DECEMBER 2020

International Early Learning and Child Well-being Study (IELS)

National Summary Report for England

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NFER
National Foundation for Educational Research

Contents

1 Executive summary

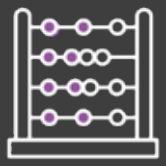
The International Early Learning and Child Well-being Study (IELS) is a new study of 5-year-olds by the Organisation for Economic Cooperation and Development (OECD), involving children, teachers and parents in England, Estonia and the United States.

It examined early learning outcomes in:

social-emotional development

emergent literacy

self-regulation



emergent numeracy

physical development (England only)

The research took place in autumn 2018[1].

1 This report summarises some of the main findings from NFER's national report for England (Kettlewell *et al.*, 2020) and from OECD reports describing outcomes for England (OECD, 2020a) and for all participating countries (OECD, 2020b).

1.1 Key insights

The international findings

The development of 5-year-olds in England differed notably from the other two countries in two measures; emergent numeracy, in which children in England showed stronger development, and inhibition, in which children in England showed lower development. For the remaining cognitive and self-regulation measures (emergent literacy, working memory and mental flexibility) England showed similar development to Estonia and greater development than the United States. For the social-emotional measures children from England and the United States had similar levels of development.

Key findings for 5-year-olds in England

Individual and familial characteristics

- Girls showed greater development than boys in emergent literacy, social-emotional and physical development, while boys showed greater development in inhibition. There was no difference between boys and girls for emergent numeracy.
- Children identified in the National Pupil Database (NPD) as having special educational needs had lower average scores in all measures, except trust. Low birthweight was associated with lower physical and cognitive development, but not social-emotional development.
- Children eligible for free school meals showed lower development than their peers in all measures except for inhibition.
- Children with English as an additional language showed lower development than their peers in the cognitive measures but less so in the social-emotional and physical development measures.
- Children from a White ethnic background showed greater development in emergent literacy than children from Asian and Black ethnic backgrounds and greater development in emergent numeracy compared to children from Black ethnic backgrounds. There were no other differences by ethnic group.

> Girls showed greater development than boys in emergent literacy, social-emotional and physical development

The home learning environment and parental involvement

- At age 5, parents/carers reading to children at least 5 days a week was associated with greater development in emergent literacy and all social-emotional and self-regulation measures, when compared to those whose parents did this less than once a week or never. Children whose parents helped them read words and sentences on 3 or more days a week showed greater development in emergent numeracy, emergent literacy and all three self-regulation measures when compared to those whose parents did this less than once a week or never.
- Children whose parents had back-and-forth conversations with them about their feelings at least 5 days a week showed greater development in emergent literacy and those who did this 3 to 4 days a week showed greater development in emotion identification, when compared to those whose parents/carers did these activities less than once a week or never.
- Having a larger number of children's books in the home, including library books, was related to greater levels of emergent literacy, emergent numeracy, social-emotional development, working memory, mental flexibility and physical development.
- Attending special or paid-for activities (such as sports clubs, dance, swimming or language lessons) regularly (between 1 and 4 times per week, depending on the measure) was associated with greater development in emergent literacy, emergent numeracy, physical development and empathy.
- Parental engagement with schooling was associated with greater development across all social-emotional measures and emergent literacy and emergent numeracy.
- Low use of digital devices (at least monthly but not every week) was associated with greater development in emergent literacy and trust. Higher use (at least once every week) was associated with greater development in working memory.
- Greater physical development (which included both fine and gross motor development) was not related to more frequent physical activities outside the house but was related to more frequent drawing and painting at home.

Early childhood education and care

- After accounting for socio-economic status, there were very few differences by early childhood education and care (ECEC) type, intensity or age of attendance, which may reflect the high ECEC attendance rates of children in England (98 per cent of children in the sample had attended some form of ECEC).

The relationship between measures and with persistence

- Children's development in each area of learning was related to their development in other areas of learning.
- Children's persistence, measured through the teacher questionnaire was seen to be statistically significantly related to all of the 11 IELS outcome measures. It was correlated most strongly with prosocial behaviour, trust and physical development. A higher level of persistence was associated with statistically significantly greater development across all IELS measures.

> A higher level of persistence was associated with greater development across all IELS measures

2 Introduction

The International Early Learning and Child Well-being Study (IELS) is a new international study by the Organisation for Economic Co-operation and Development (OECD). It aims to further our understanding of children's abilities at age 5[2] and the influence of individual and family demographic characteristics, the home learning environment and early education experiences on their learning and development.

What early outcomes were measured?

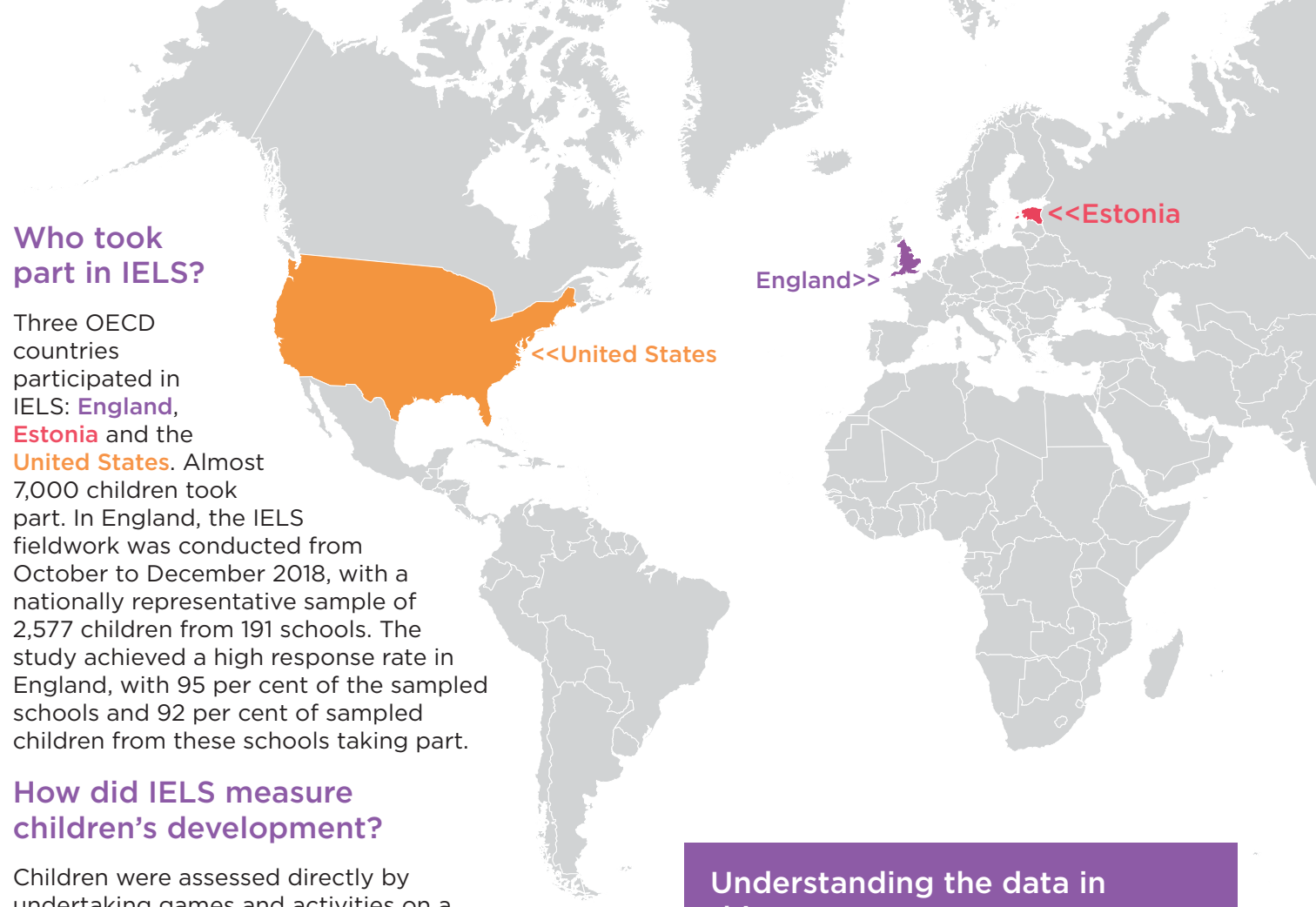
IELS measured development in emergent literacy, emergent numeracy, self-regulation and social-emotional development. In England, a teacher-assessed module on physical development was added to IELS. These key aspects combine to present a holistic picture of young children's development.

Key components of IELS early learning outcomes

Outcome	Key Components
Emergent literacy	Listening comprehension, vocabulary knowledge and phonological awareness
Emergent numeracy	Identifying numbers, counting and identifying patterns and shapes
Self-regulation	Working memory Inhibition Mental flexibility
Social-emotional development	Emotion identification Emotion attribution Trust Prosocial behaviour Non-disruptive behaviour
Physical development*	Fine motor skills (e.g. holding a pencil) and gross motor skills (e.g. catching a ball)

Note: *Assessed in England only.

2 Note that although the majority of the children were aged 5, the sample also included some younger children who were aged 4 years 11 months and some older children who were aged 6 years 0 months at the time of assessment.



Who took part in IELS?

Three OECD countries participated in IELS: **England**, **Estonia** and the **United States**. Almost 7,000 children took part. In England, the IELS fieldwork was conducted from October to December 2018, with a nationally representative sample of 2,577 children from 191 schools. The study achieved a high response rate in England, with 95 per cent of the sampled schools and 92 per cent of sampled children from these schools taking part.

How did IELS measure children's development?

Children were assessed directly by undertaking games and activities on a tablet. Each child was assigned a specially trained study administrator who provided one-to-one support as the child completed the assessments. There was no text involved and no previous experience of digital devices needed. IELS also assessed children indirectly, using questionnaires completed by parents and teachers. Most early learning outcomes were assessed both directly and indirectly. Exceptions were physical development and some aspects of social-emotional development, which were only assessed indirectly. The staff and parent questionnaires also collected information on children's background and their home learning environment.

Understanding the data in this summary

This report provides a summary of the overall IELS findings and contextualises the findings for England by linking the IELS data with the NPD. The NPD provides information on individual characteristics of children in IELS, including whether they have an identified special educational need (SEN), their ethnicity, English as an additional language (EAL) status and their eligibility for free school meals (FSM).

This report also includes an additional national measure of physical development, created from a suite of eight questions in the teacher survey covering both gross and fine motor skills and analysis of the IELS measures in relation to children's persistence (to what extent the child continues his/her planned course of action in spite of difficulty or obstacles).

Where there were statistically significant age-related differences on IELS measures these were used to calculate the average gain in points for each additional month of age. This has been used to indicate in relative terms how many months ahead, or behind, one group is compared to another.

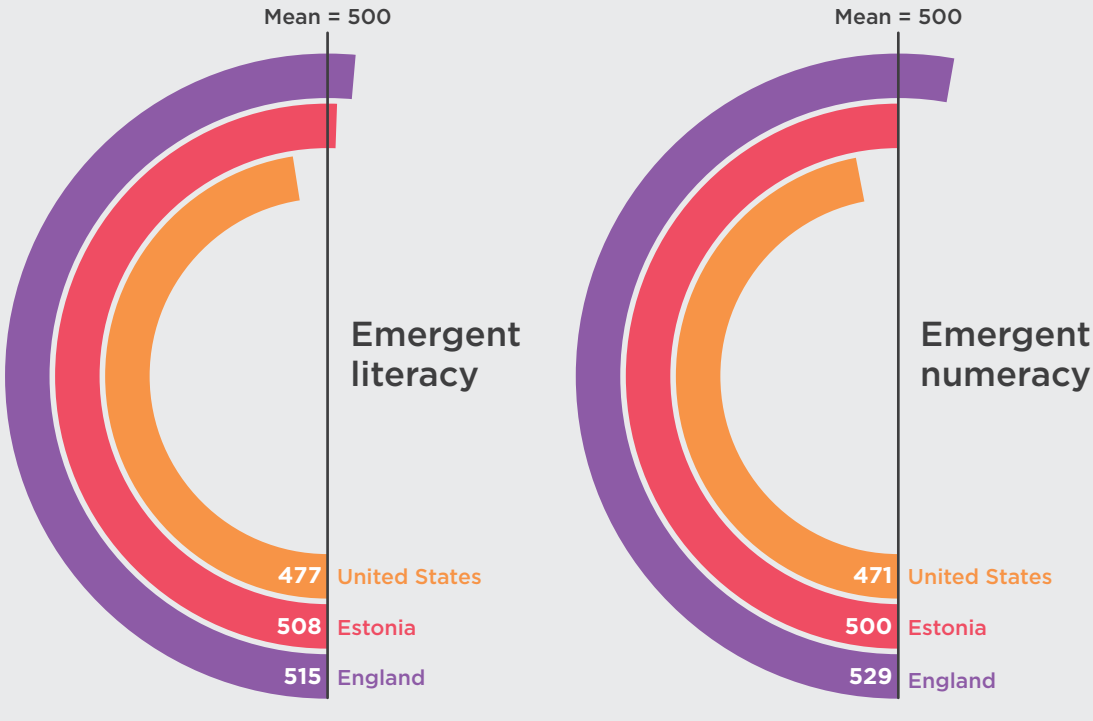
3.1 International highlights

The IELS international report (OECD, 2020b) highlights large differences between the demographic and early childhood education and care policies across the three countries involved. England often occupies the middle ground between Estonia and the United States, being more aligned to the United States on demographic diversity (greater levels of ethnic diversity and disparity of wealth), but being more like Estonia in terms of having relatively comprehensive ECEC systems and policies in place. The OECD reported that in 2017, participation rates in ECEC in England and Estonia were similar, with 100 per cent of 3-year-olds in England and 91 per cent of 3-year-olds in Estonia participating in ECEC compared to 42 per cent in the United States.

PISA 2018 assessment of 15-year olds (OECD, 2019) put Estonia as one of the best performing countries, in reading, science and mathematics. The United Kingdom is above the OECD average for these three areas of learning while the United States is similar to the United Kingdom for reading and science but lower for mathematics.

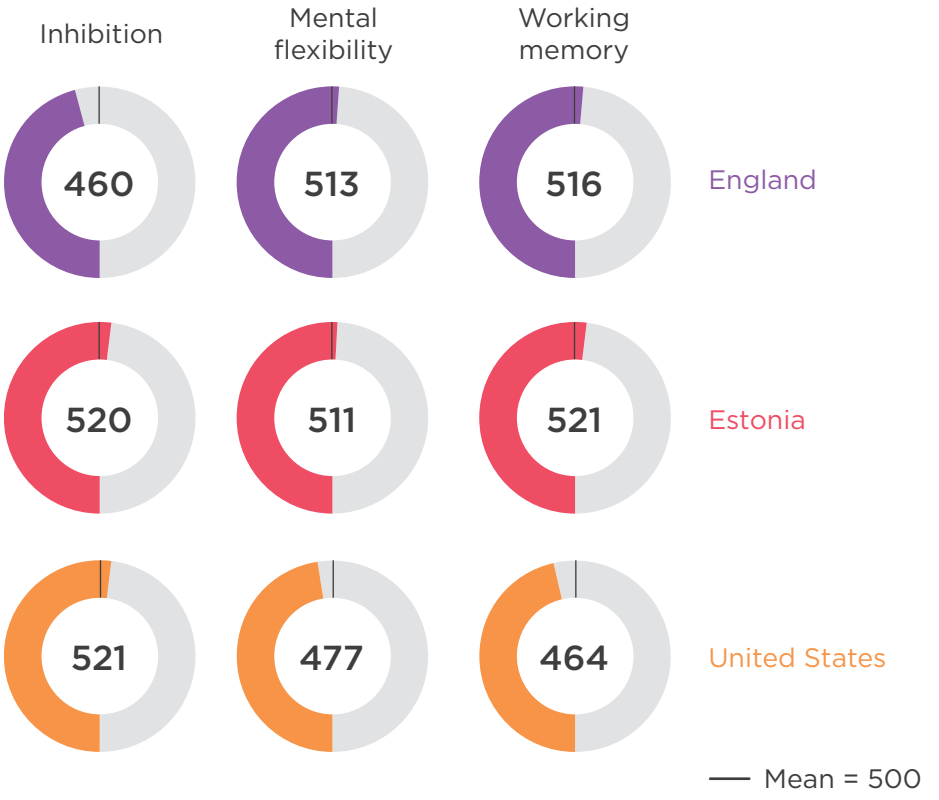
The IELS international report (OECD, 2020b) found that at age 5, children in England showed greater development in emergent numeracy than their counterparts in Estonia and the United States. Children in England showed similar development in emergent literacy to children in Estonia and greater development than children in the United States.

Average scores of 5-year-olds by country on the IELS cognitive measures



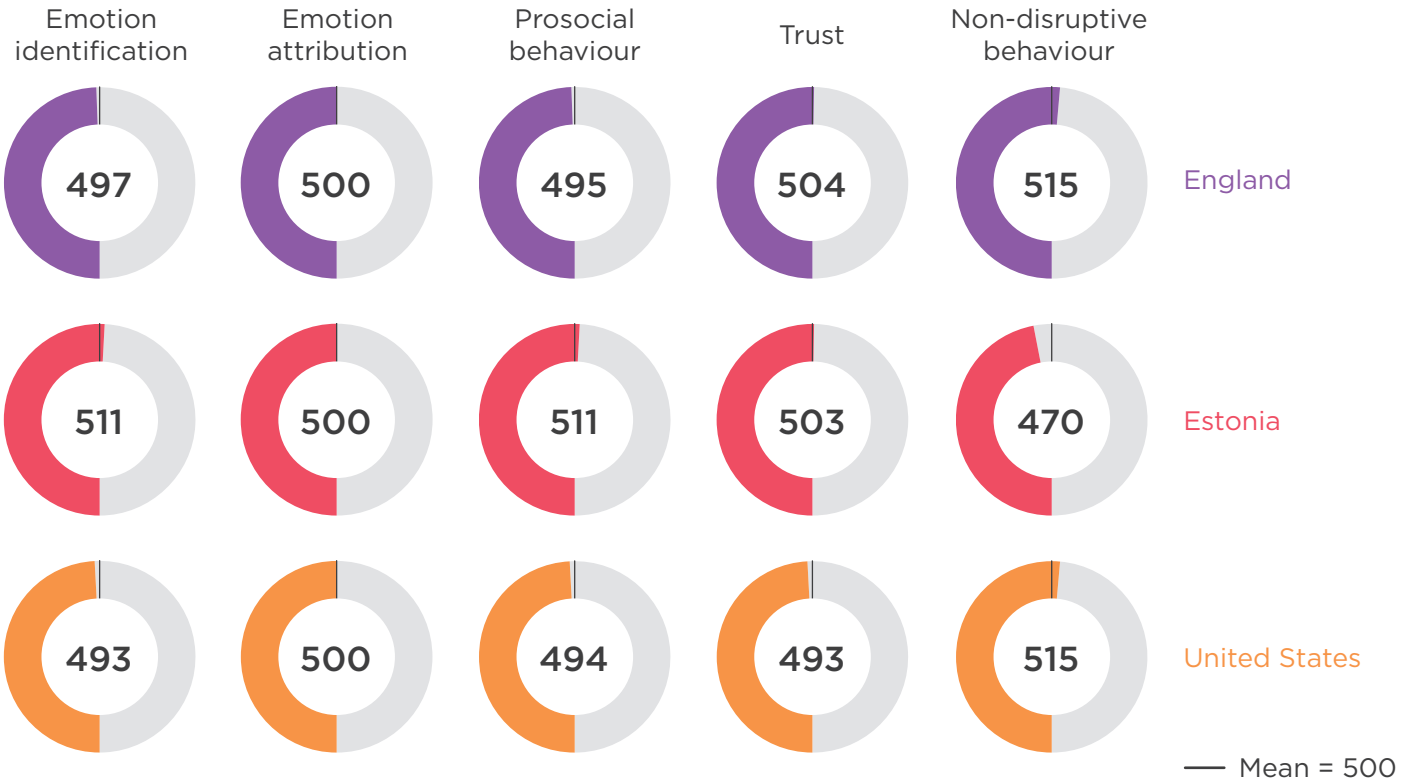
In two of the three areas of self-regulation measured in IELS (working memory and mental flexibility), children in England showed similar development to children in Estonia and greater development than children in the United States. However, for the third measure in self-regulation (inhibition), children in England showed significantly lower development than children in both the United States and Estonia.

Average scores of 5-year-olds by country on the IELS self-regulation measures



For the five social-emotional development areas (namely emotion identification, emotion attribution, pro-social behaviour, non-disruptive behaviour and trust), there were mixed outcomes across the three countries. For non-disruptive behaviour, children in England and the United States showed higher levels than those in Estonia. Children in England and the United States showed lower levels of emotion identification and prosocial behaviour than those in Estonia. Children in all three countries had similar levels of emotion attribution and trust.

Average scores of 5-year-olds by country on the IELS social-emotional measures



3.2 Key findings for England

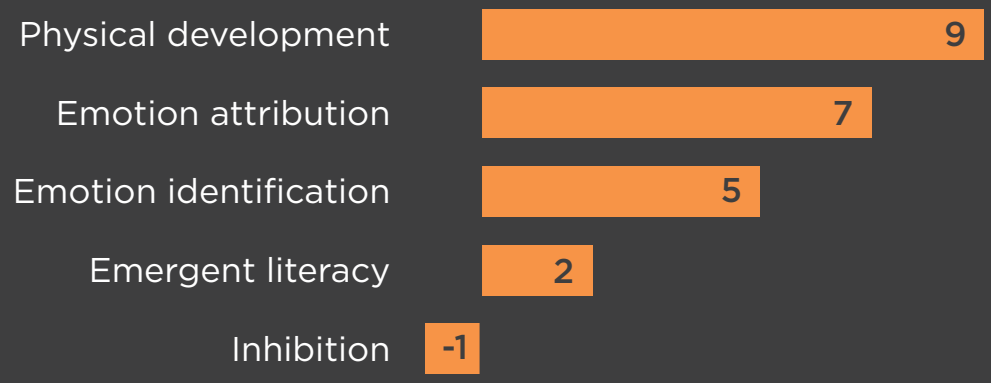
Girls showed greater development than boys in emergent literacy, social-emotional measures and physical development

At the age of 5, girls were on average 9 months ahead of boys in physical development. Girls were also 2 months ahead of boys in emergent literacy but the same as boys in emergent numeracy. Girls being ahead of boys in emergent literacy but not emergent numeracy was also reported in the other two participating countries. However for England, the lack of gender difference in emergent numeracy was unexpected given the higher performance of girls in mathematics in the Early Years Foundation Stage Profile (EYFSP) results (DfE, 2018).

Girls showed higher levels of social-emotional development than boys, with girls significantly outperforming boys in all five of the IELS social-emotional outcomes. For the two social-emotional outcomes that can be converted to months' difference, girls were 5 months ahead in emotion identification and 7 months ahead in emotion attribution.

For self-regulation girls and boys in England showed similar levels of development for working memory and mental flexibility. For inhibition, boys showed greater development, which equated to 1 month's difference. Interestingly, a different pattern was seen in the other two participating countries, with girls outperforming boys in inhibition and working memory, but no gender differences for mental flexibility.

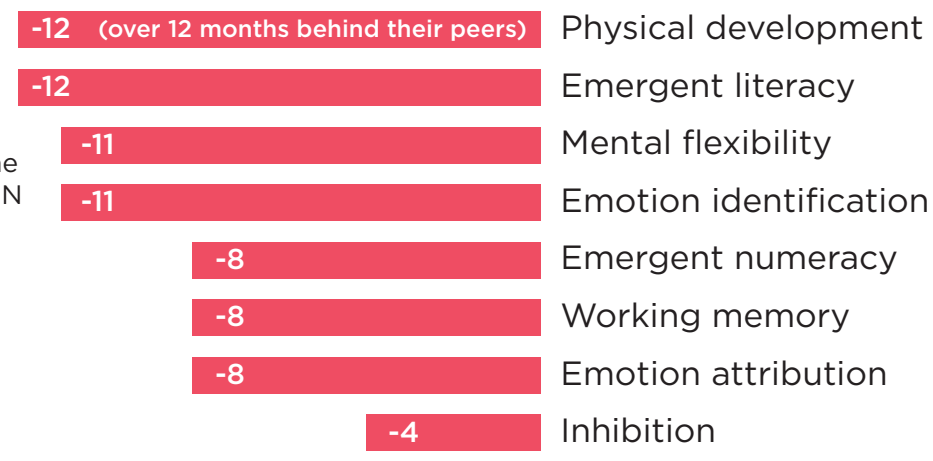
Months' difference: girls ahead of boys on a number of IELS measures



Five-year-old children with SEN identified in the NPD had lower average scores in all measures, except trust

Overall, 12 per cent of the children in the sample had a SEN identified in the NPD. The majority of these children had difficulties with communication and interaction. They showed markedly lower scores across all measures with the exception of trust, in which they showed higher levels when compared with children with no identified SEN. The greatest differences in outcomes for SEN were in physical development in which children with SEN were over 12 months behind their peers; emergent literacy in which they were approximately 12 months behind; mental flexibility in which they were approximately 11 months behind; and emotion identification in which they were 11 months behind.

Months' difference: children with an identified SEN were behind those without on a range of IELS measures

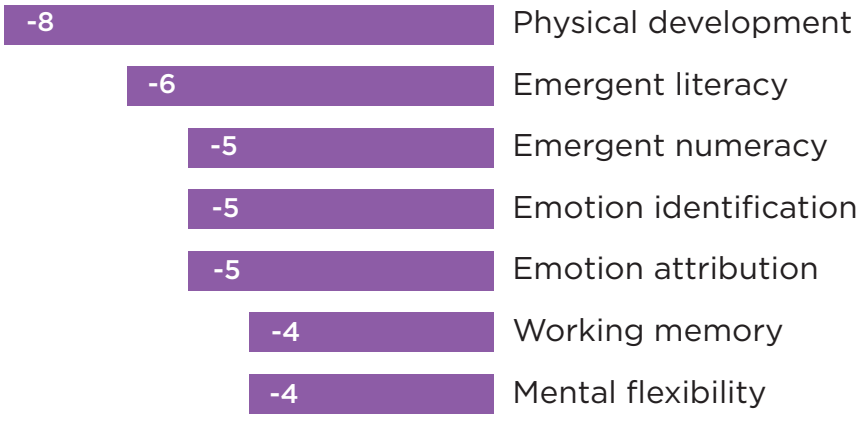


Children aged 5 eligible for free school meals showed lower development than their peers in almost all measures

Overall 17 per cent of children in the sample were eligible for FSM and there was a clear relationship between eligibility for FSM and lower development across measures covered by IELS. Inhibition was the only measure in which there was no statistically significant difference between children eligible for FSM and those who were not.

The differences in development by FSM were equivalent to approximately 8 months for physical development; 6 months for emergent literacy; 5 months for emergent numeracy, emotional identification and emotional attribution; and 4 months for both working memory and mental flexibility.

Months' difference: children eligible for FSM were behind those who were not on a range of IELS measures



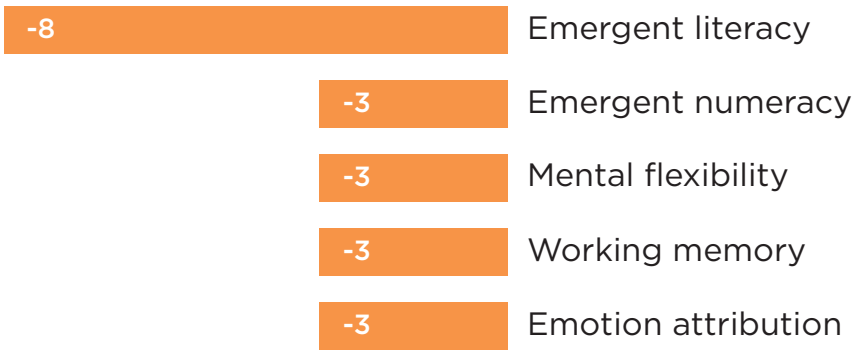
At age 5, children with English as an additional language were behind their peers in the cognitive measures but less so in other measures

Just under a fifth (17 per cent) of children in the sample had English as an additional language (EAL). These children showed on average lower development than their peers in cognitive development (emergent literacy and emergent numeracy) and in some of the self-regulation and social-emotional measures. The differences can be summarised as:

- children with EAL were approximately 8 months behind their peers for emergent literacy and approximately 3 months for emergent numeracy
- within self-regulation, children with EAL were approximately 3 months behind in both mental flexibility and working memory
- children with EAL showed lower development in three of the social-emotional measures (emotion attribution, prosocial behaviour and trust). The difference in emotion attribution was equivalent to approximately 3 months.

Children with EAL showed similar development to their peers in inhibition, non-disruptive behavior, emotion identification and physical development.

Months' difference: children with English as an additional language were behind other children on a range of IELS measures

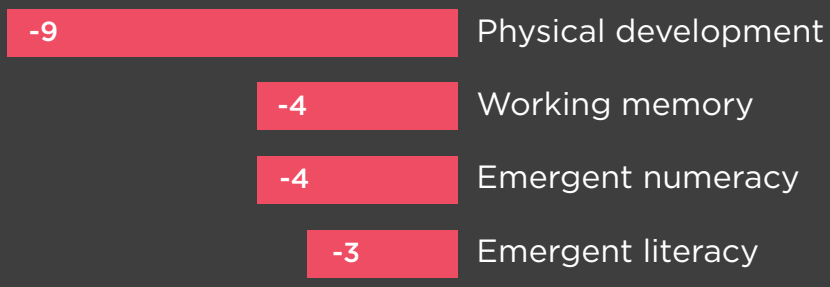


Low birthweight was associated with lower physical and cognitive development at the age of 5, but not social-emotional development

One of the interesting features of IELS was the ability to investigate the influence of low birthweight on children's development, as this information is not routinely collected by ECEC settings or schools. Children whose parents had reported them as having low birthweight[3] (11 per cent of the sample for whom information was available) had statistically significantly lower levels of emergent literacy, emergent numeracy, working memory and physical development compared to their peers.

The largest development gap associated with low birthweight was found in physical development (equivalent to approximately 9 months). The other gaps were around 3 months (emergent literacy) or 4 months (emergent numeracy and working memory). Low birthweight was not significantly related to development in any of the social-emotional measures in IELS.

Months' difference: children with low birthweight were behind other children on a range of IELS measures



3 Low birthweight was defined as children weighing 2.5 kg or less at birth.

Children's development in emergent literacy and emergent numeracy differed by ethnic group but other areas of development did not

At the age of 5, children from a White ethnic background showed greater development in emergent literacy than children from Asian and Black ethnic backgrounds (approximately 7 and 5 months' difference, respectively), and greater development in emergent numeracy compared to children from Black ethnic backgrounds (equating to approximately 3 months' difference). There were no differences in development between children of different ethnic groups in any of the self-regulation, social-emotional and physical development measures.

At age 5, parents/carers reading to children, helping them read words and sentences, and having back-and-forth conversations was associated with greater development in a range of domains

IELS gathered information on children's home learning environment (HLE) through a set of questions in the parent questionnaire. The key findings, after controlling for socioeconomic status (SES), are summarised below.

- **Reading to children at least 5 days a week** (reported by 59 per cent of the parents who responded) was associated with greater development in emergent literacy and all measures within the self-regulation and social-emotional domains, when compared to those who did this less than once a week (three per cent of the responding sample).
- **Helping children to read words and sentences**[4] on 3 or more days a week (73 per cent of the sample) was associated with greater development in emergent literacy, emergent numeracy, and the self-regulation measures when compared to those whose parents did so less than once a week or never (six per cent of the sample).
- **Having a larger number of children's books in the home**, including library books, was related to greater levels of emergent literacy, emergent numeracy, social-emotional development, working memory, mental flexibility and physical development. In particular, when compared to the nine per cent of children with fewer than ten books in the home, those with over ten books (91 per cent of the sample) had higher levels of development in emergent literacy, those with over 25 books in the home (79 per cent of the sample) had higher levels of development in emergent numeracy, and those with other 100 books in the home (29 per cent of the sample) had higher levels of physical development and mental flexibility.
- **Having back-and-forth conversations with children about their feelings** at least 5 days a week (53 per cent of the sample) was associated with greater development in emergent literacy, when compared to those whose parents did so less than once a week (three per cent of the sample). Additionally those who had these conversations at least 3 days a week (81 per cent of the sample) had greater development in emotion identification than children who did so less than once a week.

4 This was a national question for England only and has not been adjusted for SES.

Parental engagement with schooling was associated with greater development, particularly in social-emotional measures

Just over two-thirds (69 per cent) of children at age 5 had parents whose teachers considered them to be engaged with their schooling (e.g. by attending parents' evenings and activities at the school, accounting for 69 per cent of the sample). Just under one third (31 per cent) of children had parents rated as slightly or not engaged in their child's schooling. Those with parents rated as more engaged showed greater development in emergent literacy, emergent numeracy and all social-emotional measures than those whose parents were rated as less involved in their child's schooling. This difference remained significant after controlling for SES.

Attending special or paid-for activities every week was associated with greater development across social-emotional and cognitive measures

For children aged 5, attending special or paid-for activities (such as sports clubs, dance, swimming or language lessons) regularly was associated with greater development in a number of measures, after controlling for SES. However, it was not the case that those attending these activities most often showed greater development in these measures, but rather those attending these activities between 1 and 4 days a week (depending on the measure) showed the greatest development.

- For the social-emotional measures of emotion identification, emotion attribution and prosocial behaviour, children attending special or paid-for activities on 1 or 2 days a week showed greater development compared to those who went less than once a week or never.
- For emergent literacy and emergent numeracy, the positive difference was seen when children attended such special activities 3 to 4 days a week compared to those who did this less than once a week or never.
- For physical development, children who attended special or paid-for activities between 1 and 4 days a week showed greater development than those who attended less than once a week or never.

There were some positive relationships between use of digital devices and areas of development at age 5

- Low use of digital devices such as computers, tablets and Smartphones (characterised as using them at least once a month but not every week) was associated with greater development in emergent literacy and higher levels of trust.
- Higher use of digital devices (weekly or daily) was related to greater development in working memory.
- Using digital devices for educational activities specifically once or twice a week was related to greater development in emotion identification.
- There were no significant differences in physical development between children who did educational activities on a computer, tablet or smartphone regularly and those who did not.

Greater physical development at the age of 5 was not related to more frequent physical activities outside the home but was related to more frequent drawing and painting

Children who drew pictures or painted at home or with a parent/carer on 3 or 4 days a week showed significantly greater physical development than children who drew pictures or painted less than once a week or never. The difference between these groups was equivalent to approximately 5 months of development. However, IELS found no significant differences in physical development between children who regularly did physical activities outside and those who did not.

After accounting for socio-economic status, there were very few differences by ECEC type, intensity or age of attendance

The parent questionnaire collected extensive information on early childhood education and care (ECEC), including age of attendance, type of setting and intensity of attendance. The IELS study (OECD, 2020a) found few statistically significant differences by ECEC factors after adjusting for SES, which may reflect that the majority of children in England attended ECEC (98 per cent of children in the sample had attended some form of ECEC with 71 per cent of these children first attending before the age of 3 and 29 per cent attending at age 3 or 4). Two statistically significant findings were found for ECEC among 5-year-old children in England.

- Children who started ECEC earlier (those attending for more than 20 hours before the age of 1) showed greater development in emergent literacy and working memory and higher levels of trust than those who attended for less than 20 hours or did not attend at age 1. The association with higher levels of trust was statistically significant for girls but not for boys.
- On the other hand, attending ECEC later (children who first attended at age 3 or more) was associated with greater levels of non-disruptive behaviour compared with children who started ECEC before the age of 3. This finding is consistent with the SEED study (Melhuish and Gardiner, 2020) which found that using more formal childcare between age 2 and start of school was associated with social-emotional problems at age 5.

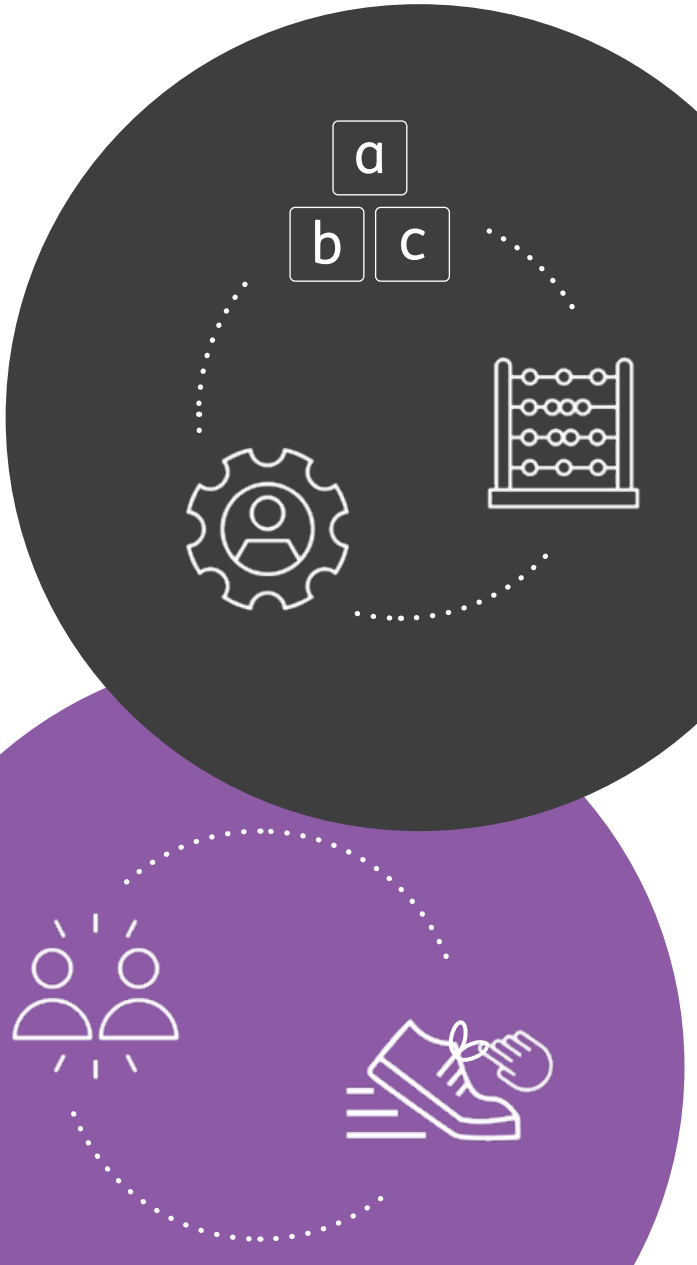
It should be noted that in the United States where a much larger proportion of children did not attend ECEC (20 per cent of children) compared to England, IELS found these children had lower emergent literacy and emergent numeracy scores than those who had attended, even after controlling for SES (OECD, 2020c).

> Both emergent literacy and emergent numeracy were strongly correlated with mental flexibility, working memory and emotion identification

At the age of 5, children's development in one area of learning is related to their development in other areas of learning

IELS measures are, to differing extents, correlated with each other. The strongest relationships are highlighted below.

- Children's development in emergent literacy at age 5 was most strongly related to their development in emergent numeracy. Both emergent literacy and emergent numeracy were strongly correlated with the outcome measures of mental flexibility, working memory and emotion identification.
- Mental flexibility and working memory were strongly correlated.
- Emotion identification and emotion attribution were strongly correlated with each other; and prosocial behaviour was strongly correlated with trust and non-disruptive behaviour.
- Physical development was strongly correlated with prosocial behaviour and trust.



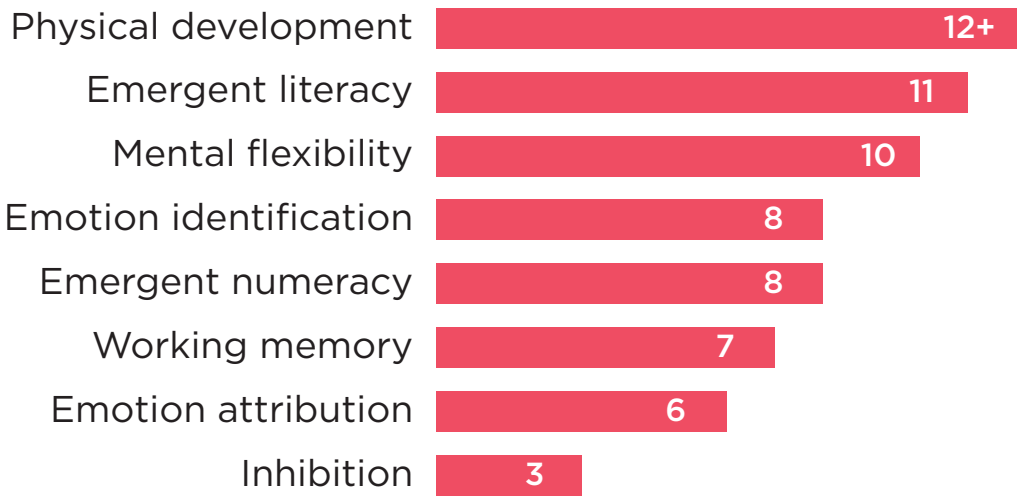
Persistence is associated with early development

Children's persistence was measured through a question on the teacher questionnaire. Teachers were asked to rate the child's ability to 'continue on his or her planned course of action in spite of difficulty or obstacles'. Just over one third (34 per cent) of 5-year-olds were rated as having high levels of persistence ('often' or 'always' continuing their planned course of action), while 48 per cent were rated as having medium levels ('sometimes') and 18 per cent were rated as having low persistence ('rarely' or 'never' continuing their planned course of action).

Persistence was statistically significantly related to all 11 of the IELS outcome measures. The differences were particularly pronounced for prosocial behaviour, trust and physical development. Where possible the differences between those rated as highly persistent and those who were not have been converted into differences in months, which are summarised below.

- Children whose teachers rated them as 'often or always' persistent were over 12 months ahead of their peers rated as 'rarely or never' persistent in physical development.
- Children whose teachers rated them as 'often or always' persistent were approximately 11 months ahead of their peers rated as 'rarely or never' persistent in emergent literacy and 8 months ahead in emergent numeracy.
- Children whose teachers rated them as 'often or always' persistent were approximately 10 months ahead of those rated as 'rarely or never' persistent in mental flexibility, 7 months ahead in working memory and 3 months ahead in inhibition.
- Children whose teachers rated them as 'often or always' persistent were approximately 8 months ahead of their peers rated as 'rarely or never' persistent in emotion identification and approximately 6 months ahead in emotion attribution.

Months' difference: children rated as having high levels of persistence were ahead of those rated as having low levels of persistence on a range of IELS measures



> Persistence was statistically significantly related to all 11 of the IELS outcome measures.

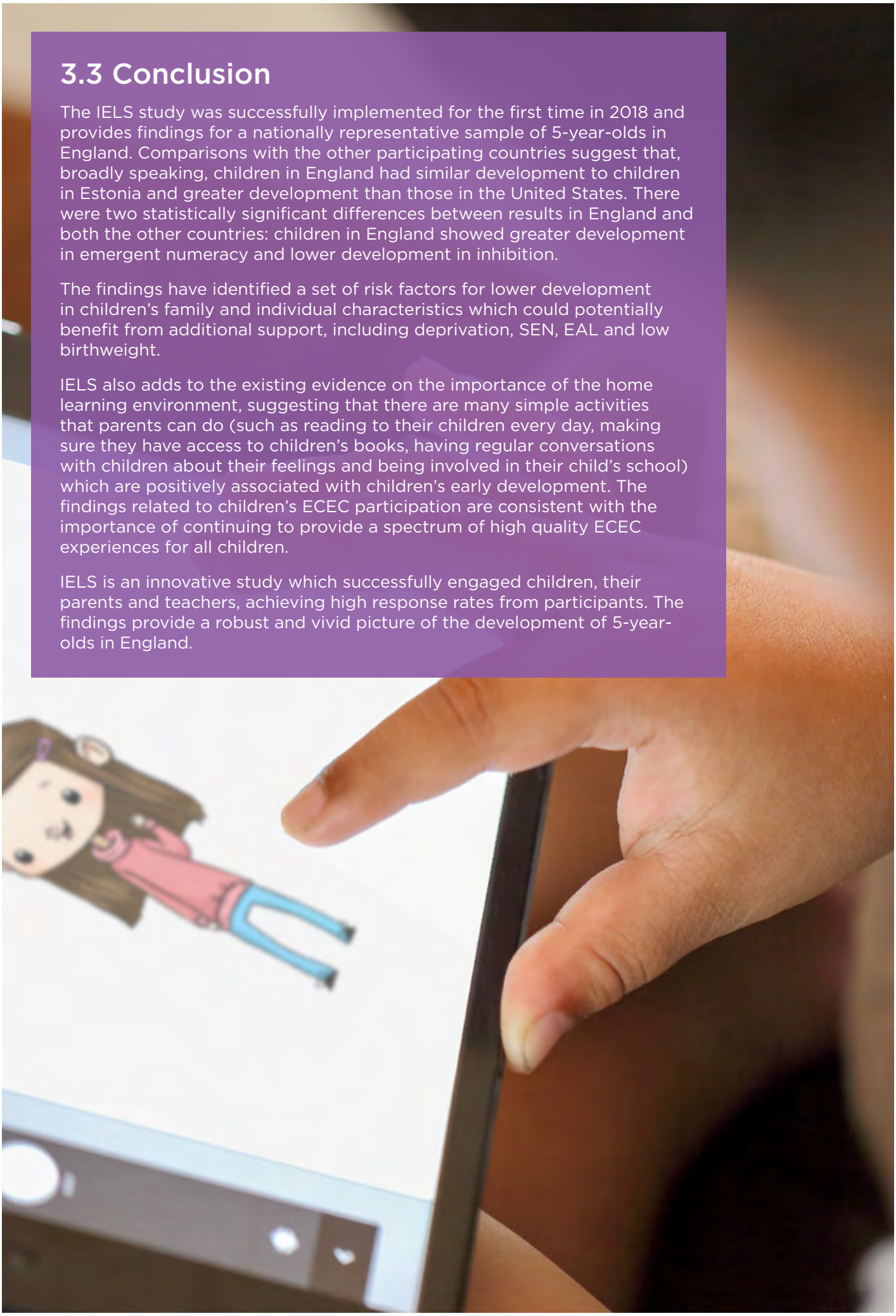
3.3 Conclusion

The IELS study was successfully implemented for the first time in 2018 and provides findings for a nationally representative sample of 5-year-olds in England. Comparisons with the other participating countries suggest that, broadly speaking, children in England had similar development to children in Estonia and greater development than those in the United States. There were two statistically significant differences between results in England and both the other countries: children in England showed greater development in emergent numeracy and lower development in inhibition.

The findings have identified a set of risk factors for lower development in children's family and individual characteristics which could potentially benefit from additional support, including deprivation, SEN, EAL and low birthweight.

IELS also adds to the existing evidence on the importance of the home learning environment, suggesting that there are many simple activities that parents can do (such as reading to their children every day, making sure they have access to children's books, having regular conversations with children about their feelings and being involved in their child's school) which are positively associated with children's early development. The findings related to children's ECEC participation are consistent with the importance of continuing to provide a spectrum of high quality ECEC experiences for all children.

IELS is an innovative study which successfully engaged children, their parents and teachers, achieving high response rates from participants. The findings provide a robust and vivid picture of the development of 5-year-olds in England.



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NFER was contracted to carry out IELS in England on behalf of the Department for Education (DfE) and this report includes analysis of pupil administrative data from the DfE's National Pupil Database (NPD). However the views expressed in this report are the authors' and do not necessarily reflect those of the DfE.

Please note that this work was produced using statistical data from ONS. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

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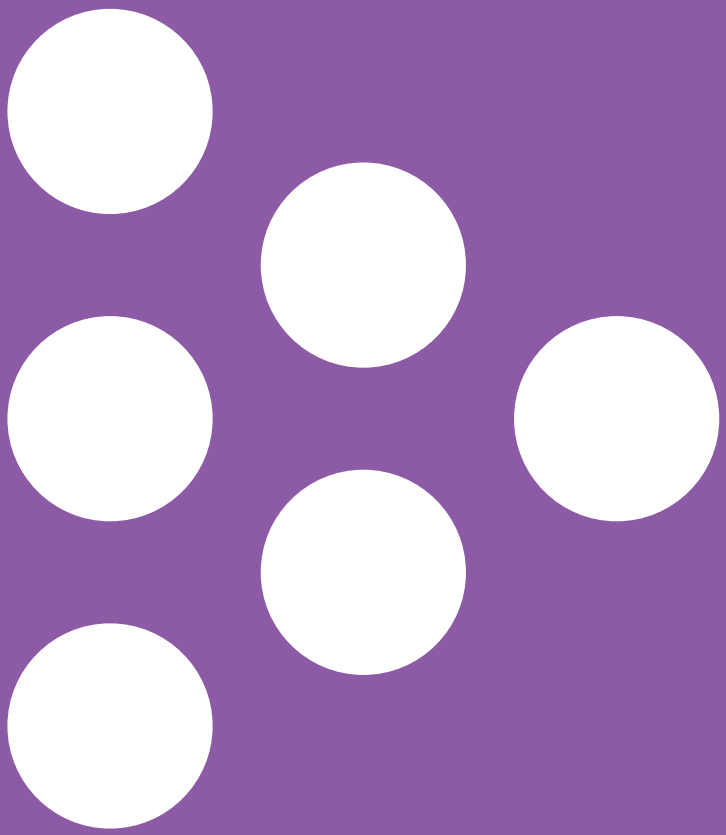

ISBN: 978-1-912596-31-7

How to cite this publication:
Kettlewell, K., Sharp, C. and Eivers, E. (2020). *International Early Learning and Child Well-being Study (IELS): National Summary Report for England*. Slough: NFER.

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December 2020

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