# Child Development and Success or Failure in the Youth Labour Market

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## I. Introduction

Economic success or failure in the early years of adulthood is the outcome of a number of potentially complex interactions involving an individual's development as a child, their family background, their school experience and the state of the labour market. In this paper we consider the determinants of relative success in the initial years of working life, focussing specifically on the associations that disadvantages in the childhood years have with later economic outturns. We use a large unique cohort database of British individuals to examine a range of issues to do with child development and subsequent outcomes (mostly economic, though broader social outcomes are also to be considered in places).

The basic idea of the paper is, first, to try to pin down the factors associated with childhood disadvantage. We try to do so by using data on detailed characteristics of the families in which children grow up, and on child specific factors like school attendance, staying on at school and contact with the police. We use these variables to characterise individuals' childhood experiences into classifications which suggest whether or not they may be at some kind of disadvantage at age 16.[1] We choose to focus on two groups of measures, the first based on family circumstances in the years of childhood, the second based on child-specific individual-behavioural attributes.

We then go on to relate measures of economic success at later ages (for example, going on to higher education, higher wages, being in work) and failure (spells of unemployment or

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1. Other work focuses specifically on child disadvantage in terms of children living in poor families or those dependent on welfare: an excellent up-to-date survey of (mostly American) work is given in Currie (1995). For recent study of trends in child poverty and the evolution of the income distributions of families with and without children in Britain see Gregg, Harkness, Machin and Thomas (1996).

poor educational attainment) as a function of these childhood factors. Our empirical analysis is based on the National Child Development Survey (NCDS), a survey of all individuals born in a week of March 1958 and currently contains detailed information (from parents, schools, nurses and the cohort members themselves) at ages 0, 7, 11, 16, 23 and 33. Because the data source follows a cohort of people through time this allows us to follow a sequential modelling approach where we gradually build up progressively more detailed econometric models as we sample individuals at older ages. This enables us to fix initial conditions (by effectively standardising the characteristics of individuals at an early age) and then to identify the transmission mechanisms that underpin the determinants of economic success or failure in adulthood.

The structure of the remainder of the paper is as follows. Section II sets the scene by briefly describing trends in the youth labour market in Britain, using annual cross-sections from the Labour Force Survey from the mid-1970s onwards. Section III uses NCDS data to estimate individual-level models of the determinants of age 16 economic and social outcomes. We then define various measures of juvenile delinquency or disadvantaged backgrounds which we use as independent variables in the models of relative success or failure at ages 23 and 33. These models are presented in Sections IV (age 23) and V (age 33). As already noted, we are interested in the transmission mechanisms that may underpin any link with success/failure and therefore, as we view educational attainment as a key potential transmission mechanism, we report models that do and do not condition on highest educational qualification (by age 23). We do this because we are interested in whether or not delinquency/disadvantage variables have an impact over and above education or whether it is simply that the delinquents and disadvantaged do worse because of their massively lower educational attainment. We also try

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to identify whether disadvantaged individuals who invest in education at a later age have any

scope to catch up with their counterparts who obtained educational qualifications at an earlier

age. In the last part of Section V we also introduce an intergenerational aspect to our analysis

by considering the relationship between the early age cognitive skills of the children of NCDS

cohort members and the childhood disadvantage status of the cohort member. Finally, Section

VI concludes.


## II. Trends in the British Youth Labour Market

In this section we provide a background description of trends in labour force and student status

amongst young British individuals from the Labour Force Survey (LFS).[2] The LFS was an

annual[3] survey carried out in Spring each year which covered individuals in a sample of about

60,000 responding households in Great Britain. We define two age cohorts of youths to

examine the state of the youth labour market between 1975 and 1995. The two age cohorts

are defined (by date of birth) to cover school year cohorts aged 16/17 (one year after the

compulsory school leaving age) and aged 18/19 (one year after individuals would have taken

'A' levels).[4] So the first year of data matches with our NCDS cohort of individuals, who if

they left at the compulsory school leaving age, would have left school in the Summer of 1974.

Table I reports labour force and schooling status for the full populations of the two age

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2. See Blanchflower and Freeman (1996) for an international comparison of the evolution of youth labour markets across the OECD.

3. From 1983 to 1991 the survey was conducted annually. Before that (starting in 1975) it was carried out once every two years, and since Spring 1992 it has become a quarterly survey.

4. The 'standard' pattern of schooling in Britain is that individuals take Ordinary level ('O' level) exams in their last year of compulsory schooling when aged 15/16 and then Advanced levels ('A' levels) two years after that when aged 17/18.

cohorts between 1975 and 1995.[5] Labour force status is broken down into three categories, employed, unemployed and inactive (where employed includes individuals on government training schemes) and, given the increased likelihood of students combining student and work status in recent years, student status is defined as whether an individual carried on full-time in the education system post 'O' or 'A' levels broken down by working or non-working (after 1984 when information on this first became available).

Looking at the numbers in Table I makes it very clear that the youth labour market has changed dramatically since the 1970s. There is a very clear rise in staying on rates, coupled with a massive decline in employment as an individual's sole labour market state. And, whilst unemployment displays a cyclical pattern there is a persistent upward rise in inactivity rates. For example, in 1975 61 percent of male 16/17 year olds were employed, whilst 34 percent stayed on in education. By 1995 only 26 percent were in employment and 65 percent stayed on. For 16/17 women the pattern is even more marked: in 1975 53 percent were employed and 39 percent stayed on; by 1995 only 21 percent were in work and a massive 71 percent stayed on. Around half of the rise in staying on after 1985 was from people combining study and (normally part-time) employment.[6]

The same kind of pattern is observed for the older, aged 18/19, cohort. Employment rates fell sharply between 1975 and 1995: by 34 percentage points (from 77 to 43 percent) for males and by 27 percentage points (from 69 to 42 percent) for females. Looking at the staying

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5. As is well known, the relative size of these cohorts, in terms of their share in the working age population, shifted over this time period. In 1975 2.5 percent of the working age population were in the age 16/17 cohort. This rose and peaked at 2.9 percent in 1981 and then fell continuously to 1.9 percent by 1995. For the age 18/19 cohort the percentage was 2.3 in 1975, which rose and peaked at 2.7 percent in 1985 and then fell to 2.0 percent by 1995.

6. See Robinson (1994) for more details on changes in the education system in the UK.

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on in higher education post 'A' level age category illustrates the magnitude of the expansion of the education system: for men 15 percent stayed on in 1975, whilst by 1995 this more than doubled to 41 percent; for women the staying on rate also more than doubles, going from 14 percent in 1975 to 39 percent by 1995. And, at the same time, simultaneously combining work and study seems even more relevant for this older cohort in the 1990s.

The data described in Table I clearly demonstrate that large changes in the education system and in the youth labour market occurred between the 1970s and 1990s. There was a very large expansion of the higher education system, as is made evident by the sharp rise in staying on rates for both age cohorts.[7] At the same time the employment rates of teenagers fell very sharply, with about 1/4 (1/5) of male (female) 16/17 year olds and about 40 percent of male and female 18/19 year olds being employed in 1995. Also, despite the expansion of the education system, male unemployment rates (whilst displaying a cyclical evolution) were higher by 1995 than in the 1970s and male inactivity among the youth rose very sharply. On the whole, it seems that women did better than men, but that the youth labour market displayed a growing polarisation between the 1970s and 1990s, with far more individuals going on to higher education, but this trend was mirrored by a rise in non-employment (especially for men). These trends, and the gender differences they suggest, are important to bear in mind in the analysis that follows.

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7. The bulk of the increase took place after 1989 following the introduction of a new examination system (the General Certificate of Secondary Education or GCSE) that was first relevant to students sitting examinations in the Summer of 1989.

### III. Models of Economic and Social Outcomes at Age 16

**Data Description**

The National Child Development Survey (NCDS) is an ongoing survey of all persons born between 3 and 9 March 1958. To date, follow-up surveys of the participants have occurred in 1965 (NCDS1), 1969 (NCDS2), 1974 (NCDS3), 1981 (NCDS4) and 1991 (NCDS5). NCDS1 to NCDS3 include interviews with the parents of the children involved on a wide range of topics concerning the background, environment, health and education of the child. These are backed up by questionnaires given to the child's school and the child. NCDS4 and NCDS5 are based on detailed interviews with the subjects themselves (by then aged 23 or 33 respectively). For our purposes, the data is an extremely rich source that allows us to model youth labour market outcomes as a function of childrens' development through environmental, parental and individual specific factors.

**Modelling Approach**

We begin with modelling age 16 outcomes so as to try to isolate factors that are associated with being in a less advantaged position at that age.[8] We will then, in the Sections that follow, use these classifications to see the extent to which being in a disadvantaged position at age 16 is associated with various economic and social outcomes at later ages (age 23 and 33). These models build up in a sequential manner, and we implement our estimation procedure as essentially a block recursive system that builds up by age (i.e. identification comes from the aging of the cohort).

The general form of the initial econometric model we intend to estimate treats an

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8. The compulsory school leaving age in Britain is 15/16 depending on date of birth - given that they were all born in March 1958 it would be age 16 for the cohort we study.

outcome measure for youths as a function of various individual, parental and environmental factors. We consider three age 16 outcomes:

(i) School attendance in the Autumn (Fall) term of the last year of school (aged 15-16). This comes from school records and is defined as the proportion of possible half days attended by the cohort member = (number of possible half days attendances - number of half days absences) / number of possible half days attendances.

(ii) Contact with the police which comes from a question asking "Has the child ever been in contact with the police or probation office?".

(iii) Staying on at school after the compulsory school leaving age.[9]

The NCDS is an extremely useful data source for analysing the determinants of these outcomes because it contains very rich information on individuals as they grow up. We are able to specify a fairly rich set of independent variables that go back to the earlier years of an individual's life.

We choose to model outcomes (i)-(iii) as a function of the characteristics of individuals and their families at various points in time. As was noted above NCDS interviews took place at ages 0, 7, 11 and 16 so we prefer to split the cohort members' childhood development into an early and late stage. Given the survey construction we take the former to be age 7 or before and the latter to be between ages 7 and 16 (these can be loosely thought of as pre-school and during school timings).

In terms of our modelling strategy we then estimate our first stage econometric models

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9.     See also Micklewright (1989) for an analysis of staying on at 16 using the NCDS3 data.

for cohort member i of the form[10]:

$$Y_i^{\text{age}16} = \Gamma_1 X_i^{\text{pre}16} + \epsilon_1$$

where $Y^{\text{age}16}$ is the appropriate age 16 outcome under consideration and $X^{\text{pre}16}$ is a set of childhood factors as follows:

(a) age 7 individual-specific characteristics: ethnicity, age 7 cognitive skills measured by maths and reading test scores), indicators of illness[11] and behavioural problems[12] and whether the child was classified as an educational special needs child;

(b) parental educational status;

(c) the pre-7 and age 7-16 outcomes of interest. In our empirical models these are the following: whether the child was living in a lone mother family; whether the father figure was unemployed at the survey date; whether the family was in financial difficulties in the year prior to the survey date[13]; whether the child has ever been in care.

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10.     Notice that the 1 subscript attached to the parameter vector and the error term is there simply to denote that this is the first stage in our sequential modelling approach.

11.     The illness variables correspond to the age 15/16 school year and are included in the school attendance and staying on models to ensure that we are not classifying children as low school attendance individuals or poor school performers if they are ill.

12.     The behavioural problems variables are defined from the following eight "syndrome" scores given in NCDS: unforthcomingness, withdrawal, depression, anxiety, hostility towards adults, anxiety for acceptance by children, restlessness and "inconsequential" behaviour. They are entered into the empirical models as 0-1 dummies indicating positive scores on 1, 2/3 and 4 or more of the 8 measures (with no positive scores being the reference group).

13.     To be precise the age 11 and 16 questions on family financial difficulties related to the previous year but at age 7 it referred to the child's early years.

We prefer to think of the inclusion of the variables in (a) and (b) as fixing what we might call the 'initial conditions' (i.e. standardising the characteristics of individuals at an early age) so that we can then follow a sequential modelling approach as individuals grow older. Put alternatively, we are interested in the relationship between our age 16 outcomes and the variables in (c) above in models that hold constant these initial conditions.

**Descriptive Statistics**

Tables IIa and IIb reports some simple descriptive statistics on the age 16 outcomes. They are reported separately for male (in IIa) and female (in IIb) cohort members, as are all the empirical models that we present. Mean school attendance for males was .88 and for females was .87 in Autumn 1973 and there are clear differences for both sexes in terms of childhood characteristics: school attendance is lower for lower age 7 ability children, for children who have ever been in care, for those from families with less educated parents and from lone mother families or where fathers were unemployed at the survey date. It is also considerably lower for individuals whose family reported being in financial difficulties during the childhood years. The same pattern holds for females.

In terms of whether cohort members had ever been in contact with the police or probation service, the mean is (not surprisingly) higher for males than females and the qualitative pattern of differences across characteristics is broadly the inverse of the school attendance breakdown. Finally, the third outcome of interest, whether the cohort members stayed on at school, is the same on average for males and females and, for both sexes, the breakdown by characteristics is displays a similar qualitative pattern to the school attendance variables and the converse pattern to the police/probation contact variable. Staying on at school is higher for higher ability children, for children who have never been in care, for

children from more educated parents and where the family has not had financial difficulties or not suffered from father's unemployment or lone mother status.

**Econometric Estimates**

A number of the patterns in the raw data remain statistically significant in the econometric models reported in Table III (Table IIIa for males, Table IIIb for females) which reports Tobit models of school attendance (as there is upper censoring at complete school attendance equal to 1) and Probit models of whether the cohort member has been in contact with the police or whether they stayed on at school. For males the "good" outcomes, higher school attendance or staying on at school, are more likely for higher reading ability children (staying on is also higher for higher maths ability children). Better school performance (i.e. better attendance or staying on) at this stage is also more likely for those whose parents stayed on at school after age 15. They are also more likely for children living in families without financial difficulties (in early or late childhood) or who have never been in a lone mother family nor had an unemployed father. These last three variables are strongly related to one another and in the models we report the financial difficulties variable seems to dominate: leaving it out of the specification, however, produced much stronger effects of living in a lone mother family or having an unemployed father (and this was true in all the models of Table III). We take this strong inter-relation into account when we move on to characterise children into disadvantaged states below.

Turning to the "bad" outcome variable, whether the child had been in contact with the police or probation service, it is reassuring that the effects of the independent variables largely go in the opposite direction. Better reading ability (for males) and maths ability (for girls) is

associated with less police contact. Whether the child was in care during the childhood years has a very strong positive association with police contact as does whether the family was in financial difficulties during the child's years of growing up.

In Table IV we illustrate the relative magnitude of these effects by computing school attendance, police contact and staying on probabilities for a base group individual and then examining deviations from the base. These are of interest as they give some indication of the relative magnitude of the estimated effects. They also let us combine together the effects of more than one variable in our examination of the deviations from the base set of characteristics (as in the last 2 rows of the Table). The largest positive effect on school attendance comes from higher age 7 reading ability and on staying on rates from better reading and maths ability at age 7 for both males and females: for example, the second last row of the Table combines the two effects showing that being in the highest quintile of both raises staying on rates by a huge .406 higher than the base for males and .444 for females. On the down side the most negative effects on school attendance are from growing up in a family facing financial hardship and the same is true for staying on rates, along with a strong negative effect from low parental education. The last row of the Table highlights this pattern showing that school attendance is .099 and .136 points lower than the base and the staying on rate is .482 and .409 points lower than the base for males and females who grew up in low parental education families that faced financial difficulties during the childhood years. Finally, contact with the police or probation services is much higher for children who have ever been in care at .098 higher than the .024 base for males and .028 higher than the .006 base for females. Children growing up in low parental education families with financial difficulties during the childhood years are also much more likely to have contact with the police for both males and females (with positive deviations

of .134 and .042 for males and females respectively).

**Characterising Delinquency and Disadvantage**

For the remainder of the paper we require some measures of delinquency and disadvantage that we can use as independent variables in our models of success or failure at later ages. To ensure the analysis is manageable and to facilitate a clear interpretation of the reported effects we choose two sets of variables as measures. The first set are variables based on individual behavioural attributes that we stylise as juvenile delinquency and the second are measures based on family circumstances which we stylise as describing disadvantaged social backgrounds in the years of childhood.

We model juvenile delinquency in terms of school attendance and contact with the police. First, we define a variable for low school attendance which equals 1 if school attendance is less or equal to .75 (unless the child was ill where we do not code them as low attendance). Second, we consider the dummy variable indicating whether the individual has been in contact with the police. We use these two variables to characterise individuals who have delinquent tendencies at age 16.

We model childhood disadvantage on the basis of the ways in which the family based measures enter the age 16 equations discussed above. Four particular variables are considered:

(i) whether the cohort member was ever placed in care during his/her childhood;

(ii) whether the family was ever in financial difficulties;

(iii) whether the cohort member ever lived in a lone mother family;

(iv) whether the cohort member's father was unemployed at any of the age 7, 11 and 16 interview dates.

Because of the clear overlap between (ii), (iii) and (iv) in terms of their correlations

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with age 16 outcomes we enter the financial difficulties variable directly but then define two dummies for the lone mother and father unemployed variables conditional on not having financial difficulties. That is, the actual variables entered into the econometric models: are ever lived in a lone mother family but without facing financial difficulties; and, ever had an unemployed father without facing financial difficulties. This is because, as noted above, when they coincide the financial difficulties variable and the lone mother family and father unemployed variables tend to capture similar effects in the reported regressions. We define the variables in this particular way because the financial difficulties variable seems to dominate in the Table III models.

Of course, there are clear issues associated with characterising children and their families in this rather coarse way but, as we intend to examine a large number of outcomes at different ages, we require some parsimony in our approach. We have, however, estimated fuller specifications and it is reassuring that, for the most part, our classifications seem to parameterize the concepts of age 16 delinquency and disadvantage relatively well.

## IV. Models of Economic and Social Outcomes at Age 23

In this Section we treat a variety of age 23 outcomes as a function of our measures of juvenile delinquency and social disadvantage.[14] We begin by considering educational attainment and then go on to look at economic and social outcomes in models that do and do not condition on education. We choose to do the following as it is of interest whether or not

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14.     See also some early work using the NCDS up to age 23 by Elias and Blanchflower (1987) and the more recent study by Kiernan (1995). Blanchflower and Elias (1993) also examine some of the economic outcomes that we consider here in their work on NCDS twins.

any significant correlations are affected by netting out educational achievement.

**Age 23 Educational Attainment**

Table V breaks down age 23 educational attainment by the juvenile delinquency and social disadvantage variables. Educational attainment is measured by a nine fold ordered ranking of educational qualifications ranging from no educational qualifications to a degree or higher (see the notes to the Table for the precise definition). The Table makes it very clear that, in the raw data, our groups of interest do much worse in terms of educational attainment. For example, in the full sample 26 percent of males have no educational qualifications, whilst the same is true of 61 percent of males with low school attendance and 48 percent of males who had been in contact with the police or probation services in their adolescent years. Young men with no educational qualifications are also over-represented in the disadvantaged family groups, with the percentages for men being 52 percent of those who has ever been in care and 46 percent of those from poor families. Things are better in the lone parent/father unemployed cases in the absence of family financial difficulties where the percentages are 25 and 27 percent respectively. For females the contrast is equally stark with delinquent/disadvantaged females having a much higher probability of having no educational qualifications.

The picture is equally bleak for higher levels of educational attainment. At the upper end of the educational spectrum about 11 and 9 percent of men and women have a degree or higher qualification. Hardly any of the low school attendance individuals possess a degree and, with the exception of the lone parent (no financial difficulties) group the percentages with a degree are much lower for the delinquency/disadvantage groups.

We can now move to stage 2 in our modelling procedure. If we define the delinquency measures as $DELINQ_i$ and the family disadvantage measures as $DISADV_i$ this involves

estimating educational attainment equations of the form:

$$ED_i^{age23} = \alpha_2 + \beta_2 DELINQ_i + \psi_2 DISADV_i + \Gamma_2 X_i^{pre16} + \epsilon_2$$

where $ED^{age23}$ is the age 23 educational attainment variable (and the 2 subscripts denote that we are now at stage 2 in our sequential modelling procedure).

Table VI reports Ordered Probit estimates of educational attainment equations. The Table reports six specifications, comprising three each for males and females, which differ in which of the DELINQ, DISADV and $X^{pre16}$ variables are included. We basically build the specifications up, first looking at the correlation between $ED^{age23}$ and the DISADV variables (i.e. setting $\beta_2 = \Gamma_2 = 0$), then entering the $X^{pre16}$ variables and finally including the DELINQ variables.

It is clear from the Table that the main thrust of the results holds for both groups as the estimated specifications are qualitatively very similar for males and females and there is a strong linkage between worse educational achievement and delinquency or disadvantage amongst this cohort of British young adults. Even after conditioning on the pre-16 variables[15] there remains a strongly negative association between age 23 educational attainment and age 16 juvenile delinquency or social disadvantage for males and females.

The bottom eight rows of the Table convert the Ordered Probit coefficient estimates on

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15.     Of the pre-16 variables it is very clear that (in results nor reported here, but available on request) doing better in tests administered to NCDS children at age 7 leads to higher educational attainment as being in a higher quintile of the age 7 maths and/or reading score distributions strongly raise the probability of having a higher educational qualification by 23. There is also a strong relationship between educational attainment and whether one's parents left school at the compulsory school leaving age. The estimated coefficients on dummy variables for whether an individual's father or mother left school at age 15 or less are significantly negative in all cases.

the key dummy variables of interest into marginal effects. These are defined as

$\Pr[\text{Educ}=j|D=1]$ - $\Pr[\text{Educ}=j|D=0]$ = $\Phi(X\theta+\tau_j + \Theta)$ - $\Phi(X\theta + \tau_j)$ for the ordered educational variable Educ which is modelled as a function of a set of control variables X with associated coefficients $\theta$, a threshold parameter $\tau_j$ and a dummy independent variable D with an estimated coefficient $\Theta$ ($\Phi(.)$ is the standard normal distribution function and we evaluate it at the sample means of the X variables). This can be interpreted as the *ceteris paribus* impact of D on the probability of being in a given educational qualification category.

The reported marginal effects are sizable. Males with low school attendance or who had been in contact with police/probation are 11 and 8 percentage points less likely to be in the higher academic category and 17 and 10 percentage points more likely to have no educational qualifications as compared to the other NCDS cohort members (for females comparable marginal effects are 8 and 4 for degrees or higher and 23 and 9 for no qualifications).

Growing up in a socially disadvantaged background characterised by ever being placed in care renders males 6 percentage points less likely to have a degree and 6 percentage points more likely to have no educational qualifications (from the fullest specifications). For females comparable figures are -3 and 6 percentage points. Finally, being in a family facing financial difficulties during the childhood years has a strong effect, even when all the other delinquency/disadvantage variables and the $X^{pre16}$ variables are included. The marginal effects here correspond to a 7 (5) percentage point lower probability of being in the top educational group and a 7 (10) percentage point increased chance of being in the bottom group for males (females).

Despite the coarseness of our measures of disadvantage these results are striking.

Educational attainment by age 23 is very strongly hampered by child development factors and children growing up in relatively disadvantaged situations have strikingly worse levels of educational attainment. As such, education must play a potentially important role as an intermediating factor, or transmission mechanism, that may underpin any association with economic success or failure. We now consider this explicitly in models of age 23 economic and social outcomes.

**Age 23 Economic and Social Outcomes**

For male NCDS cohort members we consider four economic and social outcomes at age 23:

(a) ln(hourly wages) if in employment in 1981;

(b) unemployment time since age 16, defined by a count of the number of months spent unemployed;

(c) the probability of being in employment in 1981;

(d) whether an individual has ever had a spell of prison or borstal (since age 16).

For female NCDS cohort members we consider four outcomes, the first three being the (a) to (c) wage, unemployment time and employment outcomes plus a further outcome:

(e) whether a female cohort member was a lone parent by age 23.

The variables in (a) to (e) enable us to consider a relatively wide range of outcomes (from higher wages through to prison attendance for males and through to lone parenthood for females) in our search for factors that shape relative success or failure in the early years of adulthood.

Table VII reports descriptive statistics for the economic and social outcomes for all NCDS cohort members and broken down by the delinquency and disadvantage variables. In

these raw data descriptions hourly wages and the probability of being employed are lower than average in almost all cases. On the other hand, time spent unemployed since age 16 and the probability of having had a prison/borstal spell (for males) or being a lone parent (for females) are higher in almost all cases. There is some variation across the different groups with low school attendance being strongly associated with lower wages and employment and higher unemployment. Also, ever being placed in care during the childhood years and being in contact with the police/probation between ages 10 and 16 are associated with much higher incidence of prison/borstal spells for men.

Again following our modelling strategy of building up progressively more detailed models as the individuals age the age 23 models we estimate are of the following form:

$$Y_i^{age23} = \alpha_3 + \beta_3 DELINQ_i + \psi_3 DISADV_i + \Gamma_3 X_i^{pre16} + \Omega_3 ED_i^{age23} + \epsilon_3$$

where $Y^{age23}$ denotes the relevant age 23 economic or social outcome variable.

Tables VIIIa and VIIIb report models of the determinants of age 23 outcomes. For each outcome four specifications are reported, the first three being the same as the education models in Table VI, plus a further specification that enters age 23 educational attainment. In some sense this is a key distinction as we are interested in models that set either set $\Omega_3 = 0$ or estimate $\Omega_3$ along with the other parameters of the model. The reason for doing this is we are interested in the role that educational attainment may play as a transmission mechanism and some information on this can be gleaned from considering models which do and do not condition on educational attainment.

Table VIIIa reports least squares estimates of wage equations, Tobit estimates of the

determinants of unemployment time (as there is censoring at 0) and Probit models of employment and prison/borstal status for male cohort members. The overall picture that emerges is one which shows a marked relationship between delinquency/disadvantage and economic and social outcomes. What is also clear is that educational attainment acts as an important transmission mechanism as an important part of the association is usually wiped out by including the edcuation variable (compare the third and fourth column coefficients and witness the absolute fall in the size of the estimated effects). Nevertheless, some important associations with the delinquency/disadvantage results remain intact (and significant in most cases). The main exception to this is the wage results but we would argue that looking at wages at age 23 is probably too early in the life cycle to identify any important effects - this is borne out when we consider the age 33 results below. For females, all four outcomes are significantly worse for most of the delinquency/disadvantage variables (except for the lone parent and father unemployed variables, whose effects are more mixed), and remain so (albeit smaller) once one controls for education.

Looking in a little more detail, the quantitatively most important effects in the models that control for educational attainment are the following: poor school attendance is associated with about 5 months more of unemployment between ages 16 and 23 for both men and women; individuals growing up in a family facing financial difficulties have about 5 months (males) and 3 months (females) higher unemployment and joblessness rates about 6 percent higher for both sexes; being in contact with the police or probation services results in much lower employment probabilities (5 percent for men, 13 percent for women) and significantly higher probabilities of a prison/borstal spell for men (the marginal effect is .016) and lone parenthood for women (marginal effect = .045).

It is also interesting that the Tables show that conditioning on education reduces the estimated coefficients by somewhere up to 50 percent (the 'typical' reduction is probably by about 1/3). As these estimated models include the early age 'ability' related measures (what we earlier called the 'initial conditions' variables) this reflects that education is indeed an important transmission mechanism that underpins the relationship between disadvantage and inferior economic and social outcomes.

Whilst we have only summarised some of the key results here all in all we feel they display strong evidence that childhood factors linked to delinquency or social disadvantage factors have important linkages with age 23 economic and social outcomes. Even after netting out a variety of pre-labour market factors and educational attainment the less advantaged individuals in the NCDS cohort are much less likely to be employed, to have experienced longer unemployment spells and experienced detrimental social experiences. In this sense we view our measures of social disadvantage as important, albeit noisy, characterisations of the "at risk" population of the worst performers in the early years of adulthood. In the next Section we examine whether the economic effects of such disadvantages persist to age 33.


**V. Models of Economic and Social Outcomes at Age 33**

**Age 33 Economic and Social Outcomes**

The most up-to-date Wave of the NCDS that we can currently access is the age 33 survey that was carried out in 1991. In this Section of the paper we consider wage and employment outcomes at age 33 and relate them to our measures of delinquency and disadvantage in the same kind of approach as above where we build up progressively more detailed models which net out factors from earlier ages. The second issue on which we focus

is the difficult question of whether there is potential for a "late developer" effect. We operationalise this by asking whether there exist wage returns from late educational upgrading and, perhaps more importantly, whether they differ for our measures of social disadvantage. A third issue we consider is the possibility of a cross-generational effect as we look at the potential for intergenerational spillovers onto the early age cognitive skills of cohort members' children.

Table IX reports a set of descriptive statistics for the pay and employment of NCDS cohort members at age 33 in 1991. The structure of the Table is the same as for the earlier 1981 data. Hourly wages and employment rates are clearly lower for the first four measures (low school attendance, police/probation, ever in care, ever in financial difficulties) though there is less difference for the family structure (in the absence of financial difficulties) variables.

Continuing with the same kind of modelling approach that we have adopted thus far in the paper our fourth stage of multivariate models take the form:

$$Y_i^{age33} = \alpha_4 + \beta_4 DELINQ_i + \psi_3 DISADV_i + \Gamma_4 X_i^{pre16} + \Omega_4 ED_i^{age23} + \epsilon_4$$

where $Y^{age33}$ denotes the relevant age 33 outcomes (wages and employment).

Tables Xa and Xb reports least squares estimates of wage equations and Probit models of employment for males (Xa) and females (Xb) in 1991. The structure of each Table is the same as for the age 23 models reported in Tables XIIIa and XIIIb above. The estimated models make it clear that the effects of childhood disadvantage do not die out by age 33. This is especially the case for men where there are negative wage effects, after controlling for

education, from low school attendance, growing up in a family facing financial difficulties or in a lone parent family. Male employment rates are significantly lower for low school attendance and ever being in care. For females, significant associations are less common but there do seem to be significant negative wage effects for the financial difficulties variable. There is much less of an effect on female employment rates at age 33. The male/female comparisons are interesting as it is clear that, between age 23 and 33, the position of disadvantaged females did not worsen and some of the earlier effects were ameliorated. These gender based differences after age 23, with disadvantaged men doing worse than women in terms of economic success, seem to be in line with recent labour market trends for younger age cohorts of men and women in Britain (as discussed in Section II above).

**Late Developers and the Potential to Catch Up**

We now go on to see if there exists any potential for catch up or late development for individuals who look relatively unsuccessful in the early years of adult life (i.e. as characterised by our relative disadvantage measures). We consider one possible route through which this might happen, namely educational upgrading. We defined a variable *Upgrade* equal to 1 if individuals improved their educational qualifications between 1981 and 1991 and entered this into equations modelling wage growth between the ages of 23 and 33.[16] Basic regressions show clear evidence of wage gains associated with educational upgrading for both men and

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16.     Upgrading one's educational qualifications is significantly more likely for individuals with higher age 7 maths and reading scores and for those with parents with lower educational attainment. It is not significantly related to the measures of delinquency/disadvantage.

women, with slightly larger gains for women:

$$\textit{Males}: \qquad \ln(\textit{Wage}^{\,age33}) \; - \; \ln(\textit{Wage}^{\,age23}) \; = \; \frac{.122}{(.025)} \; \textit{Upgrade}$$

$$\textit{Females}: \qquad \ln(\textit{Wage}^{\,age33}) \; - \; \ln(\textit{Wage}^{\,age23}) \; = \; \frac{.171}{(.033)} \; \textit{Upgrade}$$

Notes: Least squares estimates; standard errors in parentheses.

This pattern of results remains robust to the inclusion of the 1981 wage and a variable *Outtime* measuring the number of months spent out of the labour force between ages 23 and 33 (which, especially in the case of women of this age group, is an important variable to control for in wage change equations):

$$\textit{Males}: \ln(\textit{Wage}^{\,age33}) \; - \; \ln(\textit{Wage}^{\,age23}) \; = \; \frac{.120}{(.025)} \; \textit{Upgrade}$$

$$- \; \frac{.628}{(.027)} \ln(\textit{Wage}^{\,age23}) \; - \; \frac{.677}{(.071)} \textit{Outtime}$$

$$\textit{Females}: \ln(\textit{Wage}^{\,age33}) \; - \; \ln(\textit{Wage}^{\,age23}) \; = \; \frac{.139}{(.027)} \; \textit{Upgrade}$$

$$- \; \frac{.487}{(.024)} \ln(\textit{Wage}^{\,age23}) \; - \; \frac{.874}{(.050)} \textit{Outtime}$$

Next we consider whether the potential returns to upgrading one's education differ for individuals who we characterise as childhood delinquents or from disadvantaged backgrounds. To do this we estimate wage growth models including interactions between *Upgrade* and the delinquency and disadvantage measures considered above. This produced the following estimates:

$$Males: \ln(Wage^{age33}) - \ln(Wage^{age23}) = \frac{.145}{(.026)} \, Upgrade$$

$$- \; .\frac{134}{(.086)} \, Upgrade*Low \; School \; Attendance \; - \; .\frac{040}{(.112)} \, Upgrade*Ever \; in \; Care$$

$$- \; \frac{.038}{(.097)} \, Upgrade*Contact \; with \; Police/Probation$$

$$- \; \frac{.102}{(.064)} \, Upgrade*Ever \; in \; Financial \; Difficulties$$

$$- \; \frac{.025}{(.097)} \, Upgrade*Ever \; in \; Lone \; Mother \; Family \; (No \; Fin. \; Diff.)$$

$$+ \; \frac{.050}{(.150)} \, Upgrade*FatherEver \; Unemployed \; (No \; Fin. \; Diff.)$$

$$- \; \frac{.629}{(.023)} \, \ln(Wage^{age23}) \; - \; \frac{.677}{(.069)} \, Outtime$$

$$Females: \ln(Wage^{age33}) - \ln(Wage^{age23}) = \frac{.152}{(.035)} \, Upgrade$$

$$+ \; .\frac{002}{(.122)} \, Upgrade*Low \; School \; Attendance \; + \; .\frac{030}{(.236)} \, Upgrade*Ever \; in \; Care$$

$$- \; \frac{.145}{(.268)} \, Upgrade*Contact \; with \; Police/Probation$$

$$- \; \frac{.103}{(.093)} \, Upgrade*Ever \; in \; Financial \; Difficulties$$

$$+ \; \frac{.068}{(.111)} \, Upgrade*Ever \; in \; Lone \; Mother \; Family \; (No \; Fin. \; Diff.)$$

$$- \; \frac{.171}{(.150)} \, Upgrade*FatherEver \; Unemployed \; (No \; Fin. \; Diff.)$$

$$- \; \frac{.488}{(.025)} \, \ln(Wage^{age23}) \; - \; \frac{.873}{(.051)} Outtime$$

As these are wage change equations then the delinquency/disadvantage variables cannot be entered in levels (as they would be differenced out) but their interactions with *Upgrade* can be considered. The results that emerge show that, if anything, men with low school attendance in their last year or who were in low income families benefit less from educational upgrading. For women, the picture is less depressing as all interaction terms are insignificant suggesting no difference in the potential to achieve wage gains from increasing levels of education at a later age. This gender difference is clearly in line with the background trends we presented in Section II with women doing better than men in the 1980s and early 1990s.

**Children of NCDS Cohort Members in 1991**

As the NCDS cohort members are old enough to have their own children, the survey coordinators have now incorporated information on cohort members' children in the survey. The NCDS contains data on test score outcomes from a battery of tests administered to the cohort members' children. This data permits to introduce an intergenerational aspect to our study and to ask the very important question of whether social disadvantage faced by the NCDS cohort member in their childhood years has any clear relationship with their own children's cognitive abilities.

Table XI reports information on two tests administered to the cohort members' children for children aged between 6 and 9. The tests are the well-known Peabody Individual Achievement Tests (for maths and reading recognition) and are standardised for age differences (see Social Statistics Research Unit, undated, for more details). Children have been classified into percentiles of the test scores distribution and we report the mean percentile broken down by parents' social disadvantage in the Table. A clear and strong pattern emerges. For maths

and reading tests children for whom one of their parents faced social disadvantages in their own childhood have lower percentile rankings.

Table XII reports regressions that include the social disadvantage measures and also consider the intergenerational correlations of test scores.[17] Two specifications are reported for the maths and reading tests and these differ in whether or not they include the parental test score quintile dummy variables. The results show a strong negative relationship between the cognitive skills of cohort members' childrens and whether (one of) their parents faced social disadvantages whilst growing up. In almost all cases the effects are large and show that test scores are somewhere between 5 and 10 percentile points lower for each of the parental disadvantage measures. The results also show an important intergenerational correlation of test scores (especially for reading) and, whilst boys do better in the maths test, girls seem to outperform boys on the reading test.

These results demonstrate a further effect of social disadvantage when growing up, namely the existence of an intergenerational spillover. The children of parents who grew up in socially disadvantaged situations are more likely to have lower scores in tests administered to them at an early age. As early age maths and reading ability are important determinants of economic and social success or failure as an adult this suggests that the effects of childhood disadvantage persist over generations.

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17.　　　Notice that the tests are not identical for cohort members and their children. As noted above the childrens' tests are Peabody Individual Achievement Tests and the tests administered to NCDS cohort members at age 7 were the Southgate Group reading test and a problem arithmetic test. For more work on intergenerational mobility in terms of the earnings and education of NCDS cohort members and their parents see Dearden, Machin and Reed (1997).

## VI.  Concluding Remarks

The basic message of this study is clear.  Economic and social disadvantages faced during childhood display a persistent association with the subsequent economic success of British individuals.  We use unique longitudinal data from a cohort of all individuals born in a week of March 1958 to examine models of relative success or failure in the early years of adulthood. Our results suggest that individual and family characteristics, especially those associated with adverse economic and social child development, display an important association with subsequent success or failure in the labour market.  In particular children who we characterise as juvenile delinquents or from socially disadvantaged backgrounds fare badly in terms of employment and unemployment and their social disadvantages persist and still have a strong effect even at age 33.[18]  An important transmission mechanism that underpins these links is educational attainment which is vastly inferior for those we classify in the delinquent/disadvantaged groups. However, over and above this, factors such as poor school attendance and growing up in a family in financial distress matter (and in our work matter more than lone parenthood which seems to be dominated by such family poverty measures). Furthermore, the children of parents who grew up in a socially disadvantaged situation during their own childhood have lower early age cognitive abilities suggesting a potentially important cross-generational link that may well spill over onto the subsequent economic fortunes of children of disadvantaged individuals.

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18.     For related work on an earlier cohort of British individuals born in 1946 see Kuh and Wadsworth (1991).  They report that the earnings of men aged 36 were substantially affected by early life factors after controlling for education, social class and early age abilities.  In their study very few men from disadvantaged backgrounds achieved success in terms of reaching the upper third of the earnings distribution and the impact of early life factors seemed to persist into the mid-life years.

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## Table I:  Labour Force Status and Staying on in Education for British Youths, 1975-95

| 1st year post 'O' level - 16/17 year olds | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Males | | | | | Females | | | | |
| | | | | Student | | | | | Student | |
| | Employed | Unemployed | Inactive | Out of Work | Working | Employed | Unemployed | Inactive | Out of Work | Working |
| 1975 | 60.5 | 4.8 | 0.4 | 34.2 | ** | 52.7 | 5.4 | 3.3 | 38.5 | ** |
| 1977 | 55.8 | 6.4 | 0.7 | 37.1 | ** | 46.0 | 6.5 | 2.7 | 44.9 | ** |
| 1979 | 58.0 | 5.5 | 1.0 | 35.6 | ** | 50.7 | 5.0 | 2.9 | 41.4 | ** |
| 1981 | 50.5 | 15.4 | 1.9 | 32.2 | ** | 47.1 | 13.5 | 4.4 | 35.0 | ** |
| 1983 | 48.2 | 13.2 | 2.6 | 36.0 | ** | 40.6 | 8.2 | 3.6 | 47.6 | ** |
| 1984 | 47.6 | 10.8 | 2.5 | 39.1 | ** | 40.4 | 8.7 | 3.4 | 47.6 | ** |
| 1985 | 48.9 | 8.6 | 2.9 | 30.4 | 9.4 | 40.1 | 7.0 | 5.2 | 30.4 | 17.3 |
| 1986 | 47.8 | 8.6 | 2.7 | 29.8 | 11.2 | 38.3 | 7.9 | 6.8 | 29.4 | 17.6 |
| 1987 | 46.1 | 9.2 | 3.0 | 29.4 | 12.2 | 40.5 | 6.3 | 5.0 | 30.2 | 18.0 |
| 1988 | 48.6 | 7.8 | 2.9 | 26.5 | 14.2 | 40.6 | 6.1 | 4.8 | 27.5 | 21.0 |
| 1989 | 51.2 | 5.1 | 3.1 | 26.5 | 14.2 | 37.8 | 5.3 | 4.5 | 30.6 | 21.8 |
| 1990 | 45.5 | 6.5 | 2.5 | 28.4 | 17.1 | 34.5 | 3.5 | 4.3 | 32.0 | 25.7 |
| 1991 | 40.3 | 7.4 | 2.6 | 31.6 | 18.2 | 29.8 | 5.8 | 3.4 | 34.5 | 26.5 |
| 1992 | 30.5 | 7.4 | 3.7 | 37.0 | 21.4 | 24.0 | 4.9 | 5.1 | 39.2 | 26.9 |
| 1993 | 30.1 | 5.5 | 4.2 | 44.2 | 16.0 | 19.1 | 5.2 | 4.0 | 45.8 | 26.0 |
| 1994 | 24.7 | 6.1 | 3.0 | 43.3 | 22.9 | 21.3 | 4.3 | 4.3 | 43.6 | 26.5 |
| 1995 | 26.0 | 6.3 | 2.6 | 43.2 | 22.0 | 21.0 | 3.6 | 4.4 | 39.8 | 31.2 |

| 1st year post 'A' level - 18/19 year olds | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Males | | | | | Females | | | | |
| | | | | Student | | | | | Student | |
| | Employed | Unemployed | Inactive | Not Working | Working | Employed | Unemployed | Inactive | Not Working | Working |
| 1975 | 76.8 | 7.0 | 0.7 | 15.4 | ** | 69.1 | 6.1 | 11.3 | 13.6 | ** |
| 1977 | 78.0 | 7.1 | 1.5 | 13.4 | ** | 70.6 | 6.7 | 10.2 | 12.5 | ** |
| 1979 | 79.7 | 5.3 | 1.3 | 13.7 | ** | 72.7 | 5.9 | 10.9 | 10.5 | ** |
| 1981 | 69.2 | 16.9 | 2.6 | 11.3 | ** | 65.2 | 12.2 | 11.4 | 11.4 | ** |
| 1983 | 61.7 | 20.6 | 3.8 | 13.9 | ** | 60.8 | 14.9 | 11.0 | 13.3 | ** |
| 1984 | 61.2 | 22.3 | 4.2 | 12.3 | ** | 55.2 | 17.0 | 15.3 | 12.6 | ** |
| 1985 | 63.9 | 17.3 | 5.7 | 10.7 | 2.4 | 60.0 | 14.2 | 13.7 | 9.2 | 2.9 |
| 1986 | 63.1 | 18.0 | 6.2 | 10.5 | 2.1 | 59.8 | 13.2 | 14.3 | 9.4 | 3.2 |
| 1987 | 63.6 | 17.5 | 5.5 | 10.3 | 3.1 | 64.5 | 11.4 | 10.0 | 9.4 | 4.6 |
| 1988 | 66.6 | 14.4 | 5.4 | 10.1 | 3.5 | 63.0 | 9.4 | 13.5 | 9.9 | 4.3 |
| 1989 | 68.9 | 11.0 | 5.5 | 10.6 | 4.1 | 64.5 | 8.6 | 12.8 | 9.6 | 4.5 |
| 1990 | 67.3 | 9.9 | 5.8 | 12.0 | 5.0 | 61.2 | 8.1 | 13.0 | 10.9 | 6.7 |
| 1991 | 57.8 | 15.1 | 5.0 | 15.1 | 7.0 | 59.7 | 8.8 | 13.2 | 11.3 | 7.0 |
| 1992 | 51.0 | 13.5 | 6.5 | 21.6 | 7.4 | 49.2 | 8.7 | 13.0 | 20.2 | 9.0 |
| 1993 | 45.6 | 15.7 | 5.8 | 24.9 | 8.0 | 42.3 | 9.1 | 12.8 | 26.1 | 9.6 |
| 1994 | 43.9 | 12.9 | 5.8 | 27.0 | 10.3 | 39.7 | 7.2 | 12.8 | 27.3 | 12.9 |
| 1995 | 42.8 | 10.7 | 5.2 | 28.9 | 12.5 | 41.9 | 6.6 | 12.2 | 26.0 | 13.3 |

Notes:
1. ** denotes data not available.

**Table IIa: Age 16 Outcomes and Child and Family Characteristics - Males**

| | Males | | | | | |
|---|---|---|---|---|---|---|
| | School Attend-ance | Sample Size | Contact With Police/ Probation | Sample Size | Stay on at School | Sample Size |
| All Individuals | .883 | 6381 | .108 | 5995 | .289 | 6267 |
| White | .895 | 4759 | .100 | 4708 | .303 | 4449 |
| Non-White | .891 | 203 | .130 | 200 | .355 | 141 |
| Bottom Quintile of Age 7 Reading Test | .829 | 1288 | .171 | 1209 | .080 | 1248 |
| Top Quintile of Age 7 Reading Test | .926 | 944 | .081 | 896 | .567 | 928 |
| Bottom Quintile of Age 7 Maths Test | .855 | 1027 | .139 | 944 | .117 | 987 |
| Top Quintile of Age 7 Maths Test | .916 | 1223 | .082 | 1129 | .476 | 1236 |
| Ever in Care | .841 | 277 | .388 | 304 | .123 | 244 |
| Never in Care | .886 | 5960 | .093 | 5688 | .295 | 5884 |
| Father Left School Aged 15 or Less | .876 | 3739 | .121 | 4455 | .207 | 3522 |
| Father Left School After Age 15 | .937 | 1047 | .052 | 1233 | .600 | 987 |
| Mother Left School Aged 15 or Less | .876 | 3860 | .121 | 4615 | .207 | 3615 |
| Mother Left School After Age 15 | .934 | 1054 | .056 | 1238 | .597 | 994 |
| Ever in Lone Mother Family | .847 | 731 | .181 | 747 | .202 | 636 |
| Never in Lone Mother Family | .888 | 5514 | .097 | 5248 | .298 | 5497 |
| Father Ever Unemployed | .812 | 492 | .203 | 528 | .152 | 447 |
| Father Never Unemployed | .890 | 5753 | .096 | 5467 | .299 | 5686 |
| Family Ever in Financial Difficulties | .817 | 1111 | .204 | 1151 | .126 | 982 |
| Family Never in Financial Difficulties | .898 | 5080 | .084 | 4826 | .320 | 5101 |

Notes:
1. Source:  National Child Development Survey Waves 1, 2 and 3 (at ages 7, 11 and 16).  Ever/Never refers to any of age 7, 11 or 16.

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**Table IIb: Age 16 Outcomes and Child and Family Characteristics - Females**

| | Females | | | | | |
|---|---|---|---|---|---|---|
| | School Attend-ance | Sample Size | Contact With Police/ Probation | Sample Size | Stay on at School | Sample Size |
| All Individuals | .866 | 6135 | .038 | 5696 | .289 | 6270 |
| White | .880 | 4622 | .037 | 4702 | .299 | 4436 |
| Non-White | .879 | 174 | .027 | 152 | .364 | 121 |
| Bottom Quintile of Age 7 Reading Test | .792 | 818 | .062 | 747 | .081 | 790 |
| Top Quintile of Age 7 Reading Test | .910 | 1300 | .029 | 1229 | .496 | 1386 |
| Bottom Quintile of Age 7 Maths Test | .824 | 1134 | .059 | 1041 | .122 | 1103 |
| Top Quintile of Age 7 Maths Test | .899 | 970 | .032 | 913 | .480 | 1056 |
| Ever in Care | .813 | 228 | .664 | 231 | .175 | 223 |
| Never in Care | .869 | 5968 | .032 | 5459 | .292 | 5910 |
| Father Left School Aged 15 or Less | .862 | 3626 | .043 | 4224 | .207 | 3522 |
| Father Left School After Age 15 | .927 | 1003 | .013 | 1180 | .565 | 982 |
| Mother Left School Aged 15 or Less | .859 | 3721 | .042 | 4340 | .215 | 3584 |
| Mother Left School After Age 15 | .928 | 1054 | .022 | 1239 | .563 | 1024 |
| Ever in Lone Mother Family | .815 | 725 | .064 | 747 | .186 | 683 |
| Never in Lone Mother Family | .895 | 5282 | .034 | 4949 | .300 | 5461 |
| Father Ever Unemployed | .787 | 499 | .063 | 506 | .141 | 466 |
| Father Never Unemployed | .874 | 5508 | .035 | 5790 | .300 | 5678 |
| Family Ever in Financial Difficulties | .780 | 1109 | .074 | 1100 | .128 | 1057 |
| Family Never in Financial Difficulties | .887 | 4867 | .029 | 4583 | .321 | 5050 |

Notes:
1. Source:  National Child Development Survey Waves 1, 2 and 3 (at ages 7, 11 and 16).  Ever/Never refers to any of age 7, 11 or 16.

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| | School Attendance (Tobit) | Contact With Police/Probation (Probit) | Stay on at School (Probit) |
|---|---|---|---|
| Constant | .995 (.010) | -1.981 (.113) | .022 (.097) |
| **Individual Characteristics** | | | |
| Non-White | -.003 (.012) | .029 (.127) | .129 (.126) |
| 2nd Lowest Quintile of Maths Test Scores (age 7) | -.000 (.007) | .102 (.078) | -.036 (.077) |
| Middle Quintile of Maths Test Scores (age 7) | -.015 (.008) | .160 (.082) | .129 (.075) |
| 2nd Highest Quintile of Maths Test Scores (age 7) | -.010 (.008) | .165 (.085) | .186 (.076) |
| Highest Quintile of Maths Test Scores (age 7) | -.008 (.008) | .249 (.091) | .315 (.076) |
| 2nd Lowest Quintile of Reading Test Scores (age 7) | .025 (.007) | -.073 (.071) | .174 (.074) |
| Middle Quintile of Reading Test Scores (age 7) | .047 (.007) | -.156 (.079) | .448 (.074) |
| 2nd Highest Quintile of Reading Test Scores (age 7) | .069 (.008) | -.206 (.086) | .748 (.075) |
| Behavioural Response 1 | -.015 (.006) | .043 (.074) | -.105 (.054) |
| Behavioural Response 2/3 | -.022 (.006) | .234 (.066) | -.207 (.053) |
| Behavioural Response 4 | -.025 (.007) | .435 (.072) | -.324 (.068) |
| Ever Educational Special Needs | .015 (.011) | -.077 (.110) | -.269 (.129) |
| Ever Sick in Last School Year - Minor Ailments | -.095 (.005) | | -.351 (.052) |
| Ever Sick in Last School Year - More Serious Ailments | -.124 (.008) | | -.303 (.082) |
| Highest Quintile of Reading Test Scores (age 7) | .068 (.008) | -.384 (.097) | 1.035 (.078) |
| **Family Structure and Parent Characteristics** | | | |
| Ever in Care | -.004 (.011) | .814 (.084) | -.276 (.122) |
| Father Left School Aged 15 or Less | -.036 (.007) | .257 (.074) | -.612 (.055) |
| Mother Left School Aged 15 or Less | -.023 (.007) | .191 (.072) | -.633 (.055) |
| Lone Mother Family at Child age 7 | -.011 (.012) | .050 (.122) | -.097 (.127) |
| Lone Mother Family at Child age 11 or 16 | -.016 (.008) | .120 (.074) | .010 (.078) |
| Father Unemployed at Child age 7 | -.043 (.015) | .035 (.140) | -.210 (.196) |
| Father Unemployed at Child age 11 or 16 | -.026 (.009) | .057 (.083) | -.078 (.096) |
| Family in Financial Difficulties at Child age 7 | -.039 (.010) | .279 (.089) | -.474 (.122) |
| Family in Financial Difficulties at Child age 11 or 16 | -.042 (.007) | .254 (.062) | -.232 (.071) |
| Proportion Censored (Tobit) / Mean Proportion (Probit) | .161 | .108 | .289 |
| Log-Likelihood | 1264.17 | -1845.58 | -2974.84 |
| Sample Size | 6381 | 5995 | 6267 |

Notes: Standard errors in parentheses. The behavioural response variables are based on eight sets of teacher reported answers to questions about interactions between the cohort member and adults and other children (see footnote 11 in the main body of the paper). Scores 1, 2/3 and 4 denote a score for 1 set, 2 to 3 and 4 or more of the 8 scores indicating behavioural difficulties.

**Table IIIb: Estimates of the Determinants of Age 16 Outcomes - Females**

| | School Attendance (Tobit) | Contact With Police/Probation (Probit) | Stay on at School (Probit) |
|---|---|---|---|
| Constant | .978 (.011) | -2.532 (.166) | -.140 (.101) |
| **Individual Characteristics** | | | |
| Non-White | .020 (.014) | -.338 (.242) | .288 (.130) |
| 2nd Lowest Quintile of Maths Test Scores (age 7) | .013 (.007) | -.178 (.108) | .137 (.071) |
| Middle Quintile of Maths Test Scores (age 7) | -.003 (.008) | -.109 (.109) | .311 (.070) |
| 2nd Highest Quintile of Maths Test Scores (age 7) | -.003 (.008) | -.263 (.124) | .312 (.071) |
| Highest Quintile of Maths Test Scores (age 7) | .004 (.009) | -.057 (.124) | .530 (.073) |
| 2nd Lowest Quintile of Reading Test Scores (age 7) | .026 (.008) | .027 (.119) | .100 (.088) |
| Middle Quintile of Reading Test Scores (age 7) | .043 (.009) | .085 (.126) | .318 (.086) |
| 2nd Highest Quintile of Reading Test Scores (age 7) | .057 (.009) | .112 (.128) | .544 (.085) |
| Highest Quintile of Reading Test Scores (age 7) | .070 (.009) | .188 (.134) | .826 (.086) |
| Behavioural Response 1 | -.009 (.006) | .335 (.091) | -.124 (.049) |
| Behavioural Response 2/3 | -.023 (.007) | .371 (.097) | -.140 (.059) |
| Behavioural Response 4 | -.017 (.008) | .460 (.115) | -.357 (.085) |
| Ever Educational Special Needs | -.024 (.015) | .324 (.160) | .196 (.156) |
| Ever Sick in Last School Year - Minor Ailments | -.098 (.005) | | -.363 (.047) |
| Ever Sick in Last School Year - More Serious Ailments | -.132 (.008) | | -.435 (.074) |
| **Family Structure and Parent Characteristics** | | | |
| Ever in Care | -.012 (.012) | .702 (.113) | -.071 (.112) |
| Father Left School Aged 15 or Less | -.023 (.007) | .375 (.117) | -.503 (.054) |
| Mother Left School Aged 15 or Less | -.037 (.007) | .070 (.100) | -.583 (.053) |
| Lone Mother Family at Child age 7 | -.002 (.013) | .032 (.163) | -.148 (.125) |
| Lone Mother Family at Child age 11 or 16 | -.023 (.008) | .047 (.107) | -.136 (.078) |
| Father Unemployed at Child age 7 | -.052 (.016) | .085 (.209) | .100 (.162) |
| Father Unemployed at Child age 11 or 16 | -.016 (.009) | -.054 (.117) | -.194 (.096) |
| Family in Financial Difficulties at Child age 7 | -.053 (.010) | .159 (.121) | -.343 (.108) |
| Family in Financial Difficulties at Child age 11 or 16 | -.059 (.007) | .258 (.087) | -.238 (.068) |
| Proportion Censored (Tobit) / Mean Proportion (Probit) | .121 | .038 | .289 |
| Log-Likelihood | 1361.30 | -829.88 | -3103.87 |
| Sample Size | 6135 | 5696 | 6270 |

Notes: As for Table IIIa.

|  | Males | | | Females | | |
|---|---|---|---|---|---|---|
|  | School Atten-dance | Contact With Police/ Probation | Stay on at School | School Atten-dance | Contact With Police/ Probation | Stay on at School |
| Base Individual | .853 | .024 | .509 | .841 | .006 | .444 |
| **Deviations From Base:** | | | | | | |
| Non-White | -.001 | +.001 | +.050 | +.010 | -.004 | +.114 |
| Top Quintile of Maths Test Scores | -.003 | +.018 | +.123 | +.002 | -.002 | +.208 |
| Top Quintile of Reading Test Scores | +.018 | -.015 | +.346 | +.025 | +.004 | +.310 |
| Ever in Care | -.001 | +.098 | -.109 | -.006 | +.028 | -.027 |
| Father Left School Aged 15 or Less | -.019 | +.018 | -.232 | -.013 | +.010 | -.184 |
| Mother Left School Aged 15 or Less | -.012 | +.013 | -.239 | -.022 | +.001 | -.209 |
| Lone Mother Family at Child age 7 | -.005 | +.003 | -.039 | -.001 | +.000 | -.057 |
| Lone Mother Family at Child age 11 or 16 | -.010 | +.007 | .003 | -.013 | +.001 | -.053 |
| Father Unemployed at Child age 7 | -.024 | +.002 | -.086 | -.033 | +.001 | .040 |
| Father Unemployed at Child age 7 | -.013 | +.003 | -.032 | -.009 | -.001 | -.075 |
| Family in Financial Difficulties at Child age 7 | -.021 | +.020 | -.186 | -.033 | +.003 | -.129 |
| Family in Financial Difficulties at Child age 11 or 16 | -.023 | +.018 | -.092 | -.038 | +.006 | -.091 |
| Top Quintile of Maths and Reading Test Scores | +.017 | -.007 | +.406 | +.026 | +.002 | +.444 |
| Father and Mother Left School Aged 15 or Less, Family in Financial Difficulties at Child age 7, 11 or 16 | -.099 | +.134 | -.482 | -.136 | +.042 | -.409 |

Notes:
1. Derived from Tobit and Probit Models in Tables IIIa and IIIb.
2. The base individual is White, Lowest Quintiles of Test Scores, Never in Care, Father and Mother Left School After 15, Never in Lone Mother Family, Father Never Unemployed, Never in Family With Financial Difficulties, not sick in last school year and behavioural response score of 0)

**Table V: Educational Qualifications at Age 23 and Age 16 Delinquency and Social Disadvantage**

| | Sample Size | No Quals | Lower Academic | Lower Vocational | Intermediate Vocational | Intermediate Academic | Advanced Vocational | Advanced Academic | Higher Vocational | Higher Academic |
|---|---|---|---|---|---|---|---|---|---|---|
| **Males** | | | | | | | | | | |
| All | 6267 | .257 | .014 | .018 | .022 | .280 | .163 | .057 | .081 | .109 |
| School attendance< .75 (and not ill) | 264 | .606 | .034 | .023 | .038 | .208 | .049 | .008 | .023 | .011 |
| Contact With Police/ Probation | 463 | .477 | .026 | .024 | .052 | .242 | .123 | .015 | .030 | .011 |
| Ever in Care | 244 | .520 | .008 | .033 | .025 | .238 | .094 | .016 | .033 | .033 |
| Family Ever in Financial Difficulties | 982 | .458 | .014 | .024 | .030 | .275 | .097 | .024 | .043 | .035 |
| Ever in Lone Parent Family (But Not Financial Difficulties) | 331 | .254 | .024 | .024 | .024 | .317 | .151 | .066 | .054 | .085 |
| Father Ever Unemployed (But Not Financial Difficulties) | 183 | .279 | .022 | .044 | .016 | .311 | .164 | .055 | .060 | .049 |
| **Females** | | | | | | | | | | |
| All | 6270 | .298 | .023 | .012 | .007 | .368 | .060 | .051 | .088 | .093 |
| School attendance < .75 (and not ill) | 261 | .663 | .023 | .011 | .023 | .211 | .011 | .008 | .038 | .012 |
| Contact With Police/ Probation | 162 | .525 | .025 | .012 | .000 | .296 | .049 | .012 | .049 | .031 |
| Ever in Care | 223 | .547 | .013 | .013 | .000 | .251 | .067 | .022 | .054 | .031 |
| Family Ever in Financial Difficulties | 1057 | .535 | .017 | .016 | .005 | .304 | .023 | .023 | .052 | .026 |
| Ever in Lone Parent Family (But Not Financial Difficulties) | 348 | .305 | .026 | .009 | .000 | .376 | .055 | .043 | .089 | .098 |
| Father Ever Unemployed (But Not Financial Difficulties) | 174 | .279 | .022 | .044 | .016 | .311 | .164 | .055 | .060 | .049 |

Notes: The educational attainment variable is defined as: 0 - no qualifications; 1 - lower academic (CSEs, no 'O' levels); 2 - lower vocational/other; 3 - intermediate vocational (craft quals., apprenticeships); 4 - intermediate academic ('O' levels only); 5 - advanced vocational (ONC/TEC); 6 - advanced academic ('A' levels only); 7 - higher vocational (HTEC/HND, Teaching, Nursing); 8 - higher academic (degree or higher degree).

| | Males | | | Females | | |
|---|---|---|---|---|---|---|
| Low School Attendance | | | -.699 (.054) | | | -.733 (.054) |
| Contact With Police/ Probation | | | -.448 (.057) | | | -.322 (.096) |
| Ever in Care | -.590 (.075) | -.360 (.078) | -.286 (.079) | -.454 (.079) | -.283 (.083) | -.234 (.084) |
| Family Ever in Financial Difficulties | -.672 (.039) | -.450 (.041) | -.348 (.041) | -.731 (.039) | -.452 (.041) | -.358 (.042) |
| Ever in Lone Parent Family (But Not Financial Difficulties) | -.204 (.060) | -.178 (.061) | -.139 (.062) | -.134 (.060) | -.133 (.061) | -.100 (.062) |
| Father Ever Unemployed (But Not Financial Difficulties) | -.307 (.080) | -.253 (.081) | -.235 (.082) | -.255 (.084) | -.183 (.087) | -.123 (.087) |
| Age 7 Controls and Parental Characteristics | No | Yes | Yes | No | Yes | Yes |
| Log-Likelihood | -11219.10 | -10319.16 | -10165.62 | -10204.05 | -9219.37 | -9073.99 |
| Sample Size | 6267 | 6267 | 6267 | 6270 | 6270 | 6270 |
| Pr[Educ = 8 \| Low School Attendance = 1] - Pr[Educ = 8 \| Low School Attendance = 0] | | | -.111 | | | -.078 |
| Pr[Educ = 0 \| Low School Attendance = 1] - Pr[Educ = 0 \| Low School Attendance = 0] | | | .172 | | | .225 |
| Pr[Educ = 8 \| Police/Probation = 1] - Pr[Educ = 8 \| Police/Probation = 0] | | | -.080 | | | -.041 |
| Pr[Educ = 0 \| Police/Probation = 1] - Pr[Educ = 0 \| Police/Probation = 0] | | | .095 | | | .087 |
| Pr[Educ = 8 \| Care=1] - Pr[Educ = 8 \| Care= 0] | -.090 | -.059 | -.055 | -.066 | -.030 | -.032 |
| Pr[Educ = 0 \| Care=1] - Pr[Educ = 0 \| Care= 0] | .199 | .091 | .060 | .159 | .090 | .063 |
| Pr[Educ = 8 \| Financial Difficulties = 1] - Pr[Educ = 8 \| Financial Difficulties = 0] | -.109 | -.075 | -.067 | -.104 | -.048 | -.048 |
| Pr[Educ = 0 \| Financial Difficulties = 1] - Pr[Educ = 0 \| Financial Difficulties = 0] | .226 | .116 | .074 | .276 | .155 | .103 |

Notes:  These are Ordered Probit coefficient estimates (standard errors in parentheses) where the dependent variable is the ordered educational attainment variable defined in TableV.  All models include the $X^{pre16}$ as defined in main body of the paper.

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## Table VII: Age 23 Outcomes and Age 16 Juvenile Delinquency and Disadvantaged Background Status

| | Hourly Pay | Unemployment Time | Pr[Employment] | Pr[Prison], Males / Pr[Lone Parent], Females |
|---|---|---|---|---|
| Males | | | | |
| All | 2.710 | 4.707 | .861 | .011 |
| Low School Attendance | 2.496 | 10.788 | .723 | .042 |
| Police/Probation | 2.610 | 9.309 | .767 | .050 |
| Ever in Care | 2.562 | 10.734 | .721 | .074 |
| Ever in Financial Difficulties | 2.595 | 8.746 | .773 | .025 |
| Ever in Lone Parent Family (Not Fin Diff) | 2.707 | 5.849 | .855 | .009 |
| Father Ever Unemployed (Not Fin Diff) | 2.647 | 6.497 | .780 | .016 |
| Females | | | | |
| All | 2.380 | 3.614 | .661 | .080 |
| Low School Attendance | 2.051 | 7.388 | .467 | .199 |
| Police/Probation | 2.022 | 6.086 | .438 | .191 |
| Ever in Care | 2.215 | 6.009 | .511 | .170 |
| Ever in Financial Difficulties | 2.243 | 5.757 | .485 | .163 |
| Ever in Lone Parent Family (Not Fin Diff) | 2.416 | 3.448 | .678 | .075 |
| Father Ever Unemployed (Not Fin Diff) | 2.161 | 5.011 | .618 | .080 |

| Males | | | | |
|---|---|---|---|---|
| | Ln(Hourly Wage) - Least Squares | | | |
| Low School Attendance | | | -.011 (.023) | .028 (.023) |
| Police/Probation | | | -.010 (.025) | .011 (.024) |
| Ever in Care | -.049 (.034) | -.009 (.034) | -.009 (.034) | .006 (.034) |
| Family Ever in Financial Difficulties | -.035 (.018) | -.015 (.018) | -.013 (.018) | .005 (.018) |
| Ever in Lone Parent Family (But Not Financial Difficulties) | .010 (.027) | .011 (.027) | .009 (.028) | .015 (.027) |
| Father Ever Unemployed (But Not Financial Difficulties) | -.035 (.038) | -.029 (.038) | -.029 (.038) | -.017 (.038) |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| R-Squared | .002 | .036 | .037 | .056 |
| Sample size | 4720 | 4720 | 4720 | 4720 |
| | Unemployment Time - Tobit | | | |
| Low School Attendance | | | 7.049 ( .817) | 5.012 ( .813) |
| Police/Probation | | | 5.499 ( .903) | 4.371 ( .891) |
| Ever in Care | 8.319 (1.217) | 5.364 (1.201) | 4.289 (1.199) | 3.511 (1.176) |
| Family Ever in Financial Difficulties | 8.774 ( .669) | 7.133 ( .668) | 5.842 ( .670) | 4.835 ( .660) |
| Ever in Lone Parent Family (But Not Financial Difficulties) | 4.330 (1.093) | 3.877 (1.065) | 3.350 (1.063) | 3.030 (1.043) |
| Father Ever Unemployed (But Not Financial Difficulties) | 4.280 (1.455) | 4.098 (1.416) | 3.726 (1.397) | 3.295 (1.367) |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| Log-Likelihood | -14285.69 | -14171.01 | -14105.10 | -13998.81 |
| Proportion Censored at 0 | .541 | .541 | .541 | .541 |
| Sample size | 6263 | 6263 | 6263 | 6263 |

Notes: Standard errors in parentheses.

| Males | | | | |
|---|---|---|---|---|
| | Pr[Employed] - Probit | | | |
| Low School Attendance | | | -.314 (.066) [-.075] | -.244 (.068) [-.055] |
| Police/Probation | | | -.261 (.073) [-.061] | -.220 (.074) [-.049] |
| Ever in Care | -.436 (.089) [-.115] | -.265 (.093) [-.064] | -.197 (.095) [-.045] | -.168 (.096) [-.037] |
| Family Ever in Financial Difficulties | -.417 (.051) [-.104] | -.335 (.054) [-.080] | -.277 (.055) [-.128] | -.241 (.056) [-.053] |
| Ever in Lone Parent Family (But Not Financial Difficulties) | -.105 (.089) [-.023] | -.079 (.091) [-.017] | -.035 (.092) [-.007] | -.028 (.094) [-.006] |
| Father Ever Unemployed (But Not Financial Difficulties) | -.415 (.107) [-.109] | -.419 (.108) [-.108] | -.398 (.109) [-.101] | -.408 (.110) [-.101] |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| Log-Likelihood | -2461.11 | -2394.26 | -2371.89 | -2322.38 |
| Sample size | 6251 | 6251 | 6251 | 6251 |
| | Pr[Prison/Borstal Since 16] - Probit | | | |
| Low School Attendance | | | .385 (.140) [.008] | .284 (.143) [.004] |
| Police/Probation | | | .692 (.140) [.022] | .651 (.142) [.016] |
| Ever in Care | .844 (.135) [.050] | .714 (.143) [.028] | .592 (.153) [.017] | .556 (.156) [.013] |
| Family Ever in Financial Difficulties | .373 (.110) [.012] | .304 (.116) [.007] | .231 (.124) [.004] | .165 (.127) [.002] |
| Ever in Lone Parent Family (But Not Financial Difficulties) | .070 (.223) [.002] | .039 (.232) [.001] | -.042 (.254) [-.001] | -.029 (.259) [-.000] |
| Father Ever Unemployed (But Not Financial Difficulties) | .280 (.247) [.009] | .289 (.260) [.007] | .304 (.268) [.006] | .272 (.275) [.004] |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| Log-Likelihood | -353.21 | -334.24 | -317.22 | -306.07 |
| Sample size | 6267 | 6267 | 6267 | 6267 |

Notes:  Standard errors in round parentheses.  Marginal effects in square parentheses.

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| Females | | | | |
|---|---|---|---|---|
| | Ln(Hourly Wage) - Least Squares | | | |
| Low School Attendance | | | -.125 (.027) | -.073 (.026) |
| Police/Probation | | | -.105 (.053) | -.084 (.052) |
| Ever in Care | -.060 (.045) | -.013 (.044) | -.002 (.044) | -.028 (.021) |
| Family Ever in Financial Difficulties | -.113 (.021) | -.063 (.021) | -.049 (.021) | .011 (.042) |
| Ever in Lone Parent Family (But Not Financial Difficulties) | .036 (.031) | .033 (.030) | .032 (.030) | .038 (.029) |
| Father Ever Unemployed (But Not Financial Difficulties) | -.100 (.044) | -.077 (.042) | -.071 (.042) | -.052 (.041) |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| R-Squared | .011 | .085 | .096 | .151 |
| Sample size | 3777 | 3777 | 3777 | 3777 |
| | Unemployment Time - Tobit | | | |
| Low School Attendance | | | 5.049 ( .727) | 4.550 ( .738) |
| Police/Probation | | | 2.713 (1.328) | 2.720 (1.324) |
| Ever in Care | 3.341 (1.168) | 2.146 (1.162) | 1.892 (1.158) | 1.751 (1.155) |
| Family Ever in Financial Difficulties | 5.333 ( .587) | 4.131 ( .600) | 3.454 ( .604) | 3.171 ( .607) |
| Ever in Lone Parent Family (But Not Financial Difficulties) | 1.055 ( .979) | 1.102 ( .967) | 1.175 ( .974) | .998 ( .972) |
| Father Ever Unemployed (But Not Financial Difficulties) | 4.598 (1.308) | 4.088 (1.291) | 3.695 (1.280) | 3.511 (1.277) |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| Log-Likelihood | -12823.45 | -12768.56 | -12737.43 | -12722.38 |
| Proportion Censored at 0 | .586 | .586 | .586 | .586 |
| Sample size | 6267 | 6267 | 6267 | 6267 |

Notes: Standard errors in parentheses.

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| Females | | | | |
|---|---|---|---|---|
| | Pr[Employed] - Probit | | | |
| Low School Attendance | | | -.345 (.057) [-.131] | -.167 (.058) [-.061] |
| Police/Probation | | | -.406 (.105) [-.156] | -.333 (.107) [-.126] |
| Ever in Care | -.288 (.087) [-.110] | -.184 (.090) [-.069] | -.146 (.091) [-.054] | -.104 (.092) [-.038] |
| Family Ever in Financial Difficulties | -.548 (.044) [-.210] | -.403 (.046) [-.153] | -.340 (.047) [-.128] | -.253 (.048) [-.094] |
| Ever in Lone Parent Family (But Not Financial Difficulties) | -.053 (.072) [-.020] | -.065 (.074) [-.024] | -.042 (.076) [-.015] | -.007 (.078) [-.002] |
| Father Ever Unemployed (But Not Financial Difficulties) | -.225 (.099) [-.085] | -.166 (.101) [-.062] | -.130 (.102) [-.048] | -.087 (.104) [-.032] |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| Log-Likelihood | -3915.25 | -3768.87 | -3725.31 | -3553.67 |
| Sample size | 6256 | 6256 | 6256 | 6256 |
| | Pr[Lone Parent By 23] - Probit | | | |
| Low School Attendance | | | .347 (.071) [.053] | .220 (.072) [.025] |
| Police/Probation | | | .389 (.125) [.063] | .342 (.126) [.045] |
| Ever in Care | .364 (.105) [.065] | .285 (.108) [.044] | .237 (.110) [.035] | .204 (.112) [.024] |
| Family Ever in Financial Difficulties | .553 (.055) [.100] | .420 (.059) [.066] | .360 (.060) [.054] | .290 (.061) [.034] |
| Ever in Lone Parent Family (But Not Financial Difficulties) | .117 (.104) [.018] | .126 (.108) [.017] | .099 (.110) [.013] | .073 (.114) [.008] |
| Father Ever Unemployed (But Not Financial Difficulties) | .150 (.142) [.023] | .106 (.148) [.015] | .082 (.148) [.013] | .042 (.151) [.004] |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| Log-Likelihood | -1688.32 | -1617.80 | -1595.51 | -1518.13 |
| Sample size | 6270 | 6270 | 6270 | 6270 |

Notes:  Standard errors in round parentheses.  Marginal effects in square parentheses.

**Table IX: Age 33 Outcomes and Age 16 Juvenile Delinquency and Disadvantaged Background Status**

|  | Hourly Pay | Pr[Employment] |
|---|---|---|
| Males |  |  |
| All | 7.628 | .905 |
| Low School Attendance | 5.796 | .805 |
| Police/Probation | 6.429 | .816 |
| Ever in Care | 6.355 | .752 |
| Ever in Financial Difficulties | 6.276 | .834 |
| Ever in Lone Parent Family (Not Fin Diff) | 7.729 | .905 |
| Father Ever Unemployed (Not Fin Diff) | 7.191 | .907 |
| Females |  |  |
| All | 5.240 | .760 |
| Low School Attendance | 3.947 | .615 |
| Police/Probation | 4.489 | .627 |
| Ever in Care | 4.781 | .620 |
| Ever in Financial Difficulties | 4.223 | .649 |
| Ever in Lone Parent Family (Not Fin Diff) | 5.939 | .702 |
| Father Ever Unemployed (Not Fin Diff) | 4.751 | .691 |

| Males | | | | |
|---|---|---|---|---|
| | Ln(Hourly Wage) - Least Squares | | | |
| Low School Attendance | | | -.123 (.031) | -.042 (.030) |
| Police/Probation | | | -.045 (.033) | -.005 (.032) |
| Ever in Care | -.114 (.044) | -.037 (.042) | -.032 (.042) | .009 (.040) |
| Family Ever in Financial Difficulties | -.204 (.024) | -.107 (.023) | -.088 (.023) | -.049 (.023) |
| Ever in Lone Parent Family (But Not Financial Difficulties) | -.077 (.039) | -.070 (.037) | -.067 (.037) | -.058 (.035) |
| Father Ever Unemployed (But Not Financial Difficulties) | -.080 (.046) | -.029 (.044) | -.026 (.044) | .002 (.041) |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| R-Squared | .026 | .137 | .144 | .229 |
| Sample size | 3367 | 3367 | 3367 | 3367 |
| | Pr[Employment] - Probit | | | |
| Low School Attendance | | | -.350 (.090) [-.060] | -.234 (.091) [-.035] |
| Police/Probation | | | -.218 (.098) [-.035] | -.152 (.100) [-.022] |
| Ever in Care | -.593 (.112) [-.130] | -.409 (.118) [-.075] | -.367 (.121) [-.028] | -.324 (.122) [-.052] |
| Family Ever in Financial Difficulties | -.369 (.069) [-.067] | -.241 (.073) [-.039] | -.184 (.075) [-.028] | -.128 (.076) [-.018] |
| Ever in Lone Parent Family (But Not Financial Difficulties) | -.087 (.121) [-.013] | -.071 (.124) [-.010] | -.059 (.126) [-.009] | -.028 (.129) [-.004] |
| Father Ever Unemployed (But Not Financial Difficulties) | -.161 (.152) [-.027] | -.131 (.156) [-.020] | -.117 (.157) [-.018] | -.075 (.159) [-.010] |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| Log-Likelihood | -1338.75 | -1272.94 | -1261.19 | -1221.94 |
| Sample size | 4655 | 4655 | 4655 | 4655 |

Notes: Standard errors in parentheses. Marginal effects in square parentheses.

| Females | | | | |
|---|---|---|---|---|
| | Ln(Hourly Wage) - Least Squares | | | |
| Low School Attendance | | | -.125 (.033) | -.023 (.031) |
| Police/Probation | | | -.027 (.061) | .019 (.056) |
| Ever in Care | -.041 (.057) | -.001 (.055) | .014 (.055) | .040 (.050) |
| Family Ever in Financial Difficulties | -.230 (.026) | -.132 (.026) | -.107 (.026) | -.068 (.024) |
| Ever in Lone Parent Family (But Not Financial Difficulties) | .048 (.042) | .048 (.040) | .071 (.041) | .079 (.037) |
| Father Ever Unemployed (But Not Financial Difficulties) | -.090 (.056) | -.069 (.053) | -.056 (.053) | -.045 (.049) |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| R-Squared | .024 | .126 | .137 | .268 |
| Sample size | 3540 | 3540 | 3540 | 3540 |
| | Pr[Employment] - Probit | | | |
| Low School Attendance | | | -.142 (.064) [-.051] | -.053 (.067) [-.019] |
| Police/Probation | | | .009 (.121) [ .003] | .032 (.122) [ .011] |
| Ever in Care | -.043 (.104) [-.015] | .039 (.106) [ .014] | .045 (.107) [ .015] | .069 (.108) [ .024] |
| Family Ever in Financial Difficulties | -.071 (.051) [-.025] | -.011 (.053) [-.004] | .000 (.054) [ .000] | .037 (.054) [ .013] |
| Ever in Lone Parent Family (But Not Financial Difficulties) | .080 (.083) [ .028] | .066 (.083) [ .023] | .046 (.085) [ .016] | .062 (.086) [ .021] |
| Father Ever Unemployed (But Not Financial Difficulties) | .057 (.113) [ .020] | .085 (.114) [ .029] | .093 (.114) [ .032] | .107 (.115) [ .036] |
| Age 7 Controls and Parental Education | No | Yes | Yes | Yes |
| Controls for Age 23 Educational Qualifications | No | No | No | Yes |
| Log-Likelihood | -3067.09 | -3034.55 | -3031.27 | -2995.44 |
| Sample size | 4972 | 4972 | 4972 | 4972 |

**Table XI:  Maths and Reading Test Score Percentiles For Children (Aged 6-9) of NCDS Cohort Members**

| | Peabody Individual Achievement Test Score Percentile - Maths | Sample size | Peabody Individual Achievement Test Score Percentile - Reading | Sample size |
|---|---|---|---|---|
| All | 51.89 | 1007 | 51.28 | 1008 |
| Parent Had Low School Attendance | 48.31 | 104 | 44.48 | 105 |
| Parent Was in Contact With Police/Probation | 41.45 | 56 | 37.16 | 56 |
| Parent Was Ever in Care | 37.49 | 37 | 34.84 | 37 |
| Parent Grew Up in Family Ever in Financial Difficulties | 45.17 | 182 | 43.96 | 183 |
| Parent Ever in Lone Parent Family (Not Fin Diff) | 55.88 | 65 | 52.69 | 65 |
| Parent's Father Ever Unemployed (Not Fin Diff) | 54.19 | 31 | 47.58 | 31 |

Notes: The age range of children is from 6 years and 0 months to 9 years and 0 months inclusive (at the time of taking the tests)

**Table XII:  Maths and Reading Test Score Percentiles For Children (Aged 6-9) of NCDS Cohort Members**

| | Childrens' Peabody Individual Achievement Test Score Percentile - Maths | | Childrens' Peabody Individual Achievement Test Score Percentile - Reading | |
|---|---|---|---|---|
| Parent Had Low School Attendance | - 2.680 (3.099) | - 2.008 (3.106) | - 5.792 (3.044) | - 3.305 (3.000) |
| Parent Was in Contact With Police/Probation | - 7.289 (4.107) | - 7.253 (4.093) | -10.950 (4.048) | - 9.623 (3.953) |
| Parent Was Ever in Care | -10.018 (5.072) | - 9.558 (5.054) | -13.163 (4.999) | -11.654 (4.890) |
| Parent Grew Up in Family Ever in Financial Difficulties | - 6.762 (2.463) | - 6.070 (2.469) | - 7.742 (2.425) | - 5.287 (2.388) |
| Parent Ever in Lone Parent Family (Not Fin Diff) | 2.394 (3.844) | 1.700 (3.838) | -  .321 (3.789) | -  .645 (3.701) |
| Parent's Father Ever Unemployed (Not Fin Diff) | 1.477 (5.276) | 2.948 (5.276) | - 5.153 (5.200) | - 1.452 (5.093) |
| Child = Boy | 2.975 (1.843) | 2.920 (1.839) | - 3.874 (1.815) | - 4.193 (1.769) |
| Parents Test Scores (age 7) | | | | |
| 2nd Lowest Quintile of Maths/Reading Test Scores | | 2.563 (2.800) | | 5.340 (2.711) |
| Middle Quintile of Maths/Reading Test Scores | | 3.171 (2.692) | | 11.655 (2.630) |
| 2nd Highest Quintile of Maths/Reading Test Scores | | 2.258 (2.777) | | 13.072 (2.828) |
| 2nd Highest Quintile of Maths/Reading Test Scores | | 10.142 (2.952) | | 19.604 (2.828) |
| R-Squared | .034 | .046 | .050 | .102 |
| Sample size | 983 | 983 | 984 | 984 |

Notes:  Standard errors in parentheses.

**Table A1: Labour Force Status for People Aged 16/17 in 1975**

| | Males | | | | | Females | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | employed | unemployed | inactive | student not working | student working | employed | unemployed | inactive | student not working | student working |
| 1975 | 60.5 | 4.8 | 0.4 | 34.2 | ** | 52.7 | 5.4 | 3.4 | 38.6 | ** |
| 1977 | 78.0 | 7.1 | 1.5 | 13.4 | ** | 70.6 | 6.7 | 10.2 | 12.5 | ** |
| 1979 | 82.0 | 6.6 | 1.5 | 9.9 | ** | 66.0 | 5.4 | 20.6 | 8.0 | ** |
| 1981 | 79.0 | 14.3 | 1.7 | 5.0 | ** | 61.1 | 7.6 | 28.8 | 2.6 | ** |
| 1983 | 78.9 | 14.6 | 4.0 | 2.6 | ** | 53.4 | 7.6 | 37.0 | 2.0 | ** |
| 1984 | 80.3 | 15.0 | 2.9 | 1.8 | ** | 54.3 | 9.1 | 35.3 | 1.3 | ** |
| 1985 | 78.0 | 13.0 | 6.6 | 0.5 | 0.0 | 53.9 | 8.8 | 37.0 | 0.2 | 0.1 |
| 1986 | 83.2 | 11.3 | 5.4 | 0.1 | 0.0 | 53.1 | 7.8 | 39.0 | 0.1 | 0.0 |
| 1987 | 84.6 | 11.1 | 4.0 | 0.3 | 0.0 | 54.8 | 9,3 | 35.7 | 0.3 | 0.0 |
| 1988 | 85.7 | 8.7 | 5.3 | 0.3 | 0.0 | 58.7 | 6.2 | 35.2 | 0.0 | 0.0 |
| 1989 | 88.7 | 6.6 | 4.5 | 0.2 | 0.1 | 59.2 | 5.7 | 35.2 | 0.0 | 0.0 |
| 1990 | 88.4 | 5.9 | 5.5 | 0.2 | 0.0 | 60.6 | 5.4 | 33.9 | 0.1 | 0.0 |
| 1991 | 87.1 | 7.9 | 4.8 | 0.2 | 0.1 | 65.4 | 4.4 | 30.1 | 0.1 | 0.0 |
| 1992 | 85.9 | 9.7 | 4.3 | 0.1 | 0.0 | 64.7 | 4.4 | 30.9 | 0.1 | 0.0 |
| 1993 | 86.0 | 8.3 | 5.6 | 0.1 | 0.0 | 65.2 | 4.4 | 30.3 | 0.1 | 0.0 |
| 1994 | 86.0 | 7.9 | 5.8 | 0.2 | 0.1 | 65.1 | 3.9 | 31.0 | 0.0 | 0.0 |
| 1995 | 85.4 | 7.2 | 7.3 | 0.1 | 0.0 | 70.4 | 3.4 | 26.2 | 0.0 | 0.0 |

Notes:   1. ** denotes data not available.
            2. Based on Labour Force Survey data.