

# The impact of non-economic and economic disadvantage in pre-school children in England



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## Executive summary

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Disadvantage gaps emerge early and persist. The type of disadvantage matters yet has remained relatively understudied. This summary paper and its accompanying technical report provide new evidence on the relationship between different forms of early life disadvantage, children's cognitive and socio-emotional development and the impact of early childhood education and care (ECEC) using data from the Study of Early Education and Development (SEED), a longitudinal study of 5,642 children in England.

**We find that childhood disadvantage has two major dimensions – economic disadvantage and home disadvantage.** Much previous research has demonstrated that children from disadvantaged backgrounds have poorer health and education outcomes than children from more advantaged backgrounds; this has generally been defined as economic disadvantage. However, children's educational outcomes have also been shown to be influenced by aspects of the home environment such as the learning environment, household chaos and the quality of the parent/child relationship. This paper demonstrates that a variety of parenting-related factors can be considered together as a single measure of 'home disadvantage'. Economic and home disadvantage are found to be statistically independent of each other, and to have distinct relationships with later socio-emotional and cognitive outcomes.

Using the lens of home and economic disadvantage to analyse the relationship between ECEC use and child outcomes we find that **the type of disadvantage a child faces is important for understanding the relationship between ECEC use and later cognitive and socio-emotional development.** Our findings indicate that **disadvantaged children have more to gain from receiving more, and higher quality, ECEC than their peers from less disadvantaged backgrounds.**

The key findings of each section are as follows:

## Home and economic disadvantage and later child outcomes (Section 2)

- Factor analysis demonstrates that a single measure of home disadvantage can be constructed that is largely independent of economic disadvantage.
- The two types of family disadvantage have differing relationships with child development.
- **Home disadvantage primarily affects socio-emotional outcomes, whereas economic disadvantage primarily influences cognitive outcomes.**
- Children experiencing both types of disadvantage have considerably poorer outcomes across all measures compared to non-disadvantaged children.

## Home and economic disadvantage, the quantity of ECEC received and later outcomes (Section 3)

- Analyses in this section use multivariate regression to link hours spent by children in ECEC from the age of three to the start of school and outcomes at age five to six.
- For children who experience home disadvantage, higher hours spent in nursery care (15-20 hours per week) are associated with better verbal ability outcomes at age five, when compared to a group who use fewer hours (up to 15 hours per week). This shows that ECEC can, to some extent, make up for less advantageous home environments.
- For children who experience economic disadvantage, more hours in family and friend care is associated with better verbal ability, perhaps because the care offered is of high quality.
- For some groups, higher levels of ECEC are associated with negative socio-emotional outcomes but this is dependent on the type of disadvantage and the type of ECEC provision the child attends. Non-disadvantaged children are most at risk of poor outcomes from long hours in group-based nursery care. This could be because non-disadvantaged children have good



home environments and might receive more one-to-one interaction with an adult at home than in group care. Negative effects of nursery care on socio-emotional outcomes are only seen once usage goes above 30 hours (for economically disadvantaged children) or above 20 hours (non-disadvantaged children) per week.

- For children experiencing economic disadvantage, or both home and economic disadvantage, more hours in childminder care are linked to negative socio-emotional outcomes. This likely reflects the poorer quality of childminder care to which economically disadvantaged families have access.

## Home and economic disadvantage, the quality of ECEC received and later outcomes (Section 4.1)

- We used multivariate regression models to link the quality of childcare which children attend from the age of three to the start of school and outcomes at age five to six.
- Analyses of the relationship between ECEC quality and later developmental outcomes find that **disadvantaged children benefit much more from high quality ECEC than non-disadvantaged children, for whom variations in ECEC quality appear to be of little consequence**. The measures used in these analyses capture children's actual experience within early years settings, such as the nature of their interactions with staff, peers, the environment and the curriculum – what is known as 'process quality'.
- For home disadvantaged children, higher quality ECEC is linked to improved non-verbal cognitive abilities.
- For economically disadvantaged children, specific aspects of ECEC quality (those supporting 'shared thinking' and 'early literacy') are linked to improved non-verbal ability and better socio-emotional outcomes respectively.
- For doubly disadvantaged children, higher ECEC quality relates to improved socio-emotional outcomes.

## Where is high quality ECEC found? (Section 4.2)

- Analyses in this section investigate correlations between measures of process quality and structural aspects of nursery settings. While high quality interactions and relationships within ECEC settings clearly matter for disadvantaged children's outcomes, these aspects of 'process' quality are difficult for policymakers to influence directly. As structural factors (eg, staff qualifications and ratios) are more amenable to legislative change, if settings with high process quality are found to share common structural characteristics, then policy could usefully target these as a mechanism for raising process quality.
- Higher process quality was associated with a larger number of places, a narrower age range, more highly qualified managers and staff, a lower rate of staff turnover, a higher frequency of staff CPD and having a training plan and a training budget in place.

## Conclusion

This set of results demonstrates that a wider perspective on disadvantage that includes consideration of the home environment may be useful in formulating policy for early childhood services in England. Once a more effective and consistent strategy to learn more about home environments is developed, initiatives to improve the home environment for children can be better targeted.

Since disadvantaged children benefit much more from high quality ECEC than non-disadvantaged children, **supportive activities such as inspections and advice, and funding to support staff development, should be directed in particular to ECEC facilities that provide primarily for disadvantaged children.**

Improvements in ECEC quality can be made through policy and legislative action on structural aspects of ECEC, which are shown to be linked to process quality. In view of the increased costs involved, changes could be targeted particularly for ECEC used by disadvantaged groups.

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# 1. Introduction

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The effectiveness of the ECEC that children receive has been shown to vary according to their level of disadvantage; this has generally been defined as economic disadvantage. However, children's educational outcomes are also influenced by aspects of their surroundings at home such as the learning environment, household chaos and the quality of the parent/child relationship. This suggests that a broader understanding of child disadvantage may be possible, where disadvantage is defined in terms of aspects of the home environment that are not primarily economic. This report aims to define such a non-economic disadvantage measure and to explore the effectiveness of this measure as a predictor and moderator of children's cognitive and socio-emotional outcomes in school year one.

Previous research has indicated that the benefit that disadvantaged children derive from out-of-home ECEC may depend on both the quantity and quality of the ECEC. The second aim of this report is to identify in more detail which aspects of the quality of the ECEC that disadvantaged children receive are most significant as predictors of their cognitive and socio-emotional outcomes in school year one.

The outline of this report is as follows. This introductory section provides further background on the relationship between disadvantage, ECEC use, and child development, and makes the case for the importance of a non-economic measure of disadvantage. In Section 2 we provide details of such a measure of 'home disadvantage' and assess its association with disparities in cognitive and socio-emotional outcomes as measured at age five to six. We find that home and economic disadvantage have their own independent relationships with developmental outcomes. In Section 3 we apply this lens to the relationship between the quantity of ECEC used and later child outcomes. Our focus is on asking whether this relationship differs depending on the type of disadvantage experienced by the child. Finally, in Section 4, we provide new evidence on the relationship between the quality of ECEC a child experiences and their later cognitive and socio-emotional outcomes. We ask whether this relationship differs depending on the type of disadvantage experienced. A final analysis considers the



relationship between elements of process quality and structural elements which are amenable to change via policy measures. The SEED dataset is used throughout.

This document is a summary of a [longer technical report](#) which contains more detail on the analyses and methods used.

## 1.1 Disadvantage and child development

It has long been recognised that children from disadvantaged backgrounds have poorer health and education outcomes compared to children from more advantaged backgrounds (RCPCH, 2017). Children's development is affected by interacting influences at hierarchical levels from individual child through family, community, and wider society factors, and starts early in life. Hence, children having the best start in life is critical for wellbeing given that early years experiences and circumstances shape lifelong wellbeing and inequalities (Marmot, 2010). In the UK, one in five children are estimated to live in relative poverty, and a similar proportion start school with developmental delay (RCPCH, 2017). Developmental inequalities related to socio-economic status persist and are widening across the UK (Bradbury, 2011; Bradbury, 2013; Machin, McNally and Wyness, 2013; Ofsted, 2015; Social Mobility Commission, 2016).

Estimating inequality is typically done via socio-economic measures, including parental education, occupational status and income. For school children, disadvantage is most commonly measured using Free School Meal (FSM) status that combines parental income and benefits data. While useful indicators, research has increasingly indicated that non-economic factors also contribute to poorer child outcomes. In particular, the home learning environment (HLE) during the pre-school years has emerged as a significant determinant of cognitive and social development throughout primary school and up to 18 years of age (Sammons, Sylva et al., 2014; Toth, Sammons et al., 2019). There is a social class gradient when it comes to experiences such as parents reading and playing with their children. Families where both parents are highly educated typically spend 110 minutes a day on educational activities with their young children, compared to just 71 minutes where parents have low levels of education (Social Mobility Commission, 2016).

The relationship between the HLE and socio-economic factors is not strong, having a correlation of around 0.3 (Melhuish et al., 2001; Melhuish et al., 2008). Hence,

socio-economic and home environment disadvantage are relatively independent influences on children's development (Melhuish et al., 2008). Aspects of parenting are significantly associated with differences in how children develop, as was shown in the Study of Early Education and Development (SEED) (Melhuish and Gardiner, 2020). Combining these two bodies of research, it's clear that both economic and non-economic forms of disadvantage influence children's outcomes and should be considered.

## 1.2 The influence of ECEC on child outcomes

The positive impact of ECEC on children's development is well established (Melhuish and Barnes, 2021). The UK-based Effective Pre-school, Primary and Secondary Education (EPPSE) project, a large-scale longitudinal study, found that both the duration and quality of ECEC was associated with aspects of children's development (Melhuish et al., 2008; Sylva et al., 2010; Sammons et al., 2014). Similar findings were also reported in Northern Ireland (Melhuish et al., 2012).

The EPPSE project played a key role in driving significant changes to ECEC provision in the UK and beyond, including a large expansion of state funding and quality enhancements. A decade on from these reforms, the SEED study then explored the impact of ECEC and home learning experiences on children's outcomes in a representative sample of 4,000 children. The SEED study found child development differences associated with ECEC to be smaller than in the EPPSE study. This difference is likely due to the fact that since the aforementioned reforms, there were very few children in the SEED study with no out-of-home ECEC experience. Analyses therefore compare the impact of receiving 'more' versus 'less' ECEC. However, the SEED study did find that for the 40% most disadvantaged children, using a minimum of 10 hours per week of formal ECEC before the age of two, combined with 20+ hours per week of formal ECEC between age two and the start of school, was associated with improved child outcomes at the start of school and improved verbal ability in school year one (Melhuish and Gardiner, 2020). Also, attending higher quality ECEC between ages two and four was associated with better academic outcomes at age seven. The SEED study also found that over and above the effects associated with socio-economic factors, the HLE and several aspects of parenting were related to children's cognitive and socio-emotional outcomes.

## Box 1: The SEED dataset

The analyses in this report all use the SEED dataset (Department for Education, 2015-2021). The SEED study is a major longitudinal study of the impact of children's pre-school education and care, and other early experience, on their subsequent development and educational attainment. Set up by the Department for Education, the study sample consists of 5,642 children born in England between 2010 and 2012.

The SEED sample was selected in such a way that economically disadvantaged children were over represented. Families were recruited to the SEED study in approximately equal numbers from:<sup>1</sup>

- the most disadvantaged 20% of the population
- the moderately disadvantaged 20%–40% of the population
- the least disadvantaged 60% of the population.

The present study comprises an analysis of data from the 3,218 children who took part in the SEED Wave 4 survey, which was carried out when the children were five years old.

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## 2. Do home disadvantage and economic disadvantage have distinct relationships with child cognitive and socio-emotional outcomes?

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### Key findings

- A single measure of home disadvantage can be constructed that is largely independent of economic disadvantage.
- The two types of family disadvantage have differing relationships with child development.
  - The negative effects of home disadvantage are particularly focused on children's socio-emotional outcomes.
  - The negative effects of economic disadvantage are strongest for children's cognitive outcomes.
- Children who experience both home and economic disadvantage have considerably poorer outcomes on every measure of child development at age five to six than those who experience neither type of disadvantage.

In this section, we provide new evidence on the contribution of home and economic disadvantage to inequalities in childhood development, by assessing their independent associations with disparities in cognitive and socio-emotional skills as measured at age five to six.

The SEED dataset contains eight<sup>2</sup> variables that describe various aspects of children's home environment and the quality of the parent/child relationship (see Box 2 for further details of the measures used). Using exploratory factor analysis we constructed a single 'home disadvantage' factor and divided the sample into home disadvantaged and non-home disadvantaged groups according to whether children had above or below the median scores on this factor. Economic disadvantage was defined based on the child's family income and benefits received (further details in Box 2).

## Box 2: Defining home disadvantage and economic disadvantage

### Home disadvantage

Exploratory factor analysis was used to create a composite measure of home disadvantage from eight Home Environment/Parenting (HE/P) variables<sup>3</sup>:

1. HLE index, ie, home activities that allow learning opportunities for the child. For example, child read to, taken to library, painting/drawing, play with letters/numbers, songs/rhymes (Melhuish et al., 2008).
2. Household disorder (CHAOS scale including confusion, hubbub and disorder scale) (Melhuish et al., 2008).
3. Parent's psychological distress (using the Kessler scale). For example, symptoms of depression or anxiety (Kessler, Andrews and Colpe, 2002).
4. Warmth from the Mothers Object Relations Scales (MORS). Closeness in parent/child relationship eg, relationship characterised by affection (Simkiss, 2013).
5. Invasiveness from the MORS (conflict in the parent/child relationship eg, regarding child as demanding of attention, feeling annoyance toward child) (Simkiss, 2013).
6. Authoritative parenting, a parenting style characterised by high demands and high responsiveness, from Parenting Styles and Dimensions (PSD) (Robinson et al., 1995).
7. Authoritarian parenting, a parenting style characterised by high demands and low responsiveness, from PSD (Robinson et al., 1995).
8. Permissive parenting, a parenting style characterised by low demands and high or low responsiveness, from PSD (Robinson et al., 1995).

Children were divided into home disadvantaged and non-home disadvantaged groups according to whether they scored above or below the median on the 'home disadvantage' factor. Children in the 'home disadvantaged' group live in households characterised by poorer HLEs, lower levels of parental warmth and authoritative parenting, and higher levels of authoritarian and permissive parenting,<sup>4</sup> household chaos, parent's psychological distress and feelings of invasiveness.

### Economic disadvantage

Based on their family's income and benefits received, children in the SEED study were divided into three disadvantage groups: most disadvantaged, moderately disadvantaged and least disadvantaged. For this study, this was simplified to a two-way classification, with the first two groups making up an economically disadvantaged group and the last group constituting an economically non-disadvantaged group. This resulted in the following classification.

- Economically disadvantaged: children with parents in receipt of at least one of a predefined list of benefits, or with household gross earnings of less than £16,190.
- Non-economically disadvantaged: parents not in receipt of any of the predefined benefits and with household gross earnings of more than £16,190.

### Box 3: Measures of cognitive and socio-emotional development

Children's cognitive development was assessed during school year one using two scales from the British Ability Scales (BAS) (Elliott, 2011):

1. BAS verbal ability ('naming vocabulary')
2. BAS non-verbal ability ('picture similarities').

Children's socio-emotional development was assessed using the Children's Self-regulation and Behaviour Questionnaire (CSBQ) (Howard and Melhuish, 2017), completed by teachers during the spring of children's school year one. The CSBQ questionnaire was scored to produce two socio-emotional problems scales:

1. externalising behaviour (eg, child loses temper, child argues with other children)
2. internalising behaviour (eg, child is easily upset, child is anxious)

and five socio-emotional strengths scales:

3. sociability (eg, child has friends, child plays with other children)
4. prosocial behaviour (eg, child is co-operative, child is helpful, child shares things)
5. behavioural self-regulation (eg, child follows instructions, child waits their turn)
6. cognitive self-regulation (eg, child chooses their own tasks, child persists with tasks)
7. emotional self-regulation (eg, child is calm, child keeps temper).

In order to simplify the interpretation of results, the two socio-emotional problems scales were inverted so that for all child outcomes higher scores are associated with more favourable child outcomes.

A breakdown of the sample by home and economic disadvantage is shown in Table 1. The cross-tabulation indicates that home and economic disadvantage are only mildly associated.<sup>5</sup>

*Table 1: Cross-tabulation between home and economically disadvantaged children.*

Home disadvantage	Economic disadvantage		TOTAL
	Not disadvantaged	Disadvantaged	
Not disadvantaged	751	856	1,607
Disadvantaged	584	1,027	1,611
TOTAL	1,335	1,883	3,218

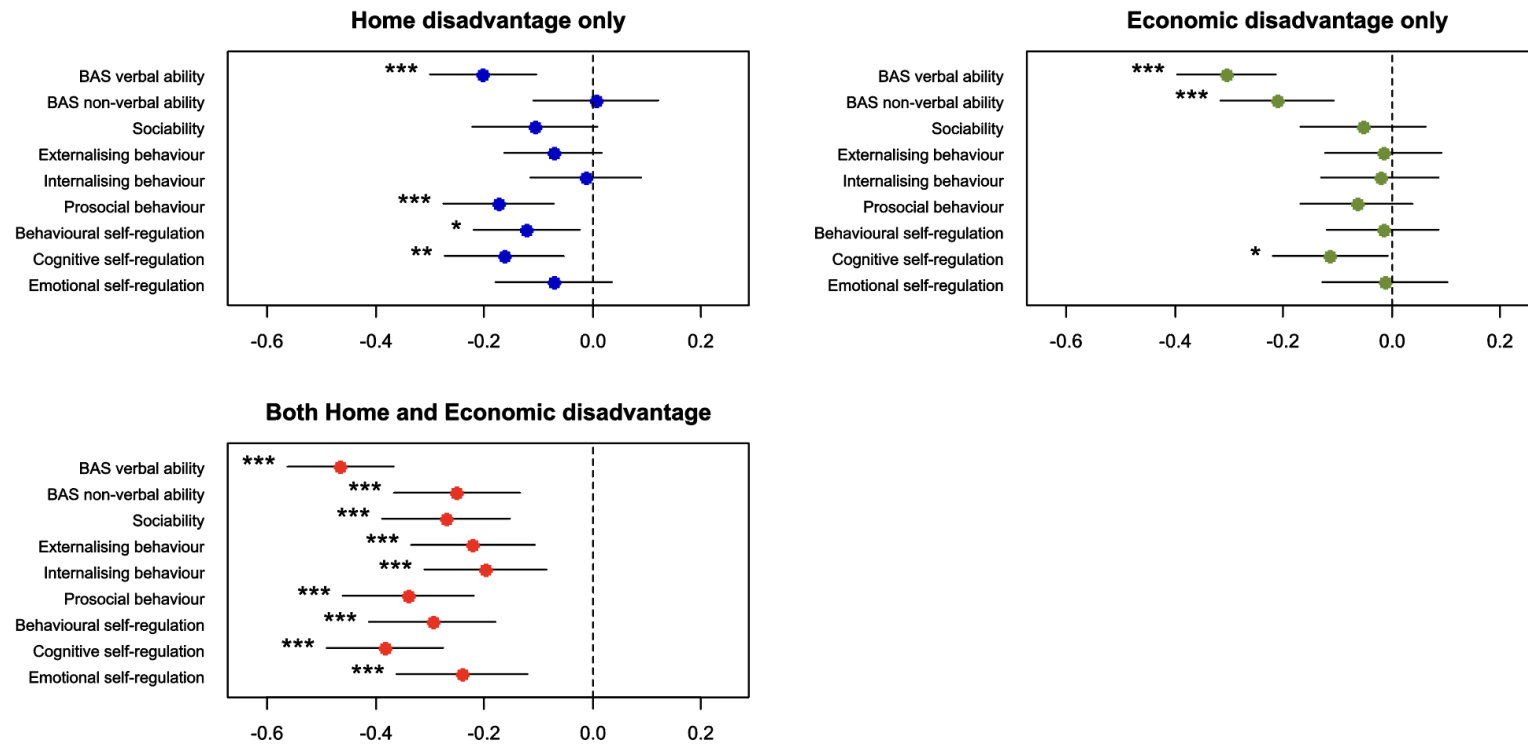


Table 1 suggests that it is possible to analyse the independent effects of home and economic disadvantage with this large sample. To do this we divide children into four groups:<sup>6</sup>

1. Children experiencing no disadvantage (reference category).
2. Children experiencing home disadvantage only.
3. Children experiencing economic disadvantage only.
4. Children experiencing both home and economic disadvantage.

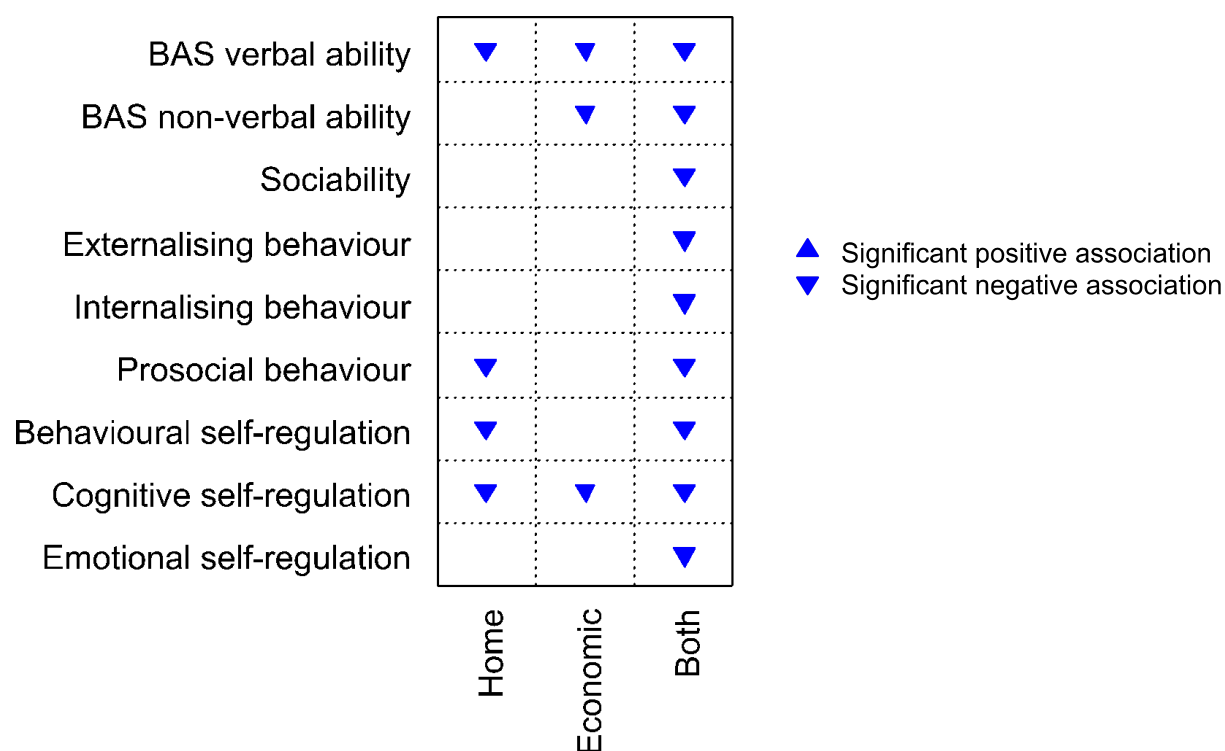
Multivariate regression analyses linking disadvantage and child outcomes are presented in Figure 1. The dependent variables are various measures of cognitive and socio-emotional development (see Box 3 for more detail.) The key explanatory variable is the four-category measure of disadvantage described above. The coefficients report the difference in the predicted score on the outcome measure in units of the standard deviation between those experiencing each type of disadvantage and children with no disadvantage, while controlling for a number of other variables.<sup>7</sup>

Figure 1: Effect on child development scores at age five to six of home and economic disadvantage, compared to children with no disadvantage.



Cells which are red indicate a statistically significant and negative association between experiencing home, economic or both types of disadvantage and scores on outcome measures, compared to children experiencing no disadvantage. Point estimates of standardised model coefficients are plotted with 95% confidence intervals shown by horizontal lines. Statistical significance is indicated: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Figure 2: Summary of the pattern of results from Figure 1



The results suggest that children who experience *both* home and economic disadvantage fare worse than non-disadvantaged children on every measure (see column 3, Figure 2). Secondly, the results suggest that the two types of family disadvantage have differing relationships with child outcomes. Children who experience *only* economic disadvantage have poorer scores on cognitive measures (see column 2, Figure 2); they score more poorly on tests of verbal and non-verbal ability at age five to six than non-disadvantaged children. They also have poorer cognitive self-regulation, which measures a child's ability to control their thoughts and beliefs within an educational context (eg, can the child sustain attention, and resist distraction, during instructions and activity?). However, they fare no worse than non-disadvantaged children on other socio-emotional and self-regulation measures. By contrast, children who experience only home disadvantage (who have an adequate family income but a poor HLE and experience negative parenting behaviours) fare worse on most socio-emotional and self-regulation measures (see column 1, Figure 2). They also have poorer verbal ability, but this is less pronounced than for those who experience economic disadvantage.

We suggest that the causality here is likely to be bidirectional. This means that the interrelationship between parenting quality and child behaviour may act as a feedback loop in which both child behaviour and home environment may spiral upwards or downwards. For policymakers interested in tackling early childhood disparities, action to improve a poor home situation by changing parental behaviour is more likely to be effective than attempting to change child behaviour, so although the relationship is bidirectional, intervention at the parental level is indicated.

In summary, the results indicate that negative effects of home disadvantage are particularly focused on children's socio-emotional outcomes whilst the negative effects of economic disadvantage are strongest for children's cognitive outcomes. This supports the idea that a broader definition of disadvantage would be of use to policymakers interested in tackling early childhood disparities.

The analysis in this section establishes that home disadvantage and economic disadvantage have distinct relationships with child development outcomes. In the rest of this paper we apply this lens to the results of previous research linking the quantity and quality of ECEC to child outcomes. In Section 3, we ask whether the quantity of ECEC received is predictive of child outcomes at age five to six, and if so, do results differ by the type of disadvantage? In Section 4 we ask which aspects of ECEC quality are associated with children's cognitive and socio-emotional outcomes at age five to six, and does this differ by the type of disadvantage?

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### 3. Does the relationship between the quantity of ECEC received and child cognitive and socio-emotional outcomes differ depending on the type of disadvantage experienced?

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#### Key findings

- Non-disadvantaged children show evidence of poorer externalising behaviour and emotional self-regulation at age five to six associated with using 20 to 30 hours per week group nursery care as compared to a low-use (up to 15 hours per week) reference group.
- Children experiencing home disadvantage showed benefits for verbal ability aged five to six from using 15 to 20 hours per week group nursery care as compared to a low-use (up to 15 hours per week) reference group.
- Children experiencing economic disadvantage showed better verbal ability aged five to six associated with family and friend care, but poorer externalising behaviour associated with using higher levels of childminder care. This group of children showed some poorer emotional and self-regulation outcomes at age five to six associated with nursery care, but only when use was in excess of 30 hours per week.
- Children who experienced both home and economic disadvantage showed an association between using childminder care and poorer sociability aged five to six. These children showed no associations, either positive or negative, between their age five to six cognitive and socio-emotional outcomes and the amount of nursery care used.

Previous studies have shown that the amount and type of ECEC which children receive affects their cognitive and socio-emotional development assessed at the

start of school. One consistent finding is that these relationships depend on the level of disadvantage experienced by the child; this has generally been defined as economic disadvantage. Economically disadvantaged children benefit from higher levels of ECEC in terms of their cognitive outcomes. But there are also negative associations between high levels of ECEC use and later socio-emotional outcomes (Melhuish and Gardiner, 2020).

The distinct relationships between home and economic disadvantage and child development established in the previous section suggest that applying the lens of home disadvantage to these questions may also be fruitful. In this section we provide new evidence on the relationship between the quantity of ECEC used between the age of three and the start of school, and child outcomes measured at age five to six. Our focus is on asking whether this relationship differs depending on the type of disadvantage experienced by the child.

As previous research indicates that the relationship between quantity of ECEC use and child development differs depending on the type of ECEC, we produce separate findings for the impact of (a) family and friend care<sup>8</sup>, (b) childminder care<sup>9</sup>, and (c) group nursery care<sup>10</sup>. It is important to note that, throughout, we are comparing the impact of receiving *more* ECEC to *less* ECEC, rather than none. Further details of this can be found in Box 4.

Multivariate regression analyses are used throughout. The dependent variables are the various measures of cognitive and socio-emotional development (see Box 3 for more detail). Details of the relevant explanatory variables are provided in each section.



### Box 4: More versus less ECEC

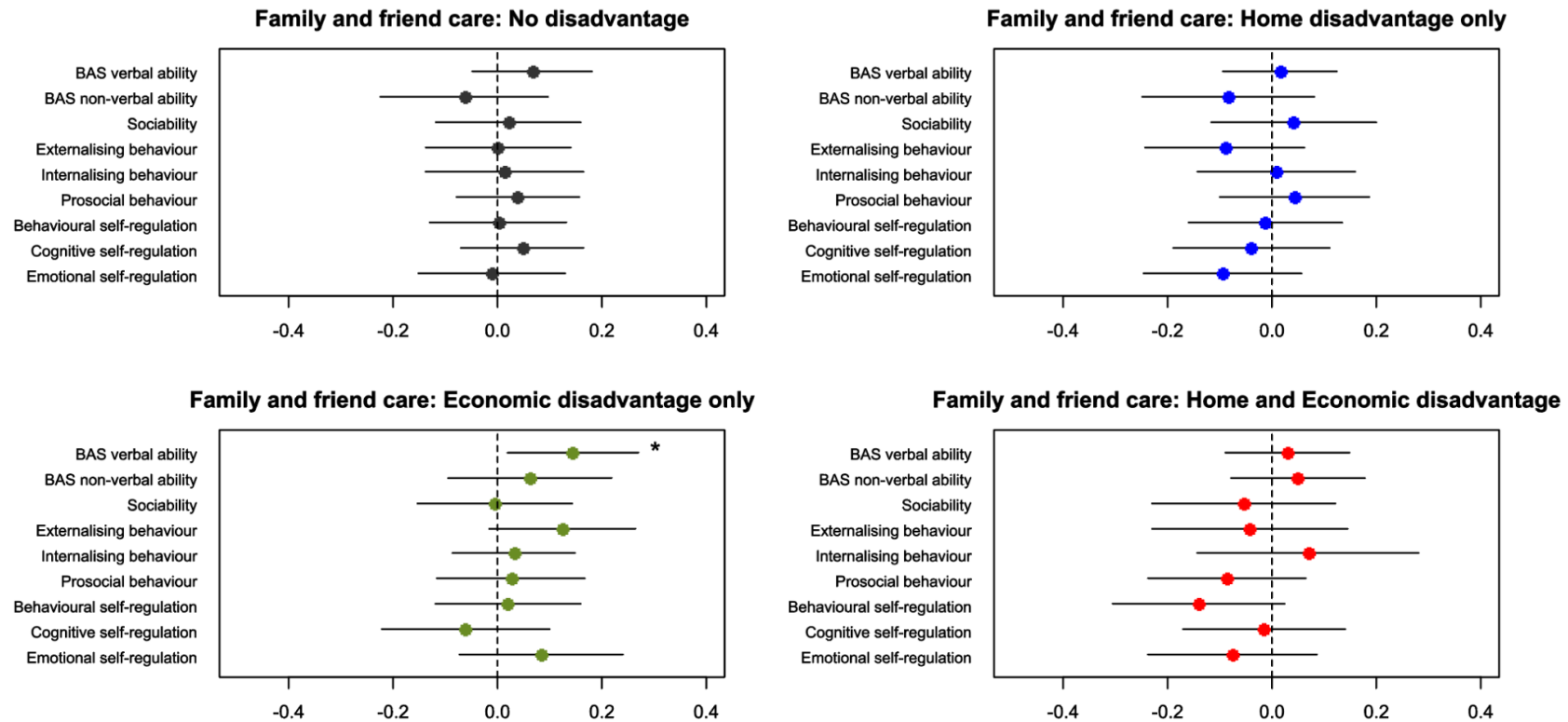
The SEED study was initiated to examine ECEC and its possible influences upon children following wide-ranging changes to the UK ECEC system. Universal free part-time ECEC was provided for all children from age three from 2004. Additionally in 2013, the free part-time ECEC provision was extended down to age two for the 40% poorest families, and in 2017 the 15 hours/week of part-time provision was extended to 30 hours/week if a parent worked or studied for 16+ hours/week. These changes meant that virtually all children received some ECEC before starting school.

Following the policy changes mentioned above there were very few children in the SEED study with no out-of-home ECEC experience, although the extent of ECEC experience varied widely. This means that the results of this section compare the impact of spending more hours in ECEC to fewer, rather than no hours in ECEC.

## 3.1 Family and friend care

Figure 3 shows the relationship between mean hours per week spent in family and friend care from age three to the start of school and child outcomes at age five to six. The key explanatory variable is a continuous measure of hours per week spent in family and friend care. The coefficients report the change in each standardised measure of cognitive or socio-emotional development associated with a two standard deviation change in the amount of time spent in family and friend care, while controlling for a number of other variables.<sup>11</sup> The coefficient for this variable is allowed to vary depending on the type of disadvantage experienced by the child (no disadvantage, home disadvantage only, economic disadvantage only, both types of disadvantage).

Figure 3: Associations between child outcomes at age five to six and mean hours per week spent in family and friend care from age three to the start of school.



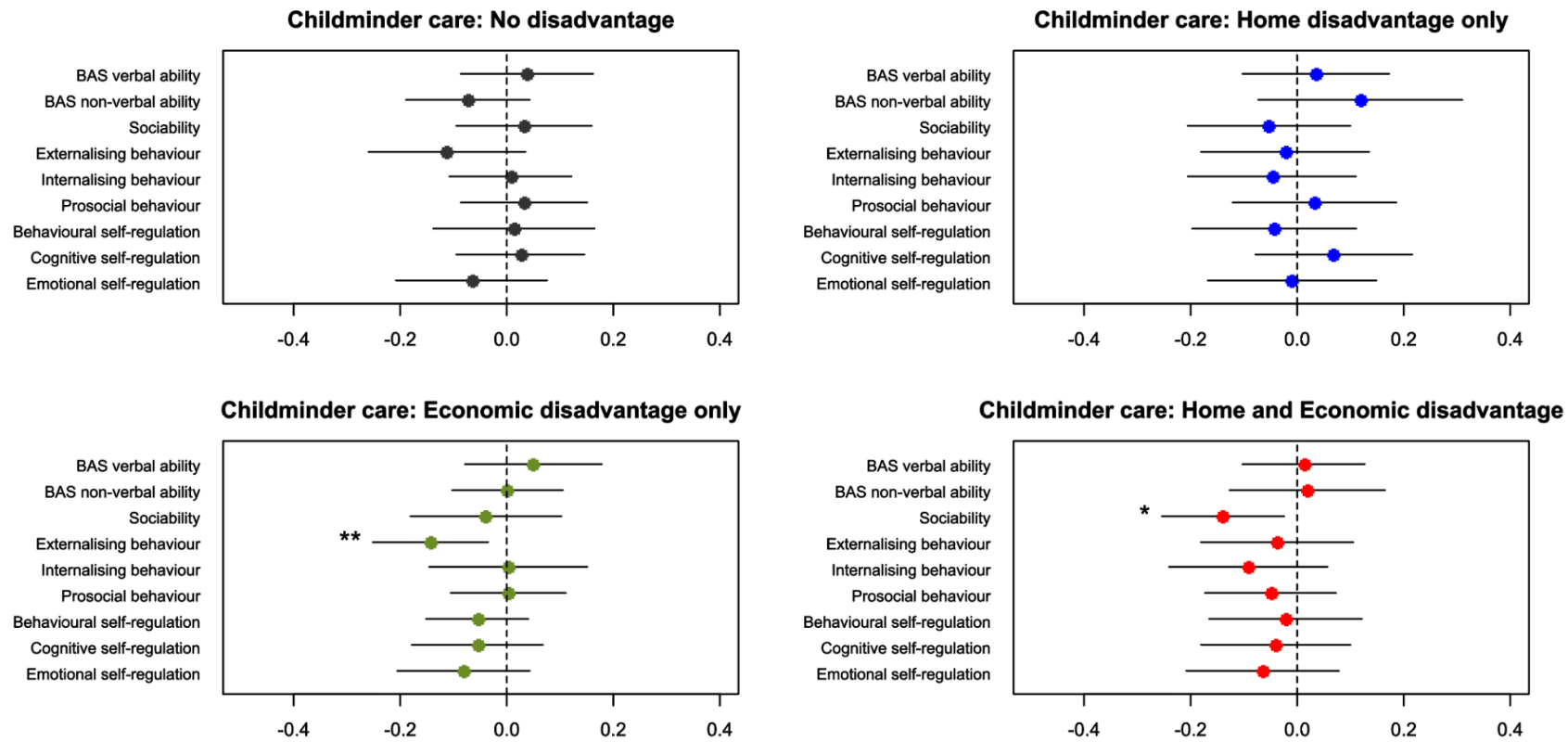
Point estimates of standardised model coefficients are plotted with 95% confidence intervals shown by horizontal lines. Statistical significance is indicated: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Figure 3 shows that overall there are few significant associations between higher levels of family and friend care and later child outcomes at age five to six, and this does not differ by type of disadvantage. The exception is that for children who experience economic disadvantage, but otherwise have a strong home environment, large amounts of family and friend care is associated with better verbal ability. The care received by these children from family and friends may be of a relatively high quality, whilst their relative economic disadvantage means that they have more need of these opportunities for learning than the economically non-disadvantaged children.

### **3.2 Childminder care**

Figure 4 shows the relationship between mean hours per week spent in childminder care from age three to the start of school and child outcomes at age five to six. The key explanatory variable is a continuous measure of hours per week spent in childminder care. The coefficients report the change in each standardised measure of development associated with a two standard deviation change in the amount of time spent in childminder care, while controlling for a number of other variables.<sup>12</sup> The coefficient for this variable is allowed to vary depending on the type of disadvantage experienced by the child.

Figure 4: Associations between child outcomes at age five to six and mean hours per week spent in childminder care from age three to the start of school.



Point estimates of standardised model coefficients are plotted with 95% confidence intervals shown by horizontal lines. Statistical significance is indicated: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

The results suggest spending more time in childminder care from age three to the start of school has little impact on later cognitive outcomes, regardless of disadvantage group. However, larger amounts of childminder hours between the ages of three and the start of school are associated with some poorer socio-emotional outcomes at age five to six, but only for children experiencing economic disadvantage, either solely or together with home disadvantage. For children experiencing only economic disadvantage, more time spent in childminder care is associated with more externalising behaviour. For children experiencing both economic and home disadvantage, more time in childminder care is associated with poorer sociability. These results may in part reflect the poorer quality of childminder care which economically disadvantaged families have access to.

### 3.3 Nursery care

Figures 5 and 6 show the relationship between time spent in nursery care from age three to the start of school and child outcomes at five to six. The key explanatory variable is a banded measure of time spent in nursery care.<sup>13</sup>

1. Up to 15 hours per week (reference level).
2. >15 to 20 hours per week.
3. >20 to 30 hours per week.
4. >30 hours per week.

The coefficients report the difference in the standardised score on the outcome measure between children using up to 15 hours per week ECEC and children using the alternative specified levels of ECEC, while controlling for a number of other variables.<sup>14</sup> The values of these coefficients are allowed to vary depending on the type of disadvantage experienced by the child (no disadvantage, home disadvantage only, economic disadvantage only, both types of disadvantage).

Figure 5: Child cognitive outcomes at age five to six and hours per week spent in nursery care, compared to those spending 15 hours per week in nursery care.

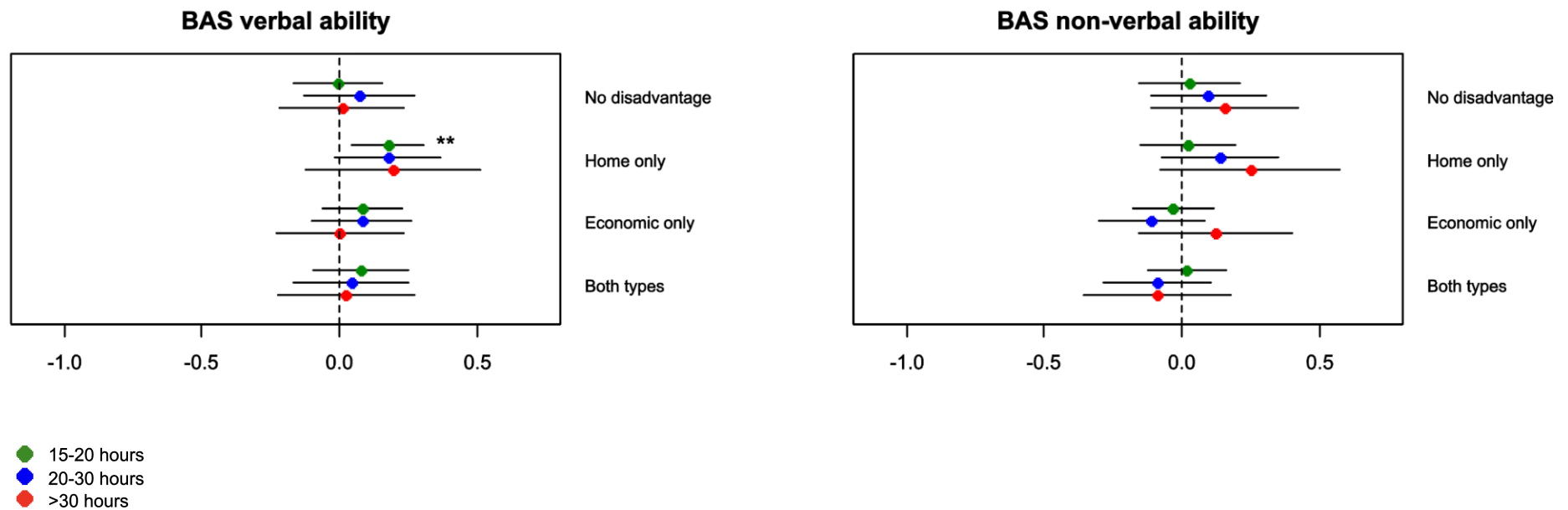
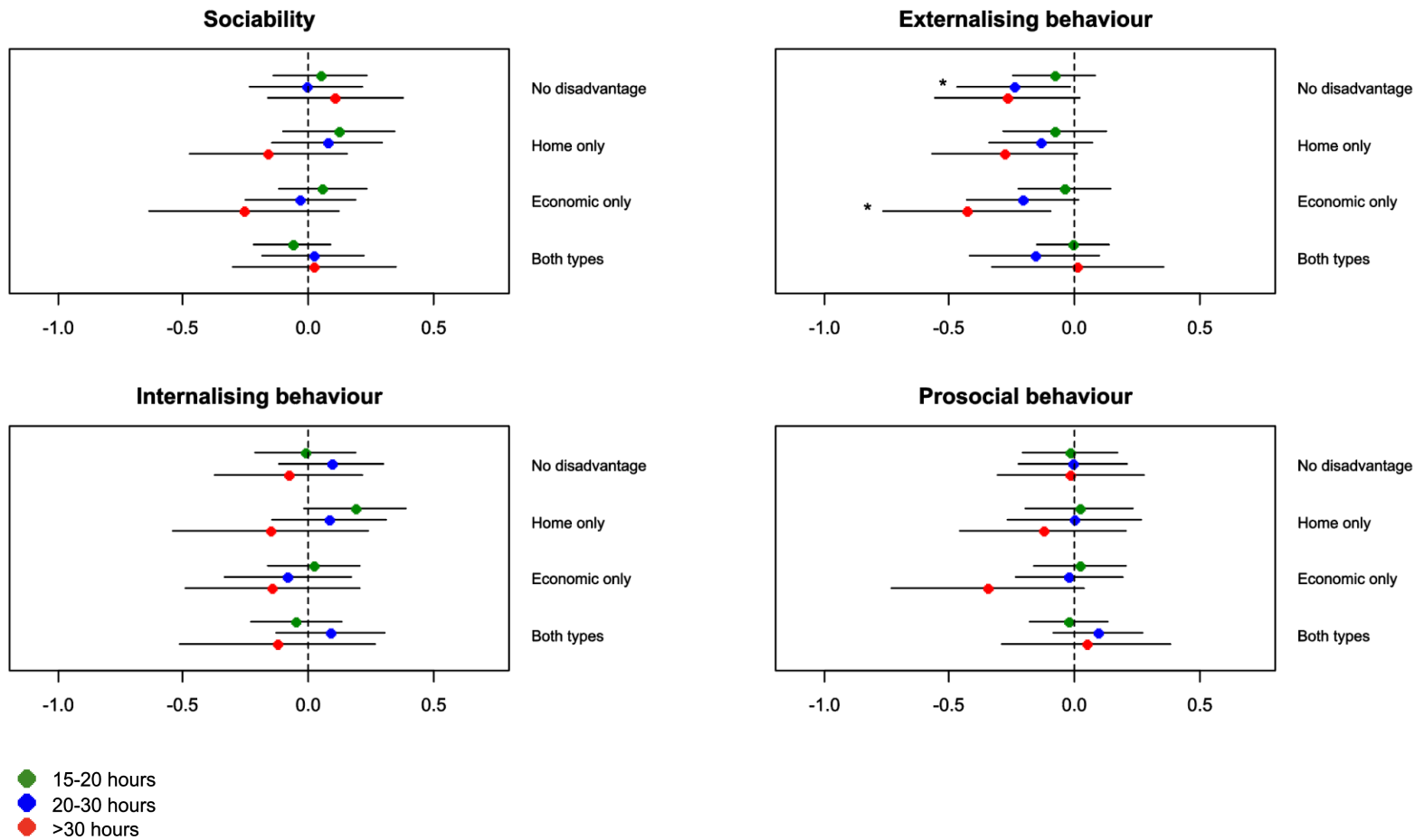


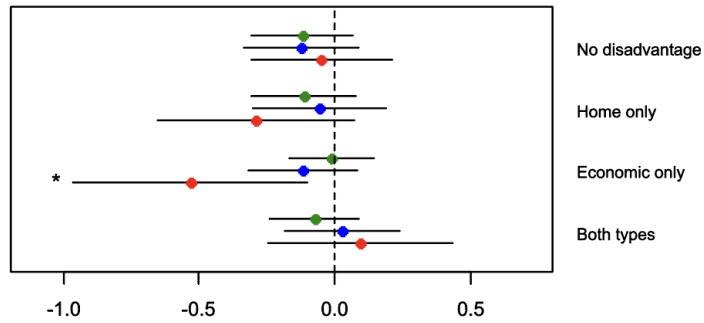
Figure 5 shows that for children experiencing home disadvantage only, spending 15 to 20 hours per week in group care between the age of three and the start of school is associated with improved verbal ability at the start of school. This provides further evidence that out-of-home care can make up for some of the disadvantages otherwise found for children who experience less advantageous home environments.



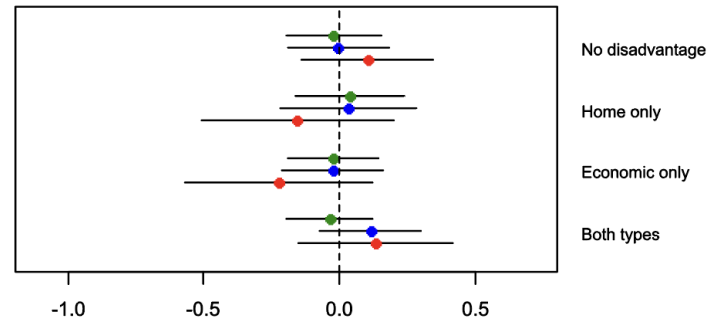
Figure 6: Child socio-emotional outcomes at age five to six and hours per week spent in nursery care, compared to those spending 15 hours per week in nursery care.



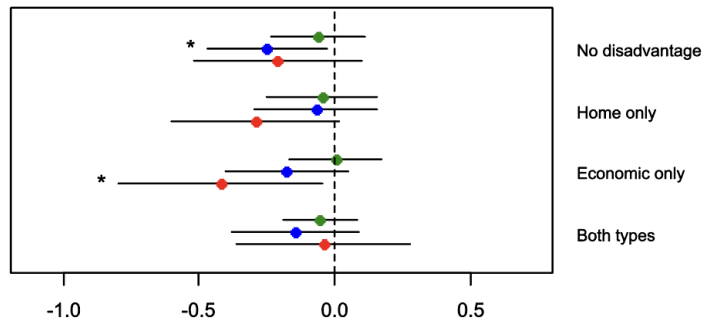
**Behavioural self-regulation**



**Cognitive self-regulation**



**Emotional self-regulation**



- 15-20 hours
- 20-30 hours
- >30 hours

Point estimates of standardised model coefficients are plotted with 95% confidence intervals shown by horizontal lines. Statistical significance is indicated: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Figure 6 shows that children who experience no disadvantage have poorer externalising behaviour and emotional self-regulation associated with using 20-30 hours per week of nursery care. It is possible that for children with the richest home environments, beyond a certain point out-of-home nursery care is relatively less beneficial than spending time at home.

Children who experience economic disadvantage only show poorer externalising behaviour, behavioural self-regulation and emotional self-regulation, but only when nursery care is in excess of 30 hours per week.

For children who experience both types of disadvantage there does not appear to be a relationship between large amounts of time in care and socio-emotional outcomes. This may be because the quality of the home environment of these doubly disadvantaged children is so poor that time spent at home is not more beneficial for their socio-emotional outcomes than even very long hours in group settings.

### **3.4 Summary**

For children who experience no disadvantage there appears to be little benefit to spending more (compared to less) time in ECEC of any sort. Additional time spent in ECEC has no impact on cognitive scores, while longer hours (20-30 hours per week) in nursery care are associated with poorer emotional self-regulation and more externalising behaviour. It is likely that for these children, with the most favourable home environments, large amounts of group ECEC is relatively less beneficial than spending time at home.

We reach a similar conclusion for children experiencing both home and economic types of disadvantage. For these children, additional time spent in ECEC has no impact on cognitive scores, while longer hours spent in childminder, but not group care, are linked to poorer child sociability. This likely reflects the poorer quality of childminder care to which economically disadvantaged families have access.

For children experiencing economic disadvantage only, higher hours in family and friend care are linked to better verbal ability outcomes, perhaps because the care offered is of high quality. For these children higher hours in childminder care are linked to poorer child externalising behaviour, again likely reflecting the poorer quality of childminder care to which economically disadvantaged families have

access. These children also show poorer socio-emotional outcomes associated with high levels of nursery care, but only when usage is in excess of 30 hours per week.

For children experiencing home disadvantage only, higher hours spent in nursery care (15-20 hours per week) is associated with better verbal ability outcomes. This shows that ECEC can to some extent make up for less advantageous home environments.

The lack of positive effects of more time spent in ECEC for economically and doubly disadvantaged children is somewhat surprising. Previous SEED analyses have found that economically disadvantaged children who use more than 20 hours per week of formal ECEC, starting no later than age two, have higher verbal ability at age five and score higher on all the EYFSP measures (with the exception of physical development) than a reference group using less than 10 hour per week starting after the age of three (Melhuish and Gardiner, 2020). A large body of previous research has found that high quality ECEC has positive impacts on children's development (eg, Melhuish and Barnes, 2021), with the strongest effects for children from disadvantaged backgrounds (Melhuish, Ereky-Stevens et al., 2015). Part of the explanation for the lack of effects detected in the present study is likely that the reference group of economically disadvantaged children receiving at least 15 hours per week of ECEC are already receiving 'enough' ECEC to reap developmental benefits. In drawing out the implications of these findings, it is important to consider these results together with the analyses in the next section which find positive effects of ECEC quality on child development, particularly for disadvantaged children.

The effects on child outcomes associated with ECEC use are generally of small size. As an example of the sort of differences which ECEC use may make, consider the difference between a child who experiences home disadvantage and who uses 15-20 hours per week nursery care as compared to a child who experiences home disadvantage who uses up to 15 hours per week nursery care. The analysis predicts that the child using 15-20 hours per week of nursery care will score, on average, 1.8 points higher on the BAS verbal ability test, a test on which the poorest performing children score 20 and the best performing score 80.

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## 4. Which aspects of ECEC quality matter for children and do they vary by disadvantage type?

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### Key findings

- High quality ECEC is important, especially for disadvantaged children.
- For home disadvantaged children, all aspects of ECEC quality are linked to improved non-verbal ability.
- For economically disadvantaged children, higher ECEC quality (specifically for 'shared thinking') is linked to better non-verbal ability, whilst higher quality (specifically for 'early literacy') is linked to better socio-emotional outcomes.
- For children experiencing both types of disadvantage, all aspects of ECEC quality are linked to better socio-emotional outcomes.
- Process quality is highest in the maintained sector.
- Settings with higher process quality are characterised by narrower age ranges for children, higher qualifications of both staff and managers, more frequent CPD, training plans and budgets, lower staff turnover, and a higher number of places.
- In private and voluntary settings, higher process quality is associated with higher staff to child ratios.

Previous studies have shown that the quality of ECEC that children receive may be more important for their development than the quantity of ECEC received (Melhuish and Gardiner, 2023), and this is particularly true for disadvantaged children. As with the question of quantity addressed in the previous chapter, this has primarily been addressed through the lens of economic disadvantage.

In Section 4.1 we provide new evidence on the relationship between the quality of nursery care between the age of three and the start of school and child outcomes

measured at age five to six. Our focus is on asking whether this relationship differs depending on the type of disadvantage. Since we are interested not just in whether quality matters, but in which aspects of quality are most important, we examine the relationship between outcomes and six measures of different aspects of setting quality (see Box 5 for more details):

- overall quality
- diversity
- numeracy
- care
- shared thinking
- early literacy.

The quality scales used in this section measure 'process quality': they capture children's actual experiences within early years settings, such as the nature of their interactions with staff, peers, the environment and the curriculum. However, for policymakers looking to improve child outcomes, process quality is both difficult to measure and impossible to influence directly. Structural factors, such as staff qualifications, staff to child ratios, and staff training are amenable to change through policy/legislative action, but their relationship with process quality is contested. In Section 4.2 we provide new evidence on the relationship between ECEC quality and structural aspects of early years settings.

## Box 5: Creating individual quality scales

During Wave 2 of the SEED study, 598 of the nursery settings that children attended at ages three to four were visited and quality assessments were carried out using three established quality scales:

- **ECERS-R** – Early Childhood Environment Rating Scale – Revised (Harms, Cryer and Clifford, 2005), a general assessment of ECEC quality for the over-threes.
- **ECERS-E** – Early Childhood Environment Rating Scale – Extension (Sylva, Siraj-Blatchford and Taggart, 2011), an extension to ECERS-R focusing on the specifically educational aspects of children's ECEC experience.
- **SSTEW** – Sustained Shared Thinking and Emotional Wellbeing Scale (Siraj, Kingston and Melhuish, 2015), which focuses on the quality of staff/child interactions in ECEC settings.

Higher scores on these scales have consistently been shown to correlate with improved child outcomes (including in SEED data). However, each of the three quality scales contains a number of different sub-components, all capturing different aspects of setting quality. Therefore, the aim in this analysis was to identify exactly which aspects of the ECEC quality that disadvantaged children receive were most significant as predictors of their cognitive and socio-emotional outcomes at age five to six.

To that end exploratory factor analysis (EFA) of the quality data was carried out on the individual quality items from which the ECERS-R, ECERS-E and SSTEW scales are derived. This analysis suggested that there were six underlying quality factors: overall quality, diversity, numeracy, care, shared thinking and early literacy.<sup>15</sup> Example items for each of the scales can be found in Table 2.

Table 2: Top five items for each quality scale.

<b>Overall quality</b>	Supporting curiosity and problem solving	Supporting concept development/ higher order thinking	Self-regulation and social development	Shared thinking in investigation and exploration	Encouraging choices and independent play
<b>Diversity</b>	Race equality and awareness	Promoting acceptance of diversity	Gender equality and awareness	Dramatic play	Music/movement
<b>Numeracy</b>	Reading and writing simple numbers	Counting and the application of counting	Shape and space	Sorting, matching and comparing	Sounds in words
<b>Care</b>	Safety practices	Health practices	Toilet/diapering	Supervision of gross motor activities	Meals/snacks
<b>Shared thinking</b>	Shared thinking in investigation and exploration	Nature/science	Music/movement	Sorting, matching and comparing	Shared thinking during storytelling
<b>Early literacy</b>	Books and pictures	Book and literacy areas	Adult reading with children	Shared thinking during storytelling	Emergent writing/mark making

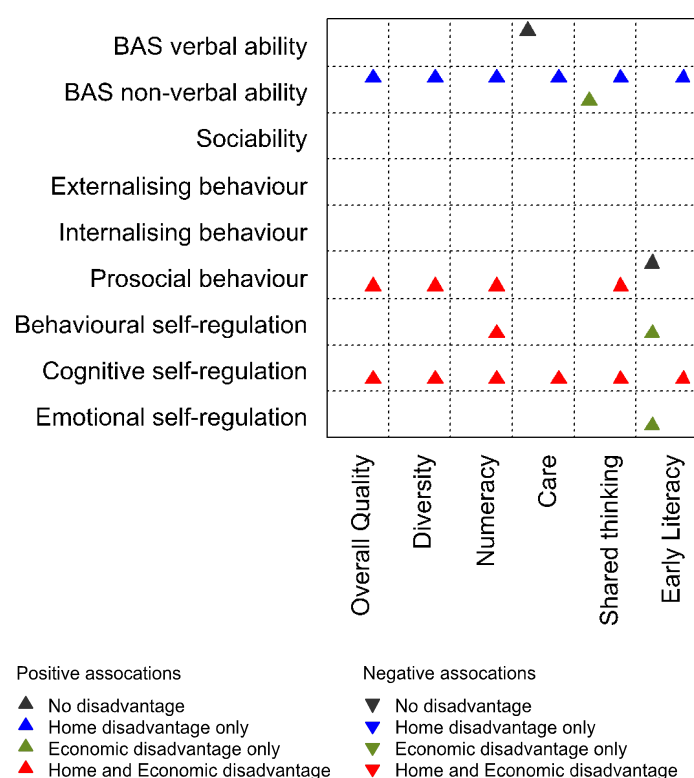


## 4.1 Which aspects of ECEC quality matter for children?

We used multivariate regression analysis to assess the relationship between child outcomes (the dependent variable – see Box 3 for details of the measures used) and the six different aspects of setting quality (the main explanatory variables – see Box 5 and Table 2 for details) while controlling for a number of other variables.<sup>16 17</sup> The models allowed the direction and strength of the relationship to vary depending on the type of disadvantage experienced by the child (no disadvantage, home disadvantage only, economic disadvantage only, both types of disadvantage).<sup>18</sup>

Full results from each model can be found in Chapter 7 of the accompanying technical report. Figure 7 summarises the pattern of significant associations from these models.

Figure 7: Summary of significant associations between the different aspects of ECEC quality and children's age five to six outcomes moderated by disadvantage group.



The results in Figure 7 support the findings of a large body of existing research: attending higher quality nursery care between the age of three and the start of school is associated with improved cognitive and socio-emotional outcomes at age

five to six, but quality is of much greater significance for disadvantaged children. It also suggests that there are differences in the effects of out-of-home ECEC quality on children according to the type of disadvantage they experience.

For children experiencing home disadvantage only, higher quality ECEC is associated with better non-verbal ability. For these children, every aspect of quality appears to be important. However, higher quality ECEC does not appear to impact (positively or negatively) the socio-emotional outcomes of home disadvantaged children. This is a potentially significant finding given the disparities in socio-emotional outcomes experienced by home disadvantaged children identified in Section 2.

For children experiencing economic disadvantage, better quality on the shared thinking scale is associated with better child non-verbal ability, whilst better quality on the early literacy scale is associated with better socio-emotional outcomes. This may reflect the benefit that children from economically disadvantaged homes experience from access to high quality learning resources, such as books, pictures and drawing materials.

For doubly disadvantaged children higher quality ECEC is associated with improved cognitive self-regulation, behavioural self-regulation and prosocial behaviour. For these children, every aspect of quality is important.

For children who do not experience disadvantage there were fewer significant associations. However these children saw benefits for verbal ability and prosocial behaviour associated with higher scores on the care and early literacy quality factors, respectively.

The effects on child outcomes associated with ECEC quality are generally of small to medium size. As an example of the sort of differences which ECEC quality may make, consider the difference between a child who experiences home disadvantage who attends nursery care rated in the top third for overall quality as compared to a child who experiences home disadvantage who attends nursery care rated in the bottom third for overall quality. The analysis predicts that the former child will score, on average, 4.2 points higher on the BAS non-verbal ability test, a test on which the poorest performing children score 20 and the best performing score 80.

## 4.2 Where is high quality ECEC found, and how can we improve it?

Quality clearly matters for children's outcomes, yet the aspects of 'process' quality analysed in the previous section are difficult to measure or influence directly from a policymaker's perspective. In this section we analyse the relationship between process quality and the structural factors of settings, which are more amenable to change.

We began by asking whether process quality was higher in private settings, voluntary settings, or within the maintained sector. Table 3 shows the results of this analysis, which used t-tests to compare the mean scores of private settings on each quality scale to those of other settings. A green cell indicates that these types of settings score higher, on average, than private settings on this aspect of quality. A red cell indicates that these types of settings score worse than private settings.

*Table 3: Mean scores of process quality by type of childcare setting. Scores are compared with private settings using t-tests.*

Quality factor	Private	Voluntary	Nursery class	Children's centre	Nursery school
Fac 1: Overall quality	-0.069	-0.137	+0.238***	+0.254**	+0.468**
Fac 2: Diversity	-0.045	-0.173**	+0.175***	+0.415***	+0.520*
Fac 3: Numeracy	-0.061	-0.193**	+0.311***	+0.199*	+0.434*
Fac 4: Care	-0.048	-0.076	+0.134***	+0.226**	+0.262
Fac 5: Shared thinking	-0.054	-0.186**	+0.254***	+0.277**	+0.458**
Fac 6: Early literacy	-0.055	-0.180*	+0.253***	+0.232**	+0.526**
N	287	137	104	25	13

*Statistical significance of t-test comparison shown using stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .*

Table 3 shows that process quality was generally higher for nursery classes and schools than for the private and voluntary settings that make up the majority of the settings which children attended. As compared to the private settings reference group, voluntary settings had significantly lower scores on the diversity, numeracy,

shared thinking and early literacy quality measures. Nursery classes and children's centres had significantly higher scores on all quality measures than private settings. Nursery schools had significantly higher scores than private settings for all measures except care.

Next, we asked which structural factors were associated with higher process quality within settings. The following structural aspects of settings were analysed:

1. Type of setting.
2. Setting on single/multiple sites.
3. Number of places provided.
4. Minimum age of children.
5. Maximum age of children.
6. SEN/D provision (yes/no).
7. Manager's highest qualification.
8. Number of staff.
9. Mean qualification level of staff.
10. Percentage of staff replaced during the last year.
11. Overall staff to child ratio.
12. Staff to child ratio for three to four year olds.
13. Frequency of staff Career and Professional Development (CPD).
14. Frequency of staff supervision.
15. Training plan in place (yes/no).
16. Training budget in place (yes/no).

Figure 8 summarises the two-way relationship between each measure of process quality and the structural factors listed above.<sup>19</sup>

**Figure 8: Significant relationships between process quality and structural quality in early years settings**

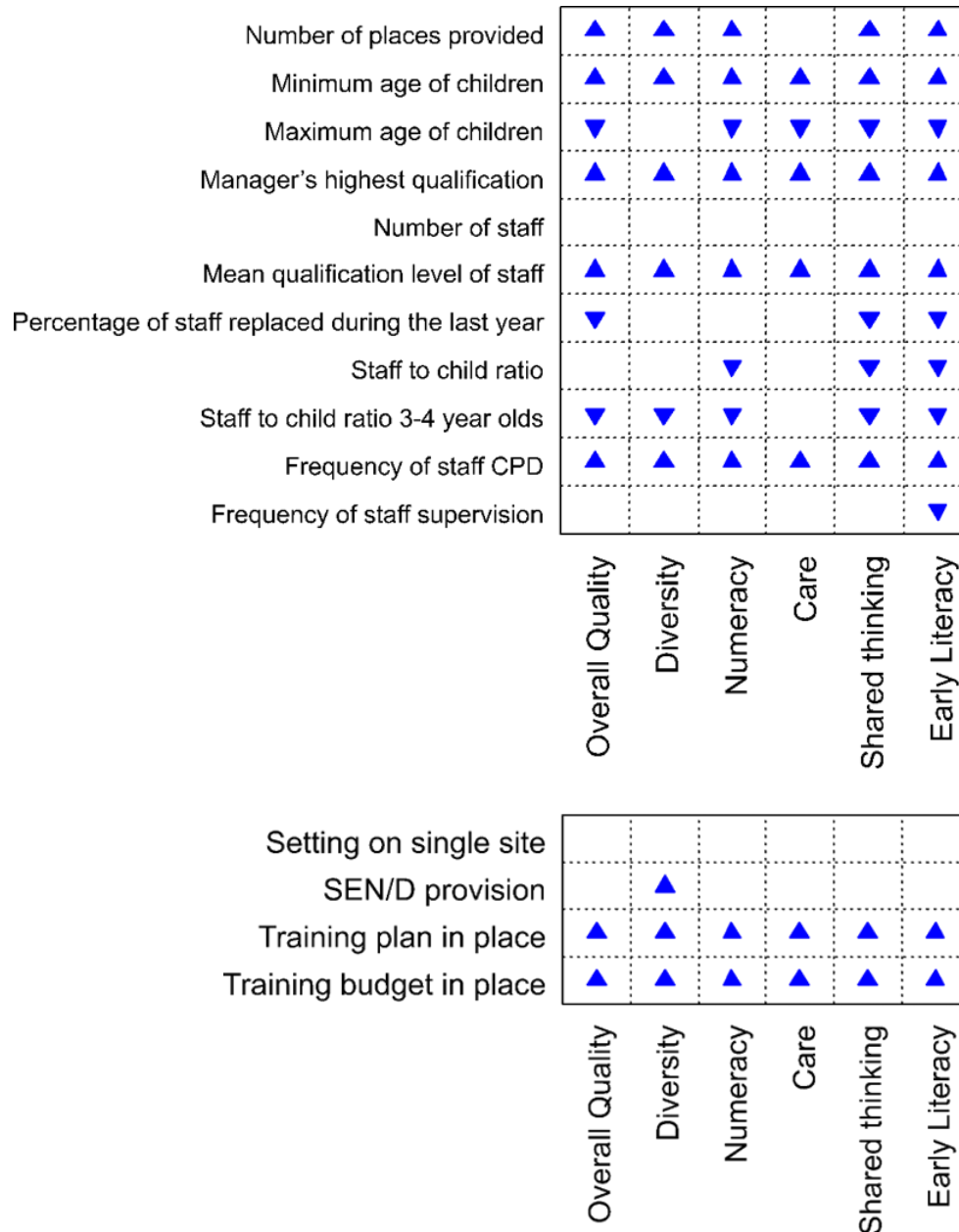


Figure 8 shows that high quality settings share common structural characteristics. Higher quality was associated with a larger number of places, a narrower age range, more highly qualified managers and staff, a lower rate of staff turnover, a

higher frequency of staff CPD and having a training plan and a training budget in place.

One perhaps counterintuitive finding of Figure 8 is that higher quality was found in settings with lower staff to child ratios. However, further investigation revealed that this was likely down to a confounding relationship between staff to child ratios and setting type. Maintained settings are allowed to have lower staff to child ratios in classes led by qualified teachers, but also have higher quality. Analyses of the relationship between staff to child ratios and quality within setting type confirmed that a higher staff to child ratio is associated with higher process quality in private settings.

The relationships observed in this section are correlational. That is, it cannot be assumed that the associations are causal, nor can it be assumed that, if they are causal, the direction of causation necessarily runs from structural characteristics to process quality. In some cases it is possible that causation could go in the other direction; for example, it could be that the associations between higher levels of staff qualification and higher process quality arise because higher quality settings are more successful in recruiting more highly qualified staff. There may also be unobserved confounding factors, which influence both structural characteristics and process quality. Nevertheless, it is cautiously suggested that the best explanation for the observed associations is mainly a causal one from structural characteristics to process quality, so that over time improving factors such as staff qualification levels and staff to child ratios would tend to result in improvements in ECEC settings quality. Previous research has shown that the quality of ECEC provision has risen greatly in the last 20 years – a period which has also seen the increasing professionalisation of the workforce, to a large extent because of government policy (Melhuish and Gardiner, 2019).

Overall, this analysis suggests that there are differences in the effects of out-of-home ECEC quality on children according to the type of disadvantage they experience. The quality of the ECEC attended appears to be of less significance for children who do not experience disadvantage, and of most significance for children who experience some form of disadvantage.

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## 5. Conclusion and implications

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Children from disadvantaged backgrounds are likely to have poorer outcomes in several ways. The existing evidence for this derives from measures of disadvantage based upon economic factors. However, it is possible to consider disadvantage in ways that are not economic. This paper demonstrates that parenting-related factors can be considered in terms of a single dimension that is here called 'home disadvantage'. This measure of home disadvantage is only mildly associated with economic disadvantage, so that it is possible to analyse the potential independent effects of home and economic disadvantage with this large sample. Analyses have demonstrated how the two types of family disadvantage have differing relationships with child development.

These results indicate that a wider perspective on disadvantage that includes consideration of the home environment may be useful in formulating policy for early childhood services. Economic disadvantage may be more straightforward to document but greater efforts are needed to gain more information about home disadvantage. This would require a substantial investment in services such as improving health visiting provision, family outreach, and possibly increasing children's centre or family hub provision, to allow better identification of children experiencing only home disadvantage. Once a more effective and consistent strategy to learn more about home environments is developed, initiatives to improve the home environment for children can be better targeted.

Some recent developments have started, as in the DfE funding for the National Children's Bureau, National Literacy Trust, Peebles, and the Foundation Years Trust to deliver a range of projects to support the HLE, particularly in disadvantaged areas of the UK. However, the results reported here indicate that, while such approaches may produce benefits, those benefits may increase should a wider range of parenting factors be considered in addition to the HLE. Overall, more needs to be discovered about the home environments of young children, prior to starting in reception classes, so that the potential impacts of disadvantage can be reduced.

Furthermore, it is clear that the quality of ECEC matters for children experiencing disadvantage. There should be further consideration of how ECEC is provided for

children with differing experiences of disadvantage and of how to enhance quality. In particular, involving more staff with higher qualifications, giving them more opportunities for CPD, and enabling them to think about training and career progression, which together with better pay, should limit staff turnover.

Clearly, disadvantaged children benefit much more from high quality ECEC than non-disadvantaged children, for whom variations in ECEC quality appear to be of little consequence. Hence, supportive activities such as inspections and advice, and funding to support staff development, should be directed in particular to ECEC facilities that provide primarily for disadvantaged children.

It is seen from the analyses that structural factors affect ECEC quality. Structural factors are amenable to change through policy/legislative action. Hence, improvements in ECEC quality can be made through policy and legislative action on structural aspects of ECEC. These structural factors include setting size, age range, staff qualifications, staff turnover, staff CPD and training. All of these are open to change, but will require more funding. In view of the increased costs involved, these changes could be targeted particularly for ECEC used by disadvantaged groups. However, it should not be assumed that enhancing structural aspects would automatically lead to higher quality. The subtle aspects of quality identified in the new factors demonstrate that the experiences of the children and the nature of their interactions are vitally important, and programmes to develop these aspects of ECEC, both for group nursery care and for childminders, would increase the likelihood that children experiencing disadvantage could develop as well as their non-disadvantaged peers. This will require improved pre-service training and more and better continuous professional development.



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## Endnotes

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1. These groups were identified using the benefits which families were in receipt of and family income.
2. An additional home environment variable, parental limit setting, was omitted. Whilst this variable is correlated with aspects of a poorer home environment, higher levels of limit setting are associated with better child outcomes in many cases (Melhuish and Gardiner, 2020). It is therefore inappropriate to see higher limit setting as contributing to either a better or worse home environment per se.
3. Further details on the factor analysis can be found in the accompanying technical report, Chapter 2.
4. Although it may seem counterintuitive to have a factor with strong loadings of both authoritarian and permissive parenting, these parenting styles are in fact positively correlated (.451) with each other. For more details see the accompanying technical report, Chapter 2.
5. This is confirmed by the low value of the Goodman-Kruskal gamma correlation (0.213).
6. Models comparing children experiencing any home/economic disadvantage to those with no-disadvantage are available in the full report.
7. Each model controls for: 1. Formal group ECEC use; 2. Formal individual ECEC use; 3. Informal individual ECEC use; 4. Child's age in school year; 5. Child's birth weight; 6. Maternal age at birth of child; 7. Child's sex; 8. Child's ethnic group; 9. Number of siblings living in the household; 10. Couple or lone parent household.
8. This includes all ECEC in a domestic setting and not eligible for government funding (eg, childcare with relatives, friends, neighbours or nannies).
9. This includes all ECEC in a domestic setting and eligible for government funding (ie, childminders).

10. This includes all ECEC in a non-domestic setting and eligible for government funding (eg, day nurseries, nursery classes or schools and playgroups).
11. Each model controls for home environment and demographic covariates.
12. Each model controls for home environment and demographic covariates.
13. Since we have no reason to expect sudden changes in child outcomes associated with particular thresholds of ECEC usage, continuous variables were used in previous sections. The situation differs for nursery care, where the issue of government funding makes it desirable to specify the effects of specific usage bands. Doing so allows us to understand if any adverse effects of nursery care are found for children using up to 30 hours per week of care, or if such effects manifest only above this usage level. Analyses employing a continuous measure of nursery care can be found in the full accompanying report in Chapter 4.
14. Each model controls for home environment and demographic covariates.
15. For more details on the exploratory factor analysis please see the accompanying full report, Chapter 6.
16. All models controlled for home environment and demographic covariates.
17. Analyses of the relationship between setting quality and child outcomes using the original ECERS-R, ECERS-E and SSTEWS scales can be found in the accompanying full report, Chapter 5.
18. Results from unmoderated models can be found in the accompanying full report, Chapter 7.
19. For the continuous structural measures, the relationship with the six quality factors was assessed using Kendall's tau correlation coefficient. For the binary measures, the quality factors were compared between the two groups using t-tests.

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