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## RESEARCH ARTICLE

# The OHC penalty in the UK: maternal experience and child development

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We examine the extent to which experience of out-of-home residential care (OHC) during childhood (ages 0–16) relates to development in the ‘next generation’. Specifically, we ask whether maternal experience of OHC during her own childhood is associated with the behavioural, emotional and cognitive development of her child (age 3), drawing on data collected for the UK Millennium Cohort Study. Comparing the children of OHC experienced mothers with those whose mothers had not spent time in care, we observe stark raw differences between their early development, with children of OHC mothers performing worse across all domains examined – cognitive (language and school readiness), behavioural and emotional adjustment. Using regression analyses, we show that while the disadvantages in cognitive (language) and emotional adjustment among children of OHC experienced mothers are explained by differences in the child’s family demographic characteristics and socio-economic status (SES), the associations between maternal OHC experience and behavioural problems and school readiness remain. Behavioural differences are mediated by aspects of parenting behaviours and the parent–child relationship; school readiness differences are only fully attenuated once maternal health and wellbeing measures are further accounted for. This article highlights the importance of extending support for those with OHC experience into adult life, particularly for those who become parents, and for particular attention to be given to initiatives that nurture parent–child relationships to help break the intergenerational transmission of disadvantage.

**Keywords** Maternal out-of-home (OHC) care experience • Intergenerational transmission of disadvantage • Parent–child relationship • Early child development • Millennium Cohort Study

### Key messages

- This study provides original evidence on the early outcomes of children whose mothers have OHC experience.
- Children of OHC mothers perform worse across all developmental domains – cognitive, behavioural and emotional.

- Findings provide evidence of intergenerational transmission of disadvantage and highlight key risk factors.
- Findings highlight the importance of early parenting support for care leavers and provision of adequate housing.

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## Introduction

There is evidence that adults who have spent time in out-of-home care (OHC) as a child have a heightened risk of exposure to adverse psychosocial circumstances across the life course, including higher risks both in their family of origin and later on through their own experiences. This adversity associated with OHC includes: low levels of educational attainment (Sebba et al, 2015; O'Higgins et al, 2017; Forsman, 2020); unemployment and socio-economic disadvantage (Buehler et al, 2000; Naccarato et al, 2010; Cameron et al, 2018; Boddy et al, 2020); unstable relationships and early family formation (Svoboda et al, 2012; Botchway et al, 2014; Roberts et al, 2017); and poorer mental and physical health (Cheung and Buchanan, 1997; Stein and Dumaret, 2011; Martin et al, 2014; Rees and Stein, 2016; Murray et al, 2020). Recent research by Parsons and Schoon (2021), using data from the UK Millennium Cohort Study (MCS), corroborates this evidence, showing that these risk factors are indeed experienced by higher proportions of mothers with OHC experience than mothers without OHC experience.

Such findings raise some important questions. The consistency of these sustained connections raises the issue about the possible role of OHC itself in the intergenerational transmission of disadvantage, over and above that of social reproduction (Willis, 1977; Bourdieu and Passeron, 1990 [1977]). In short, is there a specific 'OHC penalty' that transmits disadvantage to the children of mothers with OHC experience? And if so, what are the mechanisms of such transmission?

This is where our study contributes new evidence. For example, recent work showed that children of OHC experienced parents are at an increased risk of low educational attainment at the end of compulsory schooling (Parsons et al, 2023) and of experiencing poor mental health as teenagers (Parsons et al, 2022) and into mid-life (Parsons and Schoon, 2022). Those with OHC experience have, on average, higher adversity in terms of socio-economic conditions both during childhood and in their adult years. We also know that those with OHC experience have had a disrupted relationship with their own parent(s) and that mothers with OHC experience in their own childhood or adolescence are less likely than those without to be in contact with their own mother or father (Parsons and Schoon, 2021). These experiences in childhood and beyond are likely to shape their later interactions with their own children in profound and long-lasting ways.

The focus of this article is on the extent to which socio-economic inequalities across OHC and non-OHC mothers, and behavioural ones in relation to parenting,

alongside maternal health, mediate the relationship between OHC and children's early development. In line with existing research, we hypothesise that a range of structural factors reflecting socio-economic circumstances are likely to be important, though may not fully explain the observed associations. Behavioural factors are also likely to be very relevant, and we examine a range of parenting behaviours and parent-child interaction, which are likely to be particularly pertinent given the strong transmission of parenting behaviours across generations (Van Ijzendoorn, 1992), and the influence of challenging experiences as children on mothers with OHC experience in their own parenting (Maxwell et al, 2011). Moreover, the centrality of parental behaviours and relationships for early child development is widely documented (see Cattan et al, 2022). We also examine the role of parental physical and mental health and wellbeing, associated with OHC experience (for example, Parsons and Schoon, 2021), and also vital to children's early development (Goodman and Gotlib, 1999; Mensah and Kiernan, 2010; Parsons et al, 2021). We recognise that all aspects are interrelated and sequentially intertwined in the unfolding of the life course, and our goal is not to isolate the association of children's development with each of the regressors, but rather to examine how their inclusion changes the association between maternal OHC experience and their child's development.

Our focus is on the early years, and the interrelated domains of early cognitive and language development, and socio-emotional and behavioural adjustment. There is extensive evidence that socio-inequalities are measurable from the moment of birth (for example, in breastfeeding, see Fitzsimons and Vera-Hernandez, 2022; Kelly and Watt, 2005) and indeed before (for example, as reflected by variations in birthweight, see Weightman et al, 2012). Inequalities persist throughout childhood and adolescence and are manifest in subsequent levels of socio-emotional and behavioural adjustment (Dex and Joshi, 2004; Hansen and Joshi, 2007; 2008; Reiss, 2013; Deighton et al, 2019), and cognitive and language development (Feinstein, 2003; Parsons et al, 2011; Sullivan et al, 2013; Cattan et al, 2022) – with major repercussions for a wide range of longer-term educational and life outcomes (Schoon et al, 2021; Cattan et al, 2022). Early childhood interventions targeted towards children at high socio-economic risk can have sustained effects, enabling at-risk children to achieve socially important outcomes years, even decades, later (García et al, 2021). In particular, there is strong evidence regarding early parenting programmes (see Jeong et al [2021] for a review), a key policy lever with much potential and a key area of focus for those with OHC experience whose own formative experiences as children may have been especially challenging.

The article proceeds as follows. In the next section we discuss our aims and research questions, followed by a description of data and methods. The fourth section presents the main research findings, and the fifth section provides a discussion.

## **Aims and research questions**

This study examines whether children of mothers with OHC experience perform less well in cognitive assessments and exhibit more behavioural and socio-emotional adjustment problems in the pre-school years than their peers whose mothers did not experience OHC. In so doing, it focuses on the intergenerational transmission of risk and disadvantage for children of OHC and non-OHC mothers. It first

examines the magnitude of difference in both cognition and behaviour between children of OHC and non-OHC experienced mothers, and then examines the extent to which the relationship is mediated by factors in the early years of a child's life that are associated with both OHC experience and with early cognitive skills and/or behavioural problems. It studies the role of structural factors (socio-economic resources), behavioural inputs (parenting) and maternal health.

The first set of mediating factors, which are structural in nature, include family demographics and SES, and we assess whether the OHC 'penalty' remains after demographics and socio-economic circumstances in the early years of a child's life are accounted for. The individual characteristics we control for, as potential confounders, include sex, given important disparities in early development (Machin and McNally, 2005; Cullis and Hansen, 2008; Davis et al, 2010), ethnicity given British minority ethnic children have lower cognitive scores in the early years (Farkas and Beron, 2004; Elliot Major and Parsons, 2022; Parsons et al, 2023), and age, as younger children display more behavioural problems than older children (Fauth et al, 2017), and children born later in the academic year do less well in school-based assessments (Parsons and Hallam, 2014). The family demographics include those which have been associated with OHC experience and consistently been shown to correlate with early childhood development: maternal age at birth (Duncan et al, 2018), single parenthood (Osborn et al, 1984; Kiernan and Huerta, 2008; Hansen et al, 2010) and English as an additional language (Whiteside et al, 2017). In terms of SES, we consider home ownership as an indicator of wealth (Furley, 1989; Tunstall et al, 2013), and poor housing and overcrowding in the home as potential predictors of behavioural problems (Platt et al, 1989; Office of the Deputy Prime Minister, 2004; Evans, 2006; Harker, 2006; Coley et al, 2015; Mind, 2017). Housing conditions also play a vital role in providing a safe and secure environment for effective parenting to be delivered and positive parent-child relationships to be developed, and for promoting parental health and mental wellbeing, as examined in the subsequent set of mediators. We also account for worklessness in the household, and for the mother's highest educational qualification given strong links with both early development (for example, Parsons et al, 2014) and mother OHC experience (Parsons and Schoon, 2021).

We then examine the extent to which behavioural factors including parenting behaviours and the parent-child relationship, as well as maternal mental and physical health, mediate any remaining association between child cognitive development or behaviour adjustment and maternal OHC experience. There is long-standing evidence that parenting behaviours are strongly socially graded (for example, Hart and Risley, 1995), transmit strongly across generations (Van Ijzendoorn, 1992), and that those with OHC experience have had a disrupted relationship with their parent(s), influencing their own approach to parenting later on. Examining the extent to which it mediates the relationship between mothers' OHC experience during her own childhood and children's development provides novel insight into a key policy lever, around supporting parenting, to help reduce the intergenerational transmission of disadvantage among mothers with OHC experience and their children.

All of the factors included are assessed during early childhood (at age nine months or three years), helping to understand the extent to which these very early risk exposures cast a shadow on later outcomes.

We pose the following two research questions:

- Do children whose mothers experienced OHC fare worse in terms of early development, specifically regarding cognitive and language skills, emotional and behavioural adjustment?
- Which factors in the early years of a child's life mediate the association between a mother's OHC experience and her child's development, and in particular, what is the role of structural factors (socio-economic resources), behavioural inputs (parenting) and maternal health?

## Data and methods

### *Millennium Cohort Study*

The MCS is a multi-purpose ongoing longitudinal study of approximately 19,000 babies born to families living in the UK between September 2000 and January 2002 (Plewis, 2007; Connelly and Platt, 2014; Joshi and Fitzsimons, 2016). Data have been collected at seven sweeps, when the children were aged 9 months, 3, 5, 7, 11, 14 and 17, when approximately 10,700 study members participated. Here we use information collected from personal interviews and self-completion questionnaires administered to parents of the cohort children at child age nine months and three years and the child's performance in cognitive assessments at age three (University of London, Institute of Education, Centre for Longitudinal Studies, 2022a; 2022b). Information collected includes a wide range of robust socio-economic, employment and qualification details, together with information on family transitions, health, health-behaviour, wellbeing and parenting behaviour.

### *Analytic sample*

Of the 18,552 families who first took part in sweep 1 and the 692 new families introduced at sweep 2, our analytic sample comprises 19,082 families. The sample was restricted to families where the biological mother was the main respondent, had provided information on her OHC experience and her child's sex and ethnicity. Of the 19,082 biological mothers in the analytic sample, 308 (1.6 per cent) had experienced OHC before they were 17.

The 308 (1.6 per cent) mothers with OHC experience in our sample had an age range at baseline of 15–45 years, being born between 1955 and 1985 and experiencing (mainly) UK care systems and policies covering the 1950s to 2000.

### *Multiple Imputation*

We used Multiple Imputation (MI) to deal with attrition and item non-response to restore sample representativeness, adopting a chained equations approach (White et al, 2011) under the assumption of 'missing at random' (MAR), which assumes that the most important predictors of missing data are included in our models. To maximise the plausibility of the MAR assumption the most important predictors of missing data are included in our models to further reduce bias and retain power (see Mostafa and Wiggins, 2015; Mostafa et al, 2020; Silverwood et al, 2021). Missingness in the variables ranged from less than 1 per cent in many of the sweep 1 (nine months) measures to 33 per cent for a scale assessing parent-child closeness

(Pianta) at sweep 2 (age three), giving an overall level of missingness of 12 per cent. (See [Appendix Table A1](#) for the level of missingness in all variables included in the imputation process.) All reported analyses are averaged across 25 replicated data sets. This is based upon Rubin's Rule for the efficiency of estimation under a reported degree of missingness across the whole data of around 0.25, so we have been very conservative in our approach ([Little and Rubin, 2014](#)).

The analyses were additionally weighted to adjust for the study's stratified clustered sampling design ([Plewis, 2007](#)).

### *Key measures*

#### *Out-of-home care experience*

Experience of maternal OHC was identified with two questions included in the parent interview at child age nine months and child age three years (for the new families added at sweep 2): 'Before the age of 17, did you spend any time living away from both of your parents?' If 'yes', a follow-on question asked, 'Where did you mainly live during this time?'<sup>1</sup> The mothers who had spent time in a children's home or with foster parents, run by either a local authority or voluntary society, were coded as having experienced OHC.

#### *Bracken School Readiness*

At age three, MCS participants completed the Bracken School Readiness Assessment-Revised (BSRA-R), which is one component of the Bracken Basic Concept Scale-Revised ([Bracken, 1998](#)). The BSRA-R is used as a screening instrument to assess the 'readiness' of a child for formal education by testing their knowledge and understanding of basic concepts ([Bracken, 1998](#); [Bracken and Crawford, 2010](#)). Basic concepts are defined as aspects of children's knowledge that are taught by parents and/or pre-school teachers to prepare a child for formal education. The assessment consists of 85 items across five basic concept sub-tests: Colours (10); Letters (15); Numbers/Counting (18); Size/Comparisons (22); and Shapes (20). All items are summed to produce a total score which is age standardised. The age standardised score is also used to place participants into a five-category 'Normative Classification' variable which ranges across 'very advanced', 'advanced', 'average', 'delayed' and 'very delayed'. Differentiating between children who are 'delayed' (combining delayed or very delayed) against those who are 'school ready' (combining average, advanced or very advanced) we find that in our sample 16 per cent of children are classified as 'delayed', which is slightly higher than the percentage as the overall UK MCS age three sample who completed the assessment (for further details see [Connelly, 2013](#)).

#### *BAS Naming Vocabulary*

The British Ability Scales Second Edition (BAS II) is a battery of individually administered tests of cognitive abilities and educational achievement, published by the NFER-NELSON Publishing Company Ltd ([Elliott, 1996](#)).<sup>2</sup> The Naming Vocabulary assessment is part of the Early Years Battery that is generally administered to pre-school children under six years of age. It assesses expressive language and knowledge

of names. The child was shown a series of pictures presented in the stimulus booklet and asked to say what it was, for example, a picture of a shoe, chair or pair of scissors. The BAS includes 36 pictures of increasing difficulty level. The number of items a child answers is dependent on progress and performance. Children complete different items as they progress through the assessment based on their performance, thus their raw scores cannot be compared directly and are therefore converted to an ability score, which reflects both the raw score and the difficulty of the items administered.

### *Early behaviour problems and socio-emotional adjustment (age three)*

Behaviour problems and socio-emotional adjustment were assessed from parent reports on the Strengths and Difficulties Questionnaire [SDQ] at child age three. The SDQ is widely validated cross-nationally and cross-culturally for use in non-clinical settings (see [Goodman, 1997; 2001](#)). The SDQ includes 25 measures comprising five scales of five items each. For each negative attribute, the parent is asked to say whether it is 'not true' (0), 'somewhat true' (1) or 'certainly true' (2) about their child's behaviour, with scores reversed for positive attributes. For this analysis we use the four sub-scales – emotional symptoms, peer relationship problems, conduct problems, hyperactivity/inattention. We combine emotional with peer problems to represent 'internalising' symptoms (socio-emotional adjustment) and conduct with hyperactivity problems to represent 'externalising' symptoms (behavioural problems) ([Goodman et al, 2010](#)). We use interchangeably the terms internalising and socio-emotional adjustment, and externalising and behavioural problems.

All four of the outcome measures are standardised. Higher cognitive and lower socio-emotional and behaviour problem scores represent positive early child development.

### *Covariates*

We adjust for a wide range of current family background, socio-economic, parenting behaviours, and health and wellbeing characteristics that have been associated with early childhood cognitive and behavioural outcomes in the literature, in order to understand the extent to which they mediate the association between mother OHC experience and children's development. The measures are taken from the first MCS survey when the children were aged nine months or three years. The majority of measures were dichotomised for ease of interpretation in the regression modelling. Child characteristics include child sex (male = 0; female = 1); ethnicity (white = 0; British Minority Ethnic [BME] = 1); and age (continuous), as key confounders. We measure a set of current family demographics, including whether the children were in two-parent (0) or single-parent (1) families, whether the mother was an older (0) or teenage mother (1), and if only English is spoken in the home (0) or English and/or only another language is spoken (1).

The socio-economic measures included are the child's parent highest qualification level (National Vocational Qualification [NVQ] levels) grouped at NVQ2-5 (0) or None/NVQ1 (1); whether someone in the household is working outside the home (0) or it is a workless household (1). In terms of housing, we include if the accommodation is owner occupied (0) or rented (1); whether the home is overcrowded, comparing homes with <1 person per room (0) against those with 1+ person per room (1); and whether there is no dampness (0) or the home suffers from dampness (1).

We include a rich range of measures on parenting behaviours and the home environment, including whether the child was ever (0) or never (1) breastfed; the quality of the home learning environment, which is a composite score of key indicators including mothers reading to their children, teaching literacy and numeracy and encouraging literacy activities and library visits (for further details see [de la Rochebrochard, 2012](#)), comparing the majority (0) to the poorest, which are those with a score of 1 standard deviation (sd) below the mean (1); assessment of the parent–child relationship, using the Pianta Child-Parent Relationship Scale: Short Form<sup>3</sup> ([Pianta, 1992](#)), separately in terms of closeness and conflict, again comparing the majority (0) to those with low closeness (1) or high conflict (1), based on scores being 1 sd below/above the mean; and how the mother rates her own parenting skills, comparing separately those with below average or above average against the majority who rate their parenting skills as average.

For health, we include a measure of the mother’s current general health, comparing those who self-report good, very good or excellent health (0) against those who report having poor or fair health (1). We also include the mother’s current smoking practices comparing not being a current smoker (0) to current smokers (1). In addition, we assessed whether the mother exhibits a high number of depressive symptoms, as measured by the widely used Kessler scale K6 ([Kessler et al, 2003](#)), a screening instrument for non-specific distress. The K6 has a score range of 0–24, with higher scores indicating that the mother is experiencing higher levels of distress. For K6, cut-off points differentiate between moderate (5+) and severe (13+) levels of distress. In our analysis we use the 13+ cut-off, 0–12 (0), 13+ (1).

### *Analytic strategy*

We first describe the association between a mother’s own OHC experience and our four child development measures at age three ([Table 1](#)) and a range of child and family background characteristics and parenting measures ([Table 2](#)). For each outcome we then run a series of five ordinary least squares (OLS) regression models, given our outcomes are continuous measures. We first regress each outcome on mother OHC experience (model 1), and then adjust for additional sets of characteristics to examine how the relationship between mother OHC experience and her child’s development is mediated by interrelated familial, structural (socio-economic), behavioural (parenting) and maternal health characteristics. In summary:

- Model 1: Mother OHC experience
- Model 2: Model 1 + Child and family demographics
- Model 3: Model 2 + SES characteristics
- Model 4: Model 3 + Parenting behaviours
- Model 5: Model 4 + Maternal health and wellbeing

The complete regression results are included in the Appendix ([Tables A2–A5](#)) and we additionally present the coefficient for mother OHC experience from each of the five models for each outcome graphically to help readability.



## Results

### *Descriptives*

Table 1 shows that compared to children whose mother has no OHC experience, children of mothers with OHC experience have lower cognitive scores and higher internalising and externalising scores at age three. Differences are most notable for externalising symptoms and school readiness.

Table 2 highlights how the families differ by a mother's own OHC experience across all the covariates included in the modelling. There are no differences in terms of child sex, ethnicity or age. However, mothers with OHC experience are, on average, younger, more likely to be a single parent with only English spoken in the home. They are also far more likely to have no or low-level educational qualifications, to be part of a workless household and to be living in rented, overcrowded and/or damp housing.

In terms of parenting, fewer mothers with OHC experience rated their parenting skills as 'above average', although they provided a similar home learning environment for their child than non-OHC mothers. More mothers with OHC experience had never breastfed, were more likely to experience conflict and less likely to experience closeness in their relationship with their child. In terms of health and wellbeing, more mothers with OHC experience smoked, reported to only be in 'fair' or 'poor' general health, and experienced more symptoms associated with depression and distress.

These observed stark differences by mother OHC experience across a wide range of characteristics underline the importance of adjusting for them in measuring the relationship between OHC and children's development, to examine the extent to which they are mediating the associations.

### *Regression results*

#### *Cognitive skills: BAS Naming Vocabulary (language) and Bracken School Readiness*

Mother OHC experience has a strong and significant association with both naming vocabulary (Appendix Table A2) and school readiness (Appendix Table A3) scores, which remained when current family demographic measures were included in the

**Table 1:** Child standardised outcome scores by mother OHC experience [means and standard errors]

	Mother	
	No OHC	OHC
<b>Mean child outcomes (age 3)*</b>		
BAS: Naming Vocabulary	0.12 (0.02)	<b>-0.06</b> (0.06)
Bracken School Readiness	0.16 (0.02)	<b>-0.35</b> (0.07)
SDQ: Internalising symptoms	-0.07 (0.01)	<b>0.24</b> (0.08)
SDQ: Externalising symptoms	-0.05 (0.01)	<b>0.42</b> (0.08)
N(100%)	18,774	308

Note: \* positive SDQ and negative cognitive scores indicate poorer child development. Standard errors in parentheses. Bold indicates mean scores statistically different  $p < 0.05$ .

**Table 2:** Family characteristics, parenting behaviour and health and wellbeing: by mother OHC experience [proportions and standard errors]

	Mother	
	No OHC	OHC
<b>Child and family demographics (nine months)</b>		
CM ethnicity: BME	0.13 (0.01)	0.13 (0.03)
CM sex: female	0.49 (0.00)	0.48 (0.03)
CM age at interview: years (mean)	3.1 (0.01)	3.2 (0.07)
Single parent	0.15 (0.00)	<b>0.32</b> (0.03)
Age mother at CM birth: years (mean)	28.8 (0.12)	<b>25.4</b> (0.42)
English and/or only other language spoken at home	0.11 (0.01)	<b>0.04</b> (0.02)
<b>SES characteristics (nine months)</b>		
Parent no or NVQ1 level qualifications	0.24 (0.01)	<b>0.53</b> (0.04)
Workless household	0.18 (0.01)	<b>0.49</b> (0.04)
Rented housing	0.38 (0.01)	<b>0.81</b> (0.03)
Overcrowded home	0.25 (0.01)	<b>0.40</b> (0.04)
Damp home	0.13 (0.00)	<b>0.28</b> (0.03)
<b>Parenting behaviours (nine months; three years)</b>		
CM never breastfed	0.29 (0.01)	<b>0.41</b> (0.03)
Pianta: parent-child high conflict score	0.13 (0.00)	<b>0.23</b> (0.03)
Pianta: parent-child low closeness score	0.10 (0.00)	<b>0.23</b> (0.03)
Poor home learning environment	0.14 (0.00)	0.17 (0.03)
Mother feels she is a below average parent	0.06 (0.00)	0.09 (0.02)
Mother feels she is an above average parent	0.60 (0.01)	<b>0.44</b> (0.04)
<b>Mother health and wellbeing (nine months; three years)</b>		
Mother poor/fair general health	0.17 (0.00)	<b>0.36</b> (0.03)
Mother psychological distress (Kessler): mean [0-24]	3.4 (0.04)	<b>5.6</b> (0.33)
Mother severe psychological distress (Kessler): 13+	0.03 (0.00)	<b>0.09</b> (0.02)
Mother current smoker	0.28 (0.01)	<b>0.68</b> (0.03)
N(100%)	18,774	308

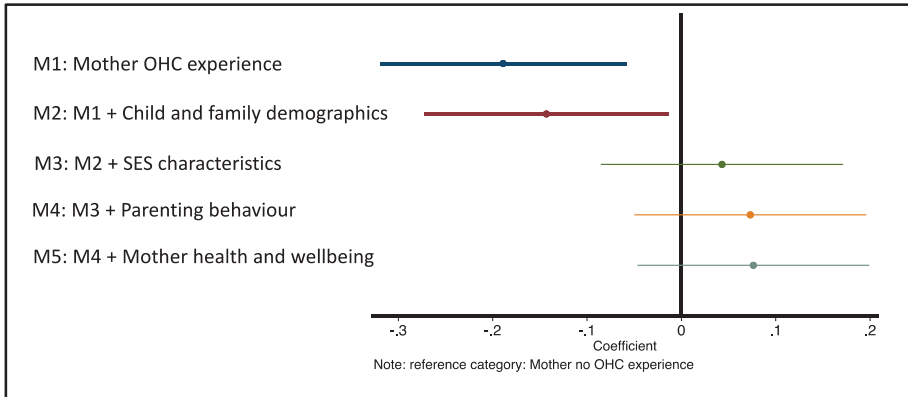
Note: Standard errors in parentheses. Bold indicates mean scores statistically different  $p < 0.05$ .

modelling. [Figure 1](#) shows that the association between mother OHC experience and naming vocabulary scores was no longer significant when current socio-economic conditions were controlled for (model 3). This is unlike school readiness scores, where the association with mother OHC experience was reduced though remained significant once socio-economic conditions were accounted for ([Figure 2](#)). The association between mother OHC and school readiness also remained significant after including parenting behaviours and the early home learning environment (model 4). Adjustment for maternal health and wellbeing (model 5) fully explained the association between OHC and school readiness.

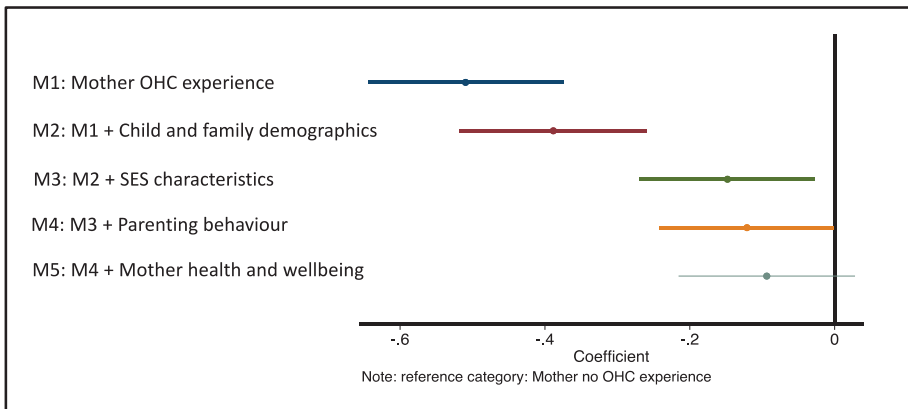
#### *SDQ internalising (socio-emotional) and SDQ externalising (behaviour) symptoms*

Mother OHC experience has a significant association with both internalising ([Appendix Table A4](#)) and externalising ([Appendix Table A5](#)) symptoms, which remained when current family demographic measures were included in the modelling. As shown in [Figure 3](#), the association with internalising symptoms was fully mediated

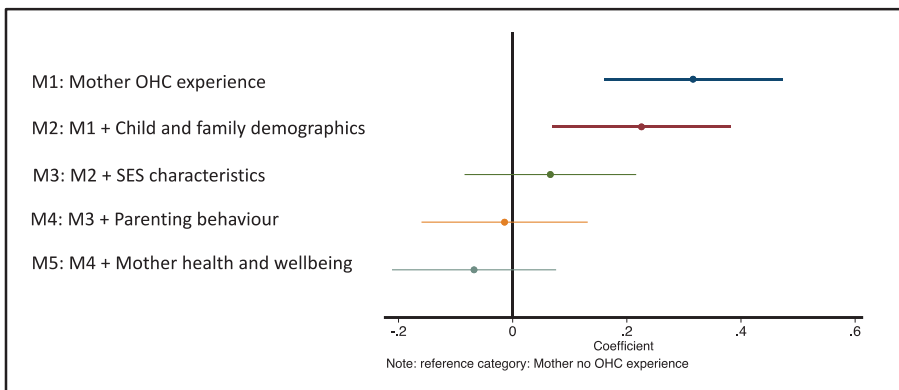
**Figure 1:** Association between mother OHC experience and BAS Naming Vocabulary scores: OLS coefficients [95 per cent CIs] from model 1 to model 5



**Figure 2:** Association between mother OHC experience and Bracken School Readiness scores: OLS coefficients [95 per cent CIs] from model 1 to model 5



**Figure 3:** Association between mother OHC experience and SDQ internalising symptoms: OLS coefficients [95 per cent CIs] from model 1 to model 5

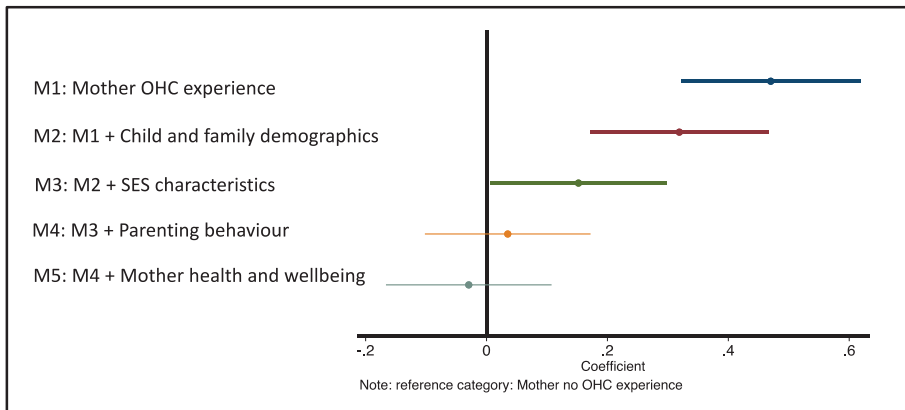


by current family socio-economic conditions (model 3), and while the association with externalising symptoms (Figure 4) reduced when socio-economic conditions were included, it remained significant. The association between OHC and externalising symptoms was fully explained on adjustment for parenting behaviours (model 4). Our focus in this article is on the association between mother OHC experience and the early cognitive performance and socio-emotional and behavioural development of her child, and the role played by structural factors including current socio-economic resources, behavioural factors relating to parenting, and maternal health, in mediating this relationship. It is therefore informative to examine differences in the  $R^2$  across the models. As suggested by previous research (Kiernan and Huerta, 2008; Kiernan and Mensah, 2009; Schoon et al, 2010), we would expect the structural measures included first in model 2 and additively in model 3 to be more important for cognitive development ( $R^2$  0.22 and 0.19 for BAS Naming Vocabulary and Bracken School Readiness respectively) than for socio-emotional and behavioural development ( $R^2$  0.09 internalising, 0.12 externalising). In contrast, parenting behaviours and the home environment are important mediators of the association between mother OHC and socio-emotional and behavioural development, most notably for externalising symptoms ( $R^2$  0.29). For further details see Appendix Tables A2–A5.

*What other factors are associated with cognitive skills and socio-emotional and behavioural development?*

The models also highlight the other risk factors associated with children's early development which are also characteristics strongly associated with mother OHC experience. We stress that these estimates, like the previous ones, are correlates and cannot be interpreted causally. From the fully adjusted model (model 5), having a mother with no or only low-level qualifications, being part of a workless household and living in rented housing are associated with lower cognitive scores, and higher externalising and internalising symptoms. Living in overcrowded housing conditions is negatively correlated with cognitive performance, and damp housing is associated with higher internalising symptoms.

**Figure 4:** Association between mother OHC experience and SDQ externalising symptoms: OLS coefficients [95 per cent CIs] from model 1 to model 5



In terms of parenting, viewing yourself as an above average parent is protective against behaviour symptoms and is associated with higher cognitive scores, whereas never having been breastfed, having a poor home learning environment and not having a close parent–child relationship are all associated with lower cognition, and with higher internalising and externalising symptoms, at age three. Having high levels of conflict in the parent–child relationship is also associated with increased internalising and externalising symptoms and lower school readiness.

Maternal mental ill-health and poor or fair general health are associated with increased internalising and externalising behavioural problems, and if the mother smoked a child has an increased risk of externalising behaviour problems and having a lower school readiness score.

As we observed in [Table 2](#), these disadvantages feature disproportionately in the lives of mothers with OHC experience and offer clear levers for policy to address, which we draw attention to in the discussion section.

## Discussion

In this study we have examined the relationship between maternal OHC experience and the early socio-emotional, behavioural and cognitive development of their children. We find evidence of an ‘OHC penalty’, in that children whose mothers experienced OHC fare worse in terms of their early cognitive, socio-emotional and behavioural development than children whose mothers had not spent time in OHC.

We hypothesise that this penalty is not only due to inequalities in socio-economic resources across OHC and non-OHC experienced mothers, but also due to differences in parenting behaviours and interactions, and maternal mental and physical health. We examine the extent to which each of these is mediating the observed ‘raw’ associations between OHC and early child development. Regarding cognitive development, we find that when current differences in family characteristics and SES are taken into account, the association between mother OHC experience and a child’s vocabulary acquisition is completely attenuated. However the association persists for school readiness, only being reduced to non-significance when all measures are included in the final model, suggesting that parenting behaviours and maternal health are important mediators of the relationship. Regarding socio-emotional and behavioural development, the association between mother OHC experience and internalising (socio-emotional) symptoms is attenuated when we account for family characteristics and SES, whereas the association between mother OHC and externalising (behavioural) symptoms remains. When we take into account parenting behaviours and aspects of the parent–child relationship, the association between mother OHC experience and her child’s externalising symptoms is fully explained.

The multiple challenges facing mothers with OHC experience and their children are clear to see. Our findings provide evidence that the intergenerational transmission of disadvantage is driven by both structural factors, such as educational qualifications and housing conditions, behavioural factors relating to parenting and the parent–child relationship, and maternal health.

There is a long history of work across different fields showing that parenting plays a vital role in all aspects of children’s formative development, and our findings underscore the fact that parenting styles and early parent–child relationships vary across

OHC and non-OHC mothers, and these observed differences play an important role in their child's behavioural development. It should be noted that behavioural problems are relatively common among young children (Campbell et al, 2000), yet untreated externalising behaviour problems are associated with a wide range of negative later outcomes for children and adolescents – for example, cognitive and academic progress through the school years (Barbarese et al, 2007; Washbrook et al, 2013), together with educational attainment, (un)employment, wages and income (Feinstein, 2000; Healey et al, 2004; Palloni, 2006; Goodman et al, 2011; Egan et al, 2015) – and notably, ineffective parenting practices increase the likelihood that some children will continue to show aggressive behaviours (McMahon and Forehand, 2003; McKee et al, 2008). Effective parenting practices are a key way to reduce externalising behavioural symptoms among children of care leaver mothers, and the findings point to the need to support parents to develop effective tools and practices specifically in this sphere of early development (O'Connor, 2002; McKee et al, 2008; Jeong et al, 2021).

Regarding cognitive development, we find that the association between a mother's OHC experience and their child's language development is fully attenuated by accounting for family characteristics and SES. For our other cognitive outcome, school readiness, measured as a continuous score, the association is only attenuated in the final model which, in addition to child and family characteristics, current SES and parenting behaviours, also includes maternal health and wellbeing measures. However, in work differentiating between children who are 'school ready' versus not, the association between maternal OHC experience and school readiness is explained by family characteristics and socio-economic resources (Parsons, et al, 2023). This combination of findings suggests that while the performance of children of OHC experienced mothers at the more extreme end of the spectrum is similar to non-OHC mothers, once current SES is accounted for, they are generally performing worse across the distribution, and this difference can be explained by differences in parenting behaviours, maternal health and wellbeing.

Interventions aiming to support the complex needs of those with OHC experience are vital to break the vicious cycle and minimise the 'OHC penalty'. This extremely vulnerable group of parents and children should – and have a basic right to – be better cared for, to improve their own and their children's future outcomes.

### *Implications of the findings*

Our findings provide robust support for the call to grant Protected Characteristic status to help eliminate the disadvantages, stigma and prejudice often encountered by care-experienced young adults and their families. The findings point to policy levers, specifically regarding the provision of adequate housing and early, focused parenting support, that can attenuate the intergenerational transmission of poorer early cognitive, socio-emotional and behavioural development among children of mothers with OHC experience and underline the need for governments to better address the experiences of children when in state care (see the 2022 report by the House of Commons Education Committee), and to offer lifelong support to ease psycho-social scarring and promote wellbeing for them and for their children.

Our analysis has highlighted how crucial parental education levels, employment and housing conditions are for the development of children's early cognitive skills

and for mitigating behaviour problems among the children of mothers with care experience. Parenting behaviours are an additional key factor, and particularly for helping in the early reduction of externalising symptoms among children of OHC experienced mothers. The findings underscore the importance of early interventions for care-experienced families with young children before problems start to escalate. These interventions should be multi-faceted and integrated, targeting the educational opportunities and attainment of children and teenagers while they are in care, as well as their access to housing upon leaving the care system, and supporting their parenting when they start to have a family of their own.

Although the mothers with OHC experience in this research had an age range of 15–45 at the birth of the cohort child and experienced care systems and policies covering the latter half of the 20th century, the findings are just as pertinent for stopping the intergenerational transmission of disadvantage among more recent care-experienced young people and their (future) children (O'Higgins et al, 2017; Sebba and Luke, 2019; Brännström et al, 2020; Okpych and Courtney, 2020). In 2013 the UK government published the Care Leaver Strategy (HM Government, 2013) identifying key areas where today's care leavers needed better, more joined up and ongoing support: education, employment, finance, health, housing, and access to the justice system. This, together with the 'Putting Children First' and 'Keep on Caring' initiatives form the foundation of current policy to address the disadvantages care leavers experience across domains (DfE, 2016; HM Government, 2016).

The past two decades have seen major public investment in the early years, mainly focused on increased public spending on early childcare places and childcare subsidies. Most of the focus has been on children aged two and over, initially on disadvantaged families but more recently on families in work. We welcome the recent Scottish Government policy of extending 1,140 free hours of early learning and childcare eligibility per year to include two-year-olds with a care-experienced parent. Eligibility for all looked-after/care-experienced children aged two or older has always been a feature of the policy, but children of care-experienced parents were more recently made eligible (Scottish Government, 2021). While these policies are a step in the right direction, our work highlights the importance of housing conditions, the home environment, parenting behaviours and parent-child relationships, right from the moment of birth. We urge increased family support, targeted at those most in need, including care-experienced parents, to help improve children's early outcomes and break the intergenerational cycle of disadvantage. Effective measures should not just focus on parenting competences, but crucially provide a secure and safe environment in which effective parenting can be delivered. Without appropriate or secure housing, the competences of parents are challenged, affecting parental health and wellbeing as well as their children's healthy development.

### *Strengths and limitations*

In interpreting the findings of this study, a number of limitations have to be considered. The study included a retrospective question on experience of out-of-home care during a mother's own childhood, which has provided a rare opportunity to examine the early cognitive and behavioural outcomes of the children of a (relatively) large sample of care-experienced individuals who became

mothers. However, our sample of OHC experienced mothers may be relatively well adjusted and functional compared to all those with care experience known to social services. After all, the mothers in our sample are looking after their children in a family setting – and they agreed to take part in the MCS study. In addition, the analysis is limited by the relatively small number of care-experienced mothers in the sample and the variables available in the data set, so we are unable to examine the role of factors such as the type, duration, quality and specific period in childhood of the OHC placement, or the support and guidance the mother had and has access to.

As with any observational longitudinal study, other factors might play an important role in explaining variations in early cognitive performance and behavioural problems, and so bias due to other unmeasured confounding in background and behavioural measures cannot be ruled out and none of the estimates can be interpreted as causal. For example, we are unable to take account of the various deficits in resources and stresses likely to be experienced by the mothers during her own childhood prior to her OHC experience, thus we must be mindful of how much of the variance in the child's outcomes is explained by the mothers' OHC experience in her own childhood and how much could be attributed to other disadvantages likely associated with her OHC placement.

Missing data due to attrition are unavoidable in a longitudinal study, although this is minimised in this research by using multiple imputation and including the most important predictors of missing data in our models to maximise the plausibility of the missing at random assumption and restore sample representativeness. However, bias due to a non-ignorable missing data generating mechanism cannot be ruled out. Moreover, the study is focused on families in the UK and children born between 2000 and 2002, limiting the generalisability to other socio-cultural and historical contexts.

Nonetheless, a key strength of this research lies in its use of the UK MCS, a large population-based and representative prospective longitudinal study with exceptionally rich data and a design that ensured adequate representation of disadvantaged groups and families from British minority ethnic backgrounds.

## **Notes**

<sup>1</sup> Response options to the question 'Where did you mainly live during this time?': Local authority children's home; Voluntary society children's home; Children's home – not sure which type; Local authority foster parents; Voluntary society foster parents; Foster parents – not sure which type; Boarding school; Living with relatives; Prison/Young Offenders Institute/Borstal; Some other place.

<sup>2</sup> The BAS II has since been updated to BAS3. For further details see [Elliott and Smith \(2011\)](#).

<sup>3</sup> The Child-Parent Relationship Scale (CPRS) was adapted from the Student-Teacher Relationship Scale (STRS, [Pianta, 1992](#)). The CPRS (Short Form) is a 15-item self-administered rating scale, with responses on a five-point Likert scale. Eight items assess conflict and seven items closeness in the child-parent relationship (For details of the scales including their alpha reliability see [Johnson et al, 2015](#)).

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### **Data availability statement**

The authors take responsibility for the integrity of the data and the accuracy of the analysis. The data for all MCS sweeps (SN 8682) are available to researchers via the UK Data Service (<http://www.ukdataservice.ac.uk/>).

### **Statement on human and animal experimentation and informed consent**

To ensure all research carried out at UCL conforms to good practice and ethical expectations, UCL has adopted a set of research governance policies and procedures. We confirm compliance with the principles of the Declaration of Helsinki. All sweeps of the MCS have been granted ethical approval by the National Health Service (NHS) Research Ethics Committee (MREC). Specific MREC approvals for MCS1 (9 months) and MCS2 (3 years) are MREC/01/6/19 and MREC/03/2/022 respectively. Cohort members (CMs) were recruited to the study at nine months, via an interview carried out with the CM's parent/guardian. Letters and leaflets sent in advance of each of the surveys have summarised what participation in the survey will involve and written consent has been sought from parents for their participation and the participation of their child(ren). CMs provided their own consent at ages 14 and 17. Written consent has also been sought for gathering information from health, education, crime and economic records, and from teachers.

### **Conflict of interest**

The authors declare that there is no conflict of interest.

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## Appendix

**Table A1:** Missingness

Variable	N	N (missing)	% (missing)
Sex of child	19,082	0	0.00
Ethnicity of child	19,082	0	0.00
Mother OHC	19,082	0	0.00
Mother age at teenager birth	19,079	3	0.00
Mother highest qualification	19,054	28	0.00
Mother has problems reading	18,753	329	0.02
Mother has problems counting money	18,752	330	0.02
Mother has problems filling in a form	18,751	331	0.02
Single parent S1	18,462	620	0.03
Workless household S1	18,462	620	0.03
Older siblings S1	18,462	620	0.03
UK country live in S1	18,462	620	0.03
Mother smokes cigarettes	18,457	625	0.03
Mother treated for depression S1	18,456	626	0.03
Mother general health S1	18,455	627	0.03
Frequency sees mother S1	18,454	628	0.03
Mother long-standing illness S1	18,454	628	0.03
Frequency sees father S1	18,451	631	0.03
Partner used force S1 and S2	18,448	634	0.03
Birthweight S1	18,445	637	0.03
Housing tenure S1	18,423	659	0.03
Poverty S1	18,404	678	0.04
Gestation (weeks) S1	18,260	822	0.04
Breastfeeding S1	18,157	925	0.05
Overcrowded home S1	18,134	948	0.05
Dislike home S1	18,124	958	0.05
Dislike area where live S1	18,122	960	0.05
Family receives state benefits S1	18,121	961	0.05
Dampness in the home S1	18,119	963	0.05
Never get what want out of life S1 and S2	18,025	1,057	0.06
Whatever I do has no effect on my life S1 and S2	18,023	1,059	0.06
Can run own life as I want S1 and S2	18,023	1,059	0.06
Place for children to play safely S1	17,892	1,190	0.06
Malaise score (depression) S1	17,737	1,345	0.07
Low satisfaction with life S1	17,536	1,546	0.08

(Continued)

**Table A1:** Continued

Variable	N	N (missing)	% (missing)
Single parent S2	15,458	3,624	0.19
Workless household S2	15,376	3,706	0.19
Child has a regular bedtime S2	15,338	3,744	0.20
Child has a regular mealtime S2	15,338	3,744	0.20
Housing tenure S2	15,337	3,745	0.20
Child long-standing illness S2	15,337	3,745	0.20
Poverty S2	15,311	3,771	0.20
Disorganised home S2	15,158	3,924	0.21
Can't hear self think at home S2	15,158	3,924	0.21
Not a calm environment at home S2	15,158	3,924	0.21
Home learning environment scale S2	15,158	3,924	0.21
Child age S2	14,944	4,138	0.22
SDQ conduct problems S2	14,676	4,406	0.23
SDQ emotional problems S2	14,650	4,432	0.23
SDQ peer problems S2	14,553	4,529	0.24
Highest qualification of partner S1	14,523	4,559	0.24
SDQ hyperactivity problems S2	14,539	5,268	0.24
BAS Naming Vocabulary score S2	13,752	5,330	0.28
Bracken School Readiness S2	13,738	5,344	0.28
Bracken School Readiness: Normative Classification	13,738	5,344	0.28
Parenting competence S2	13,534	5,548	0.29
Kessler K6 S2	13,501	5,581	0.29
PIANTA conflict scale S2	13,107	5,975	0.31
PIANTA closeness scale S2	12,847	6,235	0.33
Average missing			0.12

**Table A2:** OLS regression results: BAS Naming Vocabulary score

	M1	M2	M3	M4	M5
Mother OHC	-0.19** (0.07)	-0.14* (0.07)	0.04 (0.07)	0.07 (0.06)	0.07 (0.06)
CM ethnicity: BME		- 0.43*** (0.04)	- 0.36*** (0.03)	- 0.37*** (0.03)	-0.36*** (0.03)
CM sex: female		0.23*** (0.02)	0.24*** (0.02)	0.21*** (0.02)	0.21*** (0.02)
Single parent		- 0.23*** (0.03)	0.06 (0.03)	0.06* (0.03)	0.06* (0.03)

(Continued)

**Table A2:** Continued

	<b>M1</b>	<b>M2</b>	<b>M3</b>	<b>M4</b>	<b>M5</b>
Age mother at CM birth		0.02*** (0.00)	0.01** (0.00)	0.00** (0.00)	0.00** (0.00)
English and/or other language spoken at home		– 0.74*** (0.04)	– 0.61*** (0.04)	– 0.61*** (0.04)	–0.61*** (0.04)
Parent no or NVQ1 level qualifications			– 0.34*** (0.02)	– 0.28*** (0.02)	–0.28*** (0.02)
Workless household			– 0.25*** (0.03)	– 0.22*** (0.03)	–0.22*** (0.03)
Rented housing			– 0.12*** (0.02)	– 0.10*** (0.02)	–0.10*** (0.02)
Overcrowded home			– 0.16*** (0.02)	– 0.14*** (0.02)	–0.14*** (0.02)
Damp home			0.00 (0.02)	0.00 (0.02)	0.00 (0.02)
CM never breastfed				– 0.09*** (0.02)	–0.09*** (0.02)
Pianta: parent–child high conflict score				–0.05* (0.02)	–0.05 (0.02)
Pianta: parent–child low closeness score				– 0.29*** (0.04)	–0.29*** (0.04)
Poor home learning environment				– 0.24*** (0.02)	–0.24*** (0.02)
Mother feels she is a below average parent				0.00 (0.04)	0.01 (0.04)
Mother feels she is an above average parent				0.04** (0.02)	0.04* (0.02)
Mother poor/fair general health					–0.04 (0.02)
Mother poor mental wellbeing (Kessler)					–0.01 (0.05)
Mother current smoker					0.02 (0.02)
_cons	0.12*** (0.02)	–0.26*** (0.05)	0.16** (0.05)	0.25*** (0.05)	0.24*** (0.05)
R <sup>2</sup>	0.00	0.17	0.22	0.24	0.24
N	19,082	19,082	19,082	19,082	19,082

Notes: Standard errors in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table A3:** OLS regression results: Bracken Composite School Readiness score

	M1	M2	M3	M4	M5
Mother OHC	-0.51*** (0.07)	-0.39*** (0.07)	-0.15* (0.06)	-0.12* (0.06)	-0.10 (0.06)
CM ethnicity: BME		-0.26*** (0.04)	-0.17*** (0.04)	-0.19*** (0.04)	-0.20*** (0.04)
CM sex: female		0.24*** (0.02)	0.24*** (0.02)	0.21*** (0.02)	0.21*** (0.02)
Single parent		-0.36*** (0.03)	-0.01 (0.03)	0.00 (0.03)	0.01 (0.03)
Age mother at CM birth		0.02*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
English and/or other language spoken at home		-0.38*** (0.04)	-0.23*** (0.04)	-0.24*** (0.04)	-0.25*** (0.04)
Parent no or NVQ1 level qualifications			-0.40*** (0.02)	-0.31*** (0.02)	-0.30*** (0.02)
Workless household			-0.29*** (0.03)	-0.25*** (0.03)	-0.24*** (0.03)
Rented housing			-0.19*** (0.02)	-0.16*** (0.02)	-0.15*** (0.02)
Overcrowded home			-0.25*** (0.02)	-0.22*** (0.02)	-0.21*** (0.02)
Damp home			-0.02 (0.03)	-0.02 (0.03)	-0.02 (0.03)
CM never breastfed				-0.20*** (0.02)	-0.19*** (0.02)
Pianta: parent-child high conflict score				-0.08** (0.03)	-0.07* (0.03)
Pianta: parent-child low closeness score				-0.27*** (0.03)	-0.27*** (0.03)
Poor home learning environment				-0.32*** (0.02)	-0.32*** (0.02)
Mother feels she is a below average parent				-0.03 (0.04)	-0.02 (0.04)
Mother feels she is an above average parent				0.07*** (0.02)	0.07*** (0.02)
Mother poor/fair general health					-0.06* (0.03)
Mother poor mental wellbeing (Kessler)					-0.08 (0.05)
Mother current smoker					-0.06** (0.02)
_cons	0.16*** (0.02)	-0.52*** (0.05)	0.04 (0.05)	0.18** (0.06)	0.21*** (0.06)
R <sup>2</sup>	0.00	0.11	0.19	0.22	0.23
N	19,082	19,082	19,082	19,082	19,082

Notes: Standard errors in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table A4:** OLS regression results: internalising behaviour problems

	M1	M2	M3	M4	M5
Mother OHC	0.32*** (0.08)	0.23** (0.08)	0.07 (0.08)	-0.01 (0.07)	-0.04 (0.07)
CM ethnicity: BME		0.21*** (0.03)	0.16*** (0.03)	0.18*** (0.03)	0.18*** (0.03)
CM sex: female		-0.09*** (0.02)	-0.09*** (0.02)	-0.06*** (0.02)	-0.06*** (0.02)
CM age at interview		-0.01 (0.01)	-0.02 (0.01)	-0.01 (0.01)	-0.02 (0.01)
Single parent		0.21*** (0.03)	-0.04 (0.03)	-0.05 (0.03)	-0.05 (0.03)
Age mother at CM birth		-0.02*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)
English and/or other language spoken at home		0.32*** (0.04)	0.23*** (0.04)	0.24*** (0.04)	0.25*** (0.04)
Parent no or NVQ1 level qualifications			0.27*** (0.02)	0.19*** (0.02)	0.19*** (0.02)
Workless household			0.19*** (0.03)	0.16*** (0.03)	0.14*** (0.03)
Rented housing			0.15*** (0.03)	0.10*** (0.03)	0.09** (0.03)
Overcrowded home			0.05* (0.02)	0.04 (0.02)	0.03 (0.02)
Damp home			0.11*** (0.03)	0.09** (0.03)	0.07* (0.03)
CM never breastfed				0.11*** (0.02)	0.11*** (0.02)
Pianta: parent-child high conflict score				0.48*** (0.03)	0.45*** (0.03)
Pianta: parent-child low closeness score				0.44*** (0.04)	0.43*** (0.04)
Poor home learning environment				0.10*** (0.02)	0.09*** (0.02)
Mother feels she is a below average parent				0.07 (0.04)	0.04 (0.04)
Mother feels she is an above average parent				-0.13*** (0.02)	-0.12*** (0.02)
Mother poor/fair general health					0.12*** (0.03)
Mother poor mental wellbeing (Kessler)					0.38*** (0.06)
Mother current smoker					0.02 (0.02)
_cons	-0.07*** (0.01)	0.54*** (0.06)	0.19** (0.06)	0.03 (0.06)	0.01 (0.06)
R <sup>2</sup>	0.00	0.06	0.09	0.16	0.17
N	19,082	19,082	19,082	19,082	19,082

Notes: Standard errors in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table A5:** OLS regression results: externalising behaviour problems

	M1	M2	M3	M4	M5
Mother OHC	0.47*** (0.08)	0.32*** (0.07)	0.15* (0.07)	0.04 (0.07)	-0.01 (0.07)
CM ethnicity: BME		0.03 (0.03)	-0.02 (0.04)	0.02 (0.03)	0.02 (0.03)
CM sex: female		-0.21*** (0.02)	-0.22*** (0.02)	-0.18*** (0.02)	-0.18*** (0.02)
CM age at interview		-0.03** (0.01)	-0.04*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
Single parent		0.28*** (0.03)	0.04 (0.04)	0.01 (0.03)	0.00 (0.03)
Age mother at CM birth		-0.03*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)
English and/or other language spoken at home		0.10* (0.04)	0.00 (0.04)	0.02 (0.04)	0.05 (0.04)
Parent no or NVQ1 level qualifications			0.29*** (0.02)	0.19*** (0.02)	0.18*** (0.02)
Workless household			0.14*** (0.03)	0.09** (0.03)	0.07* (0.03)
Rented housing			0.20*** (0.03)	0.14*** (0.02)	0.11*** (0.02)
Overcrowded home			0.05* (0.02)	0.05* (0.02)	0.04 (0.02)
Damp home			0.08** (0.03)	0.04 (0.02)	0.03 (0.02)
CM never breastfed				0.13*** (0.02)	0.12*** (0.02)
Pianta: parent-child high conflict score				0.99*** (0.02)	0.96*** (0.03)
Pianta: parent-child low closeness score				0.37*** (0.03)	0.35*** (0.03)
Poor home learning environment				0.14*** (0.02)	0.13*** (0.02)
Mother feels she is a below average parent				0.02 (0.04)	0.00 (0.04)
Mother feels she is an above average parent				-0.24*** (0.02)	-0.23*** (0.02)
Mother poor/fair general health					0.14*** (0.02)
Mother poor mental wellbeing (Kessler)					0.18*** (0.05)
Mother current smoker					0.12*** (0.02)
_cons	-0.05*** (0.01)	1.05*** (0.06)	0.65*** (0.06)	0.44*** (0.06)	0.38*** (0.06)
R <sup>2</sup>	0.00	0.08	0.12	0.29	0.30
N	19,082	19,082	19,082	19,082	19,082

Notes: Standard errors in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$