

Supplementary information A: Childhood environment exposures

Childhood environment comprised socioeconomic circumstances, child rearing and parenting, family instability, and parental health. The following describes how the measures were conceived on each of the studies.

Family socioeconomic measures

The family socioeconomic measures included father's social class, parental education, lack of household amenities, overcrowding, tenure and teen parenting.

Father's social class

Father's social class was collected prospectively at ages 10 to 11 on each of the studies and was coded according to the Register General's classification where class is defined according to job type. Job type was measured using the Office for National Statistics Standard Occupational Classification 1990 (SOC90) for the NCDS and BCS70, and 1970 (SOC70) for the NSHD¹. For those cases which were missing the Register General's classification of father's social class using SOC90 in the NCDS ($n=1,232$) and the BCS70 ($n=610$), the Register General's classification was derived using SOC70 in the NCDS and SOC80 in the BCS70, instead. SOC70 and SOC80 are both comparable to SOC90. Sensitivity analysis results presented in a previous study show that substituting missing SOC90 codes for SOC70 and SOC80 codes to be comparable to just using SOC90 codes (1).

Parental education

Parental education was measured using age left full time continuous education. The measure was on a continuous scale.

Lack of amenities

Lack of amenities included lack of one or more of the following at two time points in childhood: sole use of either a bathroom or kitchen or lack of running hot water. Lack of amenities was measured at age 2 and 11 years in the NSHD, at age 7 and 11 years in the NCDS, and at age 5 and 10 years in the BCS70. In BCS70 at age 10 years old there was not a

¹ More information on the SOC coding can be found on the UK Office for National Statistics website: <https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassification/soc>

measure for lack of hot water, it was thus assumed that all cohort members had access to hot water. The measure was categorised into lacked amenities at no occasions, one occasion, or two occasions.

Overcrowding

Overcrowding comprised the average number of people per room across multiple time points during childhood, this was ages 2, 4, 6, 8 and 11 years in NSHD, ages 7, 11 and 16 years in NCDS and age 5 years in BCS70. The measure was categorised into Up to 1 person per room, over 1 to 1.5 person per room, over 1.5 to 2 person per room and over 2 persons per room.

Tenure

Tenure differentiated between rented and owned accommodation and was measured at two time points in childhood: ages 2 and 11 years in NSHD, 7 and 11 years in NCDS and 5 and 10 years in BCS70. The measure was categorised into rented at two time points, owned at one time point, and owned at two time points.

Teen parenting

Teen parenting was identified using the birth year of the parents, which was collected at birth of the cohort member. All those under 20 years old at the cohort member's birth were categorised as either a teen mother or a teen father.

Child rearing and parenting measures

Three measures of childrearing were used: breastfeeding, parental bonding and parental interest in child's education.

Breastfeeding

Whether mother breastfed the cohort member was collected at age 2 in NSHD, age 7 in NCDS and age 5 in BCS70. For this analysis the measure was dichotomised into yes or no.

Parental bonding

Parental bonding in NSHD and BCS70 was divided up into parental care and overprotection using the parental bonding instrument (2). In the NSHD the measure was collected retrospectively at age 43, was asked about both parents individually and contained 24 items, whilst in BCS70 it was collected prospectively at age 16, asked about both parents

together and contained 11 items. Parental care and overprotection items were identified in the instrument using factor analysis. In NSHD average scores were derived across both parents for comparability with NCDS. The relevant items were totalled for parental care and overprotection to give scores of parental care from 0 to 33 in NSHD and 0 to 7 in BCS70. The parental care scale was reverse coded so that low scores represent high parental care and high scores low parental care. For parental overprotection the scale ran from 0 to 33 in NSHD and 0 to 4 in BCS70, with low scores reflecting low parental overprotection and high scores high parental overprotection.

In NCDS there were not an equivalent measures of parental bonding, but instead a measure of whether the cohort member got on with either parent, which was collected at age 16 and was dichotomised into yes or no.

Parental interest in child's education

A measure of parental interest in cohort member's education was given at age 11 years by the teacher and mother in NSHD and age 7 and 10 years in NCDS and BCS70 by the teachers only. In NSHD it was asked about both parents together, whilst in NCDS and BCS70 it was asked about each parent separately. In NCDS and BCS70 the most interested parent was used to create the measure. The measure was categorised into very interested, some interest, and little interest.

Family instability measures

Family instability was measured through parental divorce, separation from mother and number of residential moves in childhood.

Parental divorce

Parental divorce was measured up until the age of 16 in the three studies. The measure was dichotomised into yes or no.

Separation from mother

A measure of whether the cohort member was ever separated from their mother during childhood was derived, but the measure is different across the studies. In NSHD and NCDS they are comparable measuring whether the cohort member was separated from mother over night or longer at age 4 and 7 respectively, but in the BCS70 the available measure was only collected if the cohort member was not currently living with their natural mother from

birth to age 10, which implies long-term separation. The measure was categorised into separated for less than one week (including never separated from mother) and separated for more than one week.

Number of residential moves

The number of residential moves was collected at age 15 years in NSHD, age 16 in NCDS and age 10 in BCS70. The measure was categorised into no moves, 1 to 3 moves, 4 moves or more.

Parental health measures

Parental health comprised whether either parent had a chronic health condition and maternal / family mental health.

Parental health conditions

Parental health conditions was determined by whether either parent had any chronic health conditions. In NSHD and NCDS the health conditions included asthma, eczema or hay fever, chronic cough, rheumatism in joints, anaemia, nervous / psychological, heart trouble, kidney trouble, cardiovascular and dermatological conditions. In BCS70 the measure only captured whether either parent had been ill and didn't specify particular chronic conditions. The measure was collected at age 15 in NSHD, age 11 in NCDS and age 10 in BCS70 and was dichotomised into yes or no.

Maternal / family mental health

Maternal mental health was measured differently in the three studies. In NSHD it was a measure of maternal neuroticism using the Maudsley personality inventory (3) when the cohort member was age 15 years, in the NCDS there was only a measure of whether there was a family mental health problem which was collected by the health visitor at age 7. In BCS70 a measure of maternal depression was collected at age 10 using the malaise inventory (4).

References

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