Parental Education and Child Health: Evidence from a Schooling Reform

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BY: ANTHONY FONTANA

Other Articles from Literature

- McCray, J & Royer H (2006). "The Effect of Female Education on Fertility and Infant Health: Evidence From School Entry Policies Using Exact Date of Birth". Journal of Economic Literature.
- Doyle, O., Harmon, C. & Ian, Walker (2005). "The Impact of Parental Income and Education on the Health of Their Children". Journal of Economic Literature.
- Chen, Y & Li, H (2009). "Mother's Education and Child Health: Is There a Nurturing Effect?". Journal of Health Economics.
- Cochrane, S., Leslie, J., & O'Hara, D. (1982) "Parental Education and Child Health: Intracountry Evidence". Health Policy and Education.

Question Analyzed by Paper

- Does the education of a parent effect the Health outcome of their child and health outcome of themselves?
- Health outcome is measured at birth and also at later stages in life
- Main indicators at birth are: low birth-weight (below 3000g) and an indicator of whether the child experienced illness in the first week of life
- Illness can include incompatible Rh, severe jaundice, congenital malformation, convulsions (or cerebral irritation/cyanotic attacks), hypothermia, respiratory distress, infection, and pyloric stenosis

Later Life Health Measures

- Collected by questioning parents and consulting a medical physician who records the specific problems.

Appendix: Supplementary Variable Description

Listed below are the 12 possible groups of conditions we distinguish for children. When constructing the number of conditions, we assign for each groups a value 1 if one or more of the conditions in this group are present. Furthermore, we assume that a child has a chronic condition if s/he has at least one of the conditions defined under categories 4, 5, 6, 7, 8. A child has a mental condition if s/he has at least one of the conditions defined under categories 10, 11. A child has an acute condition if s/he has at least one of the conditions defined under categories 1, 2, 3, 9.

Outcome Variables Explained

1) Ear and Throat problems:
- Parents report "ever had" running ears
- Parents report "ever had hearing difficulty (excluding hearing impairment)
- Parents report of hospital admission for tonsils / adenoids
- Parents report of > 3 throat and ear infections with fever in the last year
- Doctors examination showed signs of past or present otitis media

2) Other Acute illness:
- Parents report of TB, Glandular fever, etc
- Parental report of pneumonia
- Parental report of abdominal operation

3) Acute likely to recur:
- Parents report "ever had" medical treatment for urinary Infection
- Parents report of fit or convulsion either before or after the 1st year of life (excludes epilepsy)

4) Asthma, Bronchitis and Wheezing:
- Parents report "ever had" asthma
- Parents report "ever had" bronchitis with wheezing

5) Allergies:
- Parents report "ever had" hay fever and sneezing
- Parents report "ever had" eczema before or after the 1st year of life
Doctors examination showed eczema

6) Chronic Medical:
- Doctors examination - heart condition (murmur excluded)
- Doctors examination - other signs of heart disease
- Doctors summary - heart condition present
- Parents report - congenital heart condition
- Parents report "ever had" nephritis or urogenital disorder
- Doctors summary - alimentary system (slight to severe handicap)
- Doctors summary - epilepsy
- Ascertained epilepsy
- Doctors summary - blood disorder / diabetes(slight to severe handicap)
- Parents report of rheumatic fever

7) Chronic (Physical) nonmedical:
- Ascertained - physical handicap (cerebral palsy)
- Parents report of having had congenital dislocation of hip
- Parent report of having had talipes
- Doctors summary - upper or lower limb or spinal abnormality

    - general motor handicap
    - other CNS condition (moderate to severe handicap)
- Doctors examination - congenital limb defects
    - malfunction upper limb
    - lower limb defect
    - mal function lower limb
    - cerebral palsy
    - spina bifida
    - talipes
    - spinal disorder
    - neurological or skeletal disorder
- Doctors summary - mental retardation
- Ascertained ESN

8) Chronic (Sensory) nonmedical:
- Ascertained - speech
- Ascertained - deaf or partial hearing
- Ascertained - blind or partially sighted
- Doctors examination - stammer (mod to severe)
    - speech unintelligible (mod to severe)
    - hearing 1mpaired (mod to severe)
    - vision (handicap with reading)
- Visual acuity with glasses - 6/12 or worse in one or both eyes

9) Injuries:
- Parental report of hospital admission for road accidents
- Parental report of hospital admission for home accident
- Parental report of hospital admission for other accident or injury
- Parental report of concussion or head injury with unconsciousness

10) Psychosocial:
- Ascertained as maladjusted
- Doctors summary - emotional maladjustment (slight to severe handicap)
- Parental report – "Wet by day after age 3"
- Parental report – "Wet by night after age 5"
- Parental report - "Soiled by day after age 4"

11) Psychosomatic:
- Parents report - vomiting or bilious attack
- Parents report - abdominal pain
- Parents report - frequent headaches or migraine

12) Other:
- Parents report hospital admission for hernia repair
- Parents report hospital admission for other operation (Incl. blood transfusion)
- Doctors report
- Inguinal hernia on examination
    - other hernia
- Parents report of hernia of any sort
- Doctors and parents report of major handicapping condition (only if respondent not included elsewhere)

Using this information we develop several measures of child health. The first measure for morbidity is based on the number of conditions the child has experienced at ages 7, 11 and 16 (as reported by both parents and the physician).[4] We use the total number of conditions as well as whether or not the child has a mental condition, a chronic condition or an acute condition. See the appendix for a definition of the latter three dichotomous variables. In addition, the survey contains information on the height and weight of the cohort members measured by a physician (and therefore less subject to measurement error than self-reports), which can be used to construct anthropometric indicators. Height-for-age-*z*-scores are built by comparing the height data with the distribution of height for a reference population, which is constructed by the US National Center for Health Statistics. Low height for age, or stunting, is an indicator of past growth failure and is associated with frequent or chronic illness, chronic inappropriate nutrition (insufficient energy intake and protein), and poverty. Height and weight are also used to construct the body mass index, which is a measure for overweight and thinness. We use the height-for-age-*z*-scores and the body mass index when the child was 7, 11 and 16. Health may be a non-linear function of body mass index and we therefore also use an indicator for overweight and underweight. Overweight of the child is defined in accordance with age and gender specific cut-off points in body mass index as defined in Cole et al. (2000). A child is underweight if it weighs less than 1 standard deviation of the weight for age *z*-score.

- This question is motivated to understand what causes child health outcomes because child health outcomes are linked to poor socioeconomic outcomes and negatively effect human capital
- Cochrane, S., Leslie, J., & O'Hara, D. (1982) find that parental education is strongly related to nutritional status of the infant and the child mortality
- McCray, J & Royer H (2006) find that female education has a small and heterogenous effect on infant health
- Doyle, O., Harmon, C. & Ian, Walker (2005) find that parental education on child health outcomes suffer from severe endogeneity problems. They find a significant impact of father with additional year of schooling but after controlling for additional covariates find no effect
- Chen, Y & Li, H (2009) find that the effect of step-mother education is very positively related to the health outcome of a child. Moreover, these results are causal.

Background

- Education Act of 1944 changed the education system for secondary schools in England and Wales
- "The aims of the education reform were to "improve the future efficiency of the labor force,
increase physical and mental adaptability, and prevent the mental and physical cramping caused by exposing children to monotonous occupations at an especially impressionable age""
- The relevant feature of the policy is that it raised the minimum school-leaving age from 14-15 in April of 1947
- We are interested in this policy because we are using it as an exogenous shock that affected the total years of schooling for secondary school participants in Wales and England
- We use this policy to help explain how additional schooling covaries, and if possible causes health outcome for children

Data Source, Variables, & Measurement Process

- The National Child Development Study
- Longitudinal data
- 17,000 Babies in Great Britain in the week if 3-9 March 1958
- Cohort members traced on six other occasions to monitor physical, educational, and social circumstances (interviews)
- The survey information gathered from mothers and medical records
- Surveys during childhood were carried out with parents, teachers, and school health service
- Contains information on both parents and children
- Medical Examinations are performed by physicians, then the authors construct their variables (as seen in prior slides)

Empirical Strategy & Estimation Eqn

- Fuzzy Regression Discontinuity with 2SLS IV Regression

$$H = \beta_0 + \beta_1 E^{f} + \beta_2 E^{m} + \beta_3 S + \beta_4 P + \beta_5 R + \beta_6 A^{f} + \beta_7 A^{m} + \varepsilon$$

$$E^{f} = \delta_0 + \delta_1 Y^{f} + \delta_2 S + \delta_3 P + \delta_4 R + \delta_5 A^{f} + \gamma$$

$$E^{m} = \delta_0 + \delta_1 Y^{m} + \delta_2 S + \delta_3 P + \delta_4 R + \delta_5 A^{m} + \upsilon$$

H represents child health, *E* the age at which the father and mother finished school, *S* the sex of the child, *P* parity in 1958, *R* includes dummy variables for the region of residence, *A* includes the age of the father and the mother in 1958, and *Y* is a dummy for whether the individual was affected by the reform. The superscript f indicates that the variable relates to the father, while the superscript m relates to the mother.

This model will estimate the causal effects of parental education on a range of child health variables: the child's birth weight, being low birth weight, whether the child had an illness at birth, the number of conditions in later childhood, the occurrence of chronic, mental and acute conditions, height-for-age-z-scores, body mass index, being overweight and being underweight. The results of these analyses will be discussed in Section 5.1.

What are we trying to do???

- The estimation strategy first indicates whether or not a male or female had a change in their average amount of schooling due to the exogenous policy shock
- Notice that there are covariates in the first stage. This is because the policy shock doesn't strictly determine the additional time of school you have. People can still drop out for other reasons. The policy is supposed to make you more likely to stay in school or increase the amount of school. The covariates are included to reduce the bias in our estimations of how average school increments change when the policy is introduced
- These estimations are then used in the second stage as determinants of whatever health outcome is under discussion

Challenges to Estimation?

- Endogeneity: Relationship between the variables of interest might purely be spurious
- Old Methods? Simple bivariate and multivariate regression on cross sectional data. T-stats for group mean differences. Stepwise regression with R-Squared the primary criterion for analyzing relationships
- Then Joshua Angrist came around and revolutionized how we do applied microeconomics
- Now people are using the method employed in this paper and find a spurious relationship between the variables of interest just as this paper does

- Selection bias of dropouts
- Exclusion assumption of instrumental variable approach
- No clear demarcation between treatment and non-treatment group (ie: too fuzzy of a regression discontinuity, too much treatment non-compliance)
- External Validity (lack of generalizability to different contexts with different data) (perhaps with different treatments and different cutoffs we may see different results)
- Sensitivity of coefficients to choice of parametric or non-parametric specification (recommend checking functional form with multiple specifications and check the sensitivity of the results) (linear, quadratic, cubic, local linear etc.) (add interaction terms and nonlinear terms)
- Density tests near the cutoff
- Assumes that distribution of outcome variable doesn't change over time of fixed-effects

General Issues in the Literature

- Each study seems to be trying to answer different questions and hence come to different conclusions

- For example, Yuyu Chen a,1, Hongbin Li are answering a slightly different question which can really change the way we are viewing the topic.
- They ask what the effect of mothers education is on child health but they are asking it about a completely different population; that is Mothers adopting children not genetic mothers!!!!!!
- Problems in Literature? If we slightly respecify the hypothesis how will our conclusions change? Be clear about the hypothesis and generality of it.

Summary Stats

Table 1
Parental and child variables by level of parental schooling.

	Fathers			Mothers		
	14	15	16+	14	15	16+
Child birth weight (in kg)	3.36	3.33	3.41	3.37	3.32	3.39
Being low birth weight (less than 3000 g) (%)	24	24	18	23	25	20
Child has illness at birth (%)	3.0	2.2	2.4	3.2	2.6	2.1
Child number of conditions (average over 1965, 1969, 1974)	2.17	2.16	2.07	2.15	2.22	2.10
Child has chronic condition (%)	49	48	46	49	50	45
Child has mental condition (%)	43	42	38	43	43	39
Child has acute condition (%)	60	61	58	60	62	58
Height-for-age *z*-score	−0.098	−0.078	0.037	−0.077	−0.108	0.077
Body mass index (average over 1965, 1969, 1974)	18.1	17.9	17.6	18.1	17.9	17.6
Underweight (<1 S.D. of *z*-score) (%)	17.5	18.1	13.7	17.1	19.0	13.1
Overweight (%)	10.7	8.7	8.9	11.2	8.8	8.7
Maternal smoking during pregnancy (%)	36	31	23	37	33	21
Breastfeeding (%)	67	74	79	65	74	79
Father chronic conditions (average over 1969, 1974) (%)	8.3	4.8	4.0	8.6	5.6	4.5
Mother chronic conditions (average over 1969, 1974) (%)	6.2	5.6	4.2	6.7	5.4	4.3
Body mass index father	24.3	24.3	24.0	24.4	24.2	24.0
Father underweight (body mass index below 20) (%)	6.1	5.9	5.5	6.3	6.0	5.5
Father overweight (body mass index above 25) (%)	37.6	37.5	30.9	38.4	36.9	30.5
Body mass index mother	23.7	23.1	22.6	23.7	23.1	22.7
Mother underweight (body mass index below 20) (%)	18.9	21.4	22.2	18.4	22.1	21.3
Mother overweight (body mass index above 25) (%)	30.9	25.5	17.5	32.1	25.0	18.4
Mother works (average over 1965, 1969, 1974) (%)	53	60	49	58	59	54
Financial difficulties in the family (average over 1965, 1969, 1974) (%)	9.6	9.8	3.1	10.6	9.8	3.9

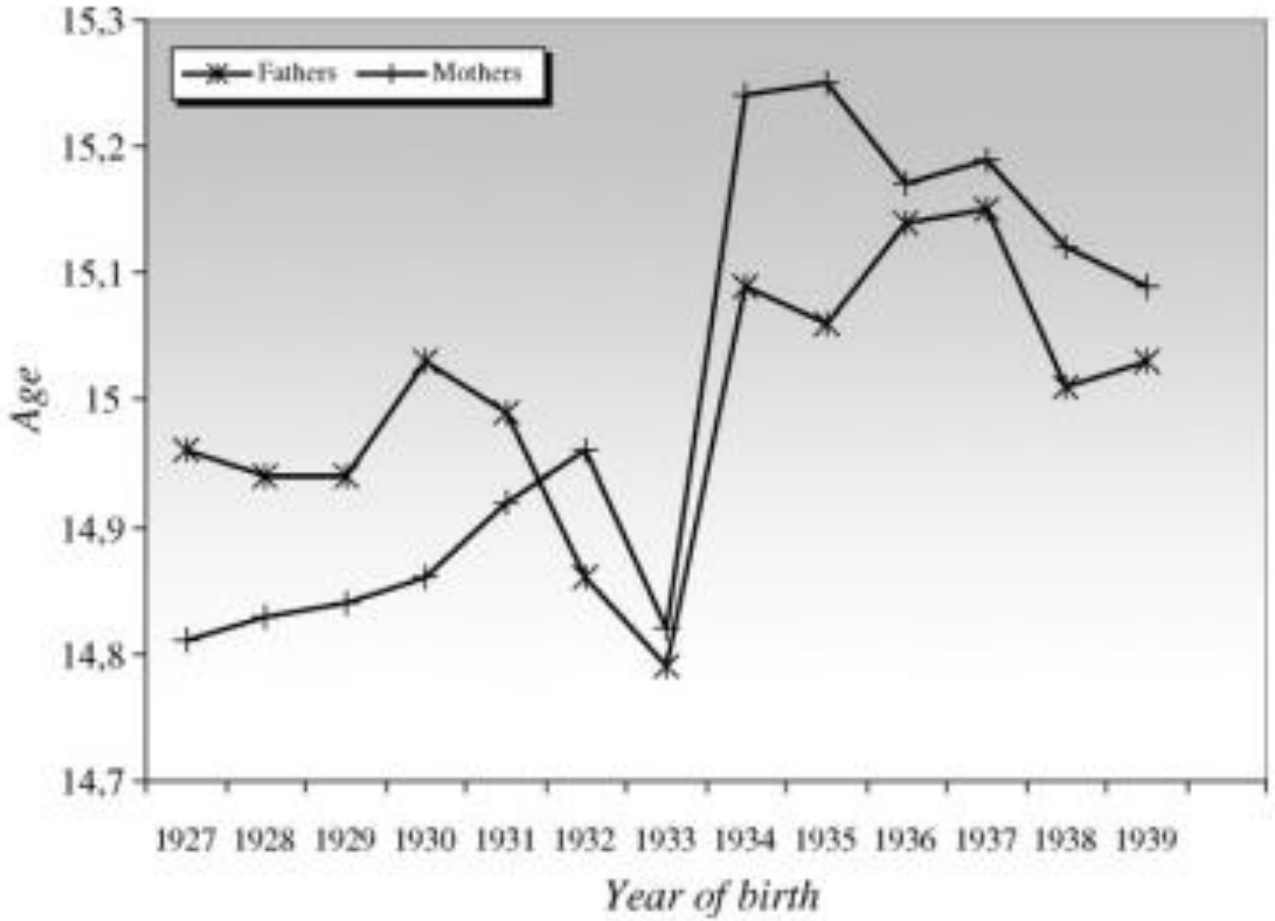
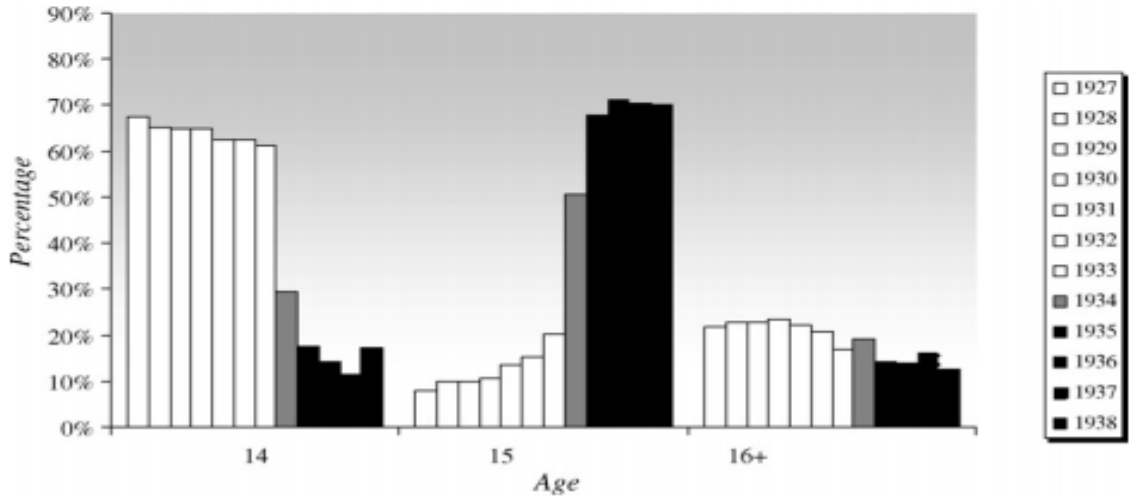


Fig. 1. Mean age of finishing schooling by birth year.

Distribution before and after Reform (Fathers)

Table 2
Distribution of parents schooling by year of birth.

	Fathers			Mothers		
	Mean	S.D.	Freq.	Mean	S.D.	Freq.
1927	14.96	2.11	1644	14.81	1.74	1254
1928	14.94	1.93	1947	14.83	1.64	1557
1929	14.94	2.00	2019	14.84	1.67	1905
1930	15.03	2.03	2133	14.86	1.62	1857
1931	14.99	1.92	1989	14.92	1.71	2316
1932	14.86	1.62	1977	14.96	1.71	2040
1933	14.79	1.65	1785	14.82	1.39	2055
1934	15.09	1.35	1500	15.24	1.29	2019
1935	15.06	0.94	1305	15.25	1.04	1986
1936	15.14	1.14	966	15.17	0.98	1860
1937	15.15	1.08	588	15.19	0.87	1608
1938	15.01	0.73	330	15.12	0.68	1245
1939	15.03	0.74	174	15.09	0.65	744



(mothers)

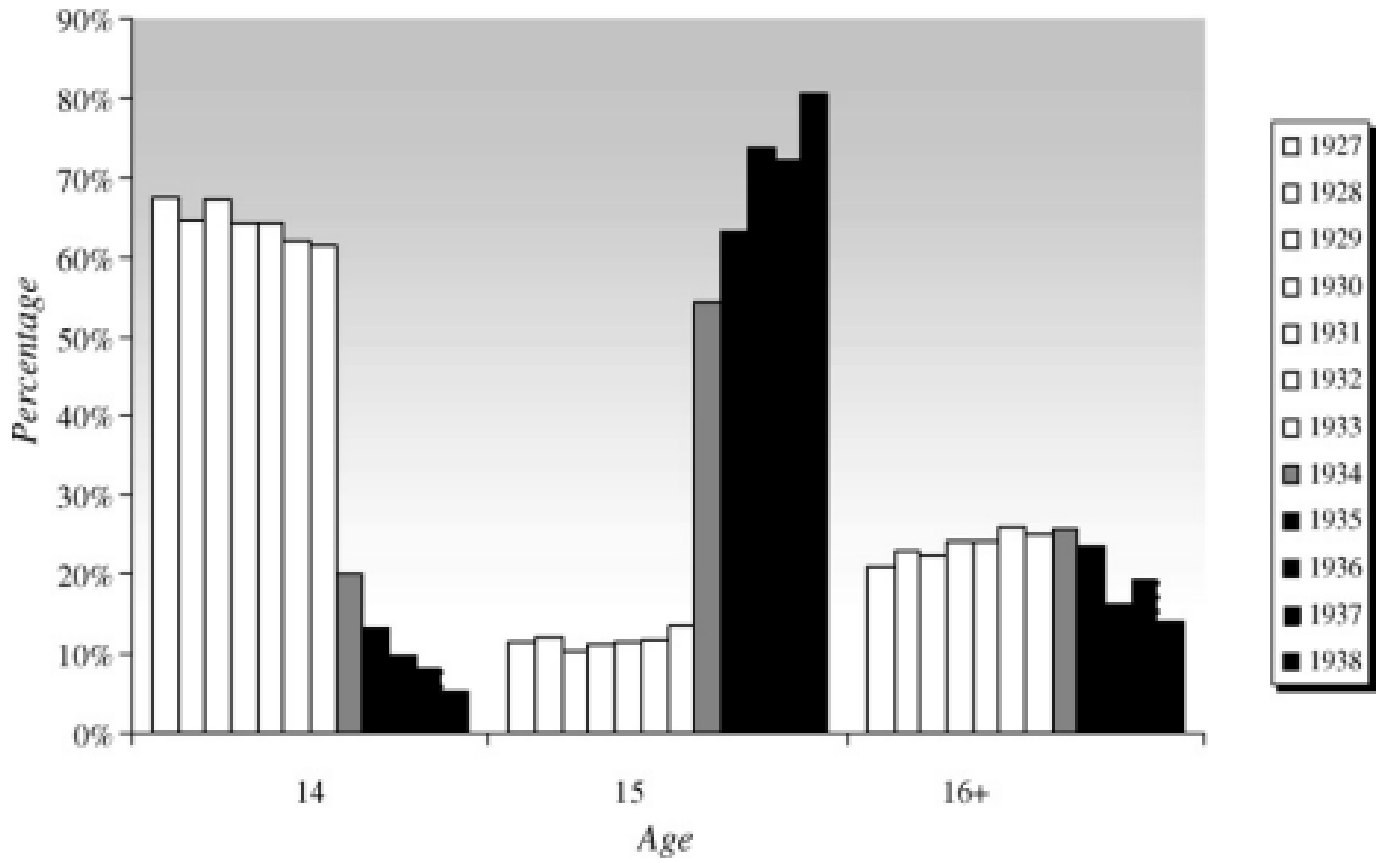


Fig. 3. Age finishing school by year of birth (mothers). The white bars describe the pre-reform period, the grey bar is the reform year and the black bars are the post-reform years.

First Stage Results

Table 3
Effect of the reform of school leaving age.

	Father		Mother	
	Full sample	Restricted sample	Full sample	Restricted sample
All years				
Born in 1934	0.147 (0.064)**	0.477 (0.024)**	0.407 (0.053)**	0.555 (0.020)**
Born in 1935 and afterwards	0.145 (0.036)**	0.671 (0.013)**	0.323 (0.025)**	0.708 (0.008)**
Observations	11,072	8389	11,274	8593
1930–1938				
Born in 1934	0.176 (0.070)**	0.443 (0.026)**	0.355 (0.058)**	0.573 (0.021)**
Born in 1935 and afterwards	0.182 (0.047)**	0.628 (0.015)**	0.292 (0.036)**	0.721 (0.011)**
Observations	4186	3342	5669	4350
1931–1937				
Born in 1934	0.218 (0.072)**	0.425 (0.026)**	0.347 (0.061)**	0.570 (0.022)**
Born in 1935 and afterwards	0.235 (0.052)**	0.613 (0.017)**	0.299 (0.042)**	0.704 (0.013)**
Observations	3365	2806	4625	3527
1933–1935				
Born in 1934	0.297 (0.090)**	0.383 (0.031)**	0.424 (0.072)**	0.552 (0.026)**
Born in 1935 and afterwards	0.266 (0.081)**	0.544 (0.029)**	0.423 (0.066)**	0.644 (0.024)**
Observations	1530	1258	2024	1508
1930–1938 excluding 1934				
Born in 1935 and afterwards	0.182 (0.047)**	0.628 (0.015)**	0.292 (0.036)**	0.721 (0.011)**
Observations	3686	2924	4996	3854

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level.

Second Stage Results & OLS

Table 4a
Parents education and child's health—OLS results (full sample).

	Birth weight	Low birth weight	Illness at birth	Number of conditions	Having a chronic condition	Having a mental condition	Having an acute condition	Height-for age-*z* scores	Body mass index	Underweight	Overweight
1930–1938											
Father	0.007 (0.006)	−0.011 (0.006)*	0.000 (0.002)	0.000 (0.015)	0.007 (0.005)	−0.005 (0.004)	0.003 (0.005)	0.028 (0.013)**	−0.040 (0.026)	−0.001 (0.004)	−0.003 (0.003)
Mother	0.020 (0.008)**	−0.011 (0.007)	−0.001 (0.003)	−0.014 (0.021)	0.000 (0.006)	−0.002 (0.006)	−0.012 (0.007)*	0.039 (0.016)**	−0.002 (0.034)	−0.008 (0.005)*	−0.005 (0.003)
P-value joint	0.000	0.001	0.951	0.725	0.314	0.331	0.216	0.000	0.150	0.054	0.029
Observations	3331	3331	3459	8186	8514	8929	8961	7921	7921	7921	7921
1931–1937											
Father	0.005 (0.007)	−0.009 (0.007)	−0.003 (0.002)	−0.009 (0.018)	0.002 (0.006)	−0.004 (0.005)	0.003 (0.006)	0.026 (0.015)*	−0.085 (0.029)**	−0.001 (0.004)	−0.007 (0.003)**
Mother	0.018 (0.010)*	−0.008 (0.009)	0.001 (0.003)	−0.021 (0.025)	−0.003 (0.008)	−0.006 (0.007)	−0.020 (0.008)**	0.042 (0.019)**	0.029 (0.041)	−0.009 (0.005)**	−0.002 (0.004)
P-value joint	0.023	0.081	0.496	0.367	0.937	0.253	0.036	0.000	0.008	0.019	0.013
Observations	2345	2345	2434	5740	5964	6249	6270	5543	5543	5543	5543
1933–1935											
Father	0.014 (0.017)	−0.024 (0.016)	0.009 (0.006)	−0.057 (0.043)	−0.009 (0.014)	−0.009 (0.011)	0.004 (0.014)	0.018 (0.027)	−0.171 (0.058)**	−0.005 (0.007)	−0.014 (0.006)**
Mother	0.013 (0.019)	−0.008 (0.018)	−0.008 (0.007)	0.001 (0.054)	0.002 (0.015)	0.004 (0.013)	−0.032 (0.018)*	0.080 (0.034)**	0.165 (0.080)**	−0.007 (0.009)	0.006 (0.010)
P-value joint	0.396	0.134	0.311	0.344	0.755	0.700	0.182	0.008	0.011	0.293	0.108
Observations	543	543	561	1321	1382	1445	1450	1288	1288	1288	1288
1930–1938, excluding 1934											
Father	0.000 (0.007)	−0.012 (0.006)*	0.000 (0.002)	0.017 (0.017)	0.012 (0.006)**	−0.005 (0.005)	0.008 (0.006)	0.023 (0.015)	−0.058 (0.028)**	0.002 (0.005)	−0.004 (0.003)
Mother	0.028 (0.009)**	−0.011 (0.008)	−0.002 (0.003)	−0.024 (0.022)	−0.005 (0.007)	−0.002 (0.006)	−0.131 (0.008)	0.047 (0.018)**	0.006 (0.039)	−0.011 (0.006)*	−0.005 (0.004)
P-value joint	0.002	0.005	0.785	0.487	0.086	0.358	0.245	0.000	0.042	0.101	0.024
Observations	2532	2532	2612	6221	6461	6778	6804	6032	6032	6032	6032

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. For each interval, both the mother and the father are born within those years. Regressions are performed for children living with their natural parents and include sex of child, parity, regional dummies, and parental age. The results for the number of conditions, height-for age-*z* scores and body mass index are based on observations when the child was 7, 11 and 16 years old. We control for the age of the child and the estimation includes clustered standard errors. Disaggregated analyses are available upon request.

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Table 4b
Parents education and child's health—OLS results (Parents finishing at age 14–15).

	Birth weight	ow birth weight	Illness at birth	Number of conditions	Having a chronical condition	Having a mental condition	Having an acute condition	Height-for age-*z* scores	Body mass index	Underweight	Overweight
1930–1938											
Father	0.084 (0.026)**	−0.071 (0.023)**	0.008 (0.008)	−0.110 (0.069)	−0.023 (0.021)	−0.038 (0.019)**	−0.005 (0.022)	0.073 (0.054)	0.049 (0.109)	−0.032 (0.017)*	0.004 (0.012)
Mother	−0.035 (0.029)	0.003 (0.026)	−0.008 (0.009)	−0.011 (0.075)	−0.024 (0.022)	−0.017 (0.020)	0.021 (0.024)	−0.062 (0.057)	−0.085 (0.119)	0.024 (0.019)	−0.018 (0.013)
P-value joint	0.006	0.006	0.515	0.238	0.176	0.045	0.680	0.314	0.752	0.120	0.426
Observations	2287	2287	2381	5609	5845	6152	6175	5415	5415	5415	5415
1931–1937											
Father	0.080 (0.030)**	−0.087 (0.027)**	0.005 (0.010)	−0.116 (0.085)	−0.032 (0.025)	−0.041 (0.022)*	−0.008 (0.027)	0.046 (0.062)	−0.035 (0.131)	−0.018 (0.020)	0.002 (0.014)
Mother	−0.015 (0.033)	0.000 (0.030)	−0.001 (0.010)	−0.021 (0.091)	−0.032 (0.026)	−0.018 (0.024)	0.037 (0.028)	−0.037 (0.066)	−0.117 (0.144)	0.025 (0.021)	−0.025 (0.017)
P-value joint	0.028	0.003	0.834	0.304	0.101	0.068	0.418	0.726	0.625	0.419	0.342
Observations	1606	1606	1669	3928	4087	4297	4315	3786	3786	3786	3786
1933–1935											
Father	0.088 (0.055)	−0.082 (0.056)	−0.200 (0.100)**	−0.231 (0.142)	−0.096 (0.044)**	−0.045 (0.037)	−0.012 (0.046)	−0.029 (0.105)	−0.357 (0.243)	0.029 (0.033)	−0.010 (0.029)
Mother	−0.109 (0.058)*	0.064 (0.062)	−0.021 (0.119)	−0.077 (0.154)	−0.006 (0.044)	−0.021 (0.042)	0.020 (0.050)	−0.048 (0.112)	−0.355 (0.276)	0.017 (0.032)	−0.060 (0.036)*
P-value joint	0.109	0.298	0.099	0.133	0.053	0.324	0.917	0.812	0.027	0.518	0.133
Observations	372	327	386	900	946	992	997	868	868	868	868
1930–1938, excluding 1934											
Father	0.099 (0.032)**	−0.085 (0.028)**	0.010 (0.010)	−0.023 (0.084)	0.017 (0.025)	−0.029 (0.023)	−0.003 (0.027)	0.047 (0.066)	0.082 (0.128)	−0.041 (0.020)**	0.002 (0.015)
Mother	−0.002 (0.004)	−0.032 (0.031)	−0.011 (0.011)	−0.063 (0.091)	−0.043 (0.027)	−0.036 (0.025)	0.002 (0.029)	−0.062 (0.068)	−0.092 (0.141)	0.026 (−0.023)	−0.024 (0.016)
P-value joint	0.006	0.001	0.483	0.697	0.276	0.057	0.994	0.599	0.719	0.109	0.334
Observations	1746	1746	1816	4282	4455	4695	4714	4151	4151	4151	4151

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. For each interval, both the mother and the father are born within those years. Regressions are performed for children living with their natural parents and include sex of child, parity, regional dummies, and parental age. The results for the number of conditions, height-for age-*z* scores and body mass index are based on observations when the child was 7, 11 and 16 years old. We control for the age of the child and the estimation includes clustered standard errors. Disaggregated analyses are available upon request.

Table 5a
Parents education and child's health—IV results (full sample).

	Birth weight	ow birth weight	Illness at birth	Number of conditions	Having a chronic condition	Having a mental condition	Having an acute condition	Height-for age-z-scores	Body mass index	Underweight	Overweight
1930–1938											
Father	0.094 (0.091)	−0.084 (0.079)	0.002 (0.027)	0.134 (0.209)	0.023 (0.060)	0.024 (0.055)	0.113 (0.073)	0.091 (0.151)	−0.301 (0.327)	0.009 (0.049)	−0.047 (0.037)
F-test 1st stage	3.41	3.41	3.81	4.17	4.19	4.81	4.88	4.16	4.16	4.16	4.16
Mother	−0.121 (0.078)	0.005 (0.068)	0.000 (0.023)	0.116 (0.195)	−0.018 (0.055)	0.032 (0.052)	0.061 (0.070)	−0.059 (0.142)	−0.175 (0.313)	0.024 (0.045)	0.019 (0.035)
F-test 1st stage	8.03	8.03	8.91	7.42	7.50	7.84	7.73	7.55	7.55	7.55	7.55
P-value joint	0.253	0.551	0.997	0.556	0.907	0.676	0.132	0.810	0.460	0.822	0.450
Observations	3331	3331	3459	8186	8514	8921	8961	7921	7921	7921	7921
1931–1937											
Father	0.087 (0.140)	−0.030 (0.119)	−0.020 (0.040)	0.183 (0.353)	0.012 (0.094)	−0.008 (0.085)	0.134 (0.128)	0.024 (0.257)	−0.285 (0.580)	0.058 (0.089)	−0.076 (0.066)
F-test 1st stage	1.43	1.43	1.66	1.63	1.75	1.93	1.95	1.59	1.59	1.59	1.59
Mother	−0.110 (0.130)	0.039 (0.110)	0.006 (0.040)	0.241 (0.320)	0.005 (0.009)	0.007 (0.081)	0.131 (0.124)	−0.231 (0.234)	−0.418 (0.483)	0.068 (0.077)	0.007 (0.057)
F-test 1st stage	2.78	2.78	3.27	2.88	2.78	2.99	3.00	2.92	2.92	2.92	2.92
P-value joint	0.533	0.92	0.885	0.655	0.990	0.992	0.376	0.609	0.625	0.563	0.514
Observations	2345	2345	2434	5740	5964	6249	6270	5543	5543	5543	5543
1933–1935											
Father	−0.025 (0.105)	−0.007 (0.115)	−0.012 (0.035)	0.055 (0.278)	−0.050 (0.075)	0.029 (0.068)	0.148 (0.086)*	−0.056 (0.162)	−0.301 (0.454)	0.021 (0.056)	−0.056 (0.056)
F-test 1st stage	4.85	4.85	4.85	3.70	3.98	4.18	4.20	3.72	3.72	3.72	3.72
Mother	−0.240 (0.187)	−0.183 (0.304)	−0.054 (0.060)	−0.525 (0.568)	−0.054 (0.156)	−0.049 (0.136)	−0.065 (0.184)	0.105 (0.381)	−0.095 (0.822)	−0.008 (0.108)	−0.017 (0.097)
F-test 1st stage	0.68	0.68	0.85	0.51	1.10	1.02	1.02	1.15	1.15	1.15	1.15
P-value joint	0.437	0.831	0.652	0.564	0.614	0.777	0.534	0.872	0.791	0.578	0.761
Observations	543	543	561	1321	1382	1445	1450	1288	1288	1288	1288
1930–1938, excluding 1934											
Father	0.183 (0.178)	−0.262 (0.172)	−0.006 (0.046)	0.161 (0.330)	0.045 (0.101)	0.080 (0.091)	0.102 (0.107)	−0.037 (0.258)	−0.011 (0.525)	0.053 (0.085)	−0.034 (0.060)
F-test 1st stage	3.33	3.33	4.00	4.92	4.75	5.41	5.44	4.79	4.79	4.79	4.79
Mother	−0.201 (0.142)	0.126 (0.138)	0.035 (0.037)	0.059 (0.305)	−0.021 (0.085)	−0.035 (0.081)	−0.028 (0.096)	−0.132 (0.226)	−0.497 (0.467)	0.022 (0.073)	−0.033 (0.052)
F-test 1st stage	8.80	8.80	10.23	10.56	10.96	11.33	11.16	11.14	11.14	11.14	11.14
P-value joint	0.362	0.317	0.544	0.688	0.901	0.664	0.470	0.668	0.396	0.536	0.399
Observations	2532	2532	2629	6221	6461	6778	6804	6032	6032	6032	6032

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. For each interval, both the mother and the father are born within those years. The regressions are performed for those children with their natural parents. Extra controls as in Table 4.

Table 5b
Parents education and child's health—IV results (Parents finishing at age 14–15).

	Birth weight	ow birth weight	Illness at birth	Number of conditions	Having a chronic condition	Having a mental condition	Having an acute condition	Height-for age-z-scores	Body mass index	Underweight	Overweight
1930–1938											
Father	0.049 (0.099)	−0.020 (0.087)	−0.018 (0.031)	−0.066 (0.241)	−0.036 (0.073)	−0.007 (0.067)	0.080 (0.082)	−0.058 (0.190)	−0.458 (0.391)	0.071 (0.063)	−0.458 (0.391)
F-test 1st stage	41.06	41.06	43.34	39.32	40.83	41.07	41.18	36.91	36.91	36.91	36.91
Mother	−0.145 (0.075)*	0.006 (0.066)	−0.005 (0.023)	0.058 (0.184)	−0.058 (0.054)	−0.017 (0.049)	0.105 (0.058)*	−0.145 (0.139)	−0.382 (0.296)	0.047 (0.046)	−0.382 (0.296)
F-test 1st stage	93.56	93.56	100.27	91.97	92.48	95.30	95.91	89.90	89.90	89.90	89.90
P-value joint	0.152	0.973	0.81	0.929	0.451	0.929	0.381	0.519	0.165	0.266	0.484
Observations	2287	2287	2381	5609	5845	6152	6175	5415	5415	5415	5415
1931–1937											
Father	0.172 (0.138)	−0.065 (0.124)	−0.073 (0.043)*	−0.036 (0.349)	−0.077 (0.106)	−0.029 (0.097)	0.071 (0.117)	−0.018 (0.272)	−0.070 (0.572)	0.080 (0.088)	−0.070 (0.572)
F-test 1st stage	20.13	20.13	21.11	19.19	20.36	20.28	20.45	18.38	18.38	18.38	18.38
Mother	−0.045 (0.097)	−0.084 (0.087)	0.009 (0.030)	0.128 (0.245)	−0.038 (0.073)	−0.004 (0.066)	0.146 (0.077)*	−0.214 (0.186)	−0.482 (0.388)	0.039 (0.059)	−0.482 (0.388)
F-test 1st stage	52.33	52.33	57.07	54.03	53.35	54.00	54.31	51.57	51.57	51.57	51.57
P-value joint	0.459	0.427	0.241	0.870	0.574	0.948	0.560	0.471	0.411	0.464	0.730
Observations	1606	1606	1669	3928	4087	4297	4303	3786	3786	3786	3786
1933–1935											
Father	0.024 (0.121)	0.062 (0.454)	−0.011 (0.039)	0.102 (0.305)	−0.123 (0.098)	0.012 (0.089)	0.094 (0.108)	−0.388 (0.243)	−0.832 (0.574)	0.179 (0.083)*	−0.832 (0.574)
F-test 1st stage	3.21	3.21	3.85	3.24	31.93	31.46	31.75	30.10	30.10	30.10	30.10
Mother	−0.098 (0.109)	−0.258 (0.275)	−0.030 (0.035)	−0.363 (0.294)	0.212 (0.211)	0.091 (0.195)	0.139 (0.237)	−0.062 (0.216)	1.380 (1.121)	−0.240 (0.164)	1.380 (1.121)
F-test 1st stage	11.03	11.03	12.93	13.95	9.20	8.16	7.98	8.72	8.72	8.72	8.72
P-value joint	0.656	0.615	0.554	0.457	0.304	0.837	0.768	0.107	0.284	0.400	0.518
Observations	372	372	386	900	946	992	997	868	868	868	868
1930–1938, excluding 1934											
Father	0.094 (0.120)	−0.080 (0.104)	−0.013 (0.038)	−0.049 (0.286)	−0.026 (0.087)	−0.004 (0.080)	0.086 (0.096)	−0.125 (0.234)	−0.014 (0.455)	0.064 (0.077)	−0.027 (0.054)
F-test 1st stage	64.56	64.56	69.71	60.8	63.46	64.87	65.17	55.32	55.32	55.32	55.32
Mother	−0.153 (0.097)	0.000 (0.084)	0.031 (0.030)	0.026 (0.230)	−0.061 (0.067)	−0.024 (0.061)	0.039 (0.072)	−0.316 (0.174)	−0.567 (0.360)	0.057 (0.057)	−0.063 (0.041)
F-test 1st stage	128.49	128.5	137.78	127.96	130.9	136.17	137.93	130.53	130.5	130.53	130.5
P-value joint	0.262	0.728	0.595	0.982	0.597	0.917	0.802	0.132	0.277	0.384	0.248
Observations	1746	1746	1816	4282	4455	4695	4714	4151	4151	4151	4151

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. For each interval, both the mother and the father are born within those years. The regressions are performed for those children with their natural parents. Extra controls as in Table 4.

Table 6a
Separate analyses for mother's education on child's health—IV results (full sample).

	Birth weight	ow birth weight	Illness at birth	Number of conditions	Having a chronic condition	Having a mental condition	Having an acute condition	Height-for age-z-scores	Body mass index	Underweight	Overweight
1930–1938											
Mother	−0.063 (0.071)	−0.010 (0.060)	−0.009 (0.022)	0.041 (0.162)	−0.038 (0.050)	−0.012 (0.045)	0.041 (0.052)	0.063 (0.127)	−0.191 (0.276)	0.003 (0.041)	0.005 (0.032)
F-test 1st stage	14.01	14.01	15.71	16.31	15.49	16.68	17.28	15.02	14.86	14.86	14.86
Observations	5337	5337	5515	13,043	13,541	14,184	13,859	12,618	12,676	12,676	12,676
1931–1937											
Mother	−0.029 (0.073)	−0.026 (0.063)	−0.009 (0.023)	0.010 (0.164)	−0.064 (0.052)	−0.027 (0.046)	0.048 (0.053)	0.096 (0.130)	−0.134 (0.278)	0.005 (0.041)	0.008 (0.032)
F-test 1st stage	12.65	12.65	14.59	16.27	15.29	16.56	17.50	14.36	14.51	14.51	14.51
Observations	4342	12.65	4496	10,625	11,028	11,536	11,275	10,277	10,326	10,326	10,326
1933–1935											
Mother	−0.107 (0.067)	−0.084 (0.086)	−0.020 (0.020)	0.083 (0.150)	0.031 (0.082)	0.046 (0.072)	0.060 (0.014)	0.156 (0.214)	0.273 (0.468)	−0.051 (0.069)	0.070 (0.058)
F-test 1st stage	15.75	15.75	16.52	13.55	12.48	14.52	15.40	11.14	11.34	11.34	11.34
Observations	1908	1908	1971	4678	4872	5107	4980	4531	4554	4554	4554
1930–1938, excluding 1934											
Mother	−0.073 (0.103)	0.078 (0.089)	0.011 (0.031)	−0.022 (0.225)	−0.071 (0.068)	−0.399 (0.064)	0.020 (0.073)	0.059 (0.175)	−0.293 (0.386)	0.033 (0.057)	−0.032 (0.043)
F-test 1st stage	13.59	13.59	16.08	18.43	17.69	18.21	19.03	16.29	16.41	16.41	16.41
Observations	4707	4707	4861	11,460	11,882	12,459	12,177	11,075	11,126	11,126	11,126

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. The regressions are performed for those children with their natural parents. Extra controls as in Table 4.

Table 6b
Separate analyses for mother's education on child's health—IV results (finishing at age 14–15).

	Birth weight	ow birth weight	Illness at birth	Number of conditions	Having a chronic condition	Having a mental condition	Having an acute condition	Height-for age-z-scores	Body mass index	Underweight	Overweight
1930–1938											
Mother	−0.094 (0.057)	0.033 (0.050)	−0.005 (0.019)	−0.007 (0.143)	−0.042 (0.051)	−0.029 (0.038)	0.040 (0.045)	−0.061 (0.107)	−0.373 (0.230)	0.038 (0.034)	−0.021 (0.027)
F-test 1st stage	288.03	288.03	304.22	278.43	281.94	287.74	281.69	275.98	275.23	275.23	275.23
Observations	4094	4094	4229	9952	10,345	10,863	10,609	9601	9640	9640	9640
1931–1937											
Mother	−0.057 (0.067)	0.011 (0.058)	−0.008 (0.022)	−0.005 (0.167)	−0.071 (0.049)	−0.037 (0.045)	0.075 (0.052)	−0.004 (0.126)	−0.359 (0.267)	0.040 (0.041)	−0.013 (0.032)
F-test 1st stage	199.04	199.04	213.82	193.29	195.28	198.30	194.17	189.81	189.69	189.69	189.69
Observations	3313	3313	3426	8054	8368	8773	8575	7761	7794	7794	7794
1933–1935											
Mother	−0.109 (0.047)**	−0.112 (0.105)	−0.015 (0.016)	0.053 (0.118)	−0.037 (0.091)	0.016 (0.084)	0.042 (0.095)	0.085 (0.237)	0.246 (0.507)	0.033 (0.076)	0.071 (0.060)
F-test 1st stage	102.67	102.67	112.54	99.29	97.05	100.16	97.65	92.45	94.38	94.38	94.38
Observations	1426	1426	1466	3469	3617	3797	3703	3335	3352	3352	3352
1930–1938, excluding 1934											
Mother	−0.101 (0.065)	0.067 (0.057)	0.006 (0.022)	−0.010 (0.164)	−0.044 (0.047)	−0.036 (0.044)	0.023 (0.051)	−0.060 (0.121)	−0.409 (0.261)	0.035 (0.039)	−0.042 (0.031)
F-test 1st stage	477.98	477.98	498.82	454.92	465.59	474.60	464.75	457.42	454.03	454.03	454.03
Observations	3627	3627	3747	8795	9129	9600	9381	8480	8513	8513	8513

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. The regressions are performed for those children with their natural parents. Extra controls as in Table 4.

Table 7a
Separate analyses for father's education on child's health—IV results (full sample).

	Birth weight	ow birth weight	Illness at birth	Number of conditions	Having a chronic condition	Having a mental condition	Having an acute condition	Height-for age-z-scores	Body mass index	Underweight	Overweight
1930–1938											
Father	0.034 (0.090)	−0.058 (0.082)	−0.011 (0.028)	0.108 (0.224)	0.016 (0.067)	0.057 (0.061)	0.072 (0.064)	−0.043 (0.177)	−0.396 (0.366)	0.037 (0.056)	−0.030 (0.041)
F-test 1st stage	5.57	5.57	6.17	6.24	6.24	7.46	7.82	5.98	6.18	6.18	6.18
Observations	3944	3944	4093	9614	10,001	10,480	10,187	9291	9332	9332	9332
1931–1937											
Father	0.016 (0.112)	−0.005 (0.102)	−0.035 (0.036)	0.219 (0.319)	−0.020 (0.043)	0.086 (0.086)	0.087 (0.090)	0.011 (0.239)	−0.325 (0.502)	0.007 (0.074)	−0.030 (0.057)
F-test 1st stage	3.92	3.92	4.10	3.54	3.61	4.28	4.35	3.39	3.49	3.49	3.49
Observations	3167	3167	3286	7692	7996	8379	8154	7423	7457	7457	7457
1933–1935											
Father	−0.019 (0.104)	0.147 (0.140)	−0.010 (0.033)	0.422 (0.355)	0.001 (0.131)	0.067 (0.120)	0.161 (0.141)	0.231 (0.309)	−0.589 (0.666)	−0.015 (0.095)	−0.058 (0.075)
F-test 1st stage	6.36	6.36	4.85	4.33	4.49	5.24	5.31	5.17	5.40	5.40	5.40
Observations	1444	1444	1496	3475	3618	3789	3689	3362	3375	3375	3375
1930–1938, excluding 1934											
Father	0.056 (0.101)	−0.090 (0.092)	−0.015 (0.031)	−0.057 (0.243)	0.011 (0.074)	0.046 (0.066)	0.050 (0.069)	−0.118 (0.209)	−0.294 (0.406)	0.063 (0.066)	−0.022 (0.046)
F-test 1st stage	8.86	8.86	10.26	10.34	10.48	12.30	12.86	9.38	9.66	9.66	9.66
Observations	3468	3468	3601	8479	8826	9252	8980	8219	8252	8252	8252

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. The regressions are performed for those children with their natural parents. Extra controls as in Table 4.

Table 7b
Separate analyses for father's education on child's health—IV results (finishing at age 14–15).

	Birth weight	ow birth weight	Illness at birth	Number of conditions	Having a chronic condition	Having a mental condition	Having an acute condition	Height-for age-z-scores	Body mass index	Underweight	Overweight
1930–1938											
Father	−0.003 (0.084)	0.012 (0.076)	−0.010 (0.027)	0.053 (0.216)	−0.014 (0.065)	0.037 (0.061)	0.058 (0.066)	−0.135 (0.175)	−0.412 (0.352)	0.091 (0.057)	−0.016 (0.041)
F-test 1st stage	101.86	101.86	106.91	90.45	94.20	93.14	91.47	85.51	85.41	85.41	85.41
Observations	3141	3141	3266	7650	7967	8373	8133	7392	7423	7423	7423
1931–1937											
Father	−0.026 (0.105)	0.041 (0.096)	−0.029 (0.033)	0.077 (0.279)	−0.059 (0.083)	0.054 (0.079)	0.054 (0.086)	−0.247 (0.230)	−0.470 (0.459)	0.110 (0.073)	−0.016 (0.053)
F-test 1st stage	61.31	61.31	62.61	53.00	55.31	54.11	52.84	48.97	48.93	48.93	48.93
Observations	2543	2543	2645	6193	6437	6764	6587	5973	6000	6000	6000
1933–1935											
Father	−0.009 (0.063)	0.338 (0.262)	−0.017 (0.019)	0.150 (0.165)	0.107 (0.232)	0.208 (0.228)	0.299 (0.247)	0.267 (0.606)	−2.265 (1.448)	0.150 (0.207)	−0.133 (0.151)
F-test 1st stage	16.31	16.31	14.83	12.5	11.80	11.98	12.42	10.30	10.56	10.56	10.56
Observations	1182	1182	1227	2837	2957	3102	3020	2735	2746	2746	2746
1930–1938, excluding 1934											
Father	0.034 (0.091)	−0.011 (0.081)	−0.011 (0.029)	−0.089 (0.229)	−0.028 (0.069)	0.021 (0.064)	0.042 (0.070)	−0.161 (0.186)	−0.213 (0.372)	0.090 (0.060)	−0.003 (0.044)
F-test 1st stage	187.34	187.34	198.45	167.18	175.50	173.58	169.81	159.38	158.78	158.78	158.78
Observations	2764	2764	2874	6751	7038	7401	7177	6553	6579	6579	6579

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. The regressions are performed for those children with their natural parents. Extra controls as in Table 4.

Table 8a
Parental education on parental variables—OLS results (full sample).

	Maternal smoking during pregnancy	Breastfeeding	Father illness	Mother illness	Body mass index father	Father under-weight	Father overweight	Body mass index mother	Mother under-weight	Mother overweight	Mother works	Financial difficulties
1930–1938												
Father	−0.016 (0.006)**	0.025 (0.005)**	−0.008 (0.002)**	−0.004 (0.002)*	−0.106 (0.042)**	−0.002 (0.003)	−0.019 (0.006)**	−0.176 (0.053)**	0.010 (0.006)*	−0.025 (0.005)**	−0.018 (0.005)**	−0.009 (0.002)**
Mother	−0.024 (0.008)**	0.016 (0.007)**	0.000 (0.003)	−0.001 (0.003)	−0.065 (0.053)	0.003 (0.004)	−0.008 (0.008)	−0.101 (0.066)	−0.004 (0.007)	−0.017 (0.006)**	0.013 (0.006)**	−0.008 (0.002)**
P-value	0.000	0.000	0.000	0.018	0.000	0.716	0.000	0.000	0.212	0.000	0.003	0.000
Observations	2889	2662	5966	5966	2938	2938	2938	2938	2938	2938	8947	8906
1933–1935												
Father	−0.023 (0.014)*	0.032 (0.014)**	−0.018 (0.006)**	−0.006 (0.007)	−0.118 (0.114)	−0.002 (0.005)	−0.023 (0.016)	−0.149 (0.138)	0.008 (0.015)	−0.031 (0.014)**	−0.007 (0.015)	−0.008 (0.004)*
Mother	−0.004 (0.019)	0.004 (0.020)	0.002 (0.007)	−0.001 (0.008)	−0.114 (0.132)	−0.008 (0.005)	−0.001 (0.021)	−0.091 (0.159)	−0.009 (0.017)	−0.021 (0.019)	0.025 (0.014)*	−0.014 (0.005)**
P-value	0.184	0.065	0.002	0.484	0.193	0.159	0.228	0.275	0.834	0.001	0.181	0.000
Observations	468	422	970	970	473	473	473	473	473	473	1449	1446
1930–1938 except 1934												
Father	−0.012 (0.007)*	0.022 (0.006)**	−0.008 (0.002)**	−0.003 (0.002)	−0.113 (0.048)**	−0.004 (0.003)	−0.025 (0.007)**	−0.218 (0.060)**	0.017 (0.007)**	−0.024 (0.005)**	−0.019 (0.006)**	−0.008 (0.002)**
Mother	−0.028 (0.008)**	0.020 (0.008)**	0.001 (0.003)	0.000 (0.003)	−0.037 (0.060)	0.004 (0.005)	−0.001 (0.009)	−0.072 (0.075)	−0.007 (0.008)	−0.017 (0.007)**	0.016 (0.007)**	−0.009 (0.002)**
P-value	0.000	0.000	0.000	0.164	0.003	0.489	0.000	0.000	0.045	0.000	0.006	0.000
Observations	2189	2019	4529	4529	2227	2227	2227	2227	2227	2227	6794	6761

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. For each interval, both the mother and the father are born within those years. The regressions are performed for those children with their natural parents. Extra controls include parental age.

Table 8b

Parental education on parental variables—OLS results (finishing at age 14–15).

	Maternal smoking during pregnancy	Breastfeeding	Father illness	Mother illness	Body mass index father	Father under-weight	Father overweight	Body mass index mother	Mother under-weight	Mother overweight	Mother works	Financial difficulties
1930–1938												
Father	−0.017 (0.028)	0.003 (0.028)	−0.013 (0.010)	0.011 (0.012)	−0.188 (0.178)	0.003 (0.013)	−0.015 (0.028)	−0.057 (0.228)	0.001 (0.024)	−0.009 (0.025)	−0.015 (0.020)	−0.019 (0.010)*
Mother	0.049 (0.031)	0.053 (0.031)*	0.010 (0.011)	−0.012 (0.013)	0.025 (0.193)	−0.010 (0.014)	0.001 (0.031)	−0.175 (0.249)	0.016 (0.026)	−0.015 (0.029)	0.012 (0.022)	−0.038 (0.011)**
P-value	0.272	0.175	0.405	0.518	0.559	0.764	0.849	0.691	0.803	0.756	0.714	0.000
Observations	1980	1829	4098	4098	2007	2007	2007	2007	2007	2007	6168	6139
1933–1935												
Father	0.125 (0.062)**	0.072 (0.060)	−0.065 (0.026)**	−0.021 (0.025)	−0.366 (0.431)	−0.001 (0.030)	−0.026 (0.065)	−0.593 (0.508)	0.073 (0.053)	−0.074 (0.062)	0.094 (0.039)**	−0.001 (0.021)
Mother	−0.029 (0.073)	0.120 (0.068)*	0.057 (0.026)**	0.021 (0.026)	−0.643 (0.491)	−0.001 (0.033)	−0.081 (0.075)	−0.187 (0.579)	−0.028 (0.061)	−0.049 (0.074)	−0.033 (0.042)	−0.025 (0.021)
P-value	0.124	0.044	0.025	0.635	0.150	0.996	0.381	0.361	0.384	0.221	0.061	0.447
Observations	320	285	667	667	320	320	320	320	320	320	998	996
1930–1938 except 1934												
Father	0.007 (0.033)	0.022 (0.034)	0.001 (0.012)	0.016 (0.015)	−0.116 (0.217)	0.001 (0.016)	−0.022 (0.034)	−0.009 (0.281)	−0.002 (0.029)	0.019 (0.032)	−0.032 (0.024)	−0.021 (0.011)*
Mother	−0.009 (0.037)	0.073 (0.037)**	0.004 (0.013)	−0.021 (0.015)	0.051 (0.238)	−0.011 (0.018)	−0.008 (0.038)	0.002 (0.308)	−0.013 (0.032)	−0.006 (0.036)	0.021 (0.027)	−0.050 (0.012)**
P-value	0.962	0.052	0.945	0.324	0.867	0.810	0.805	0.999	0.902	0.835	0.398	0.000
Observations	1512	1396	3129	3129	1534	1534	1534	1534	1534	1534	4708	4685

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. For each interval, both the mother and the father are born within those years. The regressions are performed for those children with their natural parents. Extra controls include parental age.

Table 9a
Parental education on parental variables—IV results (full sample).

	Maternal smoking during pregnancy	Breastfeeding	Father illness	Mother illness	Body mass index father	Father under-weight	Father overweight	Body mass index mother	Mother under-weight	Mother overweight	Mother works	Financial difficulties
1930–1938												
Father	0.009 (0.078)	−0.039 (0.067)	−0.018 (0.028)	−0.029 (0.028)	0.278 (0.533)	0.002 (0.040)	0.011 (0.083)	0.033 (0.661)	0.064 (0.073)	−0.044 (0.076)	−0.041 (0.055)	−0.008 (0.029)
F-test 1st stage	4.56	4.70	5.14	5.14	3.90	3.90	3.90	3.90	3.90	3.90	5.26	5.23
Mother	0.078 (0.076)	0.052 (0.075)	0.030 (0.027)	−0.021 (0.029)	0.172 (0.470)	−0.065 (0.038)*	−0.003 (0.072)	0.423 (0.583)	0.028 (0.065)	0.014 (0.067)	−0.021 (0.056)	−0.068 (0.029)**
F-test 1st stage	7.29	5.83	7.42	7.42	7.27	7.27	7.27	7.27	7.27	7.27	7.22	7.17
P-value	0.508	0.720	0.522	0.517	0.744	0.164	0.999	0.734	0.669	0.777	0.630	0.034
Observations	2889	2662	5966	5966	2938	2938	2938	2938	2938	2938	8947	8906
1933–1935												
Father	0.004 (0.280)	0.204 (0.699)	−0.015 (0.064)	−0.082 (0.059)	0.052 (0.780)	0.010 (0.057)	−0.008 (0.130)	0.122 (0.990)	−0.056 (0.116)	0.067 (0.125)	0.169 (0.321)	−0.023 (0.061)
F-test 1st stage	3.90	3.29	5.18	5.18	3.91	3.91	3.91	3.91	3.91	3.91	5.09	5.01
Mother	0.755 (0.987)	0.811 (3.216)	−0.126 (0.209)	0.056 (0.175)	−0.104 (1.961)	−0.121 (0.154)	−0.117 (0.324)	0.767 (2.489)	−0.062 (0.275)	0.070 (0.321)	0.818 (1.129)	−0.128 (0.217)
F-test 1st stage	0.42	0.23	1.79	1.79	0.73	0.73	0.73	0.73	0.73	0.73	0.49	0.49
P-value	0.721	0.958	0.833	0.327	0.996	0.714	0.936	0.948	0.868	0.854	0.751	0.833
Observations	468	422	970	970	473	473	473	473	473	473	1449	1446
1930–1938 except 1934												
Father	0.156 (0.144)	−0.060 (0.125)	−0.052 (0.049)	0.039 (0.049)	−0.576 (0.997)	0.007 (0.070)	0.020 (0.148)	−0.069 (1.209)	−0.028 (0.129)	0.061 (0.137)	0.051 (0.106)	−0.017 (0.049)
F-test 1st stage	5.46	5.41	13.58	13.58	4.48	4.48	4.48	4.48	4.48	4.48	5.91	5.93
Mother	−0.033 (0.131)	0.200 (0.117)*	0.053 (0.045)	−0.045 (0.045)	0.204 (0.865)	−0.068 (0.067)	−0.013 (0.128)	0.837 (1.049)	−0.041 (0.114)	0.008 (0.120)	−0.182 (0.095)*	−0.083 (0.044)*
F-test 1st stage	11.62	9.90	12.41	12.42	10.03	10.03	10.03	10.03	10.03	10.03	11.55	11.63
P-value	0.417	0.150	0.482	0.607	0.533	0.346	0.991	0.543	0.735	0.771	0.096	0.018
Observations	2189	2019	4529	4529	2227	2227	2227	2227	2227	2227	6794	6761

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. For each interval, both the mother and the father are born within those years. The regressions are performed for those children with their natural parents. Extra controls include parental age.

Table 9b
Parental education on parental variables—IV results (finishing at age 14–15).

	Maternal smoking during pregnancy	Breastfeeding	Father illness	Mother illness	Body mass index father	Father under-weight	Father overweight	Body mass index mother	Mother under-weight	Mother overweight	Mother works	Financial difficulties
1930–1938												
Father	0.140 (0.103)	−0.139 (0.095)	−0.023 (0.038)	0.041 (0.038)	0.496 (0.670)	−0.018 (0.051)	0.024 (0.106)	0.173 (0.858)	−0.106 (0.089)	0.045 (0.097)	0.055 (0.069)	−0.020 (0.037)
F-test 1st stage	34.95	35.48	39.92	39.92	31.96	31.96	31.96	31.96	31.96	31.96	42.25	42.02
Mother	0.155 (0.074)**	0.052 (0.072)	0.043 (0.027)	0.002 (0.028)	0.263 (0.474)	−0.042 (0.037)	0.018 (0.074)	0.274 (0.607)	0.031 (0.065)	−0.009 (0.069)	−0.024 (0.052)	−0.052 (0.027)*
F-test 1st stage	88.53	85.09	95.81	95.81	83.32	83.32	83.32	83.31	83.31	83.31	97.27	96.52
P-value	0.021	0.295	0.279	0.551	0.593	0.373	0.934	0.866	0.470	0.873	0.688	0.111
Observations	1980	1829	4098	4098	2007	2007	2007	2007	2007	2007	6168	6139
1933–1935												
Father	−0.928 (1.013)	−0.367 (0.714)	0.142 (0.272)	−0.069 (0.285)	3.547 (5.738)	−0.086 (0.284)	0.425 (0.815)	0.818 (6.080)	−0.412 (0.687)	0.038 (0.721)	−0.453 (0.483)	0.020 (0.214)
F-test 1st stage	2.46	2.61	30.67	30.67	2.12	2.12	2.12	2.12	2.12	2.12	31.52	31.46
Mother	1.120 (0.658)*	0.504 (0.459)	−0.051 (0.143)	0.118 (0.152)	−1.670 (3.155)	−0.082 (0.176)	−0.325 (0.449)	−0.852 (3.343)	0.280 (0.372)	0.031 (0.407)	0.404 (0.284)	−0.059 (0.130)
F-test 1st stage	7.92	7.49	54.78	54.78	8.68	8.68	8.68	8.68	8.68	8.68	53.99	53.70
P-value	0.194	0.472	0.870	0.680	0.823	0.656	0.769	0.965	0.749	0.984	0.362	0.860
Observations	320	285	667	667	320	320	320	320	320	320	998	996
1930–1938 except 1934												
Father	0.252 (0.122)**	−0.267 (0.112)	−0.045 (0.044)	0.019 (0.044)	0.651 (0.790)	−0.015 (0.059)	0.014 (0.124)	0.203 (1.015)	−0.111 (0.103)	0.051 (0.113)	0.135 (0.082)	−0.041 (0.042)
F-test 1st stage	54.64	54.15	62.79	62.79	51.30	51.30	51.30	51.30	51.30	51.30	67.06	66.54
Mother	0.108 (0.093)	0.104 (0.086)	0.039 (0.035)	−0.014 (0.034)	0.794 (0.609)	−0.029 (0.049)	0.083 (0.095)	0.785 (0.783)	−0.028 (0.083)	0.039 (0.088)	−0.097 (0.067)	−0.077 (0.033)**
F-test 1st stage	125.71	127.16	136.63	136.63	111.83	111.83	111.83	111.83	111.83	111.83	140.45	139.11
P-value	0.031	0.478	0.403	0.866	0.225	0.723	0.648	0.552	0.460	0.768	0.136	0.023
Observations	1512	1396	3129	3129	1534	1534	1534	1534	1534	1534	4708	4685

Robust standard errors in parentheses; *Significant at 10% level; **Significant at 5% level. For each interval, both the mother and the father are born within those years. The regressions are performed for those children with their natural parents. Extra controls include parental age.

Results from Maarten Lindeboom a, Ana Llena-Nozal b, Bas van der Klaauw c,

- Uses schooling reform as exogenous shock on parental schooling decisions and that this shock only affected people at the lower end of the education distribution
- Only about 50% affected by the shock (a really fuzzy design)
- Results find little direct effect of parental education on child health outcome

- There is pretty much no direct causal effect of parental education on child health but smarter parents seems to increase living standards which alleviates household financial burdens
- Other studies find similar results as this paper
- This is something to be excited about because it seems as if we are converging to a correct answer about this topic (provided we are referring to similar hypotheses)
- Other studies seem to come to different conclusions when the type of exogenous shock is different from this one

Conclusion

- This paper helped reduce arguments about the truth of the question
- The main policy implication (if the goal is child health) should not be to increase the education of parents. Rather, we should focus our attention on child care methods because other literature seems to suggest that it is the parents spend with their children and resources they provide
- Perhaps the author could replicate this study on another dataset (perhaps in the United States) to see if the results are externally valid
- Perhaps authors could reconstruct the measurement construct to see if results are robust to definitional changes
- Perhaps the authors can find data where the additional schooling is longer than 7 months because this seems very insufficient to effect anything, let alone child health. Maybe if they find data that shows a difference between similar groups who have 1-2 year differences in education we might find positive results.
- The results only seem applicable to this very narrow range of additional school
- Also appear very narrow to the scope of time and space considering they only cite one more article that finds similar results as they do