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Outcomes in Childhood and Adulthood by Mother's Age at Birth: Evidence from the 1970 British Cohort Study

David J. Pevalin

**ISER Working Papers
Number 2003-31**

Institute for Social and Economic Research

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ABSTRACT AND NON-TECHNICAL SUMMARY

This paper uses data from the British 1970 Cohort Study (BCS70) to investigate the associations between the age of the mother at the birth of the cohort member (1970) and a range of outcomes at birth and ages 5, 10 and 30. The results show consistent associations through childhood and early adulthood that generally reflect poorer outcomes the younger the mother.

Specifically, cohort members (CMs) born to younger mothers were more likely to be born preterm or with low birthweight. At age 5 those CMs born to younger mothers scored significantly lower on a standardised EPVT, higher on the Rutter Child Scale and were shorter in height. At age 10, the CMs born to younger mothers were more likely not to have a father figure in the home, higher residential mobility, and poorer quality housing. The CMs themselves were more likely to have been in care and were still significantly shorter in height. Also at age 10, the CMs teachers were more likely to rate them as below average on general knowledge, less popular with their peers, less co-operative and less able to concentrate.

In adulthood both men and women CMs born to younger mothers were more likely to have had a child themselves before the age of 20 and less likely to achieve A-levels or equivalent.

The analyses reported in this paper are part of a larger programme of work for the Department of Health examining the medium and long-term consequences of early childbearing.

Outcomes in Childhood and Adulthood by Mother's Age at Birth: Evidence from the 1970 British Cohort Study

This paper focuses on the associations between a range of outcomes in childhood and adulthood and the age of the mother at the birth of that child. We do this by following the members of the 1970 British Cohort from birth to age 30.

Other papers from research also funded by the Department of Health have concentrated on the consequences for the mother of early childbearing. These analyses concentrate on the children of young mothers but examine the outcomes across the whole range of age at birth.

The data

The BCS70 is a cohort study of all children born in a week in April 1970 with information collected at birth and ages 5, 10, 16, 26 and 30. The data collected at ages 16 and 26 were from partial samples and so are not included in these analyses. As shown in Table 1, 18,625 cohort members (CM) have been interviewed at least once while 8,537 have been interviewed all four times.

Table 1: Data samples

Age	Sample
Birth	17,195
5	13,134
10	14,874
30	11,259
At all ages	8,537
At any age	18,625

Table 2 shows the most common patterns of the number and time of CM interviews across the four ages – birth, 5, 10 and 30. The most common pattern is responses at all four ages with 45.8% of those ever interviewed. A substantial proportion (17.3%) was interviewed during childhood but do not have information at age 30. Additionally, 12.3% only have data from the time of birth.

Table 2: Patterns of CM interviews

Pattern	Number	Percent
1111	8,537	45.8
111-	3,220	17.3
1---	2,282	12.3
1-11	1,191	6.4
1-1-	750	4.0
11--	556	3.0
--11	449	2.4
11-1	429	2.3
--1-	398	2.1
others*	813	4.4

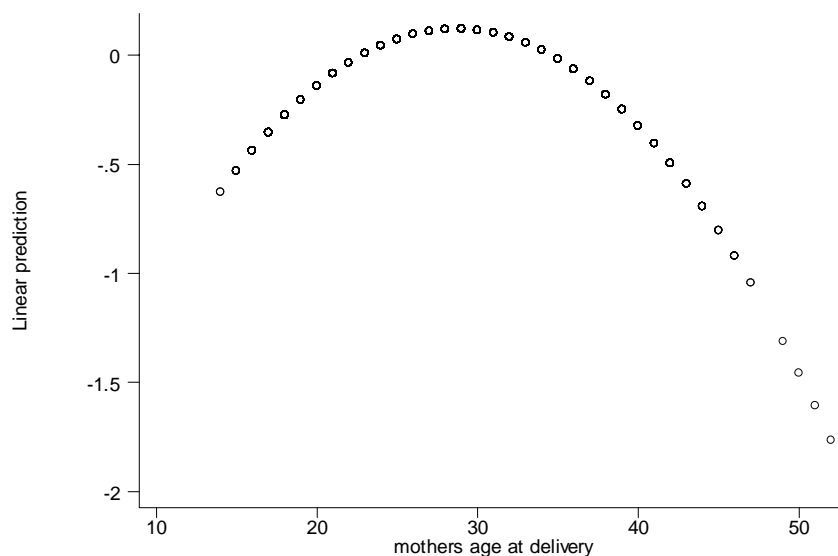
* each <2%

Predictors of attrition

As the number of CMs with data from all four ages is less than half of the original sample, an analysis of attrition by factors at birth was conducted. Of particular interest was the risk of attrition by the age of the mother at the birth of the CM as in the first part of the outcomes analysis this is used to follow children born to teenage mothers in 1970.

As can be seen in Figure 1, the likelihood of data at all four ages increases with the age of the mother of the CM until age 30 and then declines after that.

Figure 1: Likelihood of data at all four ages by age of mother at birth of CM



We also examined the likelihood of data at all four ages by marital status at birth, social class of the father and birth order of the CM. Odds ratios of data at all four ages are shown in Table 3. CMs born to single or divorced mothers are less likely to have data at all four ages as do those born to fathers in lower social classes or unsupported families and those with higher birth parity.

Table 3: ORs of data at all four ages by family factors at birth

Factor	OR
Marital status (ref. married)	
<i>Single</i>	0.37*
<i>Divorced</i>	0.51*
Father's social class (ref. class I)	
II	0.99
IIIN	1.16
IIIM	0.93
IV	0.76*
V	0.54*
Other	0.45*
Unsupported	0.34*
Birth order (for each prior child)	0.90*

* p<.001

Age of mother and birth outcomes in 1970

Table 4 shows that 9.6% of live births in the cohort were to mothers under age 20 for a number of 1,609 – 844 boys and 765 girls.

Table 4: Percent of live births by age of CM's mother at birth

<i>Age of CM's mother</i>	<i>Live births</i>
under 20	9.6
20/23	28.5
24/27	28.4
28/31	17.7
over 31	15.8
<i>n</i>	16,670

Parents characteristics

In contrast to the wealth of information collected on the CM at birth, little information was obtained on the socio-economic and family circumstances of the parents at that time. Table 5 shows that those mothers who gave birth to CMs when under 20 years

of age were more likely to be single and, if married, less likely to have a spouse in a non-manual occupation (social classes I, II and IIIN). The CM's mother was more likely to smoke during the pregnancy if she was under age 24 than those 24 and over.

Table 5: Parent's characteristics at birth by age of CM's mother at birth

<i>Percent</i>	<i>Age of CM's mother</i>				
	under 20	20/23	24/27	28/31	over 31
Single	26.0	6.5	2.3	1.4	1.5
Father SC I/IIIN	9.4	19.3	34.6	34.9	30.5
Smoked during pregnancy	38.9	38.9	33.1	30.8	31.9

Child's outcomes at birth

Table 6 shows the percentage of births that were stillborn or early neonatal death, low birthweight (under 2500g) and preterm (36 weeks or less). Younger age of the mother at birth increases the chances of low birthweight and preterm birth but the association is not linear, especially preterm births which are distinctly curvilinear with mother's age.

Table 6: Child's outcomes at birth by age of CM's mother at birth

<i>Percent</i>	<i>Age of CM's mother</i>				
	under 20	20/23	24/27	28/31	over 31
Stillbirth/early death	3.2	2.1	2.4	1.7	3.6
Low birthweight*	8.5	7.0	5.6	6.3	6.3
Preterm birth*	6.6	4.6	4.3	4.7	5.8

* live births only

The three outcomes are used in logit regressions to test for significant differences from the reference category (mother's age 24/27 years) and shown in Table 7. The older mothers were more likely to have a stillbirth or early neonatal death while the younger mothers were more likely to have low birthweights. The curvilinear association of mother's age with the likelihood of preterm births is shown to be significant. These general associations remain when other variables, namely marital status, father's social class, maternal smoking, multiple births, age mother finished education, are added to the equation indicating that they are reasonably robust.

Table 7: Logit (odds ratios) models of child outcomes by age of CM's mother at birth

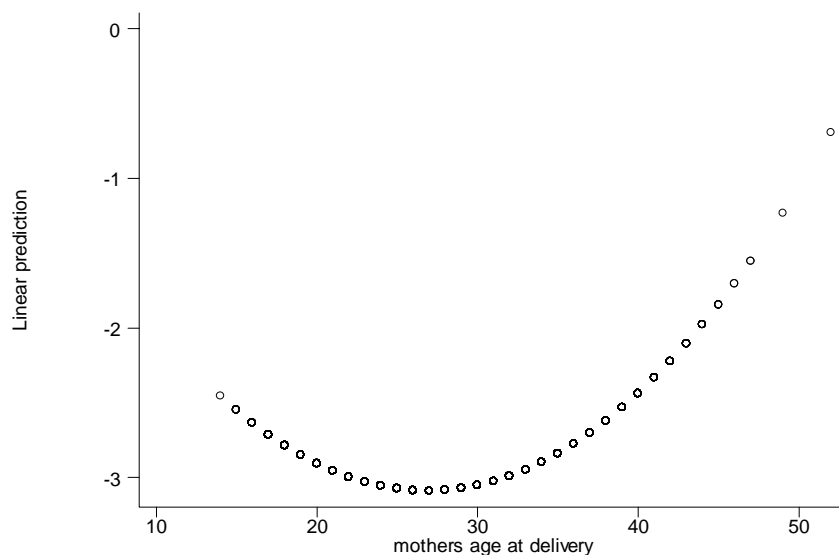
<i>Dependent variables</i>	<i>Age of CM's mother</i>				
	under 20	20/23	24/27†	28/31	over 31
Early death	1.33	0.86	(ref.)	0.70*	1.53**
LBW	1.56**	1.26**	(ref.)	1.14	1.13
Preterm	1.58**	1.07	(ref.)	1.11	1.38**

* p<.05 ** p<.01

† used as reference category as median age is 25

The predicted association between mother's age and the chances of a preterm birth is shown graphically in Figure 2.

Figure 2: Likelihood of a preterm birth by mother's age at birth



Age of mother in 1970 and child's outcomes at age 5

The overall patterns of attrition are also applicable to the time between birth and age 5.

At age 5 we examine the family situation of the child and three direct measures of the child: (1) a standardized EPVT, (2) Rutter's child scale and (3) the child's height. Although the child's height is a direct measure, it is also thought to reflect the family's circumstances through the provision of adequate nutrition.

Table 8 shows that CM's born to younger mothers are more likely to have been separated from their mother for more than one month before they are age 5, more likely to not have their father living with them, and if their father is living with them their father is less likely to be in a non-manual occupation. They are also more likely to live in more crowded accommodation and the neighbourhood rated as poor. All these differences are statistically significant from the reference category (24/27 years).

Table 8: Family characteristics at age 5 by age of CM's mother at birth

<i>Percent</i>	<i>Age of CM's mother</i>				
	under 20	20/23	24/27	28/31	over 31
Mother/child separated >1m	7.4	5.1	4.7	4.2	4.3
Father not living with child	6.5	4.1	3.2	3.0	3.3
Father SC I/IIIN	15.5	26.1	43.0	42.2	38.2
Ave. person/room ratio	0.93	0.89	0.86	0.91	0.96
Poor neighbourhood	11.5	8.4	5.9	7.5	8.6

Table 9 presents regression models of EPVT, Rutter child scale and child's (CM's) height. First, bivariate models are used, b(1), which regress the child measure on categories of the CM's mother's age only. The second model regresses the child measure on mother's age plus a number of control variables, namely child's sex, birthweight, parity, maternal smoking during pregnancy, age mother finished education and father's social class at birth of CM.

Table 9: OLS models of child outcomes by age of CM's mother at birth

<i>Dependent variables</i>	<i>Age of CM's mother</i>				
	under 20	20/23	24/27†	28/31	over 31
EPVT					
<i>b(1)</i>	-0.43**	-0.22**	(ref.)	0.00	0.01
<i>b(2)</i>	-0.42**	-0.21**	(ref.)	0.07*	0.22**
Rutter child scale					
<i>b(1)</i>	2.07**	0.99**	(ref.)	-0.48**	-0.65**
<i>b(2)</i>	1.48**	0.72**	(ref.)	-0.44**	-0.75**
Height (cms)					
<i>b(1)</i>	-1.05**	-0.51**	(ref.)	-0.06	-0.24
<i>b(2)</i>	-1.30**	-0.52**	(ref.)	0.26	0.51**

* p<.05 ** p<.01 b(1) mother's age only, b(2) mother's age plus child's sex, birthweight, parity, multiple births, maternal smoking, age mother finished education and father's social class.

† used as reference category as median age is 25

For EPVT, Rutter child scale and child height the association with mother's age becomes more clearly linear with CM's born to younger mothers scoring lower on the EPVT, higher on the Rutter scale and having lower height while those born to older mothers score higher on the EPVT, lower on the Rutter scale and are taller than the reference category.

Age of mother in 1970 and child's outcomes at age 10

Table 10 presents a number of family circumstances by age of the mother at the birth of the CM. CM's born to younger mothers are less likely to have lived with the same parent(s) since birth and more likely to have lived with just one parent. They are more likely to have no father figure in the household at age ten and more likely to have the mother's cohabitee as the resident father figure. Correspondingly, they are less likely to have their natural father resident in the household. Where a father figure is resident, they are less likely to be in a non-manual occupation. All of these percentages are significantly different from those in the mother's age 24/27 category. The CM's born to younger mothers is also more likely to have four or more residences since they were born and the accommodation they live in at age 10 is more likely to be affected by damp. These differences are statistically significant while the difference in person/room ratio is not.

Table 10: Family characteristics at age 10 by age of CM's mother at birth

<i>Percent</i>	<i>Age of CM's mother</i>				
	<i>under 20</i>	<i>20/23</i>	<i>24/27</i>	<i>28/31</i>	<i>over 31</i>
Same parent(s) since birth ^a	69.3	83.1	89.0	91.2	92.1
Ever lived with 1 parent	33.9	19.5	14.3	12.4	12.6
Father figure					
<i>none</i>	10.0	7.6	6.6	6.4	7.4
<i>cohabitee of mother</i>	3.5	1.8	0.7	0.6	0.1
Father SC I/IIIN	22.2	31.0	47.5	45.8	40.1
4+ residences	29.1	17.4	11.7	7.4	4.3
Damp accommodation	22.7	18.6	15.5	16.2	21.4
Ave. person/room ratio	1.03	1.01	0.96	0.99	1.00

^a regardless of actual family structure

Table 11 shows the coefficients of mother's age from regression models that also control for a number of other child and family characteristics. The CM's born to younger mothers are more likely to have had behavioural problems (parent report) before age 10 and also more likely to have been in care. The CM's are also significantly shorter and weigh less. We repeated the analysis for height and weight using a logit model with weight and height in the lowest decile and the association between mother's age and weight was non-significant while the general association with height held and was significant.

Table 11: Regression models of child outcomes at age 10 by age of CM's mother at birth^a

<i>Dependent variables</i>	<i>Age of CM's mother</i>				
	under 20	20/23	24/27†	28/31	over 31
Ever behaviour problems ^b	1.67**	1.22*	(ref.)	0.93	1.04
Ever in care ^b	5.40**	2.37**	(ref.)	0.63	0.30**
Height (cm) ^c	-1.38**	-0.55**	(ref.)	0.46*	1.05**
Weight (kg) ^c	-0.80**	-0.30*	(ref.)	0.26	1.07**
Body Mass Index ^c	-0.08	-0.04	(ref.)	0.03	0.31**

* p<.05 ** p<.01

† used as reference category as median age is 25

^a controlling for child's sex, birthweight, parity, multiple births, maternal smoking during pregnancy, mother's education and father's social class.

^b odds ratio from logit model, ^c unstandardised OLS coefficient

At age 10, the CM's teacher was asked a number of questions about the CM's character and ability. The characteristics were rated on a 47-point scale while the CM's general knowledge and mother's interest were collapsed to dichotomous indicators. As shown in Table 12, the CM's teachers were four times more likely to say that the mother had little or no interest in the CM's education if the mother was under 20 at the birth of the CM. There was a strong linear association across all the mother's age groups with older mothers being far less likely to be rated as such. The CMs born to younger mothers were rated by their teachers to be less popular with their peers, have fewer friends, be bolder, less co-operative, less able to negotiate their behaviour, and less able to concentrate on their work.

Table 12: Regression models of teacher ratings at age 10 by age of CM's mother at birth^a

<i>Dependent variables</i>	<i>Age of CM's mother</i>				
	under 20	20/23	24/27†	28/31	over 31
< ave. gen. knowledge ^b	2.21**	1.42**	(ref.)	0.85*	0.75**
Popularity with peers ^c	-1.33**	-0.54*	(ref.)	-0.10	-0.45
Number of friends ^c	-1.29**	-0.78**	(ref.)	-0.11	-0.70*
Boldness ^c	0.91*	0.01	(ref.)	-0.60*	-1.48**
Co-operation ^c	-1.50**	-0.68**	(ref.)	-0.08	0.02
Negotiate behaviour ^c	-1.90**	-0.94**	(ref.)	-0.17	0.36
Concentration ^c	-3.83**	-1.72**	(ref.)	0.03	0.78*
Mother little/no interest in child's education ^b	4.01**	1.64**	(ref.)	0.75*	0.52**

* p<.05 ** p<.01

† used as reference category as median age is 25

^a controlling for child's sex, birthweight, parity, multiple births, maternal smoking during pregnancy, mother's education and father's social class.

^b odds ratio from logit model, ^c unstandardised OLS coefficient

Creating summary measure of teacher ratings at age 10

The six teacher ratings of personality/behaviour (middle section of Table 12) were also highly significant for prospective outcomes in adulthood but including all of them in the same regression model 'washed out' the individual effects through multicollinearity. Initial exploration showed that the scale for boldness did not load onto the same factor in a factor analysis and was dropped. Table 13 shows the first-order correlations between the five scales.

Table 13: First-order correlations (Pearson's *r*) between teacher ratings

	2	3	4	5
1 Concentration	-0.41	0.37	-0.39	-0.37
2 Popularity with peers	-	-0.84	0.64	0.37
3 Number of friends		-	-0.59	-0.33
4 Co-operation			-	0.49
5 Negotiate behaviour				-

Scales (1) and (3) were reverse coded to correlate positively with the other scales and then all were standardised to a mean of zero and a standard deviation of one. A test of internal reliability was done (Cronbach's alpha) and was satisfactory for a five-item scale – 0.82. The five items were then scaled to create one standardised

scale. This scale was used in its continuous form and also as a series of quintiles. This summary measure can then be used to control for behaviour at age 10.

Changes in family circumstances from birth to age 10

We examine some changes in the CM's family circumstances between birth and age 10. The outcomes used in Tables 11 and 12 are then compared. These analyses are restricted to those CM's born to mothers age 23 under.

(a) Changes in family social class

Family social class variables at birth, age 5 and age 10 dichotomised into high family class (non-manual occupations RGSC classes I, II and IIIN) and low family class (manual occupations RGSC classes IIIM, IV and V). Eight possible combinations as shown in Table 14.

Table 14: Combinations of family social class at birth, age 5 and age 10 and coding categories.

<i>Family social class</i>			
birth	age 5	age 10	category
low	low	low	cont. low
high	high	high	cont. high
high	low	low	drop
high	high	low	drop
low	high	low	drop*
low	high	high	rise
low	low	high	rise
high	low	high	rise*

* last change having priority

Table 15 shows the final four categories by age of CM's mother in 1970 for the two youngest age groups. The CM's born to the younger mothers (under 20) are more likely to have been low social class at both ages and been high and then low and correspondingly less likely to be high at both times and change from low to high.

Table 15: Change in family social class by age of CM's mother (1970)

Percent	Age CM's mother (1970)	
	under 20	20/23
Cont. low	37.4	32.7
Cont. high	12.9	21.5
Drop	24.0	19.5
Rise	25.7	26.3
<i>n</i>	921	3,159
	$\chi^2 = 38.2$ $p < .001$	

Table 16 shows the child outcomes and teacher ratings from Tables 11 and 12 but with coefficients from multivariate regression models with family social class for CM's born to mothers under 20. Those who were continuously low from birth to age 10 are the reference category. The results show that those CM's in families that were continuously high were on average over 2cm taller than those from families who were continuously low. Other significant effects are seen in the lower odds of the teacher reporting below average general knowledge and that the mother has little or no interest in the child's education.

Table 16: Regression models of child outcomes and teacher ratings at age 10 by family social class from birth to age 10 (mother aged under 20 in 1970)^a

Dependent variables	Family social class birth to age 10			
	Cont. low	Cont. high	Drop	Rise
Ever behaviour problems ^b	(ref.)	1.48	1.33	1.15
Ever in care ^b	(ref.)	0.78	1.13	2.26
Height (cm) ^c	(ref.)	2.15**	0.36	0.88
Weight (kg) ^c	(ref.)	0.85	0.00	0.52
Body Mass Index ^c	(ref.)	-0.07	-0.11	0.08
< ave. gen. knowledge ^b	(ref.)	0.28**	0.50**	0.52**
Popularity with peers ^c	(ref.)	1.23	-0.03	1.66
Number of friends ^c	(ref.)	2.12	0.66	1.72
Boldness ^c	(ref.)	0.27	0.36	0.45
Co-operation ^c	(ref.)	1.13	0.06	1.30
Negotiate behaviour ^c	(ref.)	1.59	1.71	2.36*
Concentration ^c	(ref.)	1.49	1.48	1.72
Mother little/no interest in child's education ^b	(ref.)	0.41	0.38**	0.33**

* $p < .05$ ** $p < .01$

^a controlling for child's sex, birthweight, parity, multiple births, maternal smoking during pregnancy and mother's education

^b odds ratio from logit model, ^c unstandardised OLS coefficient

Table 17: Regression models of child outcomes and teacher ratings at age 10 by family social class from birth to age 10 (mother aged 20/23 in 1970)^a

<i>Dependent variables</i>	<i>Family social class birth to age 10</i>			
	Cont. low	Cont. high	Drop	Rise
Ever behaviour problems ^b	(ref.)	0.90	0.71	0.93
Ever in care ^b	(ref.)	0.35	1.18	1.17
Height (cm) ^c	(ref.)	1.59**	1.12**	1.16**
Weight (kg) ^c	(ref.)	0.93**	0.43	0.76**
Body Mass Index ^c	(ref.)	0.14	0.01	0.17
< ave. gen. knowledge ^b	(ref.)	0.23**	0.64**	0.59**
Popularity with peers ^c	(ref.)	2.77**	0.74	0.82
Number of friends ^c	(ref.)	2.80**	1.00	1.15*
Boldness ^c	(ref.)	2.37**	1.47**	0.89
Co-operation ^c	(ref.)	2.02**	0.18	0.09
Negotiate behaviour ^c	(ref.)	0.65	0.23	0.40
Concentration ^c	(ref.)	4.25**	0.96	0.66
Mother little/no interest in child's education ^b	(ref.)	0.41**	0.63*	0.63*

* p<.05 ** p<.01

^a controlling for child's sex, birthweight, parity, multiple births, maternal smoking during pregnancy and mother's education

^b odds ratio from logit model, ^c unstandardised OLS coefficient

In contrast to the few significant effects seen in Table 16, the same regression models for CM's born to mothers between 20/23 years of age produce significant differences on almost all dependent variables, particularly between the reference category (continuously low) and the continuously high.

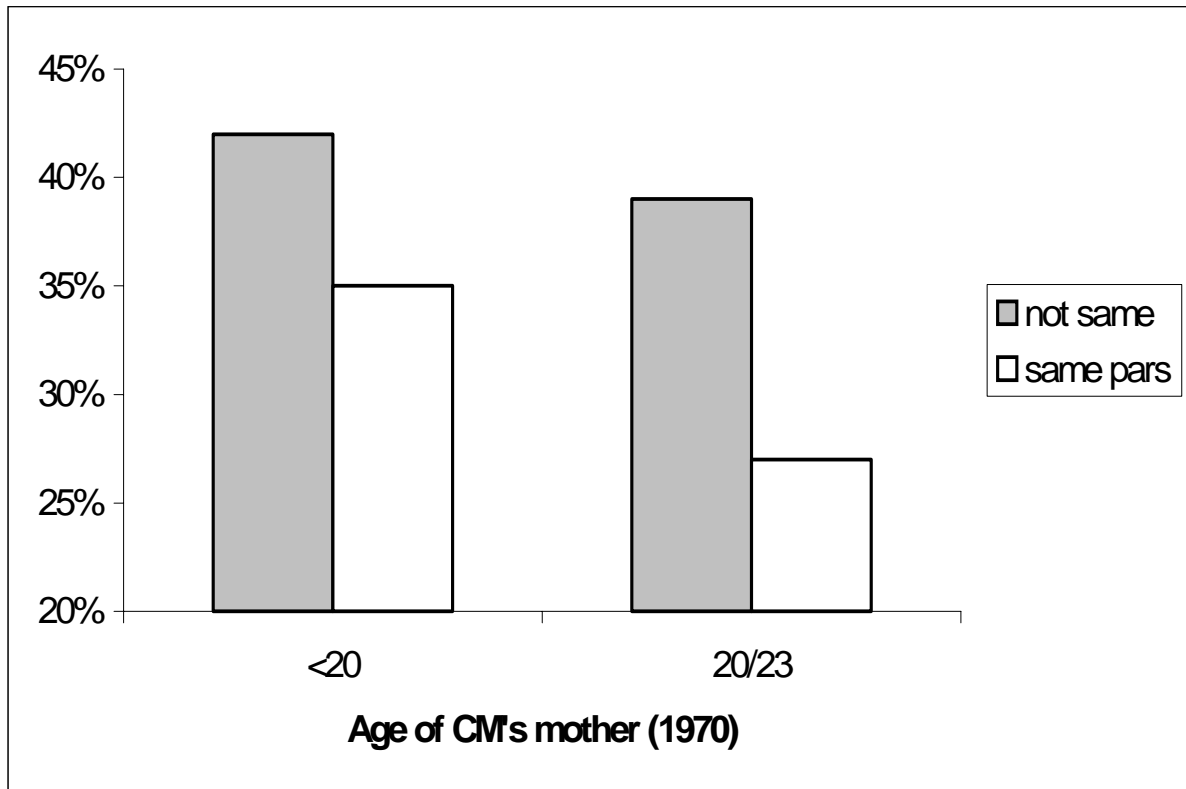
(b) Changes in family structure

At age 10 the parent was asked if the CM had lived with the same parent(s) since birth regardless of the actual structure (also see Table 10). Whether or not the CM had lived with the same parent(s) since birth had a large effect on most of the outcomes used and usually was about the same magnitude of the effect being born to a younger mother but in the opposite direction.

Figure 3 shows the percentages of CM's rated below average general knowledge by age of their mother and whether or not they had lived with the same parent(s) since birth. There is a significant difference for those CM's who had lived with the same

parent(s) since birth within both of the mother's age groups. But the percentages for those born to younger mothers but had the same parent(s) since birth and those born to the slightly older mothers but did not have the same parent(s) since birth are the same.

Figure 3: Percentage of CM's rated below average general knowledge by age of mother and whether or not lived with same parent(s) since birth.



Using multivariate regression models similar to those in Tables 11 and 12 we tested the effect of having the same parent(s) since birth and the results are shown in Table 18. In addition, possible interactions between mother's age and same parent(s) were investigated but none were significant. Therefore, the effect of having the same parent(s) from birth has an independent effect from that of age of the mother.

Table 18: Regression models of child outcomes and teacher ratings at age 10 by whether or not CM lived with same parent(s) since birth and mother's age^a

<i>Dependent variables</i>	<i>Same parents</i>		<i>Mother's age (1970)</i>	
	No	Yes	Under 20	20/23
Behaviour problems ^b	(ref.)	0.46**	(ref.)	0.74*
Ever in care ^b	(ref.)	0.09**	(ref.)	0.59*
Height (cm) ^c	(ref.)	-0.07	(ref.)	0.87**
Weight (kg) ^c	(ref.)	0.19	(ref.)	0.42*
Body Mass Index ^c	(ref.)	0.10	(ref.)	-0.02
< ave. gen. knowledge ^b	(ref.)	0.73**	(ref.)	0.62**
Popularity with peers ^c	(ref.)	1.86**	(ref.)	0.76
Number of friends ^c	(ref.)	1.75**	(ref.)	0.54
Boldness ^c	(ref.)	-0.22	(ref.)	-1.14**
Co-operation ^c	(ref.)	1.32**	(ref.)	0.81*
Negotiate behaviour ^c	(ref.)	0.97*	(ref.)	1.01*
Concentration ^c	(ref.)	2.63**	(ref.)	2.10**
Mother little/no interest in child's education ^b	(ref.)	0.66**	(ref.)	0.41**

* p<.05 ** p<.01

^a controlling for child's sex, birthweight, parity, multiple births, maternal smoking during pregnancy, household social class and mother's education

^b odds ratio from logit model, ^c unstandardised OLS coefficient

Outcomes in adulthood

Women

Table 19 shows the raw percentages of various outcomes for categories of the CM's mother's age in 1970. Table 20 shows the multivariate regression model results for the same outcomes.

Women CMs born to younger mothers are significantly more likely to not have any post 16 education, less likely to have A-level qualifications or higher, less likely to be in the labour force at 30, and if they are in the labour force be in NS-SEC Classes 1 or 2. These associations hold even after controlling for whether or not the CM had a teenage birth. Once the control for any birth is entered into the model there is no significant difference in likelihood of labour force participation, but the CMs born to younger mothers remain more likely not to have post 16 education and if they are in the labour force, less likely to be in NS-SEC Classes 1 or 2.

Women CMs born to younger mothers are also more likely to have been pregnant by age 30 and the association with mother's age is linear with those CMs born to older mother being significantly less likely to ever having been pregnant before age 30. Teenage pregnancy and teenage birth are both significantly more likely for those women CMs born to younger mothers, over three and four times respectively more likely than those women CMs born to mothers aged 24 to 27.

Of those women CMs who have a partner at age 30 (married or cohabiting) those born to younger mothers are less likely to have a partner in the labour force and in NS-SEC Classes 1 or 2.

Table 19: CM's characteristics at age 30 by age of CM's mother at birth (women)

<i>Percent</i>	<i>Age of CM's mother</i>				
	under 20	20/23	24/27	28/31	over 31
Ever married	56.5	58.4	56.7	51.7	49.7
Ever separated/divorced ^a	24.2	18.3	15.4	18.1	14.6
Ever cohabited ^b	68.4	61.8	62.2	54.6	46.3
No post 16 education	55.9	50.0	42.2	38.2	43.5
Any qualifications	64.4	72.0	76.1	76.9	73.5
O levels	53.5	62.6	69.0	70.1	67.3
A levels (1)	19.8	27.6	37.9	39.7	37.8
A levels (2)	17.8	25.5	36.2	38.0	35.2
Degree	8.2	13.2	23.6	24.1	23.4
CM					
In labour force	64.9	72.7	74.1	76.6	74.7
NS-SEC class 1/2 ^c	31.0	38.1	47.0	48.5	41.6
Partner					
No post 16 education ^d	70.7	64.8	60.0	53.2	57.2
In labour force ^d	90.3	91.9	95.0	94.3	92.2
NS-SEC class 1/2 ^d	28.8	35.4	42.6	44.6	42.9
Ever pregnant	78.6	68.8	62.1	56.3	54.8
Ever abort (of pregnant)	12.9	12.9	14.9	14.2	14.0
Teenage pregnancy	26.7	17.3	12.1	9.3	12.7
Teenage birth	20.5	12.2	7.4	6.6	8.6
GHQ 4+	19.1	20.2	19.7	19.4	23.0
Malaise 7+	25.1	20.1	18.4	17.6	20.2
Any long standing illness	24.7	22.9	24.5	22.3	25.3

^a of those ever married ^b of those single at age 30 ^c of those working ^d of those with partner

Table 20: Logit regression models of CM's characteristics at age 30 (women)^e

Odd ratios	Age of CM's mother				
	under 20	20/23	24/27	28/31	over 31
Ever married	0.85	1.00	(ref.)	0.91	0.83
Ever separated/divorced ^a	1.73*	1.26	(ref.)	1.03	0.90
Ever cohabited ^b	1.36	0.93	(ref.)	0.65*	0.48**
No post 16 education	1.55**	1.24*	(ref.)	0.75**	0.70**
(+ control teenage birth)	(1.34*)	(1.19)		(0.77*)	(0.71**)
(+ control any birth)	(1.40*)	(1.19)		(0.81)	(0.75*)
Any qualifications	0.77	0.99	(ref.)	1.15	1.22
(+ control teenage birth)	(0.86)	(1.03)		(1.12)	(1.19)
(+ control any birth)	(0.85)	(1.04)		(1.07)	(1.13)
O levels	0.70*	0.95	(ref.)	1.19	1.30*
(+ control teenage birth)	(0.78)	(0.98)		(1.16)	(1.28)
(+ control any birth)	(0.78)	(0.94)		(1.11)	(1.20)
A levels (1)	0.57**	0.75*	(ref.)	1.20	1.36*
(+ control teenage birth)	(0.65**)	(0.77*)		(1.18)	(1.32*)
(+ control any birth)	(0.67*)	(0.79*)		(1.06)	(1.19)
A levels (2)	0.55**	0.74*	(ref.)	1.23	1.33*
(+ control teenage birth)	(0.62**)	(0.77*)		(1.21)	(1.30*)
(+ control any birth)	(0.65*)	(0.79*)		(1.08)	(1.16)
Degree	0.36**	0.61**	(ref.)	1.12	1.57**
(+ control teenage birth)	(0.39**)	(0.62**)		(1.12)	(1.54**)
(+ control any birth)	(0.41**)	(0.65**)		(0.96)	(1.32)
CM					
In labour force	0.59**	0.88	(ref.)	1.27*	1.34*
(+ control teenage birth)	(0.68*)	(0.93)		(1.21)	(1.29)
(+ control any birth)	(0.78)	(1.01)		(1.00)	(1.01)
NS-SEC class 1/2 ^c	0.51**	0.86	(ref.)	1.16	1.06
(+ control teenage birth)	(0.55**)	(0.89)		(1.14)	(1.03)
(+ control any birth)	(0.57**)	(0.91)		(1.05)	(0.94)
Partner					
No post 16 education ^d	1.33	1.19	(ref.)	0.72*	0.69**
In labour force ^d	0.42**	0.53**	(ref.)	1.04	0.91
NS-SEC class1/2 ^d	0.54**	0.80	(ref.)	1.19	1.53**
Ever pregnant	2.53**	1.35**	(ref.)	0.59**	0.48**
Ever abort (of pregnant)	0.97	0.91	(ref.)	0.88	1.20
Teenage pregnancy	3.31**	1.54**	(ref.)	0.53**	0.67*
Teenage birth	4.29**	1.86**	(ref.)	0.57**	0.67
GHQ 4+	1.05	0.99	(ref.)	0.94	1.07
Malaise 7+	1.31	1.03	(ref.)	0.89	1.07
Any long standing illness	1.11	0.92	(ref.)	0.77	0.94

* p<.05 ** p<.01

^a of those ever married ^b of those single at age 30 ^c of those working^d of those with partner ^e controlling for birthweight, parity, multiple births, maternal smoking during pregnancy, teacher rating scale (age 10), same parents (birth to age 10), household social class (age 10) and mother's education (age 10).

Men

Table 21 shows the raw percentages of various outcomes for categories of the CM's mother's age in 1970. Table 22 shows the multivariate regression model results for the same outcomes.

For men CMs born to younger mothers they are more likely not to have any post 16 education (as with women CMs) and the association holds after controlling for having children. Unlike the women CMs, the men's labour force participation is still significantly lower after controlling for having children. The men CM's born to younger mothers are more likely to have children by age 30 and to have had a child under age 20. Men CMs born to younger mothers are more likely to score over the threshold on the Malaise Inventory and report a long-standing illness.

Table 21: CM's characteristics at age 30 by age of CM's mother at birth (men)

Percent	Age of CM's mother				
	under 20	20/23	24/27	28/31	over 31
Ever married	50.8	44.8	44.0	23.9	36.8
Ever separated/divorced ^a	17.8	15.9	14.2	12.7	10.8
Ever cohabited ^b	46.6	45.8	48.4	38.5	35.1
No post 16 education	70.1	59.7	50.3	48.7	55.9
Any qualifications	61.5	68.1	72.3	75.2	68.1
O levels	52.0	57.3	63.2	67.9	58.2
A levels (1)	21.3	26.6	36.1	38.6	31.9
A levels (2)	19.9	25.6	33.9	36.7	30.5
Degree	10.6	16.0	23.0	26.4	22.6
CM					
In labour force	82.9	89.4	91.6	90.8	87.6
NS-SEC class 1/2 ^c	33.5	38.9	45.9	44.3	43.6
Partner					
No post 16 education ^e	63.3	50.8	47.4	43.4	50.6
In labour force ^e	65.6	72.0	75.3	72.2	73.4
NS-SEC class1/2 ^e	46.0	48.6	54.9	54.0	51.9
Has child	55.3	46.0	37.4	31.5	33.0
Had child under age 20	6.3	3.7	2.5	2.3	3.3
GHQ 4+	18.9	12.7	16.5	14.9	13.9
Malaise 7+	21.3	14.2	13.7	12.9	14.1
Any long standing illness	26.8	23.9	22.8	21.4	22.6

^a those ever married ^b those single ^c those working ^d women only ^e those with partner

Table 22: Logit regression models of CM's characteristics at age 30 (men)^e

Odd ratios	Age of CM's mother				
	under 20	20/23	24/27	28/31	over 31
Ever married	1.37*	1.04	(ref.)	0.68**	0.65**
Ever separated/divorced ^a	1.03	1.03	(ref.)	0.65	0.56*
Ever cohabited ^b	0.90	0.85	(ref.)	0.67*	0.60**
No post 16 education	1.95**	1.26*	(ref.)	0.83	0.77*
(+ control teenage birth)	(1.89**)	(1.25*)		(0.83)	(0.78)
(+ control any birth)	(1.81**)	(1.21)		(0.87)	(0.84)
Any qualifications	0.65**	0.87	(ref.)	1.40**	1.29
(+ control teenage birth)	(0.67**)	(0.88)		(1.40**)	(1.29)
(+ control any birth)	(0.68*)	(0.89)		(1.36*)	(1.22)
O levels	0.72*	0.86	(ref.)	1.49**	1.29*
(+ control teenage birth)	(0.74*)	(0.87)		(1.49**)	(1.290)
(+ control any birth)	(0.77)	(0.88)		(1.44**)	(1.23)
A levels (1)	0.60**	0.78*	(ref.)	1.42**	1.43**
(+ control teenage birth)	(0.62**)	(0.79*)		(1.45**)	(1.43**)
(+ control any birth)	(0.67*)	(0.83)		(1.36**)	(1.31)
A levels (2)	0.64**	0.82	(ref.)	1.47**	1.51**
(+ control teenage birth)	(0.66**)	(0.83)		(1.47**)	(1.50**)
(+ control any birth)	(0.72)	(0.87)		(1.38*)	(1.37**)
Degree	0.52**	0.73*	(ref.)	1.59**	1.64**
(+ control teenage birth)	(0.53**)	(0.74*)		(1.59**)	(1.64**)
(+ control any birth)	(0.59*)	(0.78)		(1.49**)	(1.50**)
CM					
In labour force	0.42**	0.81	(ref.)	0.80	0.68
(+ control teenage birth)	(0.43**)	(0.81)		(0.79)	(0.67)
(+ control any birth)	(0.42**)	(0.81)		(0.79)	(0.67)
NS-SEC class 1/2 ^c	0.72*	0.89	(ref.)	0.96	1.30
(+ control teenage birth)	(0.73)	(0.90)		(0.96)	(1.29)
(+ control any birth)	(0.76)	(0.92)		(0.94)	(1.25)
Partner					
No post 16 education ^d	1.73**	1.07	(ref.)	0.86	0.76
In labour force ^d	0.60**	0.83	(ref.)	0.76	1.13
NS-SEC class1/2 ^d	0.89	0.80	(ref.)	1.10	1.17
Has child	1.88**	1.32**	(ref.)	0.67**	0.54**
Had child under age 20	3.36**	1.49	(ref.)	0.88	0.77
GHQ 4+	1.31	0.76*	(ref.)	0.77	0.71*
Malaise 7+	1.83**	1.07	(ref.)	0.87	0.86
Any long standing illness	1.56**	1.08	(ref.)	0.93	0.96

* p<.05 ** p<.01

^a of those ever married ^b of those single at age 30 ^c of those working^d of those with partner ^e controlling for birthweight, parity, multiple births, maternal smoking during pregnancy, teacher rating scale (age 10), same parents (birth to age 10), household social class (age 10) and mother's education (age 10).

Discussion

The results presented above show consistent associations through childhood and early adulthood that generally reflect poorer outcomes the younger the mother at the birth of the cohort member. Specifically, cohort members (CMs) born to younger mothers were more likely to be born with low birthweight or preterm. At age 5 those CMs born to younger mothers scored significantly lower on a standardised EPVT, higher on the Rutter Child Scale and were shorter in height. At age 10, the CMs born to younger mothers were more likely not to have a father figure in the home, higher residential mobility, and poorer quality housing. The CMs themselves were more likely to have been in care and were still significantly shorter in height. Also at age 10, the CMs teachers were more likely to rate them as below average on general knowledge, less popular with their peers, less co-operative and less able to concentrate. In adulthood both men and women CMs born to younger mothers were more likely to have had a child themselves before the age of 20 and less likely to achieve A-levels or equivalent.

A caveat: The mechanisms or processes that generate the associations presented here are more likely to be multifaceted and complex and will require more involved analysis. Simplistic assumptions about any possible causal effect of the age of the mother cannot be drawn from these results.