outcome examined in Table 5 is an indicator of whether a male survey member was classified as being in the Registrar General's Social Classes IV or V (semi- or unskilled manual) at age 23. For each model the likelihood-ratio chi-squared measure of goodness-of-fit is shown and the main body of Table 5 shows the odds ratios from a series of logistic models.

For men at age 23, 22 per cent of those classified into a social class were in semi- or unskilled manual occupations. We began by exploring the cluster of parental background variables (see Table 4), using a forward stepwise selection procedure with the possibility of removal, using a stringent significance level of one in 10,000. We used a stringent statistical significance criterion for several reasons: we are fitting a large number of models and wished to avoid spurious inclusion; most early entry variables are likely to remain significant at more conventional levels despite attenuation in subsequent models; and there are some grounds for regarding this kind of significance level as being appropriate with a large sample size in a Bayesian context (Raftery 1996).

Table 5: Blocked Logistic Regression Models for Registrar General's Social Class IV or V, showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age 23	[22% of 4899]				
	Parents	Behaviour and Parental Interest	Absences Police Tests	Qualifications	Free Stepwise
Chi-squared (df)	251 (3)	363 (6)	465 (8)	692 (10)	653 (6)
Some Poverty	1.82	1.57	1.44	1.30	1.39
Dad any SC IV/V	1.68	1.55	1.47	1.31	1.37
<2 Owner-Occ	1.83	1.62	1.55	1.36	
Dad Int. 2/3 Low		1.65	1.52	1.37	1.55
Mum Int. Any Low		1.62	1.40	1.21	
Any restless		1.46	1.38	1.26	
Any Test LQ			2.08	1.41	
All Tests Missing			3.77	2.81	
No qualifications				2.44	2.62
Below A Level				1.95	2.10
2/3 Tests LQ					1.48

Among the ten possible dummy variables indicating parental background, only three are retained in the selected model. We note the inclusion of father's social class in the same group at any of the childhood surveys, along with evidence of some poverty during childhood and not having lived in an owner-occupier tenancy at more than one of the three childhood waves. Each of these is associated with odds ratios of about 1.8; a man who came from a background where all three forms of parental disadvantage applied would be 5.6 times as likely to be in a semi- or unskilled occupation at age 23 compared with a man who was not known to have experienced these disadvantages.

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These three strongly significant parental background categories were then locked into the next model, where the individual behavioural and parental interest in schooling clusters were given a chance to enter the model, again at a one in 10,000 significance level. Three of the possible ten items did enter the model, which led to some inevitable attenuation of the odds ratios associated with parental background to values of about 1.6 (compared to 1.7 to 1.8). Nevertheless, the magnitude of these parental background odds ratios remains of the same order as the newly entered ones relating to survey member's behaviour and parental interest in schooling. Both mother's and father's levels of interest enter, representing two or three reports of low interest by the father and one report of low interest by the mother. Boys who were reported to be highly restless (or fidgety, or what might be termed hyperactive) on at least one occasion are also more likely to end up in the least skilled manual jobs.

These six childhood factors were then forced into the next model, where two schooling intermediate outcomes, frequent absences and educational test scores, and an indicator of contact with the police, a further powerful but somewhat intermediate correlate of subsequent exclusion, were considered for inclusion. Any educational test score in the lowest quartile during childhood doubles the odds of being in a semi- or unskilled occupation at age 23 for men. Lack of information on educational tests at any one of the three childhood waves is associated with even higher odds of low social class (OR=3.77); this small group no doubt contains some children deemed unable to be tested. The six other indicators of childhood disadvantage in the model again show small attenuation, but have odds ratios that are still around 1.4 or 1.5.

These eight terms are again forced into the final model in this hierarchy, where the qualification levels are given the chance to add explanatory power to the model. The key break points in the distribution of educational qualifications turn out to be: below A level, associated with double the odds of being in a less skilled manual group, compared with those with the rest; and having no qualifications, which increases the odds ratio a further two-and-a-half-fold to 4.76 (=1.95*2.44). All the other terms in the model show attenuated odds ratios, but all remain statistically significant at the five per cent level.

Lastly, the final column of Table 5 shows the result of fitting a stepwise logistic model where all of the childhood and qualification level indicators are considered for inclusion without any hierarchy being imposed, so that the inbuilt favouring of parental background over all the other variables, for example, is removed. This results in an even

more parsimonious model, with only six terms included as compared to the ten in the last model in the hierarchy. It is not surprising that the qualification levels are retained, since these were the last to enter in the hierarchy, and once some of the less significant correlates are removed the odds ratios for these indicators increase, albeit only slightly.

A man with no qualifications at age 23 is now estimated to be five and a half times as likely to be in a lower status occupation as a man with A levels or above. Net of qualifications, given full rein, we now see that a lower threshold for educational test scores (2/3 in lowest quartile, picking out the bottom 18 per cent) enters the model, replacing the any test in the lowest quartile (lowest 35 per cent). Since two-thirds of those with 2/3 lowest quartile test scores are unqualified at age 23, the odds for the unqualified among this group being in less skilled manual occupations are over eight times those for those with A level or above excluding the fewer than ten per cent with persistent low education scores during childhood.

Perhaps more interestingly, two of the three parental background variables, some childhood poverty and father in social class IV or V, still remain as strong predictors of the survey member himself being in that social class group at age 23. it is tempting to make something of this apparent direct transmission of occupational class across the generations, but the other results for social class IV or V (shown in Appendix Table A1) suggest such an inference can only be sustained for men. Of the second hierarchical cluster, only father's interest in schooling remains in the free stepwise model. Having a father who was ever in a low-skilled occupation and was ever uninterested in his son's education, who also experienced some poverty, would equate to an odds ratio of almost three to one, compared to the more advantaged on all these criteria.

Although there is a case for examining each age-sex group for social class IV or V in similar detail and repeating this exercise for all remaining adult outcomes, since each contains a distillation of a wealth of information, we cannot impose such a high MEGO-factor (My Eyes Glaze Over) on the reader. Instead, we propose to attempt to draw out key features of our results for each outcome in turn, looking across the gender/ age panels since this requires more thought. Since the tabulations involved are voluminous and would disrupt the flow of the text, these results are shown in detail in Appendix Tables A1 to A13). Once this has been achieved, we essay a further level of distillation, by looking at some of the results across all of the outcomes, trying to

identify sex and age patterns and commonalities and differences among the various antecedents of adult social exclusion.

5.1   Labour force and related outcomes

SOCIAL CLASS IV AND V

Although there are variations in the exact childhood precursors included in the models shown in Table A1, for both men and women at both ages 23 and 33, all models do include a measure of childhood poverty, one or more measures of social class of father, two or more parental interest indicators, and two or more indicators of educational test scores. The association of qualifications with low social class emerges more strongly by age 33 and is somewhat stronger for women than for men. In the final hierarchical models, the odds ratios for those with no qualifications are 4.8 for men at 23, 8.0 for men at 33, 5.7 for women at 23, and 6.1 for women at 33. In the free stepwise models, which permit even stronger relationships with educational qualification to emerge, these odds ratios increase to 5.5, 11.8, 11.5, and 24.4 respectively.

Low educational test scores also consistently survive even in the free stepwise models. For men at ages 23 and 33 and for women at age 23, the indicator of choice is having had two or three test scores in the lowest quartile during childhood, whereas one low quartile score suffices to discriminate for women at age 33.

For men, father's social class proves a persistent correlate of low social class at age 23 and at age 33, net of the later measures. But father's social class proves ultimately less salient in determining women's low social class status.

Childhood poverty remains powerful into the free stepwise model for both men and women at age 23, but both attenuates faster and fails to remain significant in the final stepwise model for either sex at age 33, suggesting some attenuation in the legacy of childhood poverty through the life course.

Except for men at age 23 the parents' school leaving age begins by being highly significant, but the association weakens considerably, often to statistical insignificance even at the five per cent level (indicated by italicisation), with the introduction of more proximate measures. Equally, parental housing tenure during childhood is initially important, except for men at age 33, with hints that the influence is greater at age 23 and perhaps fades later in life.

Thus, we see that the survey member's own qualifications become a more important discriminator of the propensity to be in less skilled manual occupations at 33 than at 23. Conversely, experience of

childhood poverty retains a clear association with low-skill manual occupations at age 23, but fades somewhat by age 33. Lastly, for men, the father's social class retains a significant association with low occupational status at ages 23 and 33, whereas this is less true for women.

UNEMPLOYMENT FOR MORE THAN A YEAR
Table A2 shows the results of applying our modelling strategy to the information on whether the survey member had experienced a total of 12 or more months of unemployment, between ages 16 and 23 or between ages 23 and 33.

The first point to note is that unemployment experience of women between ages 23 and 33 is barely related to any of the attributes considered here, with only very low educational test scores being indicative of increased odds of unemployment. This arises because of the complex interplays of the timing of childbearing for different social groups and the consequent impact on labour force participation. As a consequence, little can be usefully said about these results and we shall not discuss them further.

From ages 16 through 23, the survey members faced a labour market with steadily growing unemployment (period 1974-1981), with especially sharp increases at the end of the period. Since the advantaged groups (and the more educated) enter the labour force later on average, this trend will serve to mute differentials.

For men in both age segments, we see that unemployment is related to childhood poverty, perhaps more sharply up to age 23, to having a father in a low-skilled manual occupation, and to having lived in Local Authority housing, though the latter two associations attenuate quite sharply when later controls are introduced for ages 16 to 23. Moreover, the strong association of early adult unemployment with childhood poverty remains clearly significant, even in the free stepwise models, for men over both segments and also for younger women. Having lived in local authority housing during childhood also remains strongly associated with unemployment between ages 23 and 33 for men.

For young men, the legacy of frequent school absences and of contact with the police both prove powerful correlates of early unemployment, but the association has faded for the later age-range considered.

Parental interest in the survey member's education shows reasonably strong initial associations for male experiences of

unemployment, but does not survive into the free stepwise model. For early unemployment among women, the influence of parental interest in their education appears stronger, with the combined odds ratios for both parents initially being 3.53 (=1.64*2.15) and attenuating to 2.29 (=1.66*1.38) in the last hierarchical model, and the final free stepwise model retaining a term for the father's interest.

Qualification levels show fairly clear associations with unemployment experience, with unqualified men being about twice as likely to have experienced a year or more of unemployment between ages 23 and 33 (Feinstein 2000 gives similar results for the 1970 Birth Cohort Study, with a different but equally rich range of childhood factors controlled). For young women, having fewer than 5 O levels is associated with odds of a year or more of unemployment of 2.18 in the final hierarchical model, or 2.67 in the free stepwise one. For young men, the association of early unemployment between ages 16 and 23 with qualification levels is much stronger. Those with degree level qualifications experience the lowest unemployment rates, but of course also had the shortest labour market exposure. Compared with this reference group, in the free stepwise model, the odds of prolonged unemployment were 3.34 to one for those with any O levels, A levels, or higher sub-degree qualifications, 5.68 to one for those with sub-O level qualifications, and 12.09 to one for those with no qualifications. As indicated, these very high odds ratios undoubtedly partly reflect the differing exposure to risk and our next outcome is an attempt to overcome that difficulty.

NOT IN EMPLOYMENT OR EDUCATION FOR TWO OR MORE YEARS FROM 16-23

The labour force participation and occupational status histories collected in the survey at age 23 permit us to examine periods spent neither in education nor in employment and thus identify those who spent two or more years outside these categories. This outcome has very different connotations for men and women. For men, it coincides quite well with what some US authors term 'idleness' (e.g. McLanahan and Sandefur 1994), covering spells of unemployment and out of the labour force, but for women it includes periods spent out of the labour force as a housewife or mother, which do not correspond to notions of idleness. Thus, for women this outcome is a complex combination of the consequences of early childbearing (an outcome explicitly considered later) and related decisions to move out of the labour force with genuine spells of 'idleness'. As a result, there is little point in elaborating the gender differences shown in Table A3.

For men, the initial associations with parental background are few but strong, with a very high odds ratio of 3.34 for having been fairly poor during childhood and a fairly clear association with parent's having left school at the minimum age, though the latter attenuates sharply in the presence of more proximate life-course correlates. As with early unemployment, the effect of being fairly poor during childhood on 'idleness' survives into the free stepwise model and the final odds ratios are extremely similar.

Low father's interest in education again has similar associations to those for early male unemployment, attenuating considerably within the hierarchy and failing to enter the free stepwise model.

Contact with the police by age 16 is clearly related to both measures and again the odds ratios in the free stepwise model are of similar magnitude, though slightly higher for the more encompassing measure of idleness. The associations with educational test scores are also a little stronger for idleness than for unemployment, although the indicators differ too.

In examining early male unemployment, frequent school absence was a clear and persistent correlate, but does not appear at all in the models for idleness (see also Gregg and Machin 1998). Instead, except in the free stepwise model, an indicator of virtually any aggressive behaviour during childhood enters consideration along with a very high odds ratio for the small group for whom no teachers' reports on behavioural measures were available at any of the three childhood waves. Although it is tempting to regard the lack of behavioural reports and frequent school absences as close surrogates, this is not the case.

Finally, for men, the association of two or more years' idleness with qualification level is again quite strong, though weaker than for unemployment. Men who obtained some qualifications, but fewer than 5 O levels had an odds ratio for idleness of 2.61 to one in the free stepwise model, while those with no qualifications had an odds ratio of 7.96 to one (2.61*3.05). These thresholds are less confounded with definite indications of being in education after age 16, although the reference group (5 O levels and above) clearly contains many who remained in full-time education after age 16, thus providing clear indications of not being 'idle' during that education. Nevertheless, the contrast between those with minimal qualifications and those with none (odd ratio 3.05 to one) is still quite sharp.

For young women, as indicated at the beginning of this section, the measure of not being in education or employment is more complex. Early parenthood, often with associated periods of lone parenthood and

early withdrawal from the labour force, has profound consequences for the lives of young women, being associated with much greater risk of social exclusion at age 33 (Hobcraft and Kiernan 1999) and with lower subsequent life-time earnings and earning capacity upon re-entry to the labour force (Cabinet Office 2000). Thus, although the measure used here is a complex one, the combination of two differing sources of disadvantage ('idleness' and exit from labour force for partnership or parenting reasons) is justifiable. The contrast with young men's experience is brought out by recalling that 22% of women in this cohort experienced two or more years out of employment or education between ages 16 and 23, compared with only six per cent of young men. Partly as a result, there are more associations that prove statistically highly significant for women than for men.

Experience of childhood poverty shows clear and persistent associations with this outcome, being the only parental background element to enter the free stepwise model. Several other features of parental background are initially clearly related to this outcome, with all attenuating considerably in the face of later clusters of variables and none surviving into the free stepwise model.

As for men, there is evidence of a greater propensity to spend considerable periods out of education or employment from ages 16 to 23 for those exhibiting aggressive behaviour during their school careers and there is also a clear association for the few who lack any teachers' reports on their behaviour.

Parental interest in schooling appears to have considerable importance for young women's subsequent schooling and employment careers, with both any evidence of lack of strong interest by the mother at any one of the three childhood surveys and any report of low interest entering the hierarchical models and continuing to be significantly related to this outcome, even in the free stepwise model. Moreover, any report of low interest by the father also enters the free stepwise model, despite not having entered the earlier hierarchical models Taken together, in the free stepwise model, the impact of any report of low interest in education for both the mother and the father is linked to an odds ratio of 3.53 to one (=1.38*1.84*1.39), compared with a nominal reference group whose mothers were generally very interested (two or three reports) in their daughters' schooling and whose fathers were not reported as having low interest at any of the three childhood surveys.

Contact with the police by age 16, frequent school absence, and low educational test scores are all clearly associated with greater propensity to be out of education or employment, although the

associations with test scores are virtually wiped out once controls for qualifications are introduced.

Once again, there are evident problems of confounding of educational qualifications at age 23 with this outcome, since obtaining a degree requires five years of post-16 education – the extraordinarily high odds ratios for the contrast between those with below degree-level qualifications and those with them is clearly contaminated by this endogeneity.

HOPE-GOLDTHORPE UNSKILLED (CLASS VII) OCCUPATION AT AGE 33

Our earlier consideration of low-skilled occupations used the Registrar General's Social Classes IV and V as an outcome. This can in part be justified by the comparability of this classification across all waves of NCDS. However, for the first time, the Hope-Goldthorpe classification of occupations was coded properly for the survey at age 33 and, since this classification is both theoretically and empirically a sharper discriminator, we explore the chances of being in their unskilled category at age 33. A further point to note is that 19 per cent of both men and women are in this category compared with 16 per cent for men and 23 per cent for women with social classes IV and V.

The first key observation from comparing Table A4 with the relevant panels of Table A1 is that the models for this slightly more refined categorisation are very similar to those based on the R-G's Social Classes IV and V, both in the exact categorisations of the precursors that are included at each step in the hierarchy and in the magnitude of the actual odds ratios; this is not really surprising. We shall here simply point to the minor differences that emerge, rather than repeat the earlier discussion.

For men, the Hope-Goldthorpe models add an indication of housing tenure and of lack of any information on behaviour, but do not include the contrast between no qualifications and some sub-O level qualifications that enters the R-G models. Comparing the final, free stepwise, models we see the only differences to be the omission of 'no qualifications', but the inclusion of any indication of the father having low interest in the survey member's education instead in the Hope-Goldthorpe model; otherwise the odds ratios, too, are very similar.

For women, the only covariate differences arise from the inclusion of more information in the R-G models concerning educational test scores and the entry of a further split ('below degree') in the educational hierarchy for the free stepwise model. Odds ratios are again very similar.

5.2   Welfare and Poverty Outcomes

SOCIAL HOUSING

Housing tenure has been shown to be an important correlate of a wide range of outcomes and has been shown to be at the heart of social exclusion at age 33, though probably as consequence rather than cause (Hobcraft, 1998 and forthcoming).

The first and perhaps most important result shown in Table A5 concerns the intergenerational continuities in housing tenure. For all four age-sex combinations and indication of parental housing tenure (usually of being in local authority housing) not only enters the initial hierarchical model, but is also retained even in the free stepwise model, showing only mild attenuation with the inclusion of later blocks of correlates, and having a sizeable odds ratio of around two to one.

Moreover, experience of childhood poverty is also a persistent predictor of living in social housing at ages 23 and 33 for both men and women, being retained even in the free stepwise model.

Father's social class enters all four age-sex models but only persists at age 23, whilst low parental education and family disruption feature for women at ages 23 and 33 and for men at age 33, though not being retained in the free stepwise model. Family disruption effects attenuate only slightly with the addition of subsequent blocks.

Parental interest in schooling shows clearer initial associations for women than for men at both ages 23 and 33, with any low interest being associated with odds ratios in excess of three to one at initial entry, though attenuating considerably in subsequent models. Low maternal interest remains a strong correlate of women being in social housing in their own right at age 23, even in the free stepwise model.

Aggressive behaviour among women in childhood is also associated with a greater propensity to live in social housing at ages 23 and 33, with the effect persisting into the free stepwise model at age 33. A further behavioural measure reflecting restlessness also correlates with living in social housing at age 33, although this slips out of the free stepwise model.

For men, early contact with the police shows persistent relationships with entry into social housing at ages 23 and 33. For both young men and young women there is a persistent strong relationship of frequent absence from school to housing tenure at age 23. Frequent absence enters initially but is not retained for women at age 33.

Educational test scores enter all four age-sex models at their initial consideration, but tend to be dominated by the subsequent information

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on qualification levels, although some element of low performance on test scores is retained in the final stepwise models for both men and women at age 33.

Qualification levels prove to be very strongly related to the propensity to live in social housing at age 33 for both men and women. In the free stepwise models, the odds ratios are as follows:

	Men	Women
No qualification	18.31	10.30
Sub O level only	8.48	5.26
O level	4.51	2.92
A level	4.51	1.00
Above A level	1.00	1.00

RECEIPT OF NON-UNIVERSAL BENEFITS

In Table A6, for both men and women, we see that experience of childhood poverty is related to being in receipt of non-universal benefits at ages 23 and 33 and that this is the only parental attribute (background or educational interest) that is included in the free stepwise models for all four age-sex combinations. Indeed, among other parental attributes, only parental local authority housing tenure related to men at age 23 is retained for any sex-age combination.

Frequent absence from school is linked to benefit receipt for women at ages 23 and 33, with the association retained even in the free stepwise model, although the odds ratio is lower for age 33 than for age 23. For young men, early contact with the police is persistently related to benefit receipt at age 23, but does not feature as a correlate at age 33. Educational test scores survive into the free stepwise model for both men and women at age 33, whilst having faded out of the related models at age 23.

As with residence in social housing, educational qualifications become of greater discriminatory power with increasing age, with those with no qualifications having odds ratios of being in receipt of benefits of more than four to one for both men and women, compared to those with A level or higher qualifications in the free stepwise models.

LOW INCOME

Comparisons among the age-sex combinations for our measures of low income are hampered by their non-comparability. For men and women at age 23 we have used the lowest quartile for the family equivalised

income measure, which has the problem that it is often reflective of parental income. For women at age 33, we have used household income (not equivalised), but for men have taken their own earnings, which more sharply reflect their own characteristics. Of course, many more women were not in the labour market and thus we could not use an earnings measure for them.

Once again, the legacy of childhood poverty appears strong (see Table A7). The only parental attribute (again both background and educational interest) to be retained in any of the free stepwise models is experience of childhood poverty, which is retained for all but the men at age 33 (this is not simply a result of the different income measure, as a free stepwise model for low household income would also omit childhood poverty).

At age 23, early contact with the police proves a persistent predictor of low income for the men, whilst frequent school absence fills a similar role for women. Educational test scores again emerge as more salient in relation to income at age 33 than at age 23, even net of qualification levels, and especially for men.

Among women, lack of any qualifications is associated with an odds ratio of over three-and-a-half to one for having low income at both ages 23 and 33 in the free stepwise models. For men, the association with qualification levels emerges more strongly at age 33, where the odds ratio for the unqualified is 7.5:1, compared with only 2.2:1 at age 23, again in the free stepwise models. Again, Feinstein (2000) presents similar findings for wages from the 1970 birth cohort.

5.3   *Malaise Inventory scores of seven or higher – Mental Health*
We now turn to an indicator of mental health. Malaise Inventory scores of seven or higher are usually taken as indicative of incipient depression and occur more frequently among women.

Remarkably, we see once again in Table A8 evidence of a persistent and prevalent legacy of childhood poverty, with this indicator being retained in the free stepwise regression models for women at ages 23 and 33 and for men at age 33, with the association seemingly getting a little stronger for both men and women at age 33 than at age 23.

The second key element of the results in Table A8 is the persistence of behavioural measures, with retention to the free stepwise model occurring for each age-sex combination. At age 23 it appears that childhood aggression is most strongly linked to a high malaise score for both men and women. However, by age 33, it is indications of anxiety in childhood that seem more persistently salient in relation to high malaise

scores for both men and women. Thus, a clear pattern emerges in the free stepwise models, although restlessness also features for a while in the hierarchical models for women at age 23, as does aggression for men at age 33. For women at age 33, but not at age 23, frequent school absences also emerge as being persistently associated with high malaise scores.

Low educational test scores discriminate for high malaise at age 23, being retained in the free stepwise models, but seem to be supplanted by an additional split on qualification levels by age 33, where unqualified men have an odds ratio of 3.1:1 of a high malaise score and unqualified women one of 4.7:1.

5.4   *Demographic Outcomes*
FIRST BIRTH BEFORE AGE 23

Early parenthood plays a particular role in the genesis of subsequent disadvantage for young mothers, being associated with low subsequent accumulation of human capital and with greater likelihood of lone parenthood, which we consider shortly. There is some evidence that men underreport early births, especially those that take place out of marriage.

Table A9 shows the results of fitting our sequence of models for age at first birth. Low father's social class and lower-status housing tenure (lack of owner occupier status at two or more of the childhood surveys) both show persistent associations with early fatherhood, appearing even in the free stepwise model, whereas early motherhood is more closely linked to experience of childhood poverty.

Mother's interest in schooling again proves more critical for women in determining early parenthood. Fewer than two high test-scores remains clearly associated with early fatherhood, whilst knowledge of subsequent qualification levels wipes these out as a correlate of early motherhood.

As seen before, early contact with the police proves a persistent predictor of early fatherhood, but any frequent absence from school shows a clear and persistent relationship for early motherhood.

Early motherhood is especially closely associated with educational qualifications. Women with below degree-level qualifications are about 13 times as likely to have an early first birth as those with a degree. Those with below A level qualifications are a further twice as likely to have had a first birth; those below 5 O levels a further 1.5 times as likely; and those with no qualifications yet further almost twice as likely. These combinations lead to very high odds ratios: at the extreme, women with

no qualifications have an odds ratio of 5.9:1 of having a first birth before age 23 compared to those with A level or sub-degree qualifications, and of 76 to one compared with those with a degree. Of course, continuing education and entry into motherhood are often competing risks, meaning that there is some endogeneity in this apparently very close relationship. On the other hand, the association of educational qualifications with early fatherhood is less powerful, although the odds ratios of over six to one for the unqualified and of 3.8 to one for those with some qualifications up to and including A level are by no means low.

LONE PARENTHOOD FOR WOMEN

Very few men spend time as lone parents, so we restrict analysis of this outcome to women, for whom there are often consequential benefit-receipt and employment breaks. Our outcome measures lack sharpness, since the measured status is whether the woman had ever been a lone parent at age 23 and at age 33. In principle, but not practice, the outcome at age 33 should include those who had been lone parents by age 23; obvious discrepancies arise from response or coding errors.

As shown in Table A10, lone parenthood proves to be persistently related to experience of childhood poverty, although at age 33 the actual indicator included in the free stepwise model shifts to one of more extreme childhood poverty than was included in the hierarchical models. Childhood family disruption effects remain fairly large in the face of later clusters entering the hierarchical sequence, but do not survive into the free stepwise models.

Women whose mothers were not reported as being very interested in their schooling in at least two of the three childhood waves prove more likely to become lone parents, both by age 23 and by age 33. In the hierarchical models there are reinforcing effects from any evidence of low parental interest in education, although for mothers at age 23 and for fathers at age 33.

Frequent absence from school is consistently related to lone parenthood by ages 23 and 33; early contact with the police only emerges as a strong correlate of lone parenthood by age 33. Lack of any information on educational test scores, though very rare, is associated with extremely high odds ratios of lone parenthood and is even retained in the free stepwise model for early lone motherhood (by age 23).

Qualification levels wipe out the quite strong association of early lone parenthood with educational test scores in the free stepwise model. Women with no qualifications are five-and-a-half times as likely to

become lone parents by age 23 compared with those with 5 O levels or higher, and those with minimal qualifications have an odds ratio of 3.5:1. By age 33, those with no qualifications or below O level have an odds ratio of 3.4:1 and those with fewer than 5 O levels an odds ratio of 2.4:1, both contrasted with all others with 5 O levels or better.

EXTRA-MARITAL FIRST BIRTHS FOR WOMEN
We now briefly examine associations of out-of-wedlock first births for women with childhood predictors and qualification levels, shown in Table A11. Among the parental background variables, experience of family disruption (being born out-of-wedlock, having been in care, or experience of parental divorce) is most persistently related to extra-marital childbearing before age 33. The other parental background factors show faster attenuation in the sequence of hierarchical models.

Women whose mothers were not repeatedly very interested in their education are much more likely to have had extra-marital first births; this association is reinforced by any indication of low father's interest in the hierarchical models. It is not clear why an indicator of aggression in the free stepwise model should supplant the indicator of restlessness in the hierarchical models. Frequent school absences are persistently related to out-of-wedlock first births, and reinforced by early contact with the police for the hierarchical models. The few young women for whom all educational test scores were missing at the three childhood waves prove to have very high odds ratios for extra-marital first births – this group probably includes many who were of very low ability. Low qualification levels (or none for the free stepwise model) are associated with odds of two to one of having a first birth out-of-wedlock.

5.5   Lack of Telephone and Cigarette Smoking at age 33
Finally, we examine two further outcomes that may be deemed to indicate real or potential social exclusion. The first is having no telephone in the household, which is indicative of social exclusion in the sense of being less able to contact employers, agencies, relatives, or friends. The second is a health indicator, albeit one associated with likely future health implications, as reflected by current cigarette smoking status at age 33.

NO TELEPHONE IN HOUSEHOLD AT AGE 33
As shown in Table A12, experience of childhood poverty remains a strong correlate of not having access to a telephone at age 33 for both men and women, being retained in the free stepwise models (though at a

different level of childhood poverty for men). For women, this outcome is also consistently associated with having lived in local authority housing at any of the three childhood waves.

Men who had early contact with the police and women who were frequently absent from school show clear and persistent propensities to live in households without a telephone at age 33. Equally, low childhood educational test scores are retained into the free stepwise models for both men and women (though again at a slightly different level for men). Among men, those with the least (or no) qualifications have an odds ratio of over five to one of living without a telephone at age 33, whilst unqualified women are twice as likely to do so.

CIGARETTE SMOKING AT AGE 33

Table A13 shows that associations of cigarette smoking at age 33 for men with parental or personality factors attenuate quite rapidly within the hierarchy of models and do not persist into the free stepwise model. Men who had early contact with the police and those who were frequent absentees from school are much more likely to smoke and these relationships survive the introduction of all the other factors. Otherwise, male cigarette smoking is only associated with qualification levels, whereby those with minimal or no qualifications have an odds ratio of over four to one and those with one to four O levels of just under three to one compared with those achieving 5 O levels or better.

For women, the associations of cigarette smoking with childhood background are more persistent. Those from disrupted families and those who had lived in local authority housing during childhood show persistent relationships to smoking at age 33. This is also the case for women whose mothers ever showed low interest in their education, who were deemed aggressive during childhood, and who were often absent from school. The link to low or no qualifications is somewhat weaker than for the men, with an odds ratio of about 2.4 to one.

5.6   A summary 'social exclusion' measure

In order to begin a broader discussion of our results, we have created a very simple summary variable for social exclusion, which includes those adult outcomes incorporated in our analysis that are measured at both ages. Since we lack any strong theoretical or empirical evidence on how best to combine this somewhat arbitrary range of measures into an index of social exclusion, the approach adopted is simply to count the number of times that the survey member is 'socially excluded', as indicated for men by being in a semi- or unskilled manual occupation, living in social

housing, receiving non-universal benefits, having experienced a year or more of unemployment, having a low income, and having a score of seven or higher on the Malaise Inventory. For women, we add experience of lone parenthood to the list. This combination of indicators is a happenstance one and cannot therefore be taken as other than indicative. We would prefer a better-balanced measure, with less emphasis upon economic and welfare elements.

We have pursued the same broad modelling strategy as before in examining this 'social exclusion' outcome, although we have used a different model for counts to the logistic used for binary data. The results are fairly insensitive to whether a Poisson or a negative binomial specification is used, but we have chosen the latter as being more flexible; there are residual concerns with either model since the elements of our social exclusion measure are evidently not independent trials and we might therefore expect under-dispersion, rather than the over-dispersion captured by a negative binomial model.

One further problem arises with the 'social exclusion' measure being restricted to those survey members without missing values on the indicators used, which reduces sample size.

Table A14 shows the results of the by now standard modelling sequence. By combining several of the adult outcomes into a single summary measure we generally get more childhood precursors entering the models. To begin simply, let us consider the free stepwise models. For all four age-sex combinations we see that any experience of childhood poverty remains a strong precursor of social exclusion as measured here and that the relative risk is about 1.25 in each case; only housing tenure and educational test scores among the other childhood covariates have such a pervasive relationship with social exclusion. Parental interest in education does not survive in the free stepwise model for women at age 33, although pervasive elsewhere. Both early contact with the police and frequent school absence retain a clear association in the free stepwise model for men and for women at age 23, but prove much less related to social exclusion at age 33. We also see confirmation that qualifications become progressively more important as correlates of social exclusion by age 33 than they were at age 23. Thus, the odds ratios for those with no qualifications (at age 23) are 2.5:1 for men and 2.9:1 for women when we look at social exclusion at age 23, but have risen to 5.5:1 and 4.3:1 respectively for social exclusion at age 33.

6.   Summary and Discussion

In Table 6 we provide a brief summary that begins to answer the key questions as to how important childhood background is in determining subsequent adult social exclusion. We can ask about the relative importance of schooling factors compared with others and explore some of the gender differences. In total, we considered 17 outcomes for men and 19 for women, making 36 in all. The first panel of Table 6 shows how many times each broad factor (without detail about which specific level was included) appeared in the hierarchical models. The right hand side of Table 6 shows the number of occasions that each broad factor was retained in the free stepwise model.

Firstly we note that qualification levels appeared significantly related to every single outcome for both men and women, even when entered at the end of a hierarchy of explanatory variables. This strong and pervasive association with qualifications, even when detailed information on several, but by no means all, aspects of schooling were controlled, is noteworthy. Put a different way, we might have expected information on repeated measures of parental interest in education, of frequent absences and of educational test scores would have served to account for much of the impact of qualifications on outcomes in later life. In some instances, there is a direct overlap or endogeneity problem, in that post O-level qualifications are obtained after age 16 and education competes quite directly with being at risk of unemployment or with motherhood. Nevertheless, this endogeneity does not apply to that many of our outcomes and is barely relevant by age 33, when the association with qualifications often has become even stronger than at age 23, as will be discussed in more detail shortly.

Inclusion in hierarchical models
What of the childhood precursors of our adult social exclusion indicators? Parental background measures are clearly privileged in terms of initial entry to the hierarchical models through being considered first in the chain. A measure of experience of childhood poverty enters all 36 models; a measure of housing tenure enters 29, including 18 of the 19 models for women; and a measure of father's social class and of parents' school leaving age both enter 22 times. Family disruption as a combined variable only enters 10 of the 36, although eight of these are for women.

Table 6: Number of Outcomes with Childhood characteristics included in hierarchical models and in free stepwise models

Characteristic	Hierarchical models			Free stepwise models		
	Men	Women	Both sexes	Men	Women	Both sexes
Number of outcomes considered	17	19	36	17	19	36
PARENTAL BACKGROUND						
Childhood Poverty	17	19	36	11	15	26
Father's Social Class	12	10	22	5	1	6
Housing tenure	11	18	29	5	4	9
Parents' school leaving age	10	12	22	0	0	0
Born out of Wedlock	0	0	0	0	0	0
Ever in Care	0	1	1	0	0	0
Family disruption (Care, Out-of-wedlock, divorced parents)	2	8	10	0	2	0
INDIVIDUAL BEHAVIOUR						
Aggression	4	10	14	1	5	6
Anxiety	1	1	2	2	1	3
Restlessness	1	6	7	0	0	0
All behavioural measures missing	5	4	9	0	0	0
PARENTAL INTEREST IN EDUCATION						
Father's interest	12	8	20	3	4	7
Mother's interest	6	17	23	1	7	8
Both parents combined	16	19	35	4	10	14
Mother's interest in schooling missing on all	0	10	10	0	2	2
TEST SCORES, POLICE, and SCHOOL ABSENCE						
Any contact with police	9	3	12	9	1	10
Any frequent absences from school	3	14	17	4	13	17
Test scores	16	19	35	8	9	17
All test scores missing	5	11	16	0	4	4
QUALIFICATIONS	17	19	36	17	19	36

The next clusters to be considered in the hierarchy, on an equal footing, are the individual behaviour measures and the parental interest in education group. Parental interest proves to be of initial significance much more frequently than the behaviour measures. One or more of the

parental interest measures proves to add explanatory power to the parental background model (at our preferred one in 10,000 significance level) in for every sex-outcome except male malaise at age 33.

One (or both) of the indicators of father's interest enters the models 20 times, with 12 of these being for men; conversely one or both of the maternal interest measures enters on 23 occasions, with 17 of these being for women (the two exceptions for women are malaise at age 33 and lack of a telephone at age 33) and only six for men.

Thus there seem to be strong gender differences in the relative importance of parental interest in education, with father's interest proving more salient for males and mother's interest for females, perhaps suggesting the importance of same gender role models. These gender differences leave a legacy in adulthood for the survey members. Maternal interest seems to be equally influential at ages 23 and 33 (there being so few exceptions for women anyway), but 13 of the 20 clear associations with father's interest in schooling appear at age 33. Further examination shows that this arises from a strong gender imbalance at age 23, with six (of eight) male outcomes showing a clear association, but only one (of nine) doing so for the women. In contrast, at age 33, there is a gender balance with the association being clear for six (of nine) outcomes for men and seven (of ten) for women. Thus, father's interest in education begins to show up more clearly for women at age 33, whereas it is already important for men at age 23. Related to this is that mother's education shows particularly close associations for young women at age 23, with both maternal interest terms being included for five outcomes.

Turning to the behavioural measures, we see that aggression features most frequently (in 14 of the 36 possible sex-outcome combinations) and that it proves a more common predictor for women (10 of the 14 occasions, with seven of these being for outcomes at age23). Restlessness is only significant in seven models, with six of these being for women; five of these are outcomes at age 33. The measure of anxiety only features on one occasion each for men and for women, but appears for both in relation to high malaise scores at age 33. Thus, anti-social behaviour at school by women seems reflected in different measures for outcomes at ages 23 and 33, aggression and restlessness respectively. Behavioural measures feature more rarely for young men, with anti-social behaviour perhaps being captured by early contact with the police.

There are also significant gender differences in the extent to which contact with the police by age 16 and frequent school absence are

included in the hierarchical models. Nine of the twelve inclusions of early contact with the police are for men, and six of these are for outcomes at age 23 (out of only eight considered, the exceptions being low social class and high malaise scores). In contrast, only three of 17 significant associations with frequent absence from school are for men and 14 (out of a possible 19) are for women; moreover, the frequency of association for women is similar at ages 23 and 33.

The only outcome without a clear association to one or more of the summary test score measures is cigarette smoking for men at age 33; one or both of the test score measures that indicate a score in the lowest quartile were included in 32 of the 36 models, with the additional omissions (where lack of two or more highest quartile scores did prove significant) being lone parenthood at ages 23 and 33, and extra-marital first birth – all for women.

Inclusion in free stepwise models
We now turn to a closer look at the childhood precursors that remain in the most fiercely competitive model, the free stepwise model, once qualifications are given full rein. Many childhood factors that had initially entered the hierarchical models had become statistically insignificant, even at an overly generous five per cent level, when later clusters were entered in the hierarchy. Thus it is not surprising that these weaker relationships get dropped when more stringent statistical significance criteria are used. However, these models pose a different question, concerning whether earlier childhood background has persistent and lasting effects, which can be identified even after controls for more proximate precursors of adult social exclusion.

By far the most striking finding here, as shown in the second panel of Table 6, is the remarkable prevalence of childhood poverty measures in these free stepwise models, with retention in 26 of the 36. Childhood poverty features in these models for every outcome for women at age 23; for men at age 23 it is not included for early fatherhood or high malaise; for both men and women at age 33 the exceptions are both social class outcomes and cigarette smoking; and for men low income too. This pervasive legacy of childhood poverty in later life, more extensive than any other childhood factor considered here, has been partially documented before, especially for economic outcomes (e.g. CASE and HM Treasury 1999, Gregg and Machin 1998, Hobcraft 1998, and Hobcraft and Kiernan 1999 among others for the UK; Duncan and Brooks-Gunn 1997 and Mayer 1997 discuss these issues for the US).

Among the remaining parental background measures, only housing tenure (nine times, with no clear gender imbalance at this stage) and father's social class (six times, with five of these being for men, for whom occupation is of greater relative importance) appear in any of the free stepwise models. Four of the strong associations with parental housing tenure are for the four age-sex combinations of social housing. Three of the five strong male associations for father's social class are with the three social class measures considered here and both men and women at age 23 show a clear association of father's social class with being in social housing in their own right. This direct 'inheritance' pattern has been observed for several outcomes in earlier work (e.g. Hobcraft in CASE and HM Treasury 1999).

For individual childhood behaviour, aggression appears in six free stepwise models, with five of these being for women. For both men and women, childhood aggression is strongly associated with a high malaise score at age 23. Two of the three inclusions of childhood anxiety are related to high malaise scores at age 33 for men and women. Thus four of the nine persistent associations of childhood behaviour measures are with the one measure of mental health included among our outcomes. A further one is with cigarette smoking among women at age 33.

Parental interest in education is evidently more vulnerable to associations with other educational variables that are introduced later in the hierarchy, but appears in 14 of the free stepwise models for one or more of the four measures used. There is a striking gender imbalance in these associations, with ten being for women. This differentiation is clearest for the measures reflecting mother's interest in schooling, with seven of the eight retained associations being for women. Four of these strong associations with maternal interest in schooling are for the four demographic outcomes for women that are included here. Four of the seven clear associations with father's interest in schooling emerge for the six social class outcomes included here, including the Hope-Goldthorpe unskilled category for both men and women.

The associations of early contact with the police for men and of frequent school absences for women (and men) are virtually all retained after the addition of qualifications into the models. Four of the links to frequent school absences for women are to the four demographic outcomes; benefit receipt also shows similar strong associations for women at ages 23 and 33, as does spending two or more years out of education or employment, and being in social housing at age 23 – these outcomes are all clearly interlinked. Frequent school absences are also strongly linked to cigarette smoking at age 33, for both men and women.

For young men, early contact with the police is clearly related to a set of interlinked outcomes at age 23: early fatherhood, social housing, benefit receipt, unemployment of a year or more, 'idleness' for two or more years, and low income.

Table 7: Numbers of outcomes for which splits at different levels of parental interest in schooling and of educational test scores enter hierarchical and free stepwise models

Characteristic	Hierarchical models			Free stepwise models		
	Men	Women	Both sexes	Men	Women	Both sexes
Number of outcomes considered	17	19	36	17	19	36
PARENTAL INTEREST IN EDUCATION						
Father's interest in schooling low 2/3 occasions	1	0	1	1	0	1
Father's interest in schooling ever low	11	8	19	2	4	6
Mother's interest in schooling ever low	3	11	14	1	3	4
Mother's interest in schooling high once or less	4	12	16	0	5	5
Mother's interest in schooling missing on all	0	10	10	0	2	2
TEST SCORES						
2/3 Test scores in lowest quartile	8	1	9	8	1	9
Any Test score in lowest quartile	11	16	27	0	8	8
Fewer than 2 test scores in highest quartile	5	6	11	2	0	2
All test scores missing						

Educational test scores have a less pervasive presence in the final stepwise models, with only about half (17) of the 35 initially significant sex-outcome combinations being retained in the free stepwise models. Six of these powerful associations for test scores are with the six age-sex combinations of social class. Moreover, test scores are retained in the free stepwise models for both men and women for several interlinked outcomes at age 33: social housing, no telephone, benefit receipt, and low income. They also appear in the models for malaise at age 23. In sum, these consistent pairings cover 16 of the 17 strong associations for test scores, with female unemployment at age 23 being the odd one out.

As can be seen from the further detail provided in Table 7, there is a very sharp gender difference in which measure of low educational test scores is included in these free stepwise models, with the 'critical divide' coming at 2/3 low quartile test scores for the men, but at any low quartile test score for the women.

Qualification levels

Table 8 provides similar summary information on the inclusion of the different 'cut-points' in the levels of qualifications. Since the patterns are similar, we shall only consider the free stepwise models, which permit qualifications to exert their maximal influence.

At age 23, it is clear that the sharpest divide arises for the group with no qualifications, being included in the models for all but three of the outcomes (social housing and malaise for men, and unemployment for women). The next most important cut-point is for those with fewer than 5 O levels, which enters the models nine times with seven of these being for women (for whom the only omitted outcomes are benefit receipt and spending two or more years out of education or employment). The divide at below A level is the only other to have many significant values, six in all, two of which are for the two social class outcomes.

At age 33, there are a slightly larger number of significant splits. There are divides at no qualifications, below O level, and below A level for more than half of the outcomes. We note the additional divide (at 5 O levels) available for inclusion in the age 23 models and recall our earlier discussion on the differences in the distributions on qualification measures at age 23 from the surveys at age 23 and age 33, as shown in Table 4.

There is a clear divide at the no qualification threshold in the age 33 outcome models for all but five of the outcomes: Hope-Goldthorpe unskilled class, and no telephone for men, ever lone parenthood for women; and cigarette smoking for both sexes.

There is also a divide at the below O level threshold in just over half (10) of the (19) free stepwise models of outcomes at age 33. Four of these are for the four sex-social class combinations; two more apiece refer to social housing and to cigarette smoking for both sexes.

Table 8: Numbers of outcomes for which splits at different qualification levels enter hierarchical and free stepwise models

Characteristic	Hierarchical models			Free stepwise models		
	Men	**Women**	**Both sexes**	**Men**	**Women**	**Both sexes**
QUALIFICATIONS AT 23 FROM AGE 23 SURVEY						
Number of outcomes considered	8	9	17	8	9	17
No qualifications	5	6	11	6	8	14
Below O level	2	0	2	2	0	2
Below 5 O levels	1	6	7	2	7	9
Below A level	2	2	4	2	4	6
A level and below	2	1	3	2	1	3
Below degree	0	1	1	0	1	1
QUALIFICATIONS AT 23 FROM AGE 33 SURVEY						
Number of outcomes considered	9	10	19	9	10	19
No qualifications	6	6	12	6	8	14
Below O level	2	5	7	5	5	10
Below A level	7	8	15	7	8	15
A level and below	1	0	1	2	0	2
Below degree	0	0	0	1	1	2
Missing information	6	4	10	7	7	14

The divide at the below A level threshold is the most prevalent for outcomes at age 33, with only four of the free stepwise models not including this cut-point: for men, social housing and a year or more of unemployment; for women, extra-marital first birth and lack of a telephone.

By far the most pervasive association with these three qualification cut-points is for low social class at age 33, whether measured by the Registrar-General's Classes IV and V, or by the Hope-Goldthorpe Class VII: of the twelve possible combinations of these three cut-points with the two similar outcome measures for both sexes, fully eleven prove statistically significant in the free stepwise models. This is rivalled by the links to social housing for which five of the six possible values are retained.

Comparisons of odds ratios

We now turn to an examination of the combined odds ratios for the contrast between the group with the greatest relative disadvantage and that with the greatest relative advantage among the cut-points used. Except when we examine the odds ratios for qualification levels, we shall show two sets of odds ratios: the first is taken from what might be termed 'the full childhood model', which is the last model in the hierarchy before the introduction of qualifications; the second are taken from the full stepwise model. It was our original intention to focus purely on the clusters of variables associated with schooling and qualifications, but before doing so we feel obliged to look at the odds ratios for the extreme groups of experience of childhood poverty.

Table 9 shows the odds ratios, essentially for the contrast between those who were fairly poor during childhood and those who did not have evidence of having experienced any childhood poverty. Because we are looking at the full childhood model these odds ratios have already been attenuated by the entry of other clusters in the hierarchy. Few of these odds ratios are especially large, though we recall that all 36 (all sex-outcome combinations) were initially significant at the one in 10,000 level. The 26 terms that survive into the free stepwise models do not alter a great deal. The largest odds ratios are about two to one, for men's unemployment and 'idleness' at age 23, men's malaise at age 33, and lack of a telephone for women at age 33. Most of the other odds ratios in these free stepwise models range from 1.4 through to 1.8. What is remarkable is that so many of these models show statistically strongly significant associations with measures of childhood poverty, more than for any other childhood measure.

Table 10 shows the odds ratios for the strongest contrast on the combination of the four measures of parental interest in education. In the full childhood models, several of these odds ratios are quite large, being 2.5:1 or higher for several of the outcomes for women at age 23: unemployment, not in education or employment, social housing, early motherhood and ever a lone parent, and around two to one for several other outcomes, especially for women at age 33. But only 14 of the 35 initially significant relationships with parental interest in education survive into the free stepwise models and only two now exceed two to one: not in education or employment and early motherhood for women aged 23.

Table 9: Odds ratios for each outcome for experiences of childhood poverty before control for qualifications and in free stepwise models by sex

Outcome	Full childhood model odds ratios				Free stepwise odds ratios			
	Age 23		Age 33		Age 23		Age 33	
	Men	Women	Men	Women	Men	Women	Men	Women
LABOUR FORCE								
Social Class IVandV	1.4	1.5	1.4	1.3	1.4	1.5	1.0	1.0
H-G Class VII	---	---	1.2	1.5	---	---	1.0	1.0
Unemployed 12+m	2.0	1.5	1.5	---	2.1	1.6	1.5	---
No job/educ. 24+m	2.2	1.3	---	---	2.0	1.6	---	---
WELFARE and INCOME								
Social housing	1.8	1.6	1.5	1.3	1.8	1.5	1.6	1.6
Any benefits	1.7	1.6	1.4	1.4	1.4	1.6	1.4	1.4
Low income	1.5	1.4	1.4	1.5	1.5	1.4	1.0	1.6
MENTAL HEALTH								
Malaise	1.5	1.4	2.0	1.5	1.0	1.4	2.0	1.5
DEMOGRAPHIC								
Early Parent	1.2	1.4	---	---	1.0	1.5	---	---
Ever lone mother	---	1.5	---	1.3	---	1.6	---	1.5
Extra-marital birth	---	---	---	1.3	---	---	---	1.0
OTHER								
No telephone	---	---	2.2	2.0	---	---	1.6	2.0
Cigarette smoker	---	---	1.3	1.3	---	---	1.0	1.0

Note: see text for full description of adult outcomes

Table 10: Odds ratios for each outcome for lowest parental interest in education group compared with highest group before control for qualifications and in free stepwise models by sex

| Outcome | Full childhood model odds ratios | | | | Free stepwise odds ratios | | | |
| | Age 23 | | Age 33 | | Age 23 | | Age 33 | |
	Men	Women	Men	Women	Men	Women	Men	Women
LABOUR FORCE								
Social Class IVandV	2.1	2.2	1.9	2.1	1.5	1.0	1.0	1.3
H-G Class VII	---	---	1.8	2.5	---	---	1.4	1.4
Unemployed 12+m	1.3	2.9	1.5	---	1.0	1.5	1.5	---
No job/educ. 24+m	1.7	2.9	---	---	1.0	2.5	---	---
WELFARE and INCOME								
Social housing	1.5	2.5	1.3	2.2	1.0	1.5	1.0	1.0
Any benefits	1.2	1.4	1.4	1.7	1.0	1.0	1.0	1.0
Low income	1.3	1.4	1.2	1.4	1.0	1.0	1.0	1.0
MENTAL HEALTH								
Malaise	1.8	1.4	1.0	1.5	1.7	1.0	1.0	1.0
DEMOGRAPHIC								
Early Parent	1.3	2.8	---	---	1.0	2.3	---	---
Ever lone mother	---	2.8	---	2.0	---	1.8	---	1.5
Extra-marital birth	---	---	---	2.1	---	---	---	1.9
OTHER								
No telephone	---	---	1.4	1.5	---	---	1.0	1.0
Cigarette smoker	---	---	1.3	1.4	---	---	1.0	1.3

Note: see text for full description of adult outcomes

In Table 11, we summarise the overall impact of frequent absence from school on the various outcomes. Only 17 of the 36 full childhood models contain this variable, but 17 also retain this indicator in the free stepwise model (social housing for women at age 33 drops out, but school absence enters the model of low income for men at age 23 for the first time). Since these measures of association change little between the two sets of models and virtually all are retained in the free stepwise model, it suffices to examine the odds ratios for this model. All of the significant odds ratios range from 1.5 to 1.9, with none being especially large (although a few reached two to one in the full childhood model –

for not in education or a job, early motherhood, and lone-motherhood for women at age 23 and cigarette smoking for women at age 33).

Table 11: Odds ratios for each outcome for frequent school absence before control for qualifications and in free stepwise models by sex

Outcome	Full childhood model odds ratios				Free stepwise odds ratios			
	Age 23		Age 33		Age 23		Age 33	
	Men	Women	Men	Women	Men	Women	Men	Women
LABOUR FORCE								
Social Class IVandV	1.0	1.8	1.0	1.0	1.0	1.6	1.0	1.0
H-G Class VII	---	---	1.0	1.0	---	---	1.0	1.0
Unemployed 12+m	1.6	1.0	1.0	---	1.5	1.0	1.0	---
No job/educ. 24+m	1.0	2.0	---	---	1.0	1.9	---	---
WELFARE and INCOME								
Social housing	1.6	1.6	1.0	1.5	1.5	1.5	1.0	1.0
Any benefits	1.0	1.8	1.0	1.6	1.0	1.8	1.0	1.5
Low income	1.0	1.5	1.0	1.0	1.4	1.5	1.0	1.0
MENTAL HEALTH								
Malaise	1.0	1.0	1.0	1.7	1.0	1.0	1.0	1.6
DEMOGRAPHIC								
Early Parent	1.0	2.0	---	---	1.0	1.8	---	---
Ever lone mother	---	2.0	---	1.6	---	1.8	---	1.5
Extra-marital birth	---	---	---	1.6	---	---	---	1.7
OTHER								
No telephone	---	---	1.0	1.8	---	---	1.0	1.7
Cigarette smoker	---	---	1.6	2.0	---	---	1.6	1.9

Note: see text for full description of adult outcomes

Table 12 provides the same information for the combined odds ratios for educational test scores. We can see that quite a few of the 35 (of 36) that were significant at entry into the full childhood model have substantial odds ratios. For men at age 33, these odds ratios exceed four to one for the two social class indicators, social housing, and low income. There is also a sprinkling of other odds ratios of three to one or higher for educational test scores. There is thus evidence of quite powerful associations of levels of test scores with many of the adult

outcomes. However, once qualifications are introduced into the models, we see that 18 of the 35 significant associations disappear from the free stepwise models (for example all of the associations with the welfare and income cluster for both sexes at age 23) and that those that do remain are usually considerably attenuated. Apart from the high odds ratio for low test scores associated with low income for men at age 33 (2.7:1), all the odds ratios now fall below two to one.

Table 12: Odds ratios for each outcome for lowest test score group compared with highest group before control for qualifications and in free stepwise models by sex

Outcome	Full childhood model odds ratios				Free stepwise odds ratios			
	Age 23		Age 33		Age 23		Age 33	
	Men	Women	Men	Women	Men	Women	Men	Women
LABOUR FORCE								
Social Class IVandV	2.1	3.0	5.5	3.2	1.0	1.9	1.7	1.7
H-G Class VII	---	---	6.5	2.3	---	---	1.7	1.8
Unemployed 12+m	1.9	1.6	1.6	---	1.0	1.5	1.0	---
No job/educ. 24+m	2.2	3.1	---	---	1.0	1.0	---	---
WELFARE and INCOME								
Social housing	1.5	1.6	4.0	1.8	1.0	1.0	1.6	1.4
Any benefits	1.5	1.6	2.5	1.7	1.0	1.0	1.7	1.5
Low income	1.5	1.7	4.1	1.7	1.0	1.0	2.7	1.5
MENTAL HEALTH								
Malaise	2.0	1.7	1.7	1.6	1.7	1.4	1.0	1.0
DEMOGRAPHIC								
Early Parent	2.7	2.9	---	---	1.7	1.0	---	---
Ever lone mother	---	3.3	---	1.8	---	1.0	---	1.0
Extra-marital birth	---	---	---	1.9	---	---	---	1.0
OTHER								
No telephone	---	---	2.1	1.8	---	---	1.6	1.8
Cigarette smoker	---	---	1.0	1.3	---	---	1.0	1.0

Note: see text for full description of adult outcomes

Finally, Table 13 shows the odds ratios for the maximal contrasts on qualification levels. Since qualifications have their greatest impact in the free stepwise models and are significant in all 36 such models, we only show these results. Compared with all that we have seen in this section, the odds ratios on qualification levels are extraordinarily high. As mentioned before, there are endogeneity problems for a few of the outcomes at age 23 (unemployment, not in education or employment, and early parenthood), but not at age 33. For those outcomes that are measured at both ages 23 and 33 (social class IV and V, social housing, benefit receipt, low income, and malaise scores) we see that the association with qualifications becomes more powerful with increasing age for both men and women in all cases.

Table 13: Odds ratios for each outcome for least qualified compared with most qualified from free stepwise models by sex

Outcome	Odds ratios for least qualified			
	Age 23		Age 33	
	Men	Women	Men	Women
LABOUR FORCE				
Social Class IVandV	5.5	11.5	11.8	24.4
H-G Class VII	---	---	9.5	11.2
Unemployed 12+m	12.1	2.7	2.2	---
No job/educ. 24+m	8.0	44.4	---	---
WELFARE and INCOME				
Social housing	2.7	3.8	8.5	10.3
Any benefits	2.2	3.3	4.4	4.1
Low income	2.2	3.6	7.5	3.8
MENTAL HEALTH				
Malaise	2.4	2.8	3.1	4.7
DEMOGRAPHIC				
Early Parent	6.2	76.0	---	---
Ever lone mother	---	5.6	---	3.4
Extra-marital birth	---	---	---	2.1
OTHER				
No telephone	---	---	5.7	1.9
Cigarette smoker	---	---	4.2	2.4

Note: see text for full description of adult outcomes

7.   Conclusion

We have seen the extraordinary explanatory power of qualifications in relation to many social exclusion measures at ages 23 and 33 and that this power increases with age. It is perhaps quite remarkable that apparently closely related elements of schooling, whilst often providing supplementary associations with social exclusion do not capture a greater part of the association with qualifications. This is especially surprising for the information on educational test scores.

We have also seen some interesting continuities from childhood into adulthood. The pervasive influence of childhood poverty on such a wide range of early adult outcomes for men and women is noteworthy. A message that has been emphasised in my earlier work on this topic is the extent of specific continuities from childhood into adulthood, exemplified here by the strong continuities observed in housing tenure and in low social class.

Inter-generational and life-course pathways to social exclusion are complex and involve many interplays. The challenges of measuring and explaining such a multi-faceted (and ill-defined theoretically and empirically) concept are considerable, but require addressing. Whether we come to term bundles of measures of disadvantage social exclusion or something else does not really concern me. The challenge is to better understand the interplays among different elements of disadvantage, stratification, or social exclusion and how to combine these 'apples and pears'. Moreover, the challenges faced here, of tracing 'lumpy' pathways through the generations and the life-course, ultimately need to be complemented by quite sophisticated further exploration of genetic-environment interactions. New theory is required and needs to be informed and disciplined by careful and detailed empirical work, which will also require sophisticated data collection.

References

Burchardt, T., J. Le Grand and D. Piachaud (1999), "Social exclusion in Britain 1991-1995", *Social Policy and Administration*, 33(3).

CASE and HM Treasury (1999), *Persistent Poverty and Lifetime Inequality: The Evidence*, CASEreport 5 and HM Treasury Occasional Paper 10. Centre for Analysis of Social Exclusion, London School of Economics.

Duncan, G.J. and J. Brooks-Gunn (eds., 1997), *Consequences of Growing Up Poor.* New York: Russell Sage Foundation.

Dustmann, C., N., Rajah and S. Smith (1997), "Teenage truancy, part-time working and wages", *Journal of Population Economics*, 10: 425-442.

Feinstein, L. (2000), "The relative economic importance of academic, psychological and behavioural attributes developed in childhood", CEP Discussion Paper 443. Centre for Economic Performance, London School of Economics.

Gregg, P. and S. Machin (1998), "Child Development and Success or Failure in the Youth Labour Market", CEP Discussion Paper 397. Centre for Economic Performance, London School of Economics.

Hobcraft, J.N. (1998), "Intergenerational and Life-Course Transmission of Social Exclusion: Influences of Childhood Poverty, Family Disruption, and Contact with the Police", CASEpaper 15, Centre for Analysis of Social Exclusion, London School of Economics.

Hobcraft, J.N. and K.E. Kiernan (1999), "Childhood Poverty, Early Motherhood and Adult Social Exclusion", CASEpaper 28. Centre for Analysis of Social Exclusion, London School of Economics.

Hobcraft, J.N. (forthcoming), "Social exclusion and the generations", in D. Piachaud and J. Le Grand (eds.), *Understanding Social Exclusion.* Oxford: Oxford University Press.

McLanahan, S. and G. Sandefur (1994), *Growing up with a Single Parent* London: Harvard University Press.

Mayer, S.E. (1997), *What Money Can't Buy: Family Incomes and Children's Life Chances.* Cambridge and London: Harvard University Press.

Raftery, A.E. (1996), "Bayesian model selection in social research", in P.V. Marsden (ed.), *Sociological Methodology 1996.* Oxford: Blackwell.

Rodgers, B., A. Pickles, C. Power, S. Collishaw and B. Maughan (1999), "Validity of the Malaise Inventory in general population samples", *Social Psychiatry and Psychiatric Epidemiology*, 34: 333-341.

Rutter, M, J. Tizard and P. Graham. (1976), "Isle of Wight Studies: 1964-1974", *Psychological Medicine,* 16: 689-700.

Table A1
Blocked Logistic Regression Models for RG's Social Class IV or V
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age 23 [22% of 4899]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	251 (3)	363 (6)	465 (8)	692 (10)	653 (6)
Some Poverty	1.82	1.57	1.44	1.30	1.39
Dad any SC IV/V	1.68	1.55	1.47	1.31	1.37
<2 Owner-Occ	1.83	1.62	1.55	1.36	
Dad Int. 2/3 Low		1.65	1.52	1.37	1.55
Mum Int. Any Low		1.62	1.40	1.21	
Any restless		1.46	1.38	1.26	
Any Test LQ			2.08	1.41	
All Tests Missing			3.77	2.81	
No qualifications				2.44	2.62
Below A Level				1.95	2.10
2/3 Tests LQ					1.48

Men at age 33 [16% of 5441]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	270 (4)	357 (6)	510 (10)	729 (14)	679 (6)
Some Poverty	1.85	1.59	1.37	1.20	
Dad any SC IV/V	1.46	1.39	1.29	*1.18*	
Dad <2 NM	1.76	1.47	1.36	1.32	1.68
Pars Min SLA	1.83	1.58	1.39	*1.19*	
Dad Int. Any Low		1.75	1.44	1.25	
Mum Int <2 Very		1.59	1.33	*1.22*	
2/3 Tests LQ			1.63	1.34	1.72
Any Test LQ			1.56	1.23	
<2 Tests HQ			2.18	1.46	
All Tests Missing			5.76	2.93	
No quals				1.64	1.76
Below O level				1.69	1.91
Below A level				2.90	3.51
Quals Missing				3.42	4.44

Table A1 continued

Women at 23 [21% of 5022]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	352 (4)	580 (9)	775 (12)	1000 (14)	946 (6)
Some Poverty	2.18	1.76	1.49	1.34	1.49
Dad <2 NM	1.64	1.56	1.43	1.33	
<2 Owner-Occ	1.67	1.45	1.34	*1.19*	
Pars Min SLA	1.65	1.42	1.30	*1.13*	
Mum Int. Any Low		2.13	1.50	1.32	
Mum Int <2 Very		1.72	1.48	*1.20*	
Mum Int all missing		3.71	3.19	2.25	
Any Aggression		1.67	1.49	1.36	
Behaviour missing		3.07	2.90	2.22	
Any freq absence			1.77	1.48	1.62
2/3 Tests LQ			1.77	1.52	1.86
Any Test LQ			1.71	1.23	
No quals				2.40	2.78
Below 5 O levels				2.38	1.89
Below A level					2.19

Women at 33 [23% of 5463]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	296 (4)	451(8)	614 (11)	802 (15)	768 (7)
Fairly Poor	1.99	1.38	1.27	*1.12*	
Dad <2 NM	1.49	1.22	*1.13*	*1.09*	
Any Local Author.	1.53	1.37	1.31	1.19	
Pars Min SLA	1.69	1.46	1.32	1.18	
Dad Int. Any Low		1.67	1.42	1.21	1.35
Mum Int <2 Very		1.89	1.46	1.27	
Mum Int all missing		2.75	1.62	*1.31*	
Any restless		1.47	1.32	1.23	
Any Test LQ			2.09	1.56	1.73
<2 Tests HQ			2.12	1.57	
All Tests Missing			4.81	2.47	
No quals				1.80	1.88
Below O level				1.58	1.74
Below A level				2.15	2.23
Quals Missing				2.74	9.42
Below Degree					3.35

Table A2
Blocked Logistic Regression Models for Unemployment of 12 months
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men 16-23 [11% of 6267]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	216 (3)	278 (4)	430 (7)	580 (9)	577 (6)
Fairly Poor	2.80	2.48	2.03	1.87	2.05
Dad any SC IV/V	1.67	1.36	1.25	*1.12*	
Any Local Author.	1.50	1.48	1.31	*1.17*	
Dad Int. Any Low		2.00	1.35	*1.18*	
Police contact			1.94	1.73	1.79
Any freq absence			1.62	1.42	1.50
Any Test LQ			1.88	1.29	
No qualifications				2.50	2.13
Below Degree				3.62	3.34
Below O level					1.70

Men 23-33 [12% of 5606]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	138 (3)	169 (4)	189 (5)	222 (6)	207 (4)
Some Poverty	1.75	1.59	1.50	1.43	1.51
Dad any SC IV/V	1.45	1.37	1.31	1.28	
Any Local Author.	1.71	1.58	1.54	1.50	1.59
Mum Int. Any Low		1.68	1.53	1.44	1.54
2/3 Tests LQ			1.59	1.32	
No quals				1.95	2.19

Table A2 continued

Women 16-23	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
[9% of 6270]					
Chi-squared (df)	147 (3)	226 (6)	248 (7)	285 (8)	250 (4)
Some Poverty	1.89	1.60	1.50	1.44	1.56
Dad <2 NM	1.73	1.39	1.33	*1.23*	
<2 Owner-Occ	1.82	1.52	1.47	1.38	
Dad Int. Any Low		1.64	1.47	1.38	1.53
Mum Int <2 Very		2.15	1.95	1.66	
Mum Int all missing		3.46	3.00	2.48	
Any Test LQ			1.61	1.36	1.50
Below 5 O levels				2.18	2.67

Women 23-33	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
[7% of 5799]					
Chi-squared (df)	0 (0)	0 (0)	23 (1)	23 (1)	23 (1)
2/3 Tests LQ			1.86	1.86	1.86

Table A3
Blocked Logistic Regression Models for 24+ months not in job or education
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men 16-23	[6% of 6153]				
	Parents	**Behaviour Par Int.**	**Absences Police Tests**	**Qualifs**	**Free Stepwise**
Chi-squared (df)	111 (2)	201 (5)	299 (8)	434 (10)	392 (4)
Fairly Poor	3.34	2.60	2.18	1.80	1.98
Pars Min SLA	1.80	1.50	1.32	*1.06*	
Dad Int. Any Low		2.29	1.72	1.34	
<2 Low aggression		1.72	1.51	1.40	
Behaviour missing		4.05	3.83	3.12	
Police contact			2.34	1.86	2.08
2/3 Tests LQ			2.24	1.49	
All Tests Missing			3.75	2.89	
No quals				2.50	3.05
Below 5 O levels				2.40	2.61

Women 16-23	[22% of 6100]				
	Parents	**Behaviour Par Int.**	**Absences Police Tests**	**Qualifs**	**Free Stepwise**
Chi-squared (df)	522 (6)	832 (11)	1035 (16)	1321 (19)	1263 (8)
Some Poverty	1.61	1.44	1.30	1.27	1.57
Fairly Poor	1.67	1.41	1.34	*1.27*	
Any SC IV or V	1.50	1.39	1.30	1.22	
<2 Owner-Occ	1.75	1.48	1.35	1.22	
Pars Min SLA	1.64	1.33	1.23	*1.03*	
Family disruption	1.56	1.36	1.26	1.25	
Mum Int. Any Low		1.94	1.46	1.31	1.38
Mum Int <2 Very		2.45	2.00	1.67	1.84
Mum Int all missing		5.31	3.26	2.63	3.51
Any Aggression		1.51	1.35	1.25	
Behaviour missing		2.77	2.17	2.00	
Police contact			1.76	1.63	
Any freq absence			2.00	1.73	1.89
Any Test LQ			1.56	1.18	
<2 Tests HQ			1.98	*1.13*	
All Tests Missing			5.92	2.74	
No quals				1.86	1.90
A Level & below				2.24	1.99
Below Degree				8.06	11.74
Any local Authority					1.37
Dad Int. Any Low					1.39

Table A4
Blocked Logistic Regression Models for Hope-Goldthorpe Unskilled (Class VII)
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age33	[19% of 5441]					Women at age 33	[19% of 5463]				
	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise		Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	346 (5)	456 (8)	639 (12)	904 (15)	845 (6)	Chi-squared (df)	314 (4)	490 (8)	601 (9)	825 (13)	766 (6)
Some Poverty	1.64	1.44	1.23	*1.08*		Fairly Poor	2.11	1.70	1.54	1.31	
Dad any SC IV/V	1.44	1.38	1.28	*1.17*		Dad <2 NM	1.74	1.44	1.37	1.28	
Dad <2 NM	1.66	1.53	1.39	1.33	1.64	Any Local Author.	1.56	1.38	1.32	*1.17*	
<2 Owner-Occ	1.46	1.36	1.33	1.28		Pars Min SLA	1.70	1.45	1.35	*1.18*	
Pars Min SLA	1.87	1.65	1.45	1.26							
						Dad Int. Any Low		1.75	1.48	1.23	1.39
Dad Int. Any Low		1.72	1.41	1.24	1.41	Mum Int <2 Very		1.96	1.68	1.35	
Mum Int <2 Very		1.56	1.27	*1.17*		Mum Int missing		3.88	3.29	2.18	
Behaviour missing		2.94	2.35	2.18		Any Restless		1.60	1.46	1.34	
2/3 Tests LQ			1.65	1.41	1.71	Any Test LQ			2.31	1.57	1.76
Any Test LQ			1.55	*1.22*							
<2 Tests HQ			2.55	1.66		No quals				1.80	1.90
All Tests Missing			4.30	2.18		Below O level				1.80	1.96
						Below A level				2.49	3.01
Below O level				2.41	2.73	Quals Missing				3.16	3.83
Below A level				2.88	3.47						
Quals Missing				4.18	5.23						

Table A5
Blocked Logistic Regression Models for Social Housing
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age 23 [11% of 6057]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	341 (3)	372 (4)	473 (7)	511 (8)	509 (7)
Fairly Poor	2.37	2.23	1.80	1.71	1.75
Dad <2 NM	2.03	1.79	1.64	1.57	1.64
<2 Owner-Occ	2.69	2.49	2.27	2.16	2.21
Mum Int <2 Very		1.89	1.48	1.36	
Any freq absence			1.58	1.59	1.48
Police contact			1.67	1.48	1.58
Any Test LQ			1.54	1.36	
Below A Level				1.98	1.77
Below O level					1.55

Men at age 33 [14% of 4984]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	389 (5)	438 (7)	566 (11)	650 (12)	649 (8)
Some Poverty	1.95	1.80	1.55	1.44	1.60
Dad any SC IV/V	1.73	1.68	1.54	1.49	
Any Local Author.	2.13	2.09	2.04	2.02	2.14
Pars Min SLA	1.89	1.76	1.51	1.44	
Family disruption	1.65	1.64	1.50	1.52	
Dad Int. Any Low		1.71	1.33	*1.19*	
Behaviour missing		3.29	2.50	2.22	
Police contact			1.71	1.50	1.58
Any Test LQ			1.93	1.59	
<2 Tests HQ			2.08	2.02	
All Tests Missing			5.91	5.06	
No quals				2.90	2.16
2/3 Tests LQ					1.57
Below O level					1.88
A level & below					4.51
Quals Missing					8.14

Table A5 continued

Women at 23 [18% of 6114]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	577 (5)	764 (10)	850 (13)	937 (15)	878 (8)
Some Poverty	1.82	1.73	1.56	1.45	1.45
Dad SC Any 4/5	1.58	1.65	1.57	1.46	1.38
Any Local Author.	2.60	2.33	2.24	2.11	2.19
Pars Min SLA	1.56	1.26	1.20	*1.10*	
Family disruption	1.71	1.51	1.47	1.44	
Mum Int. Any Low		1.83	1.48	1.35	1.53
Mum Int <2 Very		1.86	1.69	1.46	
Mum Int all missing		3.63	2.45	1.99	
Any Aggression		1.53	1.44	1.36	
Behaviour missing		3.47	2.87	2.59	
Any freq absence			1.62	1.47	1.51
Any Test LQ			1.56	1.22	
All Tests Missing			3.57	2.91	3.43
No quals				1.50	1.67
Below 5 O levels				1.93	2.27

Women at 33 [17% of 5430]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	502 (6)	657 (11)	753 (14)	916 (18)	838 (8)
Some Poverty	1.54	1.35	1.26	*1.19*	1.60
Fairly Poor	1.68	1.49	1.39	1.31	
Dad <2 NM	1.79	1.53	1.47	1.40	
Any Local Author.	2.04	1.79	1.74	1.60	1.85
Pars Min SLA	1.74	1.50	1.42	1.26	
Family disruption	1.60	1.44	1.41	1.44	
Mum Int. Any Low		1.57	1.23	*1.07*	
Mum Int <2 Very		1.98	1.79	1.48	
Mum Int all missing		2.86	*1.62*	*1.23*	
Any Aggression		1.58	1.51	1.42	1.60
Any Restless		1.48	1.41	1.36	
Any freq absence			1.54	1.26	
Any Test LQ			1.83	1.29	1.43
All Tests Missing			4.77	3.10	
No quals				1.80	1.96
Below O level				1.67	1.80
Below A level				2.31	2.92
Quals Missing				2.78	3.58

Table A6
Blocked Logistic Regression Models for Any Non-universal Benefits
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age 23 [16% of 6259]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	182 (4)	203 (5)	269 (7)	324 (8)	287 (4)
Fairly Poor	2.02	1.90	1.69	1.59	1.44
Dad any SC IV/V	1.42	1.37	1.31	1.25	
Any Local Author.	1.37	1.30	1.26	1.22	1.38
Pars Min SLA	1.40	1.33	1.24	1.19	
Dad Int. Any Low		1.42	1.20	*1.11*	
Police contact			1.68	1.56	1.66
Any Test LQ			1.51	1.25	
No qualifications				1.88	2.23

Men at age 33 [14% of 5529]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	132 (3)	160 (4)	244 (6)	330 (9)	304 (5)
Some Poverty	1.74	1.65	1.42	1.29	1.42
Any Local Author.	1.49	1.39	1.33	1.26	
Pars Min SLA	1.52	1.38	1.25	*1.12*	
Mum Int <2 Very		1.68	1.42	1.28	
2/3 Tests LQ			1.60	1.36	1.69
Any Test LQ			1.55	1.27	
No quals				1.96	2.12
Below A level				1.81	2.07
Quals Missing				2.07	2.40

Table A6 continued

Women at 23 [16% of 6263]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	193 (3)	276 (5)	368 (7)	424 (8)	403 (4)
Some Poverty	2.11	1.79	1.58	1.48	1.62
Dad any SC IV/V	1.44	1.36	1.27	1.23	
Pars Min SLA	1.44	1.28	*1.18*	*1.11*	
Mum Int. Any Low		1.82	1.38	1.25	
Aggression <2 Low		1.37	1.28	1.24	
Any freq absence			1.80	1.66	1.79
Any Test LQ			1.56	1.26	
No quals				1.91	2.05
Below A level					1.62

Women at 33 [21% of 5730]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	176 (3)	271 (6)	365 (8)	462 (11)	439 (6)
Some Poverty	1.84	1.62	1.42	1.32	1.39
<2 Owner-Occ.	1.46	1.26	1.18	*1.10*	
Pars Min SLA	1.45	1.26	1.18	*1.06*	
Dad Int. Any Low		1.55	1.25	*1.15*	
Mum Int <2 Very		1.59	1.40	1.24	
Mum Int all missing		2.99	2.59	2.08	
Any freq absence			1.62	1.14	1.46
Any Test LQ			1.69	1.37	1.48
No quals				1.89	2.01
Below A level				1.86	2.06
Quals Missing				2.27	2.48

Table A7
Blocked Logistic Regression Models for Low Income (Lowest Quartile)
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age 23 (Family equiv.)	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise	Men at age 33 (own wages) [25% of 4704]	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	111 (2)	157 (3)	231 95)	304 (6)	293 (4)	Chi-squared (df)	129 (3)	162 (4)	294 (6)	442 (10)	427 (6)
Some Poverty	1.80	1.64	1.48	1.39	1.47	Some Poverty	1.65	1.52	1.37	1.25	
<2 Owner-Occ	1.42	1.30	1.23	1.16		Dad any SC IV/V	1.37	1.30	1.18	*1.11*	
						Pars Min SLA	1.57	1.46	1.27	*1.12*	
Dad Int. Any Low		1.61	1.33	1.22							
						Dad Int. Any Low		1.56	1.25	*1.09*	
Police contact			1.59	1.47	1.44						
Any Test LQ			1.55	1.26		2/3 Tests LQ			2.03	1.58	1.68
						<2 Tests HQ			2.03	1.53	1.61
No qualifications				1.96	2.19						
						No quals				2.07	2.21
Any freq absence					1.36	Below A level				1.51	1.59
						A level & Below				2.11	2.14
						Quals Missing				2.94	3.20

[21% of 5888]

Table A7 continued

Women at age 23 (Family equiv.) [29% of 6024]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	193 (3)	261 (4)	385 (7)	534 (9)	511 (4)
Some Poverty	1.82	1.61	1.45	1.34	1.40
<2 Owner-Occ	1.34	1.24	1.15	*1.04*	
Pars Min SLA	1.42	1.32	1.22	*1.07*	
Mum Int. Any Low		1.74	1.36	1.17	
Any freq absence			1.53	1.36	1.45
Any Test LQ			1.70	1.24	
All Tests Missing			2.58	1.89	
No quals				1.68	1.88
Below 5 O levels				1.75	1.91

Women at 33 (Household income) [23% of 5463]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	144 (3)	194 (5)	234 (6)	321 (8)	297 (4)
Some Poverty	1.77	1.60	1.53	1.45	1.58
Any Local Author.	1.50	1.38	1.32	1.24	
Pars Min SLA	1.41	1.30	1.22	*1.06*	
Mum Int. Any Low		1.58	1.36	*1.17*	
Any Aggression		1.38	1.33	1.27	
Any Test LQ				1.71	1.39	1.52
No quals				1.79	2.00
Below O level				1.86	1.92

Table A8
Blocked Logistic Regression Models for Malaise scores of seven or more
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age 23 [6% of 6267]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	72 (2)	152 (4)	182 (5)	227 (6)	211 (4)
Some Poverty	2.05	1.65	1.51	1.38	
<2 Owner-Occ	1.66	1.40	1.33	*1.20*	
Dad Int. Any Low		2.13	1.82	1.57	1.72
Any aggression		1.82	1.74	1.69	1.73
2/3 Tests LQ			1.97	1.49	1.69
Below O level				2.31	
Below 5 O levels					2.37

Men at age 33 [7% of 5573]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	63 (2)	101 (4)	118 (5)	139 (6)	121 (4)
Fairly Poor	2.37	2.22	2.01	1.87	2.04
Ever in care	2.88	2.63	2.49	2.32	
<2 low aggression		1.64	1.60	1.54	
Any anxiety		1.59	1.55	1.55	1.67
2/3 Tests LQ			1.68	1.47	
Below A level				1.74	1.69
No quals					1.82

Table A8 continued

Women at 23 [16% of 6270]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	136 (2)	261 (6)	311 (7)	371 (8)	357 (5)
Some Poverty	1.84	1.54	1.44	1.38	1.41
<2 Owner-Occ	1.68	1.56	1.45	1.30	
Mum Int. Any Low		1.64	1.38	1.25	
Any Aggression		1.63	1.57	1.52	1.62
Any Restless		1.47	1.37	1.31	
Behaviour missing		2.76	2.53	2.32	
Any Test LQ			1.75	1.45	1.44
Below 5 O levels				2.04	1.93
No quals					1.47

Women at 33 [12% of 5768]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	112 (2)	188 (4)	252 (6)	308 (8)	302 (6)
Some Poverty	2.07	1.75	1.52	1.42	1.51
<2 Owner-Occ	1.53	1.38	1.23	*1.12*	
Dad Int. Any Low		1.90	1.48	1.32	
Any Anxiety		1.50	1.44	1.45	1.46
Any freq absence			1.68	1.47	1.57
Any Test LQ			1.60	1.30	
No quals				1.80	2.14
Below 5 O levels				1.60	2.18
Quals Missing					2.31

Table A9
Blocked Logistic Regression Models for First Birth before Age 23
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age 23 [15% of 6265]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	263 (4)	303 (5)	413 (8)	509 (10)	493 (7)
Some Poverty	1.45	1.32	*1.18*	*1.12*	
Dad any SC IV/V	1.54	1.47	1.39	1.32	1.44
<2 Owner-Occ	1.95	1.83	1.70	1.60	1.60
Pars Min SLA	1.64	1.53	1.35	1.23	
Mum Int. Any Low		1.65	1.31	1.21	
Police contact			1.79	1.61	1.71
Any Test LQ			1.38	*1.15*	
<2 Tests HQ			1.95	1.45	1.75
Below O level				1.55	
A level or lower				3.38	3.77
Any high anxiety					0.70
No qualifications					1.64

Women at age 23 [29% of 6270]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	574 (5)	901 (9)	1112 (13)	1405 (16)	1363 (9)
Some Poverty	1.95	1.59	1.43	1.37	1.53
Dad <2 NM	1.63	1.34	1.26	*1.16*	
Any Local Auth.	1.59	1.34	1.27	1.17	
Pars Min SLA	1.69	1.43	1.33	*1.13*	
Family disruption	1.59	1.36	1.28	1.25	
Mum Int. Any Low		2.11	1.65	1.50	
Mum Int <2 Very		2.06	1.68	1.42	1.57
Mum Int missing		4.28	2.52	2.11	2.59
Any high aggress		1.47	1.36	1.26	
Frequent absences			1.97	1.71	1.81
Any Test LQ			1.47	1.14	
<2 Tests HQ			2.01	*1.14*	
All Tests Missing			6.72	2.94	
No qualifications				1.75	1.79
Below A level				2.65	2.16
Below degree				11.47	12.93
Dad Int. Any Low					1.44
Below 5 O levels					1.52

Table A10
Blocked Logistic Regression Models for Ever Lone Parent
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Women at 23 [8% of 6270]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	205 (4)	328 (8)	421 (11)	486 (12)	466 (7)
Some Poverty	2.09	1.67	1.54	1.47	1.62
<2 Owner-Occ	1.59	1.23	1.13	1.05	
Pars Min SLA	1.96	1.58	1.49	1.31	
Family Disruption	1.59	1.56	1.50	1.50	
Mum Int. Any Low		1.64	1.34	1.23	
Mum Int <2 Very		2.56	2.11	1.82	1.77
Mum Int all missing		5.00	2.60	2.18	
Any Aggression		1.86	1.78	1.70	1.68
Any freq absence			2.03	1.83	1.83
<2 Tests HQ			3.28	1.96	
All Tests Missing			16.76	9.49	5.82
Below 5 O levels				3.41	3.59
No quals					1.55

Women at 33 [19% of 5713]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	166 (4)	267 (7)	370 (11)	420 (12)	394 (7)
Some Poverty	1.62	1.40	1.26	1.25	
Dad <2 NM	1.49	1.26	1.20	1.14	
<2 Owner-Occ	1.37	1.22	1.15	1.11	
Family Disruption	1.59	1.49	1.40	1.39	
Dad Int. Any Low		1.51	1.34	1.28	
Mum Int <2 Very		1.62	1.50	1.39	1.47
Any restless		1.41	1.34	1.30	
Any freq absence			1.59	1.50	1.52
Police contact			1.76	1.68	1.80
<2 Tests HQ			1.85	1.52	
All Tests Missing			5.45	4.21	
Below 5 O levels				1.90	2.44
Fairly Poor					1.51
Below O level					1.40
Quals Missing					2.30

Table A11

Blocked Logistic Regression Models for Extra-marital Birth by age 33, Women only showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Women at 33	[12% of 5628]				
	Parents	**Behaviour Par Int.**	**Absences Police Tests**	**Qualifs**	**Free Stepwise**
Chi-squared (df)	155 (3)	261 (6)	366 (10)	417 (11)	295 (6)
Some Poverty	1.82	1.41	1.27	1.26	
<2 Owner-Occupier	1.62	1.30	1.20	*1.14*	
Family disruption	1.96	1.47	1.38	1.38	2.01
Dad Int. Any Low		1.53	1.36	1.29	
Mum Int <2 Very		1.68	1.53	1.41	1.87
Any restless		1.42	1.34	1.30	
Frequent Absences			1.59	1.50	1.69
Police contact			1.76	1.68	
<2 Tests HQ			1.89	1.54	
All Tests Missing			5.42	4.18	3.09
Below 5 O levels				1.92	
<2 Low Aggression					1.48
No quals					2.06

Table A12
Blocked Logistic Regression Models for Lack of Telephone
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age 33	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise	Women at age 33	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
[8% of 5530]						[7% of 5729]					
Chi-squared (df)	154 (3)	198 (5)	267 (7)	345 (10)	304 (6)	Chi-squared (df)	209 (3)	247 (4)	323 (7)	344 (8)	321 (6)
Fairly Poor	2.94	2.60	2.20	1.99		Some Poverty	2.63	2.32	1.98	1.89	1.96
Dad any SC IV/V	1.58	1.52	1.37	1.27		Any Local Authority	1.84	1.69	1.59	1.51	1.74
Pars Min SLA	1.88	1.72	1.54	1.31		Pars Min SLA	1.95	1.74	1.58	1.53	
Dad Int. Any Low		1.81	1.40	*1.21*		Dad Int. Any Low		1.98	1.54	1.43	
Behaviour missing		3.45	3.17	2.90							
						Frequent Absence			1.76	1.62	1.72
Police contact			1.81	1.58	1.73	Any Test LQ			1.81	1.52	1.80
Any Test LQ			2.06	1.51		All Tests Missing			6.16	5.00	4.64
No qualifications				1.77		Below O level				1.76	
Below 5 O levels				2.92	2.91						
Quals Missing				2.85	3.42	No quals					1.93
Some Poverty					1.64						
2/3 Tests LQ					1.59						
Below O level					1.94						

Table A13
Blocked Logistic Regression Models for Cigarette Smoking at age 33
showing Odds Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at 33 [33% of 5575]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	107 (3)	202 (6)	336 (8)	430 (10)	421 (6)
Some Poverty	1.55	1.39	1.26	1.17	
Dad <2 NM	1.30	1.17	*1.12*	*1.00*	
Family Disruption	1.57	1.54	1.38	1.33	
Dad Int. Any Low		1.60	1.33	1.22	
<2 Low Aggression		1.39	1.32	1.28	
Behaviour missing		2.35	2.16	2.01	
Police contact			2.06	1.99	2.03
Any freq absence			1.59	1.66	1.55
Below 5 O levels				1.92	1.60
Quals Missing				1.66	2.96
Below O level					1.46
A level or lower					1.81

Women at 33 [33% of 5776]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	251 (3)	395 (6)	523 (9)	562 (10)	565 (8)
Some Poverty	1.64	1.41	1.26	1.21	
Any Local Author.	1.66	1.44	1.36	1.31	1.28
Family Disruption	1.76	1.64	1.58	1.58	1.65
Mum Int. Any Low		1.79	1.41	1.33	1.34
Any high aggression		1.42	1.37	1.35	1.49
<2 Low Aggression		1.30	1.24	1.23	
Any freq absence			1.97	1.86	1.87
Any Test LQ			1.35	1.17	
All Tests Missing			2.62	2.24	
Below O level				1.57	1.57
Below 5 O levels					1.52
Quals Missing					1.85

Table A14
Blocked Negative Binomial Regression Models for Social Exclusion Sums
showing Incidence Rate Ratios from Stepwise forward selection (p<0.0001 at entry)

Men at age 23 [N=4532]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	427 (5)	617 (9)	825 (13)	1049 (15)	1005 (9)
Alpha	0.68	0.58	0.46	0.35	0.38
Some Poverty	1.28	1.18	*1.09*	*1.09*	1.27
Fairly Poor	1.43	1.37	1.31	1.24	
Dad any SC IV/V	1.26	1.18	1.13	*1.08*	
<2 Owner-Occ	1.53	1.35	1.29	1.24	1.22
Pars Min SLA	1.31	1.18	1.12	*1.06*	
Dad Int. Any Low		1.38	1.16	1.10	
Mum Int <2 Very		1.57	1.39	1.27	1.39
Mum Int. missing		2.16	2.14	1.81	1.96
Any high aggression		1.24	1.14	1.12	
Any freq. Absence			1.29	1.19	1.22
Police contact			1.38	1.30	1.33
2/3 Tests LQ			1.24	1.14	1.25
Any Test LQ			1.28	1.12	
No qualifications				1.49	1.57
Below A Level				1.57	1.61

Men at age 33 [N=4730]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	344 (3)	485 (8)	789 (12)	854 (16)	805 (8)
Alpha	0.49	0.41	0.48	0.22	0.25
Some Poverty	1.53	1.41	1.30	1.20	1.25
Dad any SC IV/V	1.31	1.25	1.16	*1.12*	
<2 Owner-Occ	1.48	1.30	1.39	1.23	1.28
Pars Min SLA	1.39	1.33	1.13	1.12	
Dad Int. Any Low		1.38	1.17	1.13	1.23
Mum Int <2 Very		1.37	1.25	1.17	
Any high restless		1.22	1.15	1.10	
Behaviour missing		1.93	1.66	1.58	
Any freq. Absence			1.30	1.13	
Police contact			1.38	*1.09*	
Any Test LQ			1.48	1.34	1.40
All Tests Missing			1.92	1.31	
Below O level				1.45	1.53
Below A level				1.52	1.58
Below Degree				2.14	2.28
Quals Missing				3.70	4.17

Table A14 continued

Women at 23 [N=4116]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	581 (6)	937 (11)	1212 (16)	1495 (19)	1445 (12)
Alpha	0.51	0.37	0.28	0.20	0.21
Some Poverty	1.51	1.34	1.25	1.19	1.24
Dad any SC IV/V	1.20	1.16	1.11	1.09	
Dad <2 NM	1.22	1.19	1.14	1.10	
<2 Owner-Occ	1.41	1.30	1.23	1.17	
Pars Min SLA	1.31	1.17	1.13	1.05	
Family disruption	1.34	1.23	1.16	1.15	
Mum Int. Any Low		1.44	1.22	1.14	
Mum Int <2 Very		1.54	1.36	1.24	1.36
Mum Int all missing		2.10	1.53	1.36	1.49
Any High Aggression		1.36	1.25	1.20	1.19
Behaviour missing		1.94	1.64	1.46	
Any freq absence			1.36	1.26	1.30
Ploice contact			1.32	1.28	1.29
Any Test LQ			1.40	1.19	1.23
<2 Tests HQ			1.41	*1.10*	
All Tests Missing			2.98	1.99	1.89
No quals				1.40	1.45
Below 5 O levels				1.36	1.40
Below A level				1.39	1.43
Any Local Authority					1.18

Women at 33 [N=3519]

	Parents	Behaviour Par Int.	Absences Police Tests	Qualifs	Free Stepwise
Chi-squared (df)	352 (5)	517 (9)	649 (13)	801 (16)	753 (9)
Alpha	0.71	0.60	0.52	0.44	0.47
Some Poverty	1.46	1.30	1.22	1.20	1.26
Dad <2 NM	1.31	1.16	1.13	*1.09*	
Any Local Author.	1.43	1.33	1.26	1.21	
Pars Min SLA	1.33	1.20	1.13	*1.06*	
Ever in Care	1.92	1.66	1.60	1.57	
Dad Int. Any Low		1.40	1.24	*1.15*	
Mum Int <2 Very		1.47	1.29	1.17	
Mum Int all missing		2.00	1.40	*1.29*	
Any High Aggression		1.32	1.26	1.21	
Any freq absence			1.36	1.27	
Any Test LQ			1.33	1.16	1.21
<2 Tests HQ			1.43	1.18	
All Tests Missing			2.73	1.86	
Below O level				1.37	1.48
Below A level				1.74	1.77
Quals Missing				1.84	3.06
Any High Restless					1.23
Below Degree					1.64