What siblings share: how family background shapes early childhood socio-emotional difficulties in the United Kingdom

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RESEARCH ARTICLE

What siblings share: how family background shapes early childhood socio-emotional difficulties in the United Kingdom

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Family background is a recognised determinant of children's socio-emotional outcomes, yet its measurement and the conceptualisation of family (dis)advantage remain inconsistent across research, policy and practice. This study adopts a multidimensional inequality framework and a sibling design with random effects to (1) estimate the overall impact of family of origin, both observed and unobserved factors, on children's age-5 socio-emotional difficulties; (2) decompose this effect across five dimensions of family background observed at age three: family demographics, emotional environment, parenting, educational environment and socio-economic circumstances; and (3) assess the relative strength of family background indicators on socio-emotional difficulties. Using current data from the nationally representative United Kingdom Household Longitudinal Study (N = 2,204, including 916 siblings) and capturing socio-emotional difficulties with the Strengths and Difficulties Questionnaire (SDQ), family-of-origin accounted for 37 per cent of the total variance in SDQ scores, with 38 per cent of the family-of-origin influence explained by observed family dimensions. Parental occupational

class, maternal psychological distress and parenting behaviours related to schedules, praise and punishment exhibited the strongest independent effects. Nonetheless, a substantial portion of the family-of-origin effect remains unexplained, underscoring the role of other unmeasured family factors. These results suggest that policy spaces should integrate a multidimensional approach to monitoring family (dis)advantage, and that holistic family support, while attending to children's individual differences, offers the best chance of reducing early childhood socio-emotional difficulties, thus reducing barriers to opportunity.

Keywords family background • socio-emotional difficulties • sibling design • multidimensional inequality • early childhood

Key messages

- Family (dis)advantage shapes children's development multidimensionally.
- In a UK sample, family-of-origin accounts for 37 per cent of variance in siblings' socio-emotional difficulties. Observed family factors account for 38 per cent, suggesting the influence of unmeasured influences.
- Socio-economic position explains most family-level variance (18 per cent), followed by maternal mental health (16 per cent) and parenting (14 per cent).

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Introduction

Promoting equal opportunities for children from disadvantaged family backgrounds is a central public policy endeavour in the UK (see, for example, the Child Poverty Act of 2010; also HM Government, 2024) and internationally (OECD, 2025). A substantial body of research demonstrates that children's learning, development and long-term outcomes are shaped by their early socio-economic and demographic family circumstances (Bukodi and Goldthorpe, 2018; Cooper and Stewart, 2021; Breen, 2022; Cattan et al, 2024). While cognitive skills have traditionally been the focus of such work, there is increasing recognition that children's early socio-emotional outcomes are also critical for later education, health and employment prospects (Heckman et al, 2006; Almlund et al, 2011; Moffitt et al, 2022; OECD, 2024). This has positioned inequalities in early socio-emotional outcomes as an important target for intervention to support children's success (Corcoran et al, 2018).

This article contributes to knowledge on inequalities in socio-emotional outcomes by using a sibling design to assess the overall influence of family-of-origin relative to observed family background indicators (Conley, 2008; Grätz et al, 2021). To date, we lack a clear understanding of the extent to which early socio-emotional outcomes are shaped by family background and what family background indicators constitute (dis)advantage for socio-emotional development. Adopting a sibling design, we

address this knowledge gap by capturing correlations between siblings that reflect everything shared in their family-of-origin (neighbourhood, parental social class, parenting, genes, and so on), regardless of whether these factors are observed in the available data (Conley, 2008). Instead of focusing on sibling dynamics, we use sibling correlations as a global measure of family background, with higher correlations indicating a stronger family influence.

Second, by adopting a multidimensional perspective on family background, we deepen understanding of how various indicators contribute, both individually and jointly, to children's socio-emotional outcomes. Research linking children's family backgrounds to their outcomes is marked by considerable variability in how family backgrounds, and thus childhood family (dis)advantage, are conceptualised and measured. While UK policy makers often use blunt threshold-based indicators, such as free school meal eligibility (Campbell et al, 2025), or aggregated geographical area-level measures, such as the Index of Multiple Deprivation (IMD) (Paterson et al, 2019), academic research tends to use more precise indicators to capture family (dis)advantage. However, different indicators, like parents' income, social class and education, are often used independently and interchangeably (Davis-Kean et al, 2021). This means that the effect of certain indicators can be overestimated, while the impact of others remains underestimated (Clery et al, 2022). Some recent studies have considered the multidimensional nature of children's developmental contexts (Schoon, 2021; Cattan et al, 2024; Thornton et al, 2024; Outhwaite, 2025), including factors outside socio-economic resource-based explanations (that is, parents' psychological health, parenting practices and family structure). Still, the relative effect of various family background indicators, as well as the overall family-of-origin effect, on children's early socio-emotional outcomes remains unclear. To advance this understanding, we take a multidimensional approach that captures five key domains of family background: family demographics, emotional environment, parenting environment, educational environment and socio-economic circumstances. This approach is grounded in life-course perspectives that underscore the cumulative impact of diverse factors on children's wellbeing and life chances (Masten and Cicchetti, 2010; Bernardi, 2014; Heidinger and Willson, 2022) and mirrors family dimensions examined in recent research on this topic (Cattan et al, 2024).

Third, we provide an estimate of family effects on children's socio-emotional outcomes on a contemporary cohort of UK children. Much of the existing evidence in the UK (Cattan et al, 2024) is based on older cohorts, such as the Millennium Cohort Study (MCS), now in their twenties, whose early years were coloured by a context of declining child poverty and government investments into early years programmes (Carneiro et al, 2024). Since 2008, austerity policies have led to a rise in child poverty amidst declining support for families with young children (Henry and Wernham, 2024). Given the different policy context, there is a pressing need for research on a contemporary cohort of UK children. To address this gap, we provide new estimates of the relationship between family-of-origin, developmental context and children's socio-emotional outcomes among young children born between 2007 and 2017. Combining high levels of child poverty and income inequality with a policy environment in which families bear substantial responsibility for buffering disadvantage, the UK provides an informative context for countries facing similar pressures of rising inequality and constrained public investment.

With this research design and updated cohort, we ask three research questions:

1. What is the total contribution of family-of-origin to children's socio-emotional outcomes?
2. How much of this total family-level variance is explained by different dimensions of family background?
3. Which indicators are most strongly linked with children's socio-emotional development?

Literature review

The importance of early socio-emotional outcomes

Socio-emotional development refers to children's growing capacity 'to form close and secure adult and peer relationships; experience, regulate, and express emotions in socially and culturally appropriate ways; and explore the environment and learn' (Yates et al, 2008: 2). In practice, socio-emotional outcomes encompass a broad set of interrelated skills and behaviours. These include sociability (playing with other children), prosocial behaviour (cooperation with other adults and/or children), behavioural self-regulation (ability to follow instructions), cognitive self-regulation (ability to persist with tasks and sustain attention) and emotional self-regulation (ability to regulate strong feelings or emotions) (Melhuish and Gardiner, 2024). Such competencies support the acquisition of other skills, such as language, communication, social adjustment and managing social relationships (Hammer et al, 2018; Law et al, 2021). Studies also show that socio-emotional development underpins a range of long-term social and economic outcomes, with evidence suggesting socio-emotional outcomes are as important as cognitive abilities for shaping later life chances (Heckman et al, 2006; Almlund et al, 2011; Moffitt et al, 2022; OECD, 2024). The influence of socio-emotional outcomes on academic achievement and other outcomes operates through well-established psychological (motivation and effort) and behavioural (learning) pathways (Heckman et al, 2006; Gruijters et al, 2024). Socio-emotional outcomes are therefore recognised as a vital component of children's development, and are a key target for interventions aimed at promoting children's short- and long-term success (Corcoran et al, 2018).

To understand how family background influences children's socio-emotional outcomes, it is essential to focus on early childhood (0–6 years), a period recognised as crucial for their development (Denham et al, 2003; Huber et al, 2019). Early life is when children learn fundamental emotional responses and interaction patterns, making this development window especially influential (Malik and Marwaha, 2022). Evidence confirms that socio-emotional difficulties vary between individuals and are responsive to interventions (Carneiro et al, 2024; Gruijters et al, 2024). If unaddressed, early lags in socio-emotional development evolve into wider adjustment and achievement gaps as children grow older (Gruijters et al, 2024). Policy interventions targeting early childhood may address developmental gaps at their outset, thereby diminishing the likelihood that early disadvantage translates into enduring educational and social inequalities (Carneiro et al, 2024; Hayre et al, 2025). However, to be effective, these interventions must be informed by a clear conceptualisation of children's developmental contexts, alongside robust identification of the most salient family background measures.

Early childhood family background and socio-emotional outcomes

Children's socio-emotional outcomes are shaped by a combination of individual, family, neighbourhood and structural factors (Yeung et al, 2002). Families are a key source of early childhood influence. However, family contexts vary substantially in their economic, cultural/educational, social and emotional resources, influencing home stress levels, parenting styles and other parental inputs, including parental time and resource investments (Harkness et al, 2020; Cooper and Stewart, 2021; Schoon, 2021). Children from economically advantaged family backgrounds are more likely to participate in organised extracurricular activities that provide opportunities for emotional skill development (Weininger et al, 2015). Meanwhile, children who grow up with fewer family resources are more likely to experience parental absence and heightened family stress due to economic hardship, increasing the likelihood of developing socio-emotional difficulties (Borghans et al, 2006; McLanahan and Percheski, 2008). Children's self-image and perceived efficacy also depend on their relative social position and the corresponding opportunities for personal development and status attainment (Boyden et al, 2015; Hitlin and Johnson, 2015). Moreover, teachers and schools can reinforce class-based differences in children's cultural-psychological resources through their interaction with and expectations towards (dis)advantaged students (Morris, 2005).

While various indicators assess children's early family (dis)advantage, most commonly focusing on socio-economic circumstances, there is no clear consensus on the best measures for capturing the sources of family inequality (Antonoplis, 2023). In the UK policy domain, free school meal eligibility and pupil premium status are commonly used proxies of children's exposure to socio-economic disadvantage. However, fewer children are registered for these entitlements than are estimated to be in poverty (Campbell et al, 2025), and the consistency of entitlement varies across UK countries (Campbell and Cooper, 2024). Area-based measures of income deprivation, such as the IMD, are also widely used (Jerrim, 2021), but they mask cases of deprivation within non-deprived areas (Paterson et al, 2019; Clery et al, 2022). Meanwhile, survey-based research includes more fine-grained information about (dis)advantages in family contexts, and has demonstrated the influence of parents' occupational class (Tamura et al, 2020) and household income (Cooper and Stewart, 2021) on children's outcomes. Others have adopted a composite index of socio-economic circumstances by combining parental education, occupation and home resources (OECD, 2021; Melhuish and Gardiner, 2024).

Beyond socio-economic circumstances, evidence suggests that family demographics, such as single-parent households (Harkness et al, 2020) and teen motherhood (Cresswell et al, 2022), relate to worse childhood outcomes. Being born into a larger family, on the other hand, may support children's socio-emotional development (Lawson and Mace, 2010). Additionally, family emotional environment, like parental emotional wellbeing (Perelli-Harris and Styrc, 2018; Parsons et al, 2021) and parents' subjective financial wellbeing (Puff and Renk, 2014), may be associated with children's outcomes. Parenting, like regular schedules (mealtime and bedtime) (Kelly et al, 2013) and discipline/reward (Rajyaguru et al, 2019), is also potentially associated with children's socio-emotional development. And finally, educational environments, like parents' educational qualifications, particularly maternal education (Noonan and Fairclough, 2018; Attanasio et al, 2020), early formal childcare (Green et al, 2021) and regular home educational activities (reading, Meroni et al, 2022), have all also been linked to children's improved socio-emotional outcomes.

Building on evidence that (dis)advantage is multidimensional, several recent studies have analysed the relationship between children's early outcomes and a range of indicators like parental education, social class, employment status, family income, home ownership, child health and legacies of COVID-19 (Schoon et al, 2021; Cattan et al, 2024; Thornton et al, 2024; Outhwaite, 2025). This approach enables consideration of the relative and independent contributions of different family background indicators to children's development. For example, Schoon and colleagues (2021) found that socio-emotional outcomes depend more on maternal education and housing conditions than on family income. This suggests that a sole focus on material environment may both underestimate the broader impact of socio-economic adversity and overstate the significance of any one indicator, such as household income.

Cattan and colleagues (2024) took the multidimensional approach even further by distinguishing between children's fixed traits at birth (ethnicity, birth order, assigned sex), family demographic characteristics (household structure, health or age of parents), educational environment (parents' education, reading books to child), and emotional, material and genetic environments in a large cohort of UK children born in 2000/2002. Although the cohort of focus was not contemporary, the results showed that all the observed family background indicators jointly explained just over 40 per cent of the variance in age-3 socio-emotional development, despite many of these indicators having relatively small independent effect sizes. Nonetheless, in terms of relative importance, they found that a child's emotional environment was by far the most important dimension, followed by the educational and material environment. This evidence highlights the significance of moving beyond a sole focus on socio-economic circumstances, towards a multidimensional approach to measuring family background. However, these studies remain limited in that they can only account for observed factors to establish the total family-of-origin effect. Expanding on the importance of capturing multiple observed indicators of (dis)advantage, we argue that unobserved family factors may lead to an underestimation of the total effect of the family background while overestimating the relative importance of certain measured indicators.

To address these limitations, we extend our analysis to a contemporary cohort of UK children and use a sibling design to estimate the total observed and unobserved family-of-origin effect on children's socio-emotional outcomes. With this design, we estimate the extent to which the family-of-origin effect can be explained using five key domains of family environment in line with aforementioned studies on this topic (Cattan et al, 2024): family demographics, emotional environment, parenting, educational environment and socio-economic circumstances. This multidimensional strategy allows us to consider the relative contribution of a range of family background indicators, providing a more nuanced and robust understanding of how family (dis) advantage shapes children's socio-emotional development.

Harnessing a sibling design to better untangle cumulative effects

Sibling designs are a uniquely comprehensive method for estimating total family-of-origin effect on child outcomes (Björklund and Jäntti, 2012; Anderson et al, 2024) because they can capture everything siblings share, including unobserved genetic endowments, parental motivations, and wider contexts such as shared

neighbourhoods and schools. The total family-of-origin effect estimates the degree of similarity between siblings on a particular outcome, thus reflecting the proportion of variance attributable to factors that increase sibling resemblance. By accounting for the influence of unobserved family factors, we can more accurately estimate the effect of family background. As such, sibling designs are a preferable alternative for assessing the influence of family background on children's socio-emotional outcomes. Following previous studies (Duta et al, 2021; Karlson and Birkelund, 2022; Iannelli et al, 2024), family-of-origin effects can also be decomposed to demonstrate the relative contributions of measured indicators, providing evidence to inform policy about what family-level factors are most important for understanding inequalities in specific outcomes.

While no previous UK study (to our knowledge) has applied a sibling design to investigate the relationship between family background and children's early socio-emotional development, research in other contexts supports the significance of shared family backgrounds. For example, Bügelmayer and Schnitzlein (2018) found that 29 per cent of the variation in German adolescent mental health could be attributed to shared family background. Similarly, Anger and Schnitzlein (2017) reported that shared environment accounted for 43 per cent of the variance in positive reciprocity, 39 per cent in negative reciprocity and 35 per cent in agreeableness among German adults, traits closely linked to socio-emotional functioning. Nonetheless, the estimated influence of shared environment tends to be lower for socio-emotional traits than for cognitive outcomes, which often show higher overall sibling correlations (for example, >50 per cent cognitive outcome similarity; Anger and Schnitzlein, 2017).

This study offers a contemporary investigation into the relationship between family background and UK children's age-5 socio-emotional outcomes. Using nationally representative panel data on children aged 3–5 years from the UK Household Longitudinal Study (UKLHS), we harness a sibling design to estimate the overall family-of-origin effect on children's early socio-emotional outcomes. We then take a multidimensional approach to family background, decomposing the family-of-origin effect across multiple domains to provide a nuanced perspective on children's family background.

Methods

Data and sample

We use Waves 1–14 of the nationally representative UKHLS, covering years 2009–22 (University of Essex and Institute for Social and Economic Research [ISER], 2024a), to capture the socio-emotional development of five-year-old children born between 2007 and 2017. Utilising the sample members from the UKHLS Pregnancy and Early Childhood dataset (University of Essex and ISER, 2024b), we linked age-5 socio-emotional outcomes (N = 2,507) to parent and household information from the mainstage survey, collected when children were three years old (N = 2,491). Finally, to facilitate comparison across models, we delete respondents with missing responses on our variables of interest listwise (N = -287), such that our final analytical sample was (N = 2,204).

As a household panel survey, UKHLS provides the opportunity to connect children who have the same mother, allowing us to consider the total contribution of

family-of-origin on children's age-5 socio-emotional outcomes. Of the total analytical sample, 916 respondents (observed at ages three and five) were siblings identified via mothers' IDs, with 429 unique mothers used as a clustering unit in our multilevel analysis, detailed in what follows. For our analyses, we consider both our full sample (N = 2,204), reflective of general family populations, not just larger families, as well as this sibling-only sample (N = 916).

Measures

Outcome variable

Our outcome of interest is children's age-5 socio-emotional difficulties, measured using parent reports of their child's behaviour on the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). Research shows the SDQ has well-established reliability and validity for studying socio-emotional outcomes among English-speaking children aged 3–7 years, including the ability to predict children's developmental and clinical outcomes two years later (Croft et al, 2015; Cairney et al, 2021). Validation of studies of the SDQ from parent reports suggests that difficulties may be slightly underreported due to social-desirability bias (Mieloo et al, 2012; Runge and Soellner, 2019), which would likely attenuate associations, making estimates potentially conservative.

The UKLHS provides a derived SDQ measure that aggregates four subscales of children's socio-emotional difficulties: conduct problems, hyperactivity, emotional problems and peer problems. Aggregated SDQ values range from 0 to 40, and higher scores indicate greater difficulties and worse socio-emotional outcomes (values >17 are considered a cause for concern, Goodman, 1997). To increase comparability with existing SDQ research (for example, Cattan et al, 2024), we use the derived SDQ measure as our main outcome and its sub-components to assess construct reliability in our sample.

Explanatory and control variables

To examine children's developmental contexts in their families of origin, we distinguish five family background domains. While alternative classifications are plausible, our aim is to follow prior literature and consider the different types of (dis)advantages captured by these dimensions (for example, economic, cultural/educational, social and emotional) (for example, Jæger, 2007; Cattan et al, 2024).

Our first domain includes family demographics: parental generation (Millennial, born between 1980 and 1996; and Generation X or older, born between 1960 and 1979), family structure (single versus two-parent households), teenage motherhood (whether age 18 or less at childbirth) and family size (number of siblings in the household: 0, 1, 2 and 3+).

Second is family emotional environment. We first include a measure of maternal mental distress (12-item General Health Questionnaire [GHQ]; range 0–36; Goldberg and Blackwell, 1970) followed by a measure of subjective financial wellbeing ('*How well would you say you yourself are managing financially these days*', with answers captured with: living comfortably, doing alright, just about getting by, finding it quite difficult, and finding it very difficult).

The third domain captures children's parenting environment, including household routines that support cognitive development: regular mealtimes (always/usually versus

less often) and regular bedtimes (always/usually versus less often). We also included how parents treat their children: whether a parent hits or slaps their children (never, seldom or sometimes/very often), whether a parent yells at their children (never/seldom, sometimes, very often) and whether a parent cuddles and praises their children (very often or less often).

Fourth, we examined children's educational environment. We first accounted for the frequency of the at-home reading parents did with their children (once a week or more versus less often). We also included the highest level of parental education (degree or higher, other higher degree, A-level, General Certificate of Secondary Education [GCSE], other qualification or no qualification), capturing families' educational/cultural resources (Jæger, 2007). Finally, we included children's formal childcare use (none, 1–10 hours per week, 11–20 hours per week, 20+ hours per week).

The fifth domain examined children's socio-economic circumstances. We include parents' highest occupational class (five categories based on the National Statistics Socio-Economic Classification: (1) higher managerial, administrative and professional occupations; (2) intermediate occupations; (3) small employers and own account workers; (4) lower supervisory and technical occupations; (5) semi-routine and routine occupations; and (6) user-derived category of parent never worked and long-term unemployed). We also include neighbourhood deprivation, using IMD quintiles (5 = lowest deprivation/1 = highest deprivation), and household equivalised disposable income quintile (based on monthly net total household income, inflated across reporting years to 2022 standards, using the UK official consumer price index, equivalised using the standard Organisation for Economic Co-operation and Development equation).

Finally, we controlled for children's characteristics, including: health-limiting conditions (yes/no); child's assigned sex at birth (female/male); child's ethnicity (White/Non-White); child's birth year (2007–2017); as well as child residence at age-3 (England, Wales, Scotland, Northern Ireland).

Except for occupational class and education, for which we used the dominance approach, we relied on maternal responses when available, substituting paternal responses for missing data (<1 per cent of cases). Except for childcare hours, measured at age two to account for near-universal uptake at age three (Cardin-Stewart, 2024), all explanatory variables were assessed at age three. Correlation analysis (see Online Supplementary Materials, Table A1) revealed no strong associations among explanatory variables (Spearman's $\rho = \pm 0.5$).

Analytical strategy

This study aims to quantify the overall contribution of family-of-origin to children's socio-emotional outcomes, assess the variance explained by distinct family background dimensions and identify which family background indicators are most strongly associated with socio-emotional development. To quantify the family-of-origin effect on children's socio-emotional outcomes, we leverage the UKHLS household panel structure, nesting individuals, i (Level-1), in families, j (Level-2), using mothers' identifiers, in both the full sample and the sibling-only sample. Random intercept models are applied to analyse children's socio-emotional outcomes, Y_{ij}. The baseline null model for the random effects analysis of variance model can be expressed as follows:

$$Y_{ij} = \gamma_{00} + U_{0j} + R_{ij} \quad (1)$$

where the outcome variable is the sum of a general mean γ_{00}, a family-level random effect U_{0j}, and an individual-level random effect R_{ij}. The family-level random intercepts (U_{0j}) and the individual-level residual errors (R_{ij}) are assumed to be independent and normally distributed, with zero means and constant variances (Snijders and Bosker, 2011). These models are estimated using the 'mixed' command in Stata v18.

Our objective is to estimate variance components and their relative contribution to total variance, and to further explain family-level variance using observed family characteristics. Therefore, of particular interest is the intra-class correlation (ICC) coefficient, given by:

$$\rho = \frac{\tau^2}{\tau^2 + \sigma^2} \quad (2)$$

where τ^2 represents the variance between families and σ^2 represents the individual variance within families. Hence, the ICC (ρ) provides the proportion of total variation in the outcome attributable to between-family differences relative to the overall variance (that is, the sum of the family and individual variance components). Equivalently, it captures the correlation between randomly selected siblings within a randomly drawn family: a higher ICC indicates stronger family-level influence on SDQ scores, hence greater sibling similarity.

To evaluate the variance in children's socio-emotional outcomes attributable to dimensions of family background, we decompose the changes in the family-level variance from the inclusion of each measured family background domain. Although some family-domain variables vary slightly between siblings, their within-family variation is minimal. Therefore, we treat them as family-level variables in the analysis. Several of our indicators, especially parental education, maternal distress and parenting practices, may function as mediators through which socio-economic circumstances shape child outcomes, consistent with extensive evidence of socio-economic gradients of parental mental health and parenting styles. Therefore, the interconnections among our predictor variables mean that correlations among family-level variables are expected. However, orthogonality is not required for the analytic decomposition of family-level variables, and including correlated family-level variables is common in this area of research (Duta et al, 2021; Karlson and Birkelund, 2022; Iannelli et al, 2024). So, the unique contribution of any single predictor, or block of variables, is not uniquely identified, and incremental contributions depend on the order in which variable blocks are entered. To tease out their separate effects, we introduce variable blocks one-by-one, before including them jointly in the final model. First, we estimate a null model, which provides the total gross family effect (M0). Next, including controls, we estimate family demographics (M1), family emotional environment (M2), parenting environment (M3), family educational environment (M4) and family socio-economic circumstances (M5), which are each examined in separate blocks and then all together (M6). Because these dimensions are correlated, the total between-family variance explained by all dimensions jointly is well-identified, but the portion attributable to any one dimension is not necessarily unique. As such, M6 can be interpreted as upper-bound estimations in a similar way sibling correlations represent upper-bound estimates of the family effect, in the

absence of school, neighbourhood and genetic components, which are inevitably captured in the overall measures of shared-siblings factors. Therefore, results should be interpreted as relative importance for explaining level-2 variance, conditional on overlap among dimensions, rather than causal effects.

This approach enables us to quantify the extent to which our family background domains explain the gross total family-level variance, separately and together. We estimate these models on both the sibling-only sample and the full sample of siblings and singletons. To answer our first two research questions, we must examine the variance between families. Given that singletons do not contribute to the family-level variance, including singletons could potentially bias the variance components in our multilevel analysis (Goldstein, 2011; Snijders and Bosker, 2011). Therefore, when considering variance components, we report estimates from our sibling-only sample. However, estimates of fixed coefficients (that is, regression coefficients) are not dependent on within-family comparisons (Hox et al, 2017) and increase in statistical power with sample size. Therefore, we rely on the full sample to report estimates of fixed indicators. With this reporting strategy, estimating models on both samples allows us to remain unbiased while providing robustness checks on the estimates across the two samples.

Results

Descriptive analysis

Table 1 presents univariate descriptives for controls and outcomes in our sibling-only and full samples, demonstrating high similarity between the two. Considering controls, the children in our samples were born between 2007 and 2017 and had about equal shares of boys and girls. Most children were White (78 per cent), resembling national population ethnicity estimates (82 per cent White; Garlick, 2022), and 4 per cent of children had health-limiting conditions. Eighty per cent lived in England, 7 per cent in Scotland, 7 per cent in Wales and 6 per cent in Northern Ireland. Child characteristics were largely similar for the sibling-only sample. SDQ components demonstrated acceptable reliability (full sample $\alpha = 0.69$; sibling-only $\alpha = 0.73$), and the samples' means (~8/40) were consistent with healthy UK child populations. Approximately 7 per cent of children indicated SDQ scores > 17, or potential difficulties. Given the negative skew (*Mdn* = 7), scores were square-root-transformed in the main analysis to approximate normality.

Table 1 also summarises our five domains of family background indicators. Regarding family demographics, almost 50 per cent of parents in both groups were born between 1980 and 1998. In the full sample, ~1 per cent of children were born to teenage mothers, and ~15 per cent lived with fewer than two parents at age three, aligning with national estimates (16 per cent; ONS, 2024). In the sibling-only sample, <1 per cent were born to teenage mothers, and 10 per cent lived in single-parent households. Some children in both samples were not living with siblings at age three (10 per cent of the sibling-only sample and 26 per cent of the full sample), though in the sibling-only sample, siblings were observed before and/or after the specific child's observation window. Similarly, 33 per cent of the full sample reported living with at least one sibling at age three, but were not included in the sibling-only sample because that sibling was not observed at ages three and five. Considering emotional environment, maternal GHQ

Table 1: Descriptive statistics comparing a sibling-only sample with the full analytical sample

	Sibling-only sample	Full sample
Socio-emotional outcomes		
Total SDQ	8.10 (0.19)	8.35 (0.12)
Total SDQ (standardised via √)	2.66 (0.03)	2.72 (0.02)
Family background indicators		
Family demographics		
Parent birth cohort		
Millennial or younger (1980–1998)	0.47 (0.02)	0.45 (0.01)
Gen X or older (1960–1979)	0.53 (0.02)	0.55 (0.01)
Number of parents in HH		
Single parent	0.09 (0.01)	0.15 (0.01)
Both parents	0.91 (0.01)	0.85 (0.01)
Mother age at childbirth		
Over age 18	1.00 (0.00)	0.99 (0.00)
Aged 18 or less	0.00 (0.00)	0.01 (0.00)
Number of siblings in HH		
None	0.09 (0.01)	0.26 (0.01)
1	0.58 (0.02)	0.50 (0.01)
2	0.10 (0.01)	0.07 (0.01)
3+	0.22 (0.01)	0.17 (0.01)
Family emotional environment		
Maternal psychological distress (GHQ)	11.62 (0.11)	11.71 (0.17)
Subjective financial stress		
Living comfortably	0.20 (0.01)	0.18 (0.01)
Doing alright	0.40 (0.02)	0.41 (0.01)
Just about getting by	0.31 (0.01)	0.30 (0.01)
Finding it quite difficult	0.07 (0.01)	0.08 (0.01)
Finding it very difficult	0.02 (0.00)	0.03 (0.00)
Parenting		
Routines to support child development		
Regular meals usually/always	0.93 (0.01)	0.90 (0.01)
Regular bedtime usually/always	0.91 (0.01)	0.88 (0.01)
Reward		
Cuddle very often	0.98 (0.00)	0.97 (0.00)
Praise very often	0.94 (0.01)	0.93 (0.01)
Punishment		
Yell		
Very often	0.24 (0.01)	0.21 (0.01)
Sometimes	0.57 (0.02)	0.57 (0.01)
Never/seldom	0.19 (0.01)	0.22 (0.01)
Hit or slap		
Very often/sometimes	0.10 (0.01)	0.10 (0.01)
Seldom	0.28 (0.01)	0.26 (0.01)
Never	0.62 (0.02)	0.64 (0.01)

(*Continued*)

Table 1: Continued

	Sibling-only sample	Full sample
Family educational environment		
Highest parental educational qualification		
Degree	0.49 (0.02)	0.47 (0.01)
Other higher degree	0.13 (0.01)	0.14 (0.01)
A-level	0.20 (0.01)	0.20 (0.01)
GCSE etc	0.16 (0.01)	0.16 (0.01)
Other qualification	0.01 (0.00)	0.02 (0.00)
No qualification	0.01 (0.00)	0.01 (0.00)
Reading at home w/ parents once or more a week	0.97 (0.01)	0.97 (0.00)
Formal childcare hours per week (age 2)		
None	0.54 (0.02)	0.54 (0.01)
1–10 hrs	0.15 (0.01)	0.13 (0.01)
11–20 hrs	0.15 (0.01)	0.15 (0.01)
20+ hrs	0.16 (0.01)	0.18 (0.01)
Family socio-economic circumstances		
IMD quintile		
5 (lowest deprivation)	0.21 (0.01)	0.19 (0.01)
4	0.16 (0.01)	0.20 (0.01)
3	0.19 (0.01)	0.20 (0.01)
2	0.24 (0.01)	0.21 (0.01)
1 (highest deprivation)	0.20 (0.01)	0.19 (0.01)
Highest parental occupational class		
Management/professional	0.56 (0.02)	0.52 (0.01)
Small employers/owners	0.11 (0.01)	0.14 (0.01)
Intermediate	0.09 (0.01)	0.08 (0.01)
Lower supervisory and technical	0.08 (0.01)	0.10 (0.01)
Semi-routine and routine	0.05 (0.01)	0.04 (0.00)
Unemployed	0.10 (0.01)	0.12 (0.01)
Household income quintile		
Highest	0.18 (0.01)	0.21 (0.01)
Second highest	0.19 (0.01)	0.20 (0.01)
Middle	0.20 (0.01)	0.20 (0.01)
Second lowest	0.21 (0.01)	0.20 (0.01)
Lowest	0.23 (0.01)	0.19 (0.01)
Control variables		
Child birth year	2011 (0.08)	2011 (0.05)
Child sex (binary)		
Female	0.51 (0.02)	0.50 (0.01)
Male	0.49 (0.02)	0.50 (0.01)
Child ethnicity		
White	0.81 (0.01)	0.78 (0.01)
Non-White	0.19 (0.01)	0.22 (0.01)

(*Continued*)

Table 1: Continued

	Sibling-only sample	Full sample
Child has limiting health condition		
No	0.96 (0.01)	0.96 (0.00)
Yes	0.04 (0.01)	0.04 (0.00)
Child country of residence		
England	0.79 (0.01)	0.80 (0.01)
Wales	0.06 (0.01)	0.07 (0.01)
Scotland	0.07 (0.01)	0.07 (0.01)
Northern Ireland	0.07 (0.01)	0.06 (0.01)
N	916	2,204

Notes: The samples are drawn from Understanding Society PEACH data and Understanding Society mainstage data (2009–2022) of children observed at ages three and five, both with and without siblings. The sibling-only sample excludes singletons and children whose siblings were not observed at key ages. Means (SE) reported for continuous variables; proportions (SE) for categorical variables. Estimates unweighted.

scores averaged ~12/36 in both samples; ~12 per cent exceeded the severe distress threshold (scores >18; Goldberg et al, 1997). Supporting comparability with the other ordinal and dichotomous indicators, GHQ scores were standardised (M = 0, SD = 1; 1 SD ≈ 5 GHQ points). In terms of financial stress, ~50 per cent of families in both samples reported some subjective financial stress. Considering parenting, ~90 per cent of children from both samples had regular meals and bedtimes, almost 95 per cent of parents from both samples reported cuddling and praising their children very often, ~20 per cent of parents yelled very often, and 10 per cent hit or slapped their children sometimes/very often. Regarding educational environment, in both samples, 3 per cent of children did not have parents who frequently read to them, ~18 per cent of parents had a GCSE or lower, and 46 per cent of children were enrolled in formal childcare at age two. Considering family socio-economic circumstances in both samples, ~40 per cent lived in a neighbourhood with the highest or second highest IMD score, ~20 per cent were in the lowest income quintile, and ~11 per cent of children had unemployed or economically inactive parents.

Disentangling multidimensional disadvantage

Table 2 summarises our random intercept models' variance components based on our sibling-only sample. Examining the share of between- and within-family variance in siblings' age-5 socio-emotional development, the estimated ICC, indicating sibling similarity, is 0.37 (Table 2, M0). This suggests ~37 per cent of the variation in socio-emotional outcomes, before including any observed indicators, is attributable to shared family-of-origin, including measured and unmeasured factors. Correspondingly, this implies that 63 per cent of the variance in children's SDQ is explained at the individual level, that is, by indicators that differ between siblings within the same family.

Given our focus on explaining family-level variation, we include individual characteristics as controls, which alone explain about 7 per cent of the estimated individual-level variance and 2 per cent of the family-level variance. Controlling for baseline individual characteristics, we then examine the extent of total family variance in SDQ score explained by our five family background domains (M1–M6). Including each family domain separately allows us to assess the relative importance

Table 2: Variance components for multilevel models estimating the relationship between age-5 socio-emotional outcomes and age-3 family background (sibling-only sample)

	M0	M1	M2	M3	M4	M5	M6
L1 (within-group) variance	0.66 (0.04)	0.61 (0.04)	0.62 (0.04)	0.62 (0.04)	0.61 (0.04)	0.60 (0.04)	0.60 (0.04)
L2 (between-group) variance	0.39 (0.05)	0.35 (0.05)	0.32 (0.05)	0.33 (0.05)	0.34 (0.05)	0.32 (0.05)	0.24 (0.04)
Total variance	1.05	0.96	0.95	0.95	0.95	0.92	0.84
ICC	0.37 (0.04)	0.36 (0.04)	0.34 (0.04)	0.35 (0.04)	0.36 (0.04)	0.35 (0.04)	0.29 (0.05)
L1 (within-group) R^2		7.86%	5.69%	5.59%	7.83%	9.49%	9.46%
L2 (between-group) R^2		10.88%	16.26%	14.20%	11.09%	17.64%	37.84%
Total R^2		8.98%	9.60%	8.78%	9.03%	12.51%	19.96%

Notes: Random intercept estimates. Significance * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. R^2 represents % variance explained by the model. M0 is a null model, M1 includes family demographics, M2 includes emotional environment, M3 includes parenting, M4 includes educational environment, M5 includes socio-economic circumstances, and M6 includes all variables together. M1–M6 include controls for the child's country of residence (England, Scotland, Wales, Northern Ireland), ethnicity (White/non-White), sex (male/female), disability, and birth year. Controls alone account for 7.26% within-group, 2.09% between-group and 5.35% total variance. Sample (N = 916) drawn from Understanding Society PEACH data and Understanding Society mainstage data, 2009–2022, of children observed at ages three and five who share a mother. Full indicator estimates are available in Online Supplementary Materials Table A2.

of observed indicators in explaining the total family-level variance, estimated by the null model (M0). We also report the proportion of individual- and total-level variance our observed characteristics explain, though our primary focus remains on family-level variance, in line with the core research aim of this study. Among our family background domains, examined separately in M1–M5, socio-economic circumstances explained the most family-level variation, ~18 per cent. The emotional and parenting domains were the next most influential, explaining ~16 per cent and ~14 per cent of the family-level variance, respectively. Educational environment and family demographics explained about 11 per cent each. When combining all the observed dimensions (M6), including controls, they explain about 38 per cent of the observed family-of-origin effect, 9 per cent of individual differences and 20 per cent of the overall variation in socio-emotional outcomes.

Shifting our focus to the sample of five-year-olds, including singletons, we examine the relationship between fixed family background indicators and children's socio-emotional outcomes (Table 3). Fewer indicators show significance in our smaller sibling-only sample, but effect sizes and directions are similar across samples (the full estimates for the siblings-only sample in Online Supplementary Materials Table A2). Additionally, the overall ICC across samples was very similar, namely 0.37 in the sibling-only sample and 0.35 in the full sample (full variance components for the full sample in Online Supplementary Materials Table A3).

Estimates from the full model (M6), which includes controls and all family background indicators, show that children of parents born between 1960 and 1979 had 0.10 lower SDQ scores compared to children of younger parents. Also, having one or more siblings was associated with 0.18–0.30 lower SDQ scores compared to not having any siblings. Considering family emotional environment, both objective and subjective measures of

Table 3: Multilevel estimates of the relationship between age-5 socio-emotional outcomes and age-3 observed family background indicators (full sample)

	M1	M2	M3	M4	M5	M6
Family demographics						
Parent birth cohort, 1960–1979	–0.18*** (0.05)					–0.10** (0.05)
Both parents in HH	–0.22*** (0.06)					–0.01 (0.07)
Mother age at childbirth 18 or less	0.34 (0.22)					0.29 (0.21)
Number of siblings in HH (ref: none)						
1	–0.18*** (0.05)					–0.18*** (0.05)
2	–0.13** (0.07)					–0.23*** (0.07)
3+	–0.12 (0.09)					–0.30*** (0.09)
Family emotional environment						
Maternal psychological distress (GHQ, standardised)		0.14*** (0.02)				0.12*** (0.02)
Subjective financial stress (ref: living comfortably)						
Doing alright		0.03 (0.06)				–0.05 (0.06)
Just about getting by		0.08 (0.06)				–0.05 (0.06)
Finding it quite difficult		0.15* (0.09)				–0.02 (0.09)
Finding it very difficult		0.34*** (0.13)				0.18 (0.13)
Parenting						
Schedules						
Regular meals			–0.03 (0.08)			0.01 (0.07)
Regular bedtime			–0.27*** (0.07)			–0.17** (0.07)
Reward						
Cuddle very often			–0.00 (0.13)			0.02 (0.13)
Praise very often			–0.23*** (0.08)			–0.22*** (0.08)
Punishment						
Yell (ref: very often)						
Sometimes			–0.15*** (0.05)			–0.15*** (0.05)
Never/seldom			–0.16** (0.06)			–0.17*** (0.06)
Hit or slap (ref: sometimes/very often)						
Seldom			–0.16** (0.07)			–0.08 (0.07)

(*Continued*)

Table 3: Continued

	M1	M2	M3	M4	M5	M6
Never			–0.25*** (0.07)			–0.16** (0.07)
Family educational environment						
Highest parental educational qualification (ref: degree)						
Other higher degree				0.10 (0.07)		–0.03 (0.06)
A-level				0.23*** (0.06)		0.04 (0.06)
GCSE etc				0.38*** (0.06)		0.12 (0.07)
Other qualification				0.36** (0.16)		0.13 (0.16)
No qualification				0.63*** (0.19)		0.19 (0.20)
Reading at home w/ parents once or more a week				–0.32*** (0.12)		–0.16 (0.12)
Formal childcare hours per week (ref: none)						
1–10 hrs				–0.07 (0.06)		–0.04 (0.06)
11–20 hrs				–0.07 (0.06)		–0.01 (0.06)
20+ hours				–0.06 (0.06)		0.02 (0.06)
Family socio-economic circumstances						
IMD quintile (ref: lowest deprivation)						
4					0.11* (0.07)	0.08 (0.07)
3					0.20*** (0.07)	0.14** (0.07)
2					0.22*** (0.07)	0.15** (0.07)
1 (highest deprivation)					0.27*** (0.07)	0.18** (0.07)
Highest parental occupation (ref: management/professional)						
Small employers/owners					0.04 (0.08)	–0.02 (0.08)
Intermediate					0.04 (0.07)	–0.02 (0.07)
Lower supervisory & technical					0.33*** (0.10)	0.23** (0.10)
Semi-routine & routine					0.28*** (0.07)	0.16** (0.08)
Unemployed					0.38*** (0.07)	0.22*** (0.08)
Household income quintile (ref: highest)						
Second highest					0.17*** (0.06)	0.16*** (0.06)

(*Continued*)

Table 3: Continued

	M1	M2	M3	M4	M5	M6
Middle					0.20*** (0.07)	0.19*** (0.07)
Second lowest					0.16** (0.07)	0.16** (0.07)
Lowest					0.10 (0.08)	0.09 (0.08)
Constant	37.94** (16.71)	31.58* (16.25)	18.48 (16.31)	19.38 (16.21)	11.98 (16.10)	9.28 (16.76)

Notes: Random intercept estimates. Significance * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. M1 includes family demographics, M2 includes emotional environment, M3 includes parenting, M4 includes educational environment, M5 includes socio-economic circumstances, and M6 includes all variables together. All models control for child's country of residence (England, Scotland, Wales, Northern Ireland), ethnicity (White/non-White), sex (male/female), disability and birth year. The sample (N = 2,204) is drawn from Understanding Society PEACH data and Understanding Society mainstage data (2009–2022) of children observed at ages three and five, both with and without observed siblings. Full variance components for the model are included in the Online Supplementary Materials Table A3.

parental wellbeing were initially significantly associated with SDQ scores. However, only maternal psychological distress remained statistically significant in M6, with a 0.12-point SDQ increase for each five-unit GHQ score increase. Among parenting practices, regular bedtime routine reduced SDQ score by 0.17 points, praising children by 0.22 points, never or seldom yelling at children by 0.15–0.17 points, and never hitting or slapping children by 0.16 points. These effects remained significant in the full model (M6). The associations for bedtime regularity and physical discipline were partially explained by the other family indicators. In M6, educational environment indicators were no longer significantly associated with children's socio-emotional outcomes, despite parental education showing a strong association when considered separately from the other family domains (M5). Yet all socio-economic indicators showed significant associations in the full model (M6). Specifically, children living in a more deprived neighbourhood (that is, third, fourth or most deprived quintile) had 0.14–0.18 higher SDQ scores compared to children living in the least deprived neighbourhoods. Also, children with parents in lower occupational classes (that is, lower supervisory and technical and semi-routine and routine) or whose parents were unemployed scored between 0.16 and 0.23 points higher than children with parents from managerial and professional classes. Regarding family income, children from families with lower household income (that is, second-highest to second-lowest quintiles) had between 0.16 and 0.19 higher SDQ scores compared to the highest income quintile. Those from the lowest income quintile did not show a significant association net of parental social class and neighbourhood deprivation. However, when included without an 'unemployed' occupational class category, the lowest income quintile is strongly significant, suggesting unemployment indicators absorb the effect of low-income indication. Overall, in line with the variance explained by different family domains, parental occupational class, parenting related to schedules, praise and punishment, and maternal psychological distress showed the largest associations.

To assess the robustness of our findings, we first consider alternative specifications using Restricted Maximum Likelihood (REML), which is particularly robust to

estimating variance components independent of fixed-effects parameters and thus allows unbiased variance component estimation (Searle et al, 2006; Maestrini et al, 2024), yielded almost identical results. We also considered the potential difference of using survey design weights on our estimates. In our main analysis, we did not apply survey weights because the UKLHS design weights account for a range of household-level indicators that we explicitly modelled at higher levels. While some suggestions exist for applying design weights in multilevel models, applying these weights can inflate intraclass correlation estimates (Carle, 2009), a pattern evident in our data, and this practice remains subject to methodological debate (Solon et al, 2013). However, given that UKLHS is designed to be used with survey weights, we assessed the potential impact of weights by comparing results from weighted and unweighted OLS models estimated on the full sample with identical variables (Online Supplementary Materials, Table A4). While not a multilevel structure, the size and direction of weighted and unweighted OLS estimates suggest that weight application yields similar estimate sizes, with some variation in significance due to standard error adjustments. Moreover, the size and direction of estimated impact in the weighted and unweighted OLS models mirror those presented in our multilevel models. Finally, we assessed sample derivation through Multiple Imputation by Chained Equations (MICE) on single-level regressions, which yielded similar results (Online Supplementary Materials, Table A5). Given the similarity in the results, we refrained from using MICE for our multilevel analysis as application to multilevel data remains under development (Grund et al, 2018).

Online supplementary materials can be accessed at doi: 10.6084/m9.figshare.31397904.

Discussion

Amid renewed UK policy focus on identifying and reducing childhood disadvantage (HM Government, 2024), this study leverages a sibling design and a multidimensional inequalities framework to examine how interconnected family-of-origin influences shape early socio-emotional difficulties. Moving beyond socio-economic circumstances, our study demonstrates how parenting practices, emotional environment, demographic factors, and unobserved family and individual factors jointly shape early socio-emotional difficulties among a contemporary cohort of UK five-year-olds (born 2007–2017). We find that family-of-origin accounted for 37 per cent of the total family-of-origin influence on age-5 socio-emotional outcomes. In our multilevel models, observed family domains accounted for 20 per cent of the total variance, 38 per cent of the family-level variance, and observed individual characteristics accounted for 10 per cent of individual-level variance, mirroring existing non-cognitive sibling similarity estimates (Anger and Schnitzlein, 2017; Bügelmayer and Schnitzlein, 2018). Among our indicators, we found that parents' occupational class and unemployment were the strongest indicators of poor socio-emotional difficulties across models, consistent with existing estimates of sibling similarity in non-cognitive outcomes (Anger and Schnitzlein, 2017). We also found that maternal psychological distress and parenting behaviours related to schedules, praise and punishment were also important indicators, highlighting the multiple dimensions through which family (dis)advantage can impact children's skill formation (Schoon, 2021).

Supporting the importance of taking a multidimensional perspective, we show that, when modelled together, most indicators retained significance, indicating multiple dimensions of family life have direct, independent associations with children's socio-emotional development, similar to previous studies based on older cohorts (Schoon et al, 2021; Cattan et al, 2024). There are also differences observed in our updated cohort. For example, compared with children born in 2000 (Cattan et al, 2024), when single-family support was robust under New Labour policy, dual-parent households are more important in our cohort, potentially reflecting the diminished investment in single-parent family support under subsequent Conservative administrations (Carneiro et al, 2024).

We also observe important overlaps in the explanatory power of our family environment dimensions. When modelled together, the effects of individual indicators within each dimension diminish. Thus, our family environment indicators may reflect complex causal chains rather than independent effects, supporting theoretical frameworks of the influence of family life on children's outcomes (Harkness et al, 2020; Cooper and Stewart, 2021). For instance, socio-economic circumstances may influence children's outcomes both directly and indirectly through their effects on maternal psychological distress and parenting practices, for which socio-economic differences are well-documented (Schoon et al, 2021). Similarly, influences from parental education may operate through its association with occupational class and income (Cooper and Stewart, 2021). While our full model showed the net association of each family indicator, it was out of the scope of this study to systematically unpack the full mechanisms behind these associations. Instead, our article focused on quantifying how much of total between-family variance was explained by them jointly and separately, despite the portion attributable to any particular dimension not necessarily being unique. The patterns should be understood as the joint explanatory power of different observed family domains that are part of the larger mechanism through which family-of-origin shapes children's socio-emotional outcomes. Future research would benefit from further unravelling the causal ordering and mediation pathways, as well as identifying which other family characteristics further explain the overall influence that family-of-origin exerts on offspring's socio-emotional outcomes. Moreover, future research should not overlook the importance of individual-level factors, given the large variance at the individual level.

Our study has both UK-specific and international policy relevance. This study is timely as it provides more recent UK estimates of inequalities in young children's socio-emotional outcomes, using a cohort born between 2007 and 2017. This cohort grew up during the aftermath of the global financial crisis, which in the UK translated into prolonged austerity and retrenchment of government support for families; the period was marked by rising child poverty and significant reductions in early years services, including the closure of hundreds of family centres (Carneiro et al, 2024; Henry and Wernham, 2024). Our findings suggest that in such contexts, family-level inequalities remain a powerful determinant of early socio-emotional development. The multidimensional pattern observed in our study also has important policy implications. We add to the growing critique against the use of blunt indicators, like free school meal eligibility and IMD, for capturing family (dis)advantage (Paterson et al, 2019; Campbell et al, 2025). To better estimate and thus effectively address early-life socio-emotional inequalities, structural, behavioural and psychological dimensions of family life must also be measured (Schoon, 2021). The interconnected

and multidimensional nature of family background associations with child socio-emotional outcomes suggests that government initiatives that provide holistic support to families, including healthcare, parenting classes, childcare and employment assistance (like the now-closed Sure Start programme for families with children under five [Carneiro et al, 2024]), remain well-positioned to address the multiple pathways through which (dis)advantage can hurt children's outcomes. The study's relevance extends beyond the UK context. The UK combines high levels of child poverty and income inequality with a policy environment that places substantial responsibility on families for buffering disadvantage. As other high-income countries face rising inequality and fiscal constraints, the UK case offers an informative example of how multidimensional family-level inequalities influence socio-emotional outcomes.

Our study is also relevant to methodological debates. Compared to Cattan and colleagues' (2024) study using independent observations, our explained variances are somewhat lower. This can be partially explained by our methodological partition of variance into family- and individual-level components. Since single-level models cannot separate family- and individual-level variance components, the estimated family-level variance is likely to be overestimated. This is because, in such studies, family indicators capture all unmeasured individual characteristics correlated with the measured family indicators included in the model. The sibling design offers a stronger approach to estimating the family effect by separating shared family influences from individual-specific variation, thereby providing greater accuracy (Anderson et al, 2024). By applying a sibling design to measure age-5 socio-emotional outcomes, this study offers a more accurate estimate of the distinct role of family background in shaping early non-cognitive outcomes.

Yet, based on our single-level models, our indicators explained only 16 per cent and 12 per cent of the total variance in age-5 socio-emotional outcomes, respectively, with and without weights (cf. Cattan et al's 45 per cent). One possible reason for the comparatively high explained variance in Cattan and colleagues' study is that they had access to a wider range of family background indicators, some of which were strong predictors of SDQ (parent–child conflict was a predictor and is also measured in the SDQ conduct items). They also measured socio-emotional outcomes at a younger age, a period when family influence on children's developmental outcomes may be stronger (Schoon, 2021). Further, our slightly older sample would have been through preschool (typically ages 3–5 in the UK; Cardin-Stewart, 2024), where they would be introduced to peer influences and exposed to developmental contexts outside the family that may mitigate some family-background-linked inequalities in socio-emotional outcomes (Sette et al, 2017; Melhuish and Gardiner, 2024).

While providing new estimates of total family-of-origin effects on children's socio-emotional outcomes, our study is limited by the scope and precision of available indicators at both the family- and individual-level. First, we cannot disentangle unobserved family influences from the genetic influences or from the wider community influences estimated in our family-of-origin effect. Second, our multilevel model suggests that individual-level factors may matter even more than family background. Nearly twice as much variance in socio-emotional outcomes was observed at the individual- than at the family-level. Focusing on family background indicators, our study only controlled for a handful of individual traits (sex, ethnicity, disability, country of residence), which explained 7 per cent of the individual-level variance. These results highlight the need to go beyond

basic measures of individual differences to understand how children's outcomes differ within families. Future research could leverage within-family variation through fixed-effects approaches to more precisely separate sibling-specific from stable family-level influences, while also exploiting the richer developmental measures available at subsequent UKHLS waves as children grow. Nevertheless, by providing more accurate estimates of total family-of-origin effects and including a wide range of family background indicators, our findings provide novel evidence underscoring the importance of looking beyond socio-economic indicators to better capture the multifaceted ways that family background is associated with early socio-emotional difficulties.

Conclusion

Our findings provide contemporary evidence that multidimensional domains of family background shape children's early socio-emotional outcomes. Using a sibling design with longitudinal data, we show that family-of-origin explains over a third of the share of the variance in age-5 socio-emotional outcomes. Multiple indicators across family background domains were important, underscoring the need for multidimensional approaches that address families' socio-economic conditions, emotional wellbeing, parenting practices and education together. At the same time, most variance in age-5 socio-emotional outcomes remains at the individual level, and much of the overall variance remains unexplained by observed family background measures. This highlights the importance of better understanding children's individual characteristics, including social, cognitive, neurodevelopmental and peer influences, to identify who may need additional support. For policy, these results reinforce the case for holistic, child-focused interventions, particularly amid declining support for families with young children. Holistic approaches to family support, like those previously delivered through Sure Start centres and now offered in new, smaller-scale Family Hubs, align with the multidimensional perspective revealed here. Our findings underline how investing in comprehensive early support for families, while also attending to children's individual differences, is likely to offer the best chance of promoting positive early childhood socio-emotional outcomes. To continue informing targeted interventions, future studies should focus on identifying additional family- and individual-level factors that contribute to differences in early-life socio-emotional outcomes, as well as understanding whether specific aspects of socio-emotional outcomes are particularly sensitive to family background influences and intersecting (dis)advantages.

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Research ethics statement
Ethical approval for this study was granted by the University of Bristol School for Policy Studies Research Ethics Committee (reference 18879).

Data availability statement
The data that support the findings of this study are available from the UK Data Service. Restrictions apply to the availability of these data, which were used under license for this study. Data are available at http://doi.org/10.5255/UKDA-SN-9075-4 (PEACH) and http://doi.org/10.5255/UKDA-SN-6614-22 (UKHLS) after creating an account with the UK Data Services and accepting the terms in the End User License provided.

Contributor statement
LW led project administration, data curation, sample derivation, software implementation and data analysis, including descriptive and OLS models and output tables, and wrote the methods (data, sample and variables) and descriptive results. RP provided feedback on the methods, and MP on the results, both of which LW implemented. AD conceptualised the analytical approach, conducted the multilevel modelling, produced output tables, and wrote the analytical strategy and results sections. LW refined these sections for conciseness and clarity. LO conceptualised the study's relevance and identified key indicators for the models. MP and LO developed the introduction and literature review, with input and revisions from LW, AD, RP and LJ. After MP and LO completed a full draft of the introduction and literature review, AD and LW refined these sections, including citations and clarity. LJ contributed to data cleaning. RP contributed to preliminary analyses, provided national benchmarks to verify sample representativeness, and provided a first draft of the discussion. LW further developed the discussion. AD contributed to the sensitivity analyses and interpretation. MP contributed to developing the UK case context in the literature review and discussion. LW, MP and AD led manuscript revision with feedback from RP.

Conflict of interest
The authors declare that there is no conflict of interest.

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