Department for Education

Factors influencing primary school pupils' educational outcomes

A literature review supporting the Five to Twelve study

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This research report was written before the new UK Government took office on 5 July 2024. As a result, the content may not reflect current Government policy.

Executive summary

The Department for Education (DfE) has commissioned a programme of longitudinal research called the Education and Outcomes Panel Study (EOPS). EOPS will track children and young people through critical phases of learning, from early years to higher education, through a series of staggered studies. EOPS will provide high quality longitudinal evidence on the factors that help to explain educational disadvantage and inequalities and examine how these influence outcomes at various life stages. The second cohort in the EOPS programme (EOPS-B, also known as 'Five to Twelve') focuses on the experiences and educational outcomes of primary school children. EOPS-B will track children and their families from years 1 to 6. The study began tracking pupils' experiences and outcomes from Autumn 2023.

This report presents the findings of a rapid literature review aimed at supporting EOPS-B. It focuses on academic attainment, primarily measured by standardised assessments, in English and maths, as well as academic progress measured by the difference between assessments at different points in time. This information will be used to inform the focus and development of EOPS-B data collection. The literature review aimed to identify the full range of factors known to affect the attainment and outcomes of primary school pupils, how risk factors can be mitigated, which protective factors can be successfully implemented, and whether there are any gaps in understanding of the interplay between these factors and outcomes for primary school pupils.

Key findings on the factors influencing primary pupils' attainment outcomes

The review provides evidence on the factors influencing primary-age young people's attainment in relation to 4 themes: children's cognitive and non-cognitive capabilities and wellbeing (theme 1), the experiences of children with special educational needs and disabilities (SEND) and those who use social services (theme 2), and children's experiences of the home (theme 3) and school environments (theme 4).

Theme 1: Children's cognitive and non-cognitive capabilities and wellbeing

The review provides evidence of a positive association between children's cognitive capabilities (such as reasoning, attention, memory and language skills) and their later academic attainment. Attainment at a particular age or stage is highly correlated with later attainment. Children's non-cognitive capabilities (such as conscientiousness, self-esteem and self-regulation) are also related to their attainment. As these capabilities are likely to affect all pupils and many may be open to improvement with appropriate support, they should be a priority for measurement within EOPS-B.

Aspects of a child's physical health (such as being breastfed as an infant and being physically active) are also related to their attainment. Risk factors include low birthweight, certain health conditions (such as asthma), food insecurity and irregular bedtimes. Indicators of poor mental wellbeing (including loneliness and anxiety), together with certain behaviours (such as aggression and hyper-activity) all present a risk to primary children's attainment outcomes. Poor physical and mental health and wellbeing affect a large minority of pupils (Newlove-Delgado et al., 2022) and the potential for adverse impact on attainment is substantial. These factors are therefore a priority to investigate in EOPS-B.

Theme 2: Children with SEND and experience of social services

The review highlights the particular challenges faced by children with Special Educational Needs and Disabilities (SEND) and children who have had experiences with social services, including looked-after children and children in need (CiN). It also considers the evidence on adverse childhood experiences (ACEs), particularly abuse, neglect, violence, bullying and parental mental and physical ill-health. Children with one of these experiences (namely SEND, looked-after children[1], CiN or ACEs) often encounter multiple risks that adversely impact their attainment outcomes, which supports their inclusion in EOPS-B. There is evidence that accessing support earlier can help to mitigate these risks.

Theme 3: Home environment

The review provides evidence of a negative association between primary children's attainment and poor socio-economic circumstances of their home environment (such as living in a family with a low income, low parental education, parental worklessness and poor housing). There is some evidence that these adverse effects can be mitigated at least to some degree by higher parental education, expectations and support for their children's learning, along with material resources (such as books) to enrich the home learning environment. Family structure was not identified as particularly influential for children's attainment outcomes after controlling for family poverty. However, there is some evidence that having fewer older siblings is a protective factor for attainment and fathers' involvement with children can be protective of children's cognitive outcomes, even when they do not live in the same household. It will be important for EOPS-B to capture a range of socio-economic indicators as well as key aspects of parenting behaviour and the home learning environment.

Theme 4: Experiences of school

Although attending school is important for children's learning, the school a child attends is associated with a smaller effect on attainment than that of parental, family and

[1] Looked-after children may also be referred to as children in care or care-experienced children.

individual factors. The review provides evidence that children's attainment is positively influenced by their school readiness and attending early childhood education and care (ECEC). Characteristics of schools associated with higher attainment (after accounting for the influence of family socio-economic status) include: strong leadership, high expectations, quality teaching, and positive relationships between teachers, parents and pupils. There is also evidence of a positive relationship between children's attainment and experiencing engaging curricular and extra-curricular activities. Risk factors include: being placed in a lower 'set' for English and having a birthdate towards the end of the school year, combined with schools' use of non-age adjusted assessments. Although each of these factors individually may only have a modest impact on attainment, their cumulative effect can be substantial. The implication for EOPS-B would be to measure as many of these factors as possible to inform educational policy and practices that tackle inequalities.

Key implications for the EOPS-B study

The review has identified a body of recent evidence that offers many insights into the factors associated with children's attainment outcomes. The review recommends the EOPS-B study over-samples children from disadvantaged backgrounds to ensure their experiences and outcomes are adequately represented and can be investigated. Because understanding the influence of socio-economic indicators is paramount in the study, the review has endorsed the importance of measuring a range of socio-economic indicators, including parental education and housing. It has also identified several aspects of the evidence base for this age group that may benefit from further consideration in the study. This includes the need to explore different perspectives – including from children with SEND and other vulnerabilities and from fathers (and possibly step-parents) in terms of the specific role that they play in influencing children's outcomes. It also indicates the need for measurement of a wide range of factors that may influence primary children's outcomes, such as cognitive and non-cognitive capabilities and early indicators of mental health; school-based and wider forms of support, particularly for children with SEND and other vulnerabilities; and the quality of teacher and peer relationships and experiences of bullying in the primary school years.

It will be important for EOPS-B to capture key aspects of parenting behaviour and the home learning environment. It will also be important to collect children's views on their own wellbeing, capabilities, attainment and aspirations, experiences at school and relationships with teachers and peers.

Review methods and limitations

The rapid review is based on systematic searches conducted in Autumn 2022. It prioritised literature published between 2012 and September 2022 and research-based literature reviews, meta-analysis and longitudinal studies conducted in the UK, although it also included international evidence from meta-analyses and systematic reviews. The review team identified 311 potentially relevant records which were coded for relevance based on the abstract/summary, resulting in a shortlist of 69 items. The shortlist was checked with DfE, collaborators and experts and recommendations were added. A total of 84 items of literature were fully appraised against a common template and form the evidence of this review. A diagram summarising the items of literature processed at each stage of the review can be found in Appendix C.

Given its rapid nature, the review has several limitations in terms of scope and depth. It should therefore be considered as indicative of the available evidence-base, rather than providing a definitive account of what is known about the key factors influencing primary children's attainment. It should also be noted that much of the evidence consists of associations and correlations, rather than causal relationships. Also, while the review seeks to identify factors which may be malleable (that is, open to positive influence through support and intervention), this is not always possible, due to limitations in the evidence-base drawn on in the review. Furthermore, while studies that used standardised outcome measures were prioritised for review, there are some studies in the review that use outcome measures that may be subject to bias, such as teacher assessments. Attempting to cover a broad range of topic areas in a short time means that findings are based on the most robust and relevant evidence that may come from a small number of sources. The review also deliberately included studies using a variety of designs, which means that evidence from more exploratory, qualitative research is included alongside large-scale quantitative studies.

1 About the literature review

This chapter sets out the purpose and aims of the literature review upon which this report is based and briefly describes the methods employed to undertake the review.

1.1 Purpose and aims of the review

The Department for Education (DfE) has commissioned a programme of longitudinal research called the Education and Outcomes Panel Studies (EOPS). EOPS will track children and young people through critical phases of learning, from early years to higher education, through a series of staggered studies. EOPS will provide high quality longitudinal evidence on the factors that help to explain educational disadvantage and inequalities and examine how these influence outcomes at various life stages.

The second cohort in the EOPS programme (EOPS-B, also known as 'Five to Twelve') focuses on the experiences and educational outcomes of primary school children. EOPS-B will track children and their families from year 1 to 6. The study began tracking pupils' experiences and outcomes from Autumn 2023. This report presents the findings of a rapid literature review for EOPS-B. The review focuses on academic attainment, primarily measured by standardised assessments, in English and maths, as well as academic progress measured by the difference between assessments at different points in time. This information will be used to inform the focus and development of EOPS-B data collection. The literature review aimed to identify the full range of factors known to affect the attainment and outcomes of primary school pupils, how risk factors can be mitigated, which protective factors can be successfully implemented, and whether there are any gaps in understanding of the interplay between these factors and outcomes for primary school pupils.

The theoretical framework underpinning the review's focus on risk and protective factors for attainment is outlined in Appendix A.

1.1.1 Research context

This section provides an overview of what is known to date about the key demographic factors related to attainment. These factors are explored further in this review, along with evidence on a broader range of factors relating to young people's characteristics and experiences.

Two of the major factors understood to influence attainment outcomes are prior attainment and pupils' socio-economic status (SES). For example, Sutherland and Ilie (2015) report that prior attainment (as measured by early years vocabulary) explains around 28% of the variability in pupils' key stage 2 (KS2) scores. Higher prior attainment could therefore be regarded as a protective factor for pupils' later attainment. A child's SES is defined by their family's social and economic position. Consistent evidence shows

that low SES creates a risk factor for children's attainment outcomes. Researchers use different measures to identify the relationship between SES and attainment in England, the most common of which is based on a child's eligibility for free school meals (FSM). Some studies use household income and parental education indicators. It has been estimated that pupils' SES accounts for around 10-15% of variability in attainment outcomes (depending on the measures of SES) (Sutherland & Ilie, 2015). In addition, the primary school a pupil attends accounts for between 10-15% of variability in pupil attainment, although this percentage is reduced when prior attainment is taken into account (Education Endowment Foundation, 2015; Reynolds, 2007). The school a child attends can also represent either a protective influence on educational outcomes or a risk, if pupils attending the school make less progress due to school factors.

There is evidence that attainment differs according to child characteristics. For example, pupils with SEND tend to have lower attainment than their peers without SEND (Hutchinson et al., 2019). In 2022, 18% of pupils with SEND reached the expected standard at KS2 compared with 59% of all pupils (Department for Education, 2022g).

There is also evidence that attainment varies between ethnic groups. In 2022, a higher proportion of pupils from Indian and Chinese backgrounds, and a lower proportion of pupils from Gypsy/Roma and Traveller of Irish heritage backgrounds, met the expected standard at KS2 compared with pupils from white British backgrounds. Attainment also differs for pupils with English as an additional language. In 2022, slightly fewer primary pupils with a first language other than English met the expected standard at KS2 (58%) compared to pupils whose first language was English (61%).

Gender is also associated with attainment and typically girls achieve higher attainment than boys in literacy and English (Kettlewell et al., 2020; Major & Parsons, 2022; Strand, 2016; Sylva et al., 2014). In 2022, girls outperformed boys at KS2 in all subjects except maths (Department for Education, 2022g).

There is a longstanding gap between the attainment outcomes of disadvantaged pupils and the typically higher attainment of their non-disadvantaged peers – this is commonly referred to as the 'attainment gap'. Disadvantaged pupils are considered by the DfE to be pupils who are eligible for FSM or have been eligible in the past six years, pupils who have been adopted from care or have left care, and children who are looked after by a local authority. The attainment gap between disadvantaged pupils and their non-disadvantaged peers is already evident by the time pupils start primary education and increases throughout primary and secondary education (Andrews et al., 2017; Hutchinson et al., 2019). There was some progress in narrowing the gap between 2011 and 2018 but by small increments (Andrews et al., 2017; Department for Education, 2022g; Hutchinson et al., 2019).

Children's attainment was negatively impacted by the widespread disruption to learning during partial school closures[2] due to the COVID-19 pandemic. During these periods, schools adapted to provide remote learning for pupils to undertake at home and offered provision in schools for pupils who were considered to be vulnerable and the children of key workers. There is evidence that under-fives were particularly adversely affected due to not attending ECEC during the pandemic (Tracey et al., 2022). Pupils whose primary education was affected also made less progress during the pandemic than would normally be expected. This has been attributed to this cohort having less ability to engage with independent learning and restricted access to informal learning opportunities (Twist et al., 2022). However, there is evidence that, on average, pupils' attainment in reading and mathematics had recovered to pre-pandemic levels by spring 2023 (Rose et al., 2023).

The attainment gap widened during the pandemic, as attainment outcomes declined more steeply for disadvantaged pupils (Renaissance Learning & Education Policy Institute, 2022; Twist et al., 2022). The disadvantage gap index increased from 2.91 in 2019[3] to 3.23 in 2022; this is its highest level since 2012 (Department for Education, 2022g), and it remained high in 2023 at 3.21 (Department for Education, 2023). Thus, it is paramount to understand the factors that may help to explain this attainment gap and to provide insights to inform strategies to reduce educational inequalities.

This literature review provides further evidence on these factors among others, seeking to understand how and why they may interact to influence inequality in attainment outcomes and what evidence is needed to investigate them further in EOPS-B.

1.1.2 About the organisations conducting the review

This review represents a collaboration between researchers and experts from the National Foundation for Educational Research (NFER), National Centre for Social Research (NatCen) and the National Children's Bureau (NCB). NFER led the review, conducted the searches and appraised, analysed and reported the evidence – along with researchers from NatCen and NCB – in relation to areas of particular expertise. The review was also guided by the DfE and the EOPS advisory board, as well as additional academic experts in fields relevant to the review.

NFER is the leading provider of independent educational evidence and assessments in the UK. As a registered charity, NFER's mission is to improve outcomes for future generations everywhere and to support positive change across education systems.

NatCen Social Research is the largest independent social research organisation in Britain and is a not-for-profit organisation that works on behalf of government and

[2] Schools were partially closed in March to July 2020 and January to March 2021.
[3] Hutchinson et al. (2019) estimated that the disadvantage attainment gap was equivalent to nine months of learning at KS2.

charities to find out what people really think about important social issues and how Britain operates.

NCB is a registered charity which brings people and organisations together to drive change in society and deliver a better childhood across the UK. They work in every local authority in England and across government in Northern Ireland.

1.2 Review methods

This report is based on a rapid review using systematic searches of relevant databases and websites to identify evidence. The searches were conducted in accordance with a literature review plan agreed with the DfE, NatCen and NCB and expert advisors (see Appendix B for further details). The review plan was devised in an iterative process to define the scope in terms of participants, reported outcomes, content and settings of interest to address the broad research question: to understand the range of factors affecting the attainment outcomes of primary school pupils. In summary, the search strategy set out:

search parameters:

- literature published between 2012 and September 2022 (when the searches were conducted)
- prioritisation of research-based literature reviews, meta-analysis and longitudinal studies conducted in the UK; large-scale quantitative and qualitative studies conducted in England/UK; international literature reviews/meta-analysis in English-speaking and/or comparator jurisdictions

sources of evidence:

- education databases; mental health and social care databases; international systematic review libraries; NFER's in-house database; selected UK websites; websites of selected key UK educational research and psychology journals; recommendations from NFER, NatCen, NCB, DfE and academic experts; and reference harvesting

inclusion and exclusion criteria

- given the broad nature of the review, it was necessary to limit the volume of evidence returned in the searches by including only evidence reporting on the risk and protective factors related to academic attainment and progress of primary-age children, while excluding literature reporting outcomes on non-academic attainment or progress[4]

[4] Although it was decided to include some evidence on outcomes closely related to attainment (such as attendance) in cases where the evidence-base was less well developed.

Initial sifting of the search results (for example, to remove duplicate items and manually apply the selection criteria) produced a ‘longlist’ of 311 items of literature that were assessed by a team of researchers based on the abstract/summary. A 10% sample of items (n=32) were blindly double coded by two researchers to check for inter-coder reliability. Quality assurance (QA) checks were also conducted by an NFER research director on 10% of coded items to ensure a consistent and robust approach. This screening process resulted in a shortlist of items which was checked with DfE, NatCen, NCB and other expert advisors who made several recommendations for additional items to be considered.

Subsequent to the initial searches, some further items of literature were included. This was largely as a result of additional recommendations from experts. The review also includes several additional relevant sources that were published after the searches or identified through reference harvesting of shortlisted items. Finally, several studies which were identified through the literature review for the EOPS-C cohort, focusing on secondary education (year 8 to 12; also known as ‘Growing up in the 2020s'), were deemed relevant for the measurement of factors during the primary age-range. Several items were removed at this stage, due to low relevance of the evidence presented in the full text.

A total of 84 items of literature were fully appraised and form the evidence of this review. Appraisals of literature were conducted by researchers from across the three partner organisations (NFER, NatCen and NCB). This involved reading the full text and completing a structured template to summarise: the main findings, methods and implications for further investigation. Appraisals also involved evaluating the quality and relevance of each item, using a ‘weight of evidence’ approach (Gough, 2007). Appraisers gave a rating for the methodological quality, methodological relevance/precision and topic relevance of each item.

A diagram summarising the items of literature processed at each stage of the review can be found in Appendix C.

Researchers further synthesised the evidence in relation to four themes (set out below in section 1.3) to draw out the findings in terms of the risk and protective factors identified within each theme, the direction and magnitude of any relationship of each factor with attainment outcomes, the interaction between factors, the extent of variability of evidence within each theme and an assessment of the quality of evidence. The collaborators met with the DfE to discuss the emerging findings from the initial analysis and their feedback informed subsequent analysis and the production of this report. The appraised evidence in this review is supplemented by a small amount of ‘wider evidence’ that did not meet the initial search criteria but was recommended by expert advisors to address a gap in the evidence.

1.2.1 Review limitations

This rapid review has several limitations, in terms of its breadth, depth and assessment of the existing evidence base. Focusing on more recent studies means that many older studies which may have been relevant to EOPS-B were excluded. Attempting to cover a broad range of topic areas in a short time means that findings are based on the most robust and relevant evidence that may come from a small number of sources. The review also deliberately included studies using a variety of designs which means that evidence from large-scale quantitative studies is included alongside more exploratory, qualitative research.

The review team attempted to mitigate some of these limitations by adopting the methods described above. However, this review is probably best regarded as indicative of the evidence-base and does not claim to provide a definitive account of the risk and protective factors affecting primary-age children's academic attainment. It should also be noted that much of the evidence highlights associations and correlations, and evidence of causal influences is limited. Although the review seeks to identify associations between attainment and other factors which are malleable (that is, open to positive influence through support and intervention), this is not always possible, due to limitations in the scope or design of studies included in the review. Furthermore, while studies that used standardised outcome measures were prioritised for review, there are some studies in the review that use outcome measures that may be subject to bias, such as teacher assessments. This report provides indications of the magnitude of the effects of different influences on pupils' attainment where these are available in the appraised studies, although caution should be exercised as these are not available in all cases and are based on different statistical measures.

1.3 Structure of this report

There are numerous factors that influence pupils' attainment outcomes throughout primary school and much interaction and overlap between them. This report attempts to group and present the evidence on the influence of these factors on pupils' attainment within the following broad overarching themes which form the subsequent chapters of the report. The themes are:

1. Children's cognitive and non-cognitive capabilities and wellbeing
2. Special Educational Needs and Disabilities (SEND), experience of social services and adverse childhood experiences
3. Home environment
4. Experiences of school

The report concludes with an overall discussion of the evidence and makes suggestions for the implications of the findings for the EOPS-B study.

2 Children's cognitive and non-cognitive capabilities and wellbeing

Key findings:

- the review provides evidence of a positive association between attainment and children's cognitive capabilities, including executive function, reasoning, problem solving, attention, memory and language skills
- there is also evidence of a positive association between attainment and children's non-cognitive capabilities including motivation, self-esteem, self-confidence, self-regulation, conscientiousness and persistence
- various aspects of children's physical health are positively associated with attainment outcomes, including being breastfed as an infant and being physically active. Food insecurity and irregular bedtimes present a risk to attainment outcomes
- the review provides some evidence of a negative association between attainment outcomes and children's mental health problems, indicated by behaviours or feelings described as externalising (for example, aggression) and internalising (for example, anxiety), although the review found limited evidence on this for the primary school age-group
- the implications for EOPS-B are that it will be important to capture children's cognitive, non-cognitive, physical and mental health indicators

This chapter explores the relationship between children's cognitive and non-cognitive capabilities and wellbeing, and their academic attainment and progress at primary school. Cognitive skills underpin the acquisition of knowledge and include aspects such as memory, attention, reasoning and language skills. Non-cognitive skills relate more to feelings, behaviour, and emotional, social and mental wellbeing and include aspects such as empathy, motivation, self-esteem and perseverance. There is a mutually reinforcing interaction between non-cognitive and cognitive skills such that they work together to facilitate wellbeing and success in later life[5].

This chapter also explores evidence on the relationship between children's health and their attainment outcomes. There is growing interest in children's wellbeing, particularly due to consistent evidence that this was adversely impacted by the COVID-19 pandemic (Kuhn et al., 2022; Nelson et al., 2021; Newlove-Delgado et al., 2021; Rose et al., 2021; Tracey et al., 2022). The incidence of probable mental disorders was already increasing in the primary age group before the pandemic. Rates of poor mental health among 7- to

[5] Note that Jones, Greenberg and Crowley (2015) argue that designating cognitive versus non-cognitive skills oversimplifies their complexity and the role of cognition in so-called non-cognitive skills.

10-year-olds increased between 2017 and 2020 but remained similar between 2020 and 2022 (Newlove-Delgado et al., 2022). There is evidence to suggest that mental health issues may be more prevalent among boys in the primary school age group (Newlove-Delgado et al., 2022) and boys' mental health appears to have been more adversely impacted by the pandemic (Kuhn et al., 2022).

The evidence suggests that it is important to understand whether early risk indicators are apparent in primary-age children and to ensure strong foundations for cognitive and non-cognitive skills and physical and mental health and wellbeing at an early age.

The review identified 22 items providing evidence on the link between attainment outcomes and children's cognitive and non-cognitive capabilities, as well as their mental and physical health. The selected studies involved a range of methodological designs, with most involving analysis of longitudinal data and several reviewing existing evidence through meta-analysis, systematic reviews and other types of review. A third of the studies were based on international evidence, with the remainder comprising UK-based studies. Given the review aimed to prioritise UK evidence, this may indicate that there is a limited UK evidence-base for this theme.

The studies were rated as of medium to high value to the review in terms of both relevance to the focus of the review and quality of the design. Many of the studies made use of well-known longitudinal data sets (such as Millennium Cohort Study (MCS), Avon Longitudinal Study of Parents and Children (ALSPAC), National Child Development Study (NCDS) and the British Cohort Study (BCS)[6]).

Most studies measured attainment outcomes in maths and English (including reading, writing and vocabulary), and commonly used statutory assessments, such as key stage 1 and 2 national assessments or other standardised tests. Several studies measured cognitive development (such as verbal and non-verbal skills, memory and mental flexibility) and others measured outcomes in addition to attainment, such as social and emotional skills and behaviour.

Typical limitations of the studies include:

- issues of missing data
- attrition in the sample
- small sample size
- inadequate control of potential confounding variables
- self-reported data
- measurement limitations

[6] Please see the glossary for more details on these studies.

- analysis of data at a single time point or relatively short-term over-time comparison

A number of sub-themes emerged in the analysis of evidence on this theme which are discussed below.

2.1 Cognitive capabilities and prior attainment

Nine studies provided evidence on the relationship between cognitive capabilities and prior attainment with later attainment outcomes, with all studies identifying a positive influence of these factors. Longitudinal analysis by Pearce et al. (2016) suggested that children with low cognitive ability were more likely to have low attainment scores and estimated that a third of the association between a child's socio-economic disadvantage and academic ability was mediated by cognitive ability. One of the conclusions from the IELS study (Classick et al., 2021) was that young children's attention – indicated by being 'on task' – was one of the factors most strongly related to children's emergent literacy and numeracy outcomes, and explained more of the variance in scores than deprivation indicators. Sullivan, Moulton and Fitzsimons (2017) found that children's verbal and non-verbal cognitive scores are strong predictors of attainment. Siraj-Blatchford et al. (2013) reported that both cognitive ability and the demonstration of problem-solving strategies were associated with children adapting more successfully to school and learning.

Cognitive abilities such as memory and non-verbal intelligence are strongly related to children's development of their first language, which is known to be fundamental to their attainment and progress at school. For example, children's language skills before they start school are associated with reading comprehension at school (Hjetland et al., 2017). Parsons, Schoon and Vignoles (2013) concluded that a child's early level of language ability, in terms of the extent of their vocabulary, is one of the most significant factors that can potentially counteract the typically negative relationship between parental worklessness (particularly repeated worklessness at multiple time points), and children's attainment and progress.

A systematic review by Allee-Herndon and Roberts (2019) offers some insight on the factors impacting the development of cognitive abilities. Recent research into brain function has identified the importance of executive function – which involves both cognitive and non-cognitive elements. Executive functioning takes place in the frontal lobe area of the brain associated with judgement, differentiation, anticipating outcomes, time management, attention and focus switching, planning and organising, remembering details and socio-emotional aptitude (Allee-Herndon & Roberts, 2019; Classick et al., 2021). This requires working memory, which has been found to affect academic progress throughout childhood and into adolescence (Donati et al., 2019). Although this is a relatively new field of enquiry, there is growing evidence to suggest that executive functioning skills are essential for succeeding in an academic environment. Deer, Hastings and Hostinar (2020) found that executive functioning was a significant

mediating factor in the relationship between family income in a child's early life and their later academic achievement. They suggest that chronic exposure to poverty-related stressors may lead to alterations in the neurobiological systems that support executive functioning, leading children to take a more 'reactive' rather than 'reflective' response pattern in order to better adapt to their environment. In addition, poor parental engagement with school and harsh parenting has been found to stifle children's cognitive growth and delay the development of executive functions (Allee-Herndon & Roberts, 2019). There is emerging evidence that these functions are malleable and can be nurtured by supportive parenting and education (Deer et al., 2020).

It is common for studies to find that children's attainment at a particular age or stage of education is highly correlated with earlier attainment outcomes. This may be because early attainment is a good indicator of underlying ability and/or because early success leads to positive reinforcement through self-concept[7], motivation and different treatment (such as praise from teachers or more challenging learning tasks). Susperreguy et al. (2018) reported significant positive predictive power of prior achievement on later achievement[8], even after controlling for child characteristics and demographic variables.

Intelligence quotient (IQ) has been found to be positively associated with academic performance[9] (Von Stumm, 2017). There is also a growing body of research into the heritability of IQ and the influence of genetics on attainment. Von Stumm et al. (2019) found that children's inherited DNA (or more technically, their genome-wide polygenic score (GPS)), is related to educational attainment. Using data from a large-scale longitudinal twin study conducted in England and Wales, they found GPS accounted for 5.7% of the variance in English and maths attainment from age 7 to 16. The authors also found that children with low GPS from less disadvantaged families had higher attainment than their counterparts living in more disadvantaged families, suggesting that higher SES appeared to compensate for the effects of low GPS on children's attainment. While collecting DNA samples is outside the remit of EOPS-B, it is nevertheless important to recognise its influence on children's attainment.

Collectively, these findings highlight the importance of measuring children's cognitive capabilities as they appear to have an important role to play in supporting attainment outcomes and there is some evidence that cognitive capabilities can be strengthened through appropriate parenting, learning and development activities.

2.2 Non-cognitive capabilities

Ten studies provided evidence on the relationship between attainment outcomes and so-called[10] non-cognitive capabilities such as motivation, self-concept and persistence. In

[7] Self-concept refers to children's thoughts and feelings about themselves, such as 'I am a good person'.
[8] Correlation coefficients ranging from 0.22 and 0.48 for maths, and 0.16 to 0.36 for reading.
[9] Correlation coefficients ranging from 0.24 to 0.39.
[10] Note that non-cognitive capabilities usually entail cognition, especially in younger children.

most cases, non-cognitive capabilities were significantly associated with attainment outcomes among primary-age children.

Several studies explored the relationship between attainment, motivation and self-concept and found these to be influential on children's attainment. For example, a meta-analysis of studies exploring the relationship between motivation and self-concept with academic achievement in children (Quílez-Robres et al., 2021) identified a moderate positive effect[11]. Susperreguy et al. (2018) found a positive effect of both self-concept of ability in reading on achievement in reading[12] and self-confidence in maths on achievement in maths[13]. Similarly, McGeown et al. (2015) found that both children's reading confidence and their reading attitude predicted variance in word reading skill[14]. The authors concluded that reading skill, attitudes, confidence and enjoyment were all related aspects in learning to read. Siraj-Blatchford et al. (2013) suggested intrinsic motivation[15] is one of several non-cognitive capabilities associated with children's learning. Although the literature commonly finds a relationship between these factors, the nature of the relationship is complex and it is not clear whether confidence and/or motivation affect attainment or vice versa or whether the relationship works in both directions.

Warren et al. (2019) conducted a longitudinal analysis of the relationship between academic attainment and children's general perceptions of intelligence (as opposed to perceptions of their own individual intelligence) – and whether they regard it as fixed and given (entity theory) or flexible and developmental (incremental theory). The authors found that holding an entity theory of intelligence[16] is negatively related to academic attainment[17]. However, this relationship did not hold for children eligible for FSM although children with FSM status and SEND held a significantly stronger entity theory of intelligence than their counterparts. This finding suggests that, while disadvantaged children are more likely to hold a fixed view of intelligence generally, other factors are likely to have a greater influence on their attainment outcomes.

Another aspect of non-cognitive capabilities commonly explored in the reviewed literature was self-regulation, defined in one reviewed study (Edossa et al., 2018) as the 'ability of individuals to adjust their cognition, emotion and behaviour in order to meet both intrinsic and extrinsic demands'. Siraj-Blatchford et al. (2013) concluded that self-regulation was an important factor in children's successful adaptation to school and learning. Pearce et

[11] r=0.32
[12] Effect size ranging from 0.12 to 0.17.
[13] Effect size ranging from 0.15 to 0.19.
[14] Effect sizes of 0.246 and 0.222 respectively.
[15] Intrinsic motivation means that an individual is involved in something for their own satisfaction, rather than being motivated by external pressures or rewards.
[16] The study involved asking children the extent to which they agreed or disagreed with three statements from Dweck's (2000) Theories of Intelligence Scale (cited in Warren et al., 2019): 'You have a certain amount of intelligence and you really can't do much to change it'; 'Your intelligence is something about you that you can't change very much'; and 'You can learn new things, but you can't really change your basic intelligence'. Higher scores of agreement indicated holding an entity theory of intelligence.
[17] r=-0.15 for maths and r=-0.19 for English.

al. (2016) found that children with low self-regulation scores were around twice as likely to have low maths and literature attainment, and that disadvantaged children were more likely to have low self-regulation. Some studies sub-divide self-regulation into behavioural and emotional types. Edossa et al. (2018) reported a substantial positive effect of behavioural self-regulation at age 7 on subsequent academic achievement at age 11[18] but only a negligible effect of emotional self-regulation.

Similarly, Quílez-Robres, Moyano and Cortés-Pascual (2021) provided evidence that emotional factors (such as emotional intelligence, emotional competence and emotional well-being) have a small positive effect on attainment outcomes[19], and that social factors (such as social intelligence, competence and social skills) have a moderate positive effect[20]. Major and Parsons (2022) identified a negative association between behaviour difficulties, such as hyperactivity, and attainment outcomes at age 5 and 16. In wider evidence from an international meta-analysis, identified for the EOPS-C literature review (Harland et al., Forthcoming), Mammadov (2022) found that conscientiousness was significantly and consistently correlated with academic attainment across primary and secondary age-groups[21].

Several authors identify possible mechanisms underpinning the development of non-cognitive capabilities such as self-regulation. These commonly include parenting and peer socialisation (Allee-Herndon and Roberts, 2019; Edossa et al., 2018). In addition, Vasilopoulos and Ellefson (2021) identified a positive influence of physical activity in supporting the development of emotional and behavioural self-regulation as mental processes are stimulated by the interaction between the body and external environment. Shankar, Chung and Frank (2017) point to food insecurity as a risk factor affecting children's behaviour and self-control.

Persistence and resilience have also been linked to attainment outcomes. A meta-analysis by Lam and Zhou (2019) found that perseverance of effort was significantly related to academic achievement[22]. Allee-Herndon and Roberts (2019) suggested that children from low-income households typically show reduced capacity for persistence with challenging academic tasks. Evidence from this systematic review suggests that children in poverty experience a less conducive environment to develop these cognitive and non-cognitive skills given the parental behaviours, parenting styles and chronic stress associated with poverty. Classick, Hope and Sharp (2021) found that being persistent (defined in the study as the extent to which the child usually continued his/her planned course of action in spite of difficulty or obstacles) was more strongly related to five-year-olds' attainment outcomes than deprivation indicators, and suggested that persistence may be open to influence through classroom-based pedagogy and specific

[18] Effect size 0.40.
[19] Effect size 0.17.
[20] Effect size 0.21.
[21] r=0.27
[22] r=0.21.

interventions. An example of this was given by wider evidence from Leonard, Garcia and Schulz (2020), who found that children's persistence was positively affected by seeing adults succeed through exerting effort, while explaining why this was worthwhile.

To summarise, there is consistent evidence in this review that both cognitive and non-cognitive capabilities are positively associated with attainment outcomes, and although these factors may vary depending on socio-economic disadvantage, there is evidence to suggest that they work independently of the effects of socio-economic disadvantage. There are definitional and measurement challenges, but if these can be overcome, there is a case to investigate this area further through EOPS-B.

2.3 Physical health

Five studies provided evidence on the relationship between physical health and attainment outcomes. This included health conditions, nutrition, physical activity, sleep and being breastfed as an infant[23]. Wider evidence indicates that the prevalence of long-term physical health conditions in school-aged children has remained stable in recent years (Panagi et al., 2022), though there have been substantial increases in obesity rates (Department for Education, 2022d) and these children are at higher risk of poorer long-term outcomes (including educational, physical and mental health).

There is strong evidence that being breastfed as an infant provides a healthy start in life and it may additionally support cognitive development. Quigley et al. (2012) found significant differences in cognitive development between 5-year-olds who were breastfed as infants and children who were never breastfed. Results showed that, after controlling for SES, breastfed children were 1 to 6 months ahead in cognitive skills and there were larger effects for children who were breastfed for 4 months or more. The authors suggest that this relationship may be underpinned by the components of breastmilk that are required in brain cell development and help defend against infections, as well as the stimulation from the close and secure interaction between the mother and infant. Major and Parsons (2022) also identified that not being breastfed was associated with lower attainment at age 5 and 16. Other early health indicators, such as low birth weight (5.5 lbs or below) and mothers smoking during pregnancy are also associated with reduced attainment outcomes for children aged 5, 7 and 16 (Jackson, 2015; Major & Parsons, 2022).

Keeping physically active has obvious health benefits in terms of maintaining body strength and a healthy weight, yet Vasilopoulos and Ellefson (2021) also identified an indirect effect of physical activity on children's academic achievement, through the benefits of physical activity for nurturing emotional and behavioural regulation. Conversely, school-age health problems tend to have a short-term negative impact on achievement, albeit with cumulative effects over time (Jackson, 2015). The author

[23] Note that evidence on children with SEND, including health-related disabilities, is provided in Chapter 3.

suggested this is likely to be due to increased school absence and lower educational expectations. However, prenatal and infant health problems appeared to have more enduring effects on children's later attainment, possibly through biological mechanisms.

Nutrition is an important component of physical health and food insecurity leading to child hunger is associated with poorer academic functioning in low-income children (Shankar et al., 2017). Interestingly, it appears that the effects of food insecurity need not be long term and the associated decrease in attainment in early primary due to food insecurity can be reversed if the child's household is no longer experiencing food insecurity by the time the child is midway through primary school. Possible underlying mechanisms for this relationship are both the physiological impact of having insufficient energy and nutrition and the social and emotional impact, such as heightened anxiety and the distraction of feeling hungry. Such findings may be particularly important in light of the potential for increasing issues of food insecurity during periods when the cost of living is higher. This suggests that food insecurity would be an important aspect to measure in EOPS-B.

Getting sufficient sleep is regarded as essential for healthy mental and physical development. Irregular bedtimes during the primary phase have been found to be related to lower cognitive test scores, and this is more common in socially disadvantaged families (Kelly et al., 2013; Parsons et al., 2013).

Given the evidence that these physical health factors are associated with attainment outcomes and that they are malleable with appropriate identification, support and intervention, these would be important aspects to explore through EOPS-B.

2.4 Wellbeing and mental health issues

Wider evidence shows that the incidence of probable mental health problems in 7- to 10-year-olds in England rose from 10.6% in 2017 to 15.2% in 2022 (4.5 percentage points), affecting almost double the proportion of boys (19.7%) compared to girls (10.5%) (Newlove-Delgado et al., 2022). Children eligible for FSM and with SEND are also particularly at risk of poorer mental health outcomes (Department for Education, 2022d). The pandemic may have also placed an additional pressure on children's wellbeing and a recent study found that half of all children and young people were concerned about the effects of the pandemic on their mental health, particularly girls (Department for Education, 2022d). However, this does not appear to have translated into an increase in probable mental disorders (as outlined in the introduction to this chapter).

There were notably fewer studies in the review providing evidence on the relationship between children's wellbeing and mental health and attainment outcomes. This is likely to reflect the fact that studies in this area tend to focus on the factors affecting mental health and wellbeing outcomes. It may also reflect the fact that mental health issues are commonly identified during adolescence rather than in younger children. Just four studies focused on this, although an additional two studies focusing on the home environment

also provided some evidence on the effects of children's mental health. The limited evidence available indicates a negative relationship between mental health issues and attainment.

Patalay et al. (2016) found a significant negative association between academic attainment and mental health issues characterised by externalising symptoms. In their longitudinal study, over three quarters (77%) of children with a low behavioural difficulties score went on to attain the expected outcomes at the end of primary education, compared to just over half (51%) of children with a high behavioural difficulties score.

Chowdry and McBride (2017) measured children's behavioural and emotional problems, including externalising (aggression, hyperactivity, conduct disorder) and internalising symptoms (depression, loneliness and anxiety). They found a negative relationship between children's early behavioural and emotional problems and educational attainment at both primary age (aged 10 years) and secondary age (aged 16 years)[24]. However, the size of the effect was reduced after taking account of other individual and family factors, such as parental education and maternal psychological wellbeing. Externalising behaviour was found to play a greater role than internalising behaviour.[25] Further analysis indicated that the relationship between behavioural and emotional problems at age 5 and outcomes at age 16 is fully explained by controlling for behavioural and emotional problems at age 10. The authors interpret this finding as indicating that the risk to outcomes at secondary age can be mitigated if behavioural and emotional problems can be addressed at primary age.

A longitudinal study of primary school children found that early externalising problems predicted poor later academic attainment for boys, while early internalising symptoms were not a predictor for either gender (Panayiotou & Humphrey, 2018). The authors suggested, however, that these findings may have been influenced by the study's reliance on teacher-reported mental health data, with teachers being more likely to report externalising problems than internalising symptoms, and for them to identify these symptoms more among boys than girls.

Quantitative analysis by Hartas (2012) revealed that the higher children scored on the Strengths and Difficulties Questionnaire (SDQ) (indicating internalising and externalising problems), the more likely they were to achieve below average attainment outcomes. Similarly, Parsons, Schoon and Vignoles (2013) found that not having behaviour problems in early childhood was associated with higher academic performance.

Morrison Gutman and Vorhaus (2012) used longitudinal data to examine the relationship between children's wellbeing and attainment. They found a positive association between higher levels of emotional, behavioural, social and school wellbeing at age 10 and better

[24] Effect size of around -0.15.
[25] Typical internalising behaviours include depressive disorders, anxiety disorders and somatic complaints (an extreme focus on physical symptoms).

educational outcomes at KS2 and 3. This relationship held regardless of gender and parental education level (an indicator of SES). This study also provided evidence that emotional and behavioural wellbeing became more influential on school engagement as children became older and moved through the school system, while demographic and other characteristics became less important over time. They concluded that attention problems present the greatest risk to attainment: *'The ability to control and sustain attention is a consistent predictor of children's learning*' (Morrison Gutman and Vorhaus, 2012, pg.6). This reinforces the importance of measuring this cognitive skill in the primary age group.

One possible explanation for the relationship between poor mental health and wellbeing and poor educational outcomes is that behavioural issues associated with such mental health conditions (such as externalising symptoms)[26] disrupt children's learning opportunities (Chowdry & McBride, 2017; Patalay et al., 2016) through, for example, making it more difficult for them to concentrate and remain on task (see section 2.1 above). Given the association that has been found in wider evidence between poor mental health and attendance for pupils of secondary age (Lereya et al., 2019), and between attendance and attainment (Klein et al., 2022), it is possible that reduced attendance may also play a role in mediating this relationship.

2.5 Gaps and implications

This rapid review has identified implications for the EOPS-B study relating to children's cognitive and non-cognitive capabilities and mental and physical health.

As there is consistent evidence that primary children's attainment is associated with cognitive and non-cognitive capabilities and physical and mental health, it will be important for EOPS-B to measure such factors to enable robust longitudinal analysis of their relationship with attainment. Several studies commented on the lack of longitudinal evidence that measures these factors and tracks the attainment of the same children over time (Lam & Zhou, 2019; McGeown et al., 2015; Quílez-Robres et al., 2021; Shankar et al., 2017; Warren et al., 2019). Based on this review, key attributes are: cognitive capabilities (especially attention and language skills), non-cognitive capabilities (such as self-esteem, self-regulation and persistence), mental health issues (such as externalising and internalising behaviours) and indicators of physical health (such as amount of physical activity, adequate sleep and basic nutrition or food insecurity).

Further evidence on these factors from the EOPS-B study will contribute to better understanding of the influence of cognitive and non-cognitive capabilities on attainment, how they interact and the direction of causality. It could also shed light on the influence of children's experiences at different ages, and their relationship with mental health and wellbeing. This will ultimately help to inform approaches and interventions to providing

[26] These can include dysregulated behaviour, conduct disorder, oppositional defiant disorder and anti-social behaviour.

appropriate support to build these skills from a young age and address areas of concern before they accumulate.

3. Special Educational Needs and Disabilities (SEND), experience of social services and adverse childhood experiences

Key findings:

- the review provides consistent evidence that children with SEND have lower average scores in educational attainment compared to their peers and are more likely to be excluded from school. In addition, many of the reviewed studies showed FSM entitlement (a proxy for income deprivation) was highly correlated with poorer educational attainment among those with SEND
- there is consistent evidence that children in need (CiN) and looked-after children have similar attainment trajectories to those with SEND, characterised by lower average educational outcomes than their peers. Looked-after children also have a higher prevalence of SEND and are therefore exposed to multiple risk factors. Accessing social services support earlier and for longer are noted as protective factors for improved attainment outcomes
- those who have experienced adverse childhood experiences (ACEs) were generally more likely to have received support for SEND and have poorer educational attainment at both key stage 1 and 2 compared to their peers. ACEs that are particularly associated with adverse attainment outcomes are parental substance use and domestic violence. The findings showed that children exposed to multiple risks did significantly worse in terms of their academic outcomes than those who were exposed to fewer risks
- whilst we know that certain types of SEND (such as profound or multiple learning difficulties) are more closely associated with poorer educational attainment, there are gaps in evidence on the factors that impact the educational attainment of children with SEND, looked-after children and CiN. More specifically, there is an inadequate exploration of the influence of personal and family characteristics and the learning environment they experience in schools. It will be important for EOPS-B to gather data to identify children with SEND, looked-after children and CiN, explore their experiences of primary education, and the support they access, to ultimately help provide greater insights to inform practice and policy developments to ensure more equitable educational outcomes for these children

This chapter focuses on three particular groups of children, namely those who have SEND, those who have experienced one or more particular adversities in childhood (such as a parent using substances), and those who have experience of social services (either as children in need (CiN) or those who are looked after through the care system).

Children in need is a broad definition spanning a wide range of children and adolescents in varying types of support and interventions for a variety of reasons. A child is defined as 'in need' under Section 17 of the Children Act 1989 as *'a child who is unlikely to achieve or maintain a reasonable level of health or development, or whose health and development is likely to be significantly or further impaired, without the provision of services; or a child who is disabled* (Child Law Advice, 2022). In practice, a child may fall into more than one of these groups.

The number of children with SEND comprises those who receive SEN support in school and those who have an education, health and care plan (EHCP)[27]. Both the number and proportion of children in each of these groups has been steadily increasing. In 2015/16, there were 558,648 children receiving SEN support representing 12.1% of all primary school-age children, increasing to 606,086 (13%) in 2021/22. The trend in the proportion of children with an EHCP has followed a similar upward trajectory but increasing more sharply from 60,446 (1.3%) of primary school-aged children in 2015/16 to 105,756 (2.3%) in 2021/22 (Department for Education, 2022c). Having an EHCP in place is important as it should guarantee a certain level of support in legal terms that others without such arrangements are not guaranteed.

The number of children in need has fluctuated somewhat but overall has increased from 390,130 in 2015 to 404,310 in 2022 (Department for Education, 2022h). Similarly, the number of children looked after has been steadily increasing over time, from 75,360 in 2018 to 82,170 in 2022 (Department for Education, 2022e). Whilst the statistics are not reported specifically for primary school, the number of children aged 5-9 who are looked after increased from 14,300 in 2018 to 14,890 in 2022 and the number of children aged 10-15 (which will include both primary and secondary school-aged children) who are looked after increased from 29,740 to 31,700.

There is a strong and compelling rationale for including these groups in the current study. Research undertaken by the DfE in 2022 (Department for Education, 2022b) illustrates that gaps in attainment emerge early in a child's life, with between 22% and 33% of pupils with an identified SEND achieving the expected standard at key stage 1 in reading, writing and maths teacher assessments (TA) in comparison to between 78% and 84% of pupils with no identified SEND. These attainment gaps persist over time and have a lasting impact on the progress that children make in later life and the pathways that they take. For example, only 20.8% of pupils with SEN support (that is those who have SEND but who do not have an EHCP in place) go on to higher education in comparison to 47.5% of pupils with no identified need.

Children in need (CiN) and looked-after children have similar challenges in terms of the gaps in attainment and impact on their pathways and outcomes (Department for

[27] The literature may refer to a child having a Statement of SEN in place. Since 2014, these have been incrementally replaced with an education, health and care plan. We therefore only refer to EHCP throughout this section of the report.

Education, 2022f). However, for these groups the impact is magnified due to a higher prevalence of SEND than in the general population of primary school-aged children. For example, in 2020/21, 23.6% of all CiN[28] were identified as requiring SEN support and a further 25.1% had an EHCP in place (Department for Education, 2022f). The picture is similar for those children who are looked after for 12 months or longer (27.4% of children were identified as requiring SEN support and 28.9% had an EHCP in place).

A total of 16 studies in this review provide evidence on the link between pupils with SEND, ACEs or those who have experience of social services, and their attainment outcomes. The studies include a range of methodological approaches, predominantly longitudinal, with several systematic reviews and single quantitative studies. The majority were based on data for the UK only, while 3 were international in scope, drawing on data from many countries.

The overall quality of the study designs differed, with the majority considered of medium, and several of high, value to the review in terms of the relevance and quality of design. Many of the studies extracted data from well-known data sets, such as the MCS and the Children in Need and Children Looked After data sets.

All of the studies which had a longitudinal design had one or more dependent/outcome variables for educational attainment scores/grades at the end of the Early Years Foundation Stage or at the end of one or more of key stages 1-4. Several of the studies included in the review had additional dependent variables including, cognitive, emotional and behavioural outcomes and verbal, non-verbal and maths skills.

The studies all reported a range of limitations including:

- small sample sizes (a particular issue for certain types of SEND such as dyslexia)
- under- or over-representation of children and young people from particular ethnic groups
- inability to separate out findings by particular characteristics such as age or gender, or other variables (for example, instances where violence had taken place)
- less evidence of what works in supporting children with SEND and experiences of social services and how to help them maintain their academic progress
- lack of data availability for some potentially important aspects of children's journeys through the care system
- high levels of participant attrition, for example, which in practical terms meant that children with higher levels of risk exposure were more likely to be lost to attrition,

[28] The data set does not present data for primary school-aged children specifically. These figures are for all CiN and all children who are looked after.

resulting in small, but nonetheless statistically significant, variations in the relative prevalence of each risk variable in the analysis

A number of sub-themes emerged in the analysis of evidence on this theme which are discussed below.

3.1 Children with SEND

Ten of the reviewed studies provided evidence on children with SEND. Consistent with the data presented above, the studies show that children with SEND attain lower average scores at the end of key stages 1 and 2 (A. Evans et al., 2020) and beyond into secondary education (Parsons & Platt, 2017), and attainment is particularly low for children with an EHCP. In addition, compared to their peers who have a similar attainment profile at their starting point, value added scores[29] for children with SEND were significantly worse than those without SEND and particularly so for those with an EHCP in place. Parsons and Platt (2017) concluded that while the attainment gap narrowed somewhat between key stage 1 and 2, 'SEN support did not seem to be equalising progress for children with SEN' (Parsons and Platt, 2017, p. 24).

In terms of the pathways of children in later life, a study by Cox and Marshall (2020), drawing on data from Scotland, showed that in general, young people with SEND were no more likely to disengage from education earlier than their peers[30]. However, young people with particular types of SEND (for example, learning difficulties or developmental disorders) and those with mental health difficulties were less likely to register for Highers qualifications.

This review identified a wide range of risk factors which impact negatively on pupils' attainment and other outcomes, including the type of SEND a child has, their gender, ethnicity, their family background (including income/deprivation levels) and behavioural difficulties they experience.

The type of primary SEND was identified as a statistically significant factor by several studies, with pupils who had profound and/or multiple learning difficulties, for example, having demonstrably lower educational attainment in comparison to those with less profound learning difficulties (Humphrey et al., 2013). Sayal, Washbrook and Propper (2015) found likewise. In their study, they looked at the relationship between particular types of behaviours present in children at age 7 and subsequent GCSE outcomes. Variables examined in their study included symptoms of inattention, Attention Deficit Hyperactivity Disorder (ADHD)[31], oppositional/defiant behaviours and hyperactivity. They found that greater prevalence of these behaviours resulted in poorer overall attainment at

[29] Measures of progress that take account of prior attainment.
[30] Of the nine health conditions, only the mental health condition indicator was significantly predictive of early disengagement (mental health condition, ß = 0.605, $p < 0.05$).
[31] The study did not include formal diagnosis for ADHD. The study looked for the presence of ADHD symptoms in children based on teacher and parent observations captured via a Development and Well-being Assessment.

GCSE level and less likelihood of children achieving 5 good GCSEs. O'Higgins, Sebba and Luke (2015) reported similar findings in terms of the progress made by children between the ages of 11 and 16.

Income deprivation and FSM entitlement were also identified as important factors as well as whether children lived in lone parent households (Parsons & Platt, 2017). Special educational needs and disabilities are much more prevalent among boys and this impacts on their attainment more significantly than for girls. Indeed, boys are much more likely to have higher special educational support needs, with over three-quarters (77.7%) of those with an EHCP in place being male (Parsons & Platt, 2017). The gender divide between boys and girls in terms of outcomes was also evident in the research undertaken by Sayal, Washbrook and Propper (2015) which showed that boys with particular types of SEND were more likely than girls to underperform. Boys with ADHD at age 7, for example, were twice as likely as girls with ADHD not to achieve five good GCSEs. Notwithstanding this, there is a growing body of research highlighting the under-identification of girls with special needs such as autism or ADHD. This may relate to differences in the manifestation of need and subsequent identification. Wider evidence indicates that this has meant an increasing number of females are receiving a diagnosis in adulthood (Lockwood Estrin et al., 2021; Tomlinson et al., 2020). It is important to note that the points made above relate to pupils' attainment only and it is beyond the scope of this review to explore the broader impacts of SEND on the mental health and well-being of both boys and girls.

Children with SEND are statistically more likely than those without SEND to experience bullying and report the lack of a safe space (either in the home and/or at school) (Parsons & Platt, 2017). This finding is consistent with wider evidence, for instance the Anti-Bullying Alliance (2021) report that 36% of young people with SEND frequently experienced bullying in comparison to 25% of those with no SEND. Being bullied has an adverse impact on attainment and this finding is consistent with other research beyond this review (see, for example, Allen, Riley and Coates, 2020). Fry et al. (2018) also suggested that boys who experienced bullying were 3 times more likely than those who did not to be absent from school, resulting in negative implications for their attainment. The level of bullying in a school has also been identified as one of the school effects associated with the attainment of learners with SEND (Humphrey et al., 2013).

Other literature has identified poorer outcomes for children with SEND across different ethnic groups. Families from minority ethnic backgrounds are less likely to apply for an EHCP for their child and where they do, may be less likely to appeal a decision where a local authority has decided not to give their child an EHCP (Hutchinson, 2021).

The findings above show that much of the variance in attainment outcomes for children with SEND can be explained by individual characteristics and family background. It follows therefore that SEND status alone, or in combination with other co-variates, does

not account for all of the variation in educational attainment (Humphrey et al., 2013; Parsons & Platt, 2017; Sutcliffe et al., 2017).

Notwithstanding this, schools can and do play a key role in terms of the quality of their provision and the extent to which their culture promotes inclusion of pupils with SEND. The literature findings show that children with an identified SEND who attend schools where there are larger proportions of children with SEND (including School Action Plus and EHCP) generally do better in terms of their academic attainment scores due to what Humphrey et al. (2013) termed the 'inclusivity effect'. Cox and Marshall (2020) suggest that intervening earlier and providing more specialist services and support to children with SEND is important in terms of helping to improve children's outcomes as well as tackling what the authors term 'low and inaccurate expectations of staff and parents' that can have a negative impact (for example, increasing rates of school exclusions).

3.2 Children in need and looked-after children

A total of 7 studies focused on the educational outcomes of CiN and looked-after children. Sinclair et al. (2020) found that children in both groups had similar attainment trajectories to those with SEND. This is to be expected, given the much higher prevalence of SEND in these groups. It is unsurprising, therefore, that a number of studies identified SEND status as a specific risk factor for these groups (Berridge et al., 2020; Fleming et al., 2021; O'Higgins et al., 2017; Sinclair et al., 2020).

A wide array of other risk factors are more prevalent for children who are looked after and are associated with poorer academic outcomes. For example, a comprehensive study conducted in Scotland (Fleming et al., 2021) found that these risk factors included: gender (with boys more likely to have poorer outcomes), being from an ethnic minority background, higher levels of absenteeism and school exclusion. In addition, wider evidence from beyond this review by Ford et al. (2007) found that looked-after children, in particular those in residential care who experienced recent placement changes, were at increased risk of all types of psychiatric disorder. Jay and Mc Grath-Lone (2019) also highlighted lower levels of aspiration to progress to higher education among those in care as another risk factor. One study pointed to the compounding effects for those being looked after who also have a special educational need, in that this group of children are at a greater risk of poorer outcomes than those with SEND in the general population (O'Higgins et al., 2017). Indeed, Ashworth and Humphrey (2020) found that as the number of risk factors a child experiences increases, difficulties in school functioning increase disproportionately, so that the number of risks a child faces is more important than the type of risk they experience.

Given the compounding nature of the risks that CiN and looked-after children face, particularly those who also have SEND, the literature points to the protective effects on attainment outcomes of entering care earlier and being in care longer. For those who are looked after, those who enter care earlier (particularly in primary school) were more likely

to start off on a 'High Achievement trajectory'[32] (Sutcliffe et al., 2017) and to have better attainment in comparison to those who entered care much later (Sinclair et al., 2020). Sutcliffe, Gardiner and Melhuish (2017) also found that for looked-after children, spending a greater amount of time in care during key stages 2-4 was an important ingredient in helping to explain higher levels of academic attainment at the end of key stage 4. O'Higgins, Sebba and Luke (2015) point to increased stability and less placement instability as important protective factors. In addition, O'Higgins, Sebba and Luke (2015) suggest that academic outcomes are improved where both carers and children themselves have higher aspirations.

3.3 Adverse childhood experiences (ACEs) and multiple risk factors

> ACEs are broadly defined as potentially traumatic events occurring in childhood and include aspects of the child's environment that can undermine their sense of safety, stability and bonding. They typically include:
>
> Abuse: physical, emotional and sexual
>
> Neglect: physical and emotional
>
> Household challenges: parental mental illness, incarceration, substance abuse, domestic violence and divorce.
>
> (Lacey and Gondek, 2021, p.1)

The research base examining the link between ACEs and health and social outcomes is relatively well advanced. Wider evidence from Lacey et al.'s (2022) analysis of ALSPAC data identified patterns in the way ACEs cluster together. Poverty was strongly associated with increased odds of reporting adversities[33], with a particularly strong association between poverty and mothers' mental health problems.

The ACEs most commonly linked to poorer outcomes include living in a household where one or more parents abuse alcohol or where the child is exposed to domestic violence. Wider evidence from a retrospective cross-sectional study of adults in the UK by Bellis et al. (2014) showed that those exposed to a range of ACEs had poorer health and social care outcomes compared to others and were more likely to expose their own children to ACEs in what is termed by Bellis as a 'cyclic effect'.

Notwithstanding this, little is known about the impact of ACEs on education outcomes at various stages of a child's journey through school and beyond. Research by Evans et al. (2020) is one of the first large-scale studies to shed some light on the impact of ACEs on

[32] This study used 'group trajectory analysis' of children's educational progress. This type of analysis identifies groups of individuals following similar progression paths (such as, in attainment). This study identified five trajectory groups: low achievement, late improvement, late decline, predominant and high achievement.

[33] With the exception of death of a household member.

attainment. Using attainment data from Wales, this study examined the impact of living in a household where a child is exposed to one or more ACEs (that is: parental mental illness, parental substance abuse, child victimisation, death of a household member and/or low family income[34]) on their attainment at ages 7 and 11. It found that not only does having one ACE have a negative impact on children reaching the expected attainment for their age, but that having multiple ACEs places children at substantially increased odds of not reaching the expected attainment levels at age 7 and 11. A study by Oliver, Kretschmer and Maughan (2014) looked at the impact of family dysfunction and examined adversities beyond those typically counted as ACEs. The study found that children living in households characterised by poor parental relationships, maternal depression and problems in parent–child relationships, experienced greater behavioural problems, which as noted above in sections 2.2, 2.4 and 3.1 is identified by various authors as being associated with poorer attainment.

Separately, a systematic review by Fry et al. (2018) examined the link between violence in childhood and levels of absenteeism and subsequent attainment, and found increased levels of absenteeism for both boys and girls. For boys, absenteeism from school was more prevalent among those experiencing bullying, physical violence and sexual violence in childhood, whilst for girls, high levels of absenteeism were strongly associated with sexual violence. Children with poor attendance at school are placed at increased risk of not attaining at the expected level throughout key stage 1 and 2 and beyond.

3.4 Gaps and implications

This rapid review has identified the following gaps in evidence which have implications for EOPS-B.

Individual differences between children only explain a proportion of the variation in attainment and value-added progress and, by extension, SEND status and SEND type in isolation only explain part of the variation in attainment. The studies have shown a wide range of factors within the family/home environment, at school and beyond, which help to explain variations in the attainment of children with SEND and who are looked after.

There is still considerable scope for exploring a broader range of factors that are suggested in the literature as being particularly influential, including: children's aspirations, exposure to ACEs, and other adversities (such as poor parent-child bonding and attachment[35]), and access to provision and support in school and across wider social services.

While schools account for less of the variation in pupil attainment than child and family characteristics, it is nevertheless important to understand the multiplicity of factors in

[34] Note that poverty is usually examined as a separate risk factor in research studies, rather than being considered as an ACE.
[35] Parent-child attachment happens when there is a stable emotional connection that forms in the process of interaction between a child and their parents.

mainstream schools and other settings that are conducive to the development of positive learning environments for pupils with SEND and/or those who are looked after. What is less clear from the research is the range of factors that are conducive to the development of positive learning spaces for children with SEND, looked-after children or CiN. It would also be worth investigating what role organisational and classroom structures play in enhancing pupils' learning, as well as teacher beliefs, practices, behaviours and actions.

The literature that does exist suggests that support from schools and local authorities at an earlier stage is important, particularly for those who are identified as CiN or who are looked after (Sinclair et al., 2020), but also for those experiencing ACEs or where parent-child attachment and relationships are poorer. More broadly, research undertaken by the Early Intervention Foundation (Department for Education, 2018) found that children and families are more likely to benefit when services are evidence-based and are known to make a difference to outcomes. An important consideration is that the services are appropriate to the child's age and the specific needs of families. Ashworth and Humphrey (2020) also point to the need for school-based interventions that have a strong logic model and evidence base to help enhance the development of protective factors (for example, high self-esteem and development of strong peer relationships)[36]. In addition, Cox and Marshall (2020) suggested that recalibration of the low expectations that teachers have of those with SEND is a critical factor in helping to foster a positive learning environment for children with SEND. It may also be useful to understand the extent to which environments that are supportive for these particularly vulnerable groups are also effective for the learning and development of all children. Therefore, the EOPS-B project should look to include a range of school/teacher-level variables in the study to examine this, where possible.

It will be important for EOPS-B to identify children with SEND, those who are looked after and CiN, and to capture their experiences of primary education as far as possible. It would also be beneficial to understand more about their experiences of support and services, such as how long they wait for support and reasonable adjustments to be put in place, what type of support they access and whether there are any barriers to accessing support. For instance, the literature suggests that children from minority ethnic backgrounds are less likely to be identified as having SEND, particularly in local authorities with smaller proportions of ethnic minorities, potentially due to stigmatism associated with the identification and seeking support. Such insights will help to inform developments in practice and policy to ensure more equitable educational outcomes for these children.

Beyond this, a number of the reviewed papers reported limitations due to 'missing' data. This may have led to under-representation of families living in deprived communities or from lone-parent families, and ultimately to under-estimations of the outcomes for young

[36] It seems possible that this could act as a protective factor or mitigation for bullying, although the study authors did not speculate on this.

people with SEND or who are CiN or looked-after children. It will be important for the EOPS-B study to over-sample particular groups based on their socio-economic background and family structure (such as lone parent households). Equally, for looked-after children, there were particular gaps reported in the reviewed sources (for example, pre-care experiences or the services they may have accessed) that might otherwise have helped to explain their attainment trajectories. It will be important for the EOPS-B study to attempt to build a picture of this via the research it undertakes with parents and carers.

4 Home environment

Key findings:

- this review provides consistent evidence of a strong association between children's attainment and the socio-economic circumstances of their home environment. Children living in a family with a low income, low parental education, parental worklessness and poor housing are at risk of lower attainment
- evidence indicates that there are some protective factors that can narrow the attainment gap for children from low-income families, particularly higher maternal education and living in owner-occupied housing
- there is some evidence that aspects of the home environment can be protective and promote better attainment outcomes for children. These include high parental expectations, parental support for the child's learning, parenting styles characterised by warmth and consistency, the availability of material resources and certain family structures (such as having fewer older siblings). However, many studies find these factors have a low impact once socio-economic variables are taken into account, indicating the more pervasive impact of household income, parental education and employment, on children's attainment and progress at school
- it will be important for EOPS-B to measure a range of socio-economic indicators as well as key aspects of parenting behaviour and the home learning environment

This chapter explores the relationship between the home environment and children's academic attainment in primary school. In this study we consider the home environment in terms of both socio-economic circumstances (including poverty, parental education, unemployment, housing and neighbourhood area conditions) and parenting behaviours and attitudes (including expectations and aspirations, homework support, shared reading and parenting style). There has also been a resurgence of focus on these factors due to the COVID-19 pandemic which led to a greater emphasis on parents' influence on children's education while they were learning at home (Outhwaite, 2020).

Households are considered to be in poverty in the UK if their income is 60% below the median household income after housing costs are accounted for that year (Joseph Rowntree Foundation, 2022b). More than 1 in 5 of the UK population are living in poverty and 4.3 million of them are children (Joseph Rowntree Foundation, 2022a, 2023).

This review identified 25 studies providing evidence on the link between children's home environment and their attainment outcomes. Most of these studies adopted a longitudinal

design, with several meta-analyses, systematic reviews and cross-sectional quantitative studies. Six of these studies were based on international evidence, with the remainder being UK-based studies. These 25 items are the main focus of this chapter, although almost all studies in the review provided some insights on the association between SES and children's attainment outcomes by controlling for this factor in analysis.

The studies were rated as of medium to high value in terms of both relevance to the focus of the review and quality of the design. Studies tended to measure attainment outcomes in maths and English, cognitive development and emotional skills. Studies tended to use key stage 1 and 2 (KS1, KS2) national assessments or other standardised tests to measure outcomes.

Limitations of the studies addressing this theme include:

- the possibility of bias introduced into parent- and teacher-reported measures
- sample and response bias created by non-response and attrition – generally favouring respondents from higher socio-economic backgrounds
- factors being measured at only one point in a longitudinal study when there is a strong likelihood it may vary over time
- small sample size
- reliance on cross-sectional studies
- limited representation of fathers' involvement

A number of sub-themes emerged in the analysis of evidence on this theme which are discussed below.

4.1 Family socio-economic circumstances

Family SES is consistently shown to be significantly associated with, and predictive of, children's educational outcomes.

Five studies focused on exploring the effects of poverty, all of which found it was a risk factor for children's poorer educational outcomes. For example, Dickerson and Popli (2016) found that children born into poverty had significantly lower cognitive test scores at ages 3, 5 and 7, which is predictive of lower attainment outcomes. Children who were persistently in poverty during their childhood had cognitive test scores at age 7 that were almost 20 percentile ranks lower than children who had never experienced poverty. This held even after controlling for a wide range of background characteristics and parents' involvement in helping with their child's learning at home. Similarly, Jones, Gutman and Platt (2013) found that poverty was associated with worse outcomes in cognitive skills, maths skills and KS1 attainment at age 7.

Notably, there is evidence from the review that persistent poverty has a larger cumulative negative influence on children's cognitive development than episodic poverty, where there appears to be some respite of periods of getting out of poverty (Dickerson & Popli, 2016). Schoon et al. (2012) also found that persistent economic hardship and experiencing poverty very early in life had a strong negative effect on children's cognitive functioning at age 5.

Poverty is also a risk factor for children's poorer listening, reading and writing outcomes. For example, Hartas (2012) found that the lower the family income, the higher the likelihood of a child being rated by teachers[37] as below average in listening, reading and writing assessments at the end of KS1. Furthermore, four times as many children in the richest quintile were rated as above average in reading and maths than children in the poorest quintile (Hartas, 2015).

The review found limited explanation on how poverty acts as a risk factor for children's attainment. Schoon et al. (2012) suggested that a lack of money limits the amount and quality of material resources that are available to children. Similarly, Hartas (2012, 2015) has argued that educational inequalities are largely the product of societal structures exacerbated by differential access to resources that are available to those with more money.

In addition to the direct effect of poverty on children's attainment outcomes due to inadequate resources, there may also be indirect effects through the influence it has on parents' behaviour. For example, Hartas (2012) points out that coping with financial disadvantage can be taxing on parents' non-financial-resources. This can limit parents' time and capacity to be involved in the child's education, thereby leading to a weaker influence of parental involvement. This hypothesis is supported by other studies (Dickerson & Popli, 2016; Washbrook et al., 2013) which found that the negative effect of poverty on children's attainment outcomes is mediated by its adverse effects on parental inputs and the quality of the home learning environment[38].

4.1.2 Parental education

Seven studies identified a lower level of parental education as a risk factor for children's educational outcomes. One study (Washbrook et al., 2013) found the influence of parental education on attainment outcomes was twice the size that of income. Similarly, Hartas (2012) found that maternal education was significantly associated with teacher-rated scores for children's reading/writing and speaking/listening. Hartas (2015) found that 6 times as many 7-year-olds with a degree-educated mother were rated as above average in reading and maths compared to children with educationally unqualified

[37] Note that reliance on teacher ratings could have introduced an element of bias to this relationship.
[38] It is possible that this could operate through mechanisms such as maternal mental health because, as reported in Chapter 3, there is a relationship between poverty and ACEs, especially in terms of maternal mental health issues.

mothers. An international meta-analysis of 41 studies involving children in grades Kindergarten to 12 (ages 5 to 18) also found that one of the biggest effect sizes between cultural capital variables and outcomes was evident when cultural capital was defined as parental education (Tan, 2017). A study by Macmillan and Tominey (2021) examined the effect of increased parental education by comparing the outcomes of children whose mothers left school at aged 15 compared to 16 (related to the raising of the school leaving age in England). They found that children of mothers who left school at aged 16 had higher cognitive test scores at age 4/5 and 6/7 compared to children of mothers who left school at age 15. Additionally, children where both parents were affected by the reform to raise the school leaving age, and therefore both had an additional year of compulsory education, had higher test scores than children with one parent affected.

The evidence suggests that parental education can act as a protective factor for the most disadvantaged children, helping to narrow the attainment gap. Jones, Gutman and Platt (2013) found children living in family poverty, but with highly educated mothers had maths and KS1 scores that were closer to children not living in poverty. This was one of only two factors that this research identified that could narrow the socio-economic achievement gap (the other factor being owner-occupied housing status). Evans and Field (2020) also found that the strongest predictor of attainment outcomes at age 11, as well as academic progress between ages 7 to 16, was parental education.

Sullivan, Moulton and Fitzsimons (2021) also suggested that parental education is a more powerful predictor of children's attainment outcomes than social class, income or home ownership. They argued that part of the association between parental education and children's vocabulary is explained by greater vocabulary of more educated parents. For example, parents with an undergraduate degree knew twice as many words as parents with no qualifications. They suggest that parental language skills are an important part of the non-material resources (cultural capital) that more educated parents possess and transmit to their children.

Other evidence in our review suggests that this link between parental education and children's achievement is explained by the relationship between education levels and income. This is because more highly educated people tend to have higher earning potential. For example, Macmillan and Tominey (2021) found that the mothers affected by the policy decision to raise the school leaving age offered their children higher human capital[39] and family income than the mothers who left school before 16. The authors found that these financial resources could explain up to 59% of the effect of parental education on their children's cognitive skills.

4.1.3 Parental employment status

Parental employment status, that is, whether parents are in paid work or not, is inherently related to their income and is therefore associated with children's attainment outcomes.

[39] In this study, human capital included home ownership, being married and being employed.

The review identified two studies that looked at particular aspects of the influence of parental employment. Parsons, Schoon and Vignoles (2013) found that both persistent and intermittent parental worklessness were associated with lower levels of academic achievement among children at age 5. They also found that persistent parental worklessness was associated with worse attainment outcomes among children than intermittent worklessness. Interestingly, this study found that lower parental education levels and low weekly income could not explain the whole association between parental unemployment and children's early school performance. The authors therefore suggest worklessness has independent risk effects.

Conversely, Nicoletti, Salvanes and Tominey (2020) found that parents working longer hours could be detrimental to children's educational outcomes. This study found a negative direct effect of an increase in mother's work hours on child test scores at age 11. This effect was even stronger for boys as an increase in mother's weekly labour hours significantly lowered the outcomes of boys at age 11 by 5.4%. However, for both genders, the resultant effect of mothers increased working hours on the household income fully compensated for this negative direct effect by age 15. This evidence suggests that while there may be some direct benefits for children's educational outcomes of having parents who work fewer hours, this is overridden if it is to the detriment of the household income and results in low income and poverty.

4.1.4 Housing and wider neighbourhood area

Four studies explored the impact of children's wider ecology, such as housing and neighbourhood area conditions, on their attainment. Parsons, Schoon and Vignoles (2013) found that living in social or private rented housing and overcrowded conditions was significantly and negatively associated with school performance at age 5. Conversely, evidence suggests that good housing can act as a protective factor for those most disadvantaged. Jones, Gutman and Platt (2013) found that poor children whose families lived in owner-occupied housing had KS1 scores that were closer to children who had never been in poverty.

Jones, Gutman and Platt (2013) also found that living in a less deprived area was associated with children having better maths skills. Some literature suggests that more affluent areas tend to be greener which is beneficial for children's development. For example, Reuben et al. (2019) found that children living in residencies surrounded by more neighbourhood greenery scored significantly higher on IQ measures at ages 5 and 11. However, this association did not hold after accounting for family and neighbourhood SES, which suggests a correlation between limited exposure to greenery and lower deprivation.

The area children live in could affect the quality of school they attend, but the research provides conflicting evidence on this. Macleod et al. (2015) identified a positive association between the KS2 performance of children eligible for FSM and attending a

school with higher proportions of children eligible for FSM. However, Classick, Hope and Sharp (2021) found a negative relationship between attending a school in a deprived area and 5-year-olds' emergent literacy and numeracy after controlling for the effect of parental SES.

The numerous studies outlined in this section highlight the importance of SES for children's achievement. Whilst there has been promise of greater social mobility, the association between family SES and children's primary school performance has remained stubbornly stable for many years (Von Stumm et al., 2022). Notably, much of this research also found that when parents living in poverty provided a positive home learning environment, this reduced but did not completely counteract the effects of poverty and disadvantage. This is explored further below.

4.2 Parental attitudes and behaviours

There has been a significant research and policy focus on parental attitudes and behaviours as risk and protective factors for children's attainment. This is partially because these factors are deemed potentially 'malleable' to intervention. Whilst the studies in this section do support the role of parental behaviours in influencing children's attainment outcomes, they also highlight the limitations of this in relation to the more pervasive effects of socio-economic factors.

4.2.1 Parents' academic expectations

Four studies included in this review show that parental expectations can be a particularly important protective factor. Axford et al. (2019) conducted a meta-analysis of 9 papers and found that parental influence plays a key role in improving children's attainment. This association was strongest when characterised by high expectations for their children's academic achievement. Kim and Hill (2015) also found the strongest relationship between parental expectations (of both mothers and fathers) and children's achievement was where it constituted 'academic socialisation', whereby parents communicate the value and utility of education. Similarly, according to a meta-analysis of 41 studies by Tan (2017), parental expectations had one of the largest individual effect sizes in relation to pupil achievement.

Support for the positive influence of high parental expectations on attainment outcomes also comes from qualitative research. Siraj-Blatchford et al. (2013) identified two groups of low SES children aged 3-11: one group which achieved results predicted for children of their SES and one which achieved higher than predicted results. Qualitative analysis showed that the latter group tended to have parents who set and reinforced high standards of academic aspirations for them. Conversely, the former group tended to have parents who expressed helplessness and felt unable to provide support or encouragement for learning and success in school. While this study does not make any claims as to causality, the authors speculate that children tend to have more academic

success when they are exposed to people around them who believe in them, encourage them, and challenge them – and this helps children to develop a strong sense of self-efficacy with regard to academic success (Siraj-Blatchford et al., 2013). The influence of parenting styles on children's attainment is explored further in section 4.2.3.

4.2.2 Formal and informal home learning support

Twelve studies explored the relationship between home learning support and children's achievement, providing mixed and to some extent contradictory evidence on the extent to which this is protective and can reduce the attainment gap for disadvantaged children despite SES characteristics.

Dickerson and Popli (2016) identified a positive relationship between home learning environment factors such as how often a child was read to, engaged in painting, was helped with reading/writing/maths, and visited the library at age 3, and cognitive ability at age 5. Sammons, Toth and Sylva (2015) also found that a good quality home learning environment in the early years and throughout primary school – including enriching outings, painting, reading and dancing – almost doubled academic achievement at age 11. Similarly, Parsons, Schoon and Vignoles (2013) found that parents reading to children, taking them to the library, and teaching them the alphabet, numbers, and songs at age 2-3, were significantly associated with school achievement at age 5. However, this did not significantly reduce the association between parents being out of work and adverse impacts on children's outcomes (Parsons et al., 2013).

A meta-analysis by Sénéchal, Whissell and Bildfell (2017) found that parent teaching and shared parent-child reading was positively associated with children's literacy and oral language skills at ages 3-5 across multiple languages. According to Puglisi et al. (2017), children's exposure to storybooks and direct literacy instruction at ages 3-4 was predictive of their English skills at age 5.

Hartas (2012) found that frequent maternal reading habits offered intellectual enrichment at home and were significantly associated with the child's learning outcomes. Compared to mothers who never read for enjoyment, having a mother who read every day was associated with a reduction in being rated 'below average' at age 7 by the magnitude of 43% for speaking, 85% for reading and 80% for writing. Hartas (2012) argued that educated mothers who read frequently for enjoyment modelled reading habits and exposed their children to educational and cultural resources.

Classick, Hope and Sharp (2021) found that parents having regular back-and-forth discussions with their children about their feelings was positively related to emotion identification at age 5, which other authors (such as Quílez-Robres, Moyano and Cortés-Pascual (2021), see section 2.2) have associated positively with attainment. Moreover, Tan (2017) identified a positive and significant relationship between parent-child

discussions and children's maths, reading and science outcomes, and suggested this was a result of parents passing on cultural knowledge and language.

A systematic review by Huat See and Gorard (2015) identified consistent evidence of a positive association between parental behaviour and their child's enhanced attainment. Such behaviours include home-school partnerships and parental interest in children's academic activities. The authors identify two mechanisms that could explain the effects of parental behaviour on children's educational outcomes. First, where the parent acts to some degree as an additional teacher, providing instruction and resources at home, reading to the child and going on outings. Second, where cultural norms of communication and behaviour in the home and at school are similar, children can find it easier to adapt and, conversely, where these cultural norms diverge, children can find it difficult to understand the behaviours expected of them in school and how to interact with teachers. Evidence from Evans and Field (2020) also highlighted the positive influence of parental involvement with school and children's academic progress.

However, other evidence brings into question the extent to which home learning support can counteract the adverse impact of poverty and lower SES. Sénéchal, Whissell and Bildfell (2017) found the associations between a positive home learning environment and improved attainment outcomes were reduced or no longer significant once the analysis controlled for parental education and maternal language skills. A number of studies (Puglisi et al., 2017; Sullivan et al., 2017) have suggested that literature exploring the home learning environment has typically downplayed parents' own knowledge, language and reading abilities which are a fundamental learning resource influencing the quality of the home learning environment. This is important because it suggests that initiatives such as encouraging parents to read to their children may not bring about the same benefits for children as a highly educated parent.

In contrast to the evidence suggesting informal parental support and exposure to learning activities are protective factors for children's attainment, some studies find no link between formal home learning activities and children's attainment outcomes. Hartas (2012, 2015) found that home learning support (comprising both homework support and more informal learning activities) did not make any substantive contribution to teachers' ratings of children's reading, maths and science ability at age 7. A study by Axford et al. (2019) found no relationship between parents providing homework assistance and their child's academic achievement. An international meta-analysis by Kim and Hill (2015) reported that parents providing homework help was not significantly correlated with their children's achievement at grades K-12 (ages 5-18). However, as all 3 of these studies provided evidence of the positive and significant influence of other or more general forms of parental involvement in education, these findings may relate more to the nature of homework specifically.

4.2.3 Parenting styles

Four studies provide evidence on the relationship between parenting style and children's educational outcomes. Evans and Field (2020) identified harmonious parent-child relationships as important factors predicting attainment and progress. Jones, Gutman and Platt (2013) found that the 'strict enforcement' of rules, closeness between parent and child, and mother's positive perception of her parenting, were all positively associated with children's verbal skills. Melhuish and Gardner (2021) found that greater warmth in the child/parent relationship was associated with better KS1 outcomes and higher scores on the phonics screening check in year 1. Higher parental limit-setting was also associated with better KS1 outcomes. On the other hand, higher permissive parenting and higher invasiveness were both associated with poorer KS1 outcomes, indicating that the most effective parenting styles in terms of children's academic performance lie somewhere in between these two extremes. Wider evidence from Batcheler et al. (2022) suggests that levels of conflict and closeness in the parent-child relationship vary particularly by maternal psychological distress.

However, the evidence on the effect of parenting style on children's attainment was not entirely consistent. Hartas (2012) found that parental warmth and discipline did not explain a significant amount of variance in teacher-rated assessments of children's attainment at age 7, although maternal affection was positively associated with improved speaking and listening. A meta-analysis by Axford et al. (2019) found only a weak association between parenting style and academic attainment of children aged 3-16. It is therefore possible that the variation in results is related to study characteristics, such as the measures used, which reinforces the need for high quality measures in EOPS-B.

4.3 Resources and enrichment

Four studies highlighted how physical materials and resources available to children in their homes may contribute to educational outcomes. For example, Tan (2017) found that access to home educational resources was a significant predictor of pupils' achievement. Classick et al. (2021) also found that having more than 50 books in the home was associated with greater development in emergent literacy and numeracy for children living in the most deprived areas. Sullivan, Moulton and Fitzsimons (2021) similarly found that having over 500 books in the home was associated with a similar vocabulary advantage as having a parent with a post-graduate degree. However, including parental vocabulary in this analysis, once again, reduced the influence of purely the number of books in the home – suggesting considerable interaction between these factors (Sullivan et al., 2021). Lastly, Talaee et al. (2018) found that home computer use had very little impact on children's progress and performance in maths, reading and writing in primary school at ages 7 and 11.

4.4 Family structure

Five studies highlighted the role of family structure in children's attainment. Jones, Gutman and Platt (2013) found that having more siblings was associated with worse cognitive skills, maths skills and KS1 attainment at age 7. Poor children who attained higher results had fewer siblings on average than poor children who did not perform above expectations. According to Sullivan, Moulton and Fitzsimons (2021), children with older siblings had significantly lower vocabulary scores, whilst the number of younger siblings made little difference. Washbrook, Gregg and Propper (2013) also found a larger family size in low-income families also contributed significantly to poorer cognitive development at age 7.

There is also some evidence of greater risks to children's development in lone parent families (Jones, Gutman and Platt, 2013) and in families where parents are divorce, particularly if they lose contact with a parent (see section 3.3 for further discussion of adverse childhood experiences). Schoon et al. (2012) measured family stability using information about changes in the mother's relationships. The research found no association between family instability and cognitive scores at age 5, after controlling for family poverty. Yet wider evidence suggests that the quality of relationships is paramount as high levels of conflict in parents' relationships can affect outcomes at an early age and into adolescence (Batcheler et al., 2022). Although Rollè et al. (2019) found that complete absence of fathers was associated with impaired child cognitive function, they concluded that fathers' involvement can still positively affect children's development even when they do not live with the child. Similarly, Tanskanen and Erola (2017) found that involvement of non-resident fathers (including higher contact frequency, relationship closeness, and financial support) was associated with increased cognitive and educational scores for their children.

4.5 Gaps and implications

The rapid review has identified several key gaps in evidence which may have implications for EOPS-B. Firstly, whilst many factors have been explored in relation to SES and the home learning environment in existing literature, the measurement of outcomes has often been limited to a single age group. There appears to be less analysis that tracks impacts to the end of primary school at key stage 2 (KS2) (Jones, Gutman and Platt, 2013). Therefore, it will be important for EOPS-B to measure home environment factors longitudinally to enable future analysis to explore the influence of SES and the home learning environment over time and for children at different ages and stages of development.

Second, it will be important for the EOPS-B study to collect, or enable linkage to, data on a range of SES indicators to measure children's exposure to episodic and persistent poverty over time. The prevalence and effects of poverty on children's attainment means it is imperative for EOPS-B to measure it, alongside other socio-economic factors related

to poverty, not least because of concerns about the impact of the current rising cost of living on children's educational attainment (Montacute, 2022; Office for National Statistics, 2024). Several studies in this review mentioned the limitations of relying solely on pupils' FSM eligibility as an indicator of SES[40]. This review has provided evidence that parental education appears to influence attainment outcomes independently of the effects of income and will therefore be an important factor to track.

The EOPS-B study will also benefit from measuring key aspects of home learning support, including parents' aspirations, parents' involvement in their child's learning activities and resources at home, as there is potential for targeted intervention to bolster these aspects. There appears to be a range of parental attitudes and behaviours that can influence children's attainment, which may be related to parental education levels and language skills. It would therefore be valuable for EOPS-B to capture parents' attitudes to education (such as valuing education, encouraging their child's participation in school, and the extent of their communication with school) as well as particular aspects of the home learning environment (such as providing help with homework, books and resources in the home, outings and extra-curricular activities).

Third, much of the salient research on the home environment focused on the influence of the mother (Kim & Hill, 2015; Macmillan & Tominey, 2021; Puglisi et al., 2017). It will therefore be important for EOPS-B to collect data about the influence of both mothers and fathers, to facilitate more nuanced understanding of how this relates to children's attainment. In addition, there is little attention paid in the literature to the influence of step-parents, which could be worthy of further investigation.

Lastly, many of the studies cited (Dickerson & Popli, 2016; Hartas, 2012, 2015; Jones, Gutman and Platt, 2013; Parsons et al., 2013; Schoon et al., 2012; Sullivan et al., 2021) used the MCS sample, which authors highlight has an over-representation of more advantaged families (Parsons et al., 2013; Schoon et al., 2012). This means that their findings may have underestimated the negative effects of poverty and outcomes. It will thus be important for EOPS-B to ensure a socio-economically representative sample. The evidence also suggests it would be useful to collect data on other potentially influential aspects of the home environment, including the quality of housing and family structure (such as the number of a child's older siblings).

[40] This will also become more complex in future, given the expansion of FSM eligibility due to the transitional arrangements to smooth the introduction of Universal Credit (Julius & Ghosh, 2022).

5 Experiences of school

Key findings:

- the review has provided evidence that children's attainment is positively influenced by the following experiences at primary school:
    - readiness to start school, which can be aided by attending ECEC
    - quality teaching, characterised by teacher feedback, warmth and support, facilitated peer interaction, clear routines and consistent behaviour management
    - strong leadership and effective use of performance data
    - relationships with teachers, parents and between pupils characterised by high expectations and aspirations, support and friendship
    - an inclusive and engaging curriculum and access to a range of extra-curricular activities
    - high attendance
- the implications for EOPS-B are to consider collecting data on these factors, including children's participation in extra-curricular activities and learning support interventions, as well as their views on school

This chapter explores the relationship between children's experiences of school, and their academic attainment and progress at primary school. There are many policy and practice developments that aim to narrow inequalities in attainment in the drive to deliver positive outcomes for all children. These include longstanding school-wide policies such as the pupil premium (introduced in 2011), evidence-based practices such as those identified in the Education Endowment Foundation's (EEF) Teaching and Learning Toolkit, and targeted interventions such as the recent National Tutoring Programme designed to support learning recovery following the COVID-19 pandemic. This chapter collates the evidence from this review on the range of school-level factors that are associated with academic attainment.

The review identified 21 studies providing evidence on the association between attainment outcomes and various aspects of the school experience. The selected studies used a range of methodological designs, including longitudinal analysis, meta-analysis and systematic reviews, single quantitative studies, mixed method studies and single qualitative studies. The majority of studies were conducted in the UK, with the exception of all four meta-analysis included in this theme, which were based on international evidence. This reflects the decision to prioritise UK evidence in the review, which was considered particularly important for this theme given the specificity of educational

systems. However, it also suggests a lack of recent UK-focused meta-analysis on the influence of school factors on children's attainment.

The studies were rated as medium to high value to the review in terms of both relevance to the focus of the review and quality of design. They used a range of well-known longitudinal data sets. Most studies measured attainment outcomes in maths and English and used statutory assessments such as key stage 1 and 2 national assessments or other standardised tests. Some studies also tracked progress between national assessments, for example the Early Years Foundation Stage Profile (EYFS) and key stage 4 (GCSE) assessments. Several measured other outcomes in addition to attainment, including non-cognitive skills and behaviour.

Limitations of the studies within this theme include:

- various forms of bias (including sample, publication and response bias)
- inadequate control and exploration of potential confounding variables, mediating and moderating variables
- questions of relevance to the current education system given that some of the data was collected before 2012

A number of sub-themes emerged in the analysis of evidence on this theme which are discussed below.

5.1 The influence of ECEC on children's progress and attainment

ECEC provision is provided by a mixed economy, comprising the maintained, private, voluntary and independent sectors. At the time of writing, all 3- to 4-year-olds are entitled to 15 hours per week of free provision and children of working parents are entitled to 30 hours per week. Children from the most economically disadvantaged families are eligible for 15 hours per week of free ECEC at the age of 2. Children start school in reception in the academic year of their 5th birthday. Despite the availability of ECEC, not all families take up a place and children who are eligible for FSM are less likely than their peers to attend (Campbell et al., 2019).

The evidence from the review indicates that the attainment gap already exists at the start of primary education and high-quality ECEC experiences help to ensure children are ready for school, though they do not necessarily eliminate the attainment gap (Classick et al., 2021).

Seven studies provided evidence on the relationship between attainment outcomes in primary education and attainment in the early years, and children's readiness for formal schooling in terms of basic skills. Children's attainment before they start school is highly predictive of future attainment in primary school and through to GCSEs (Major &

Parsons, 2022; Parsons & Hallam, 2014). Hjetland et al. (2017) suggested that early skills such as language are associated with better reading comprehension at school.

In a summary report of the Effective Pre-School, Primary and Secondary Education project (EPPSE) study, Sylva et al. (2014) documented benefits for children's school readiness and early attainment of attending a group ECEC during the early years (compared to not attending). They found that these benefits lasted throughout primary and secondary phases of education. It was also found in longitudinal analysis by Sammons, Toth and Sylva (2015) that just attending ECEC doubled the chance of a child being a high achiever at age 11 and there were further benefits of attending a high-quality setting. Longitudinal analysis using data from the Study of Early Education and Development (SEED) (Melhuish & Gardiner, 2023), showed that attending formal group ECEC was related to higher non-verbal ability of all children, particularly those from low SES backgrounds, and this effect was greater when children attended high quality settings.

5.2 School characteristics, systems and structures

Seven studies in the review provided evidence on the association between children's attainment outcomes and certain school characteristics, systems and structures.

Longitudinal analysis by Strand (2016) found that in the most effective schools, all pupils (including those eligible for FSM, male and female, and from different ethnic groups) make progress. However, schools with higher proportions of pupils eligible for FSM tended to have similar, significantly poorer attainment outcomes at key stage 1 across maths, English and science, even after controlling for individual pupil FSM status[41] (Strand, 2016). Parsons and Hallam (2014) found that schools where a higher proportion of pupils displayed behavioural difficulties tended to have poorer key stage 1 attainment outcomes. In addition, schools with larger year groups, higher proportions of children with SEND and from white British ethnic backgrounds, were associated with relatively lower attainment among pupils from disadvantaged backgrounds (Macleod et al., 2015). Such characteristics also suggest that some schools are supporting a pupil intake with greater and more complex needs than others.

Other school characteristics, such as school type have been associated with attainment outcomes. Macleod et al. (2015) found that sponsored academies and rural schools tended to have poorer academic outcomes for disadvantaged primary pupils after controlling for characteristics of their intake. In contrast, converter academies, selective schools and teaching schools were associated with higher attainment among disadvantaged children and greater improvement over time (Macleod et al., 2015). However, the evidence consistently shows that, while the contribution of schools may be important, the effect of attending a particular school is much smaller than that of parental,

[41] Effect size –0.18 for English.

family or other pupil factors (Washbrook, Gregg and Propper, 2013; Stokes et al., 2015). As Strand (2016, p.135) observed: ‘schools are unlikely to be the major locus of equity gaps in pupils' educational progress'.

Some literature has explored particular systems and structures in primary schools and the extent to which these may be associated with improvements in attainment outcomes. Many schools divide pupils into ability groups for literacy and numeracy teaching. There is evidence that this can significantly impact on pupils’ academic progress, but not always in a positive way. For example, Parsons and Hallam (2014) used data from the MCS to compare the attainment of children taught in mixed ability classes with those taught in ability groups (or ‘sets’). Compared to children with similar characteristics[42] in mixed ability classes, being in a ‘top’ set was significantly positively associated with KS1 attainment outcomes[43], but being in the ‘bottom’ set was significantly negatively associated with attainment outcomes[44]. The authors argue that these findings support the ‘divergence hypothesis’ that ability groups produce greater differences between lower and higher attaining children, while mixed ability systems reduce them. Furthermore, Murphy and Weinhardt (2018) identified a relationship between pupils’ ‘rank’ by performance in their class at primary school and future attainment in secondary school, such that children with a higher ‘rank’ in performance at primary school achieved higher test scores at age 14 and 16.

Several studies explored relative age effects (also known as season of birth effects) which is a particularly well-documented factor associated with attainment outcomes. Crawford, Dearden and Greaves (2013) found relatively large differences in educational attainment between children born at the start and end of the academic year, and even a one-month difference in age had a significant effect. Summer-born children were predicted to score lower than their Autumn-born counterparts, with when they were born accounting for around 45% of the difference in key stage 1 scores[45]. They argued that the school assessment system reflects the difference in age at the point at which the assessment was taken. While these differences were greatly reduced by the end of primary school, season of birth can still have a moderate effect at key stage 4 with summer-born[46] children receiving lower total GCSE scores than autumn-born[47] children as well as lower scores in English and maths (Major & Parsons, 2022; Sylva et al., 2014).

[42] The analysis controlled for child, family and school characteristics, including SES and prior attainment.
[43] Effect size 0.13.
[44] Effect size -0.12.
[45] The difference in age of starting school accounted for 11%, the difference in length of schooling accounted for 12% and the difference in relative age accounted for 32% of the difference in KS1 scores.
[46] Commonly defined as those with birthdays in May to August.
[47] Commonly defined as those with birthdays in September to December.

5.3 Teaching and pedagogy

Eight reviewed studies provided a range of evidence relating to aspects of teaching and pedagogy that are associated with primary-school children's attainment outcomes. Authors both within and beyond this review widely agree on the importance of high-quality teaching for facilitating pupils' progress and educational achievement (Baars et al., 2018; Macleod et al., 2015; Strand, 2016; Sutton Trust, 2011). The review included several studies that offered insights on particular aspects of high-quality teaching.

According to Wang et al. (2020), classroom climate has a small positive association[48] with academic achievement across primary and secondary year groups. There are three important features of this classroom climate:

- instructional support (with features of quality feedback, techniques to enhance pupils' critical thinking and encouraging high expectations)
- socio-emotional support (including warmth, safety, connectedness and opportunity for quality interactions between teachers-pupils and pupils-pupils)
- classroom organisation and management (including classroom routines, consistent enforcement of rules, positive behaviour supports and management of disruptive behaviour)

Tenenbaum et al. (2020) identified a small but meaningful positive effect on learning outcomes of pedagogical approaches involving peer interaction[49]. The author also noted particular learning benefits of peer interaction that asked peer groups to reach a consensus in their task as this involved verbal interaction to negotiate and consider different perspectives. Other authors add further weight to these pedagogies and highlight the importance of good behaviour management, feedback and peer-to-peer interactions in improving attainment outcomes for disadvantaged pupils (Baars et al., 2018; Macleod et al., 2015).

Studies by Macleod et al. (2015) and Baars et al. (2018), provided qualitative insights into practices associated with positive outcomes for disadvantaged pupils. Both highlighted the importance of tailoring approaches to the needs of specific pupils, including pupils with SEND, disadvantaged pupils, and in response to the progress of individual pupils. This includes strategies such as paired and small group additional teaching, one-to-one tuition, providing timely support and differentiated activities to stretch and challenge pupils.

In their meta-analysis of the effects of reduced class size, Filges, Sonne-Schmidt and Nielsen (2018) found a small significant positive effect of reduced class size on reading

[48] r=0.12.
[49] Effect size 0.40.

attainment[50], but an insignificant negative effect for maths[51]. Teachers of smaller classes may be able to devote more attention to individual pupils, allow more tailoring of approaches and have more availability of materials and resources. Evidence from the EEF Teaching and Learning Toolkit (Education Endowment Foundation, 2022) also suggests there are modest positive benefits of reducing class size, but only where the reduction is sufficient – fewer than 20 or even 15 pupils – and hence this is acknowledged as being unlikely to be a cost-effective means of narrowing the attainment gap in schools.

Finally, one international meta-analysis explored the effect of time spent on homework (comparing low and medium amounts of time) and found no significant effect for primary-age children aged 9-10 years, although there was a significant effect for secondary-age pupils (Ozyildirim, 2021). This is not dissimilar to the findings summarised in the EEF Teaching and Learning Toolkit that suggest homework has a positive impact for secondary pupils in particular.

5.4 School culture and leadership

Five of the reviewed studies provided insights into the positive effects of strong school culture and leadership on children's attainment outcomes (Baars et al., 2018; Macleod et al., 2015; Stokes et al., 2015; Strand, 2016). One aspect of school culture and leadership that stood out in the literature as being important was the effective use of performance data to track pupil progress, evaluate the effectiveness of different approaches and strategies, and identify further learning needs (Baars et al., 2018; Macleod et al., 2015; Stokes et al., 2015). To facilitate this, leaders within these studies made it a priority and supported staff to use and interpret assessment data.

Another aspect of leadership identified in schools that were narrowing the attainment gap was strong, clear and visionary leadership, that was responsive to changing priorities, and could engage staff in a shared direction and sense of purpose, making all staff responsible for achieving high standards (Baars et al., 2018; Macleod et al., 2015).

Effective school leaders also look beyond their school and work effectively with other schools to facilitate better outcomes for learners. A study by Muijs (2015) focused specifically on the benefits of collaboration for school improvement and found that pupils in schools supported by a partner school significantly outperformed their peers in comparator schools (though not all partnerships were equally effective). Qualitative work indicated that effective partnership working entailed intensive intervention by the supporting school, focused on 'doing very concrete delineated activities, based on clear and limited goals' (Muijs, 2015, p.13). Furthermore, Baars et al. (2018) highlighted that

[50] Effect size 0.11.
[51] Effect size -0.03. The study found inconsistency in both the direction and magnitude of the effect size for maths across the primary studies. Studies included in the meta-analysis compared outcomes based on class size ranging from one to 12 pupils.

one of the strategies used by primary schools to support the high performance of disadvantaged pupils was working with local secondary schools to effectively manage transition. These schools provided additional support for children identified at risk of being poorly impacted by the move from primary to secondary education.

5.6 Pupil, teacher and parent attitudes and relationships

Eight studies provided insights into the influence of pupil, teacher and parent attitudes and relationships on attainment outcomes.

Several studies cited the contribution of teachers having high expectations as a key factor in improving the performance of pupils from disadvantaged backgrounds (Baars et al., 2018; Macleod et al., 2015; Stokes et al., 2015). This was characterised by school leaders and staff communicating their high expectations of all pupils regardless of their characteristics, background or learning needs, celebrating pupils' successes and achievements, and responding positively to pupils' aspirational goals. Engendering high aspirations may encourage higher pupil engagement with schoolwork, such as spending more time completing homework (Stokes et al., 2015).

Conversely, low expectations of pupils has been associated with widening of the attainment gap (Strand, 2016). A qualitative study by Hargreaves, Quick and Buchanan, (2022), explored the perspectives of children identified as low attaining and urged greater consideration of the damaging effects this label can have and children's sense of responsibility for their apparently inadequate attainment. Similarly, Crawford, Dearden and Greaves (2013) warned of the detrimental effects to summer-born children whose performance is considered relative to their peers born earlier in the academic year.

Fostering effective relationships between school and parents also appears to be a crucial element of narrowing the attainment gap characterised by leaders' belief in the value of parental engagement and the scope to raise parental aspirations (Baars et al., 2018; Macleod et al., 2015; Stokes et al., 2015). Kettlewell et al. (2020) found that 5-year-olds whose teachers rated their parents as more engaged in their schooling (for example, by attending parents' evenings and other activities at the school) showed greater development in emergent literacy, emergent numeracy and all social-emotional measures and this difference remained significant after controlling for SES.

Some studies provide evidence on the influence of peer relationships on children's attainment outcomes. Examining the effects of peer group on the attainment outcomes of children eligible for FSM, Campbell, Gambaro and Stewart (2019) found no association after controlling for covariates, such that it does not appear to matter to their outcomes whether disadvantaged children attend ECEC with other disadvantaged children or not. Yet Strand (2016) has suggested that the influence of peer group behaviour may be a major mediating factor in the relationship between school socio-economic composition (indicated by the proportion of pupils eligible for FSM) and individual attainment. In wider

evidence from an international meta-analysis, identified for the EOPS-C literature review (Harland et al., forthcoming), Wentzel, Jablansky and Scalise (2021) found that peer social acceptance (the extent to which children are liked by their peers) was significantly and positively associated with academic achievement particularly for primary-aged pupils, with a medium effect[52]. This relationship was moderated by age, such that the association was stronger for primary-age children than secondary-age. Further analysis suggested this relationship may be at least partially mediated by the positive effect that peer acceptance has on academic self-belief and active engagement (including motivation, cooperation, effort and persistence), which in turn benefits attainment outcomes.

In wider evidence from a systematic review by Halliday et al. (2021), identified for the EOPS-C literature review (Harland et al., Forthcoming), the authors found a negative association between being bullied during the ages of 10-12 years and subsequent academic performance. The study also identified negative impacts of being bullied at this age on psychological wellbeing, social relationships and attitudes towards school, which can persist for up to 8 years after the experience of victimisation. This adverse effect could be due to the stress of victimisation and/or resultant school avoidance which both negatively influence academic performance. School approaches to promote quality friendships, school belonging and feeling safe may thus help to mitigate bullying. Generally though, the review identified less evidence on the relationship between bullying and attainment outcomes for this age group and this may be a gap in the evidence base and an important aspect of children's experiences for EOPS-B to consider. Halliday et al. (2021) also identified the need for further research on the specific impact of cyber bullying.

5.7 Curricular and extra-curricular activities

The review included 4 studies that provided evidence on the relationship between curricular and extra-curricular activities and children's academic outcomes.

Stokes et al. (2015) identified a flexible and inclusive curriculum as one of the key ingredients in schools' strategies for raising the attainment outcomes of pupils from disadvantaged groups.

Kettlewell et al. (2020) provided evidence of a positive association between both organised and informal after-school activities and emergent literacy and numeracy skills at age 5. Deer, Hastings and Hostinar (2020) found that engagement in extra-curricular activities was positively associated with executive functioning. A qualitative study by Baars et al. (2018) indicated that practices associated with more positive outcomes for disadvantaged pupils included making the most of extra-curricular activities for philosophy, oracy and debating. The authors suggested that schools achieving better

[52] Effect size 0.27.

outcomes for disadvantaged pupils adopted specific strategies to encourage participation in extra-curricular activities, including subsidising trips and extra-curricular activities for disadvantaged pupils and engaging in a variety of community partnerships.

In their longitudinal analysis, Chanfreau et al. (2016) found that children participating in sports clubs, English tuition and 'other organised' out-of-school activities from age 7 onwards were more likely to achieve Level 5 in key stage 2 maths compared to children who never took part in organised activities (even when controlling for prior attainment). Chanfreau et al. (2016) also found that attending an 'after school club' was a protective factor in improving the attainment progress of children from disadvantaged backgrounds in particular. Disadvantaged children who attended an after-school club just one day a week scored 1.7 points higher in their total point score at KS2 than predicted based on their KS1 attainment, and children attending for 2 days a week scored 3 points higher than predicted. Unfortunately, the study provides no information about the nature of these clubs. However, the authors do suggest that the positive association comes about because after-school clubs offer educational enrichment and enable pupils from different backgrounds and of different attainment levels to socialise and interact. Similar positive associations were also identified for more informal extra-curricular activities at home, including reading for enjoyment, helping with household chores and watching television. The authors suggest that the association with television-watching may reflect the likelihood of younger children viewing age-appropriate programmes with some educational focus, however no data was collected on the content viewed. In contrast, certain activities undertaken out of school, such as caring responsibilities and spending unsupervised time with friends, were negatively associated with key stage 2 attainment at age 11.

5.8 Attendance and absence

The review provided very limited evidence on the effects of school attendance and absence on primary-age children's attainment outcomes. This is presumably because attendance is typically high in primary school (average attendance in state-funded primary schools was 93.5% in 2022) (Department for Education, 2022a). However, attendance was the focus of one study in this review (Carroll, 2022) which confirmed its positive effect on attainment outcomes and the detrimental impact of absence. The author highlighted a particularly detrimental effect of absence on numeracy outcomes and hypothesised that this was due to the hierarchical learning required in numeracy, such that gaps in understanding may prohibit subsequent and increasingly complex learning. Comparatively, missed learning in literacy could be compensated to some degree through informal learning and broader experiences, therefore mitigating some of the adverse impact of absence from school. One of the school-level factors that Macleod et al. (2015) identified as being associated with less successful outcomes for disadvantaged pupils was high levels of pupil absence.

5.9 Gaps and implications

This rapid review has identified the following gaps in evidence that may have implications for EOPS-B data collection.

There is limited evidence on the impact of school absence at primary school. While unlikely to be a pervasive issue given the generally high rate of attendance at primary level, the consequences of absence are clearly detrimental to attainment, and it may constitute an early indicator for issues later in education. Thus, it could be valuable for EOPS-B to collect data on children's attendance, as well as enabling researchers to link to national attendance data held on EOPS-B participants by the national pupil database (NPD).

There is limited evidence on the impact of extra-curricular activities on pupils' attainment and yet there is potential for such activities to enrich the out-of-school experiences of disadvantaged pupils. It would therefore be worth collecting information on these activities as well as any barriers to engagement. In addition, the review indicates it may be worth exploring children's access to screens at home as well as details about the length of time spent on screens and type of content viewed. Furthermore, it would be beneficial for the EOPS-B study to track other interventions and support that pupils access – including tutoring programmes to support learning recovery following the COVID-19 pandemic.

Generally, the voice of children themselves appears to be lacking in studies and this would undoubtedly add to our understanding of the factors that influence their attainment at primary age. While data collection with young children can be challenging, this could provide a valuable additional perspective to understand their experiences of school, particularly in terms of self-perceptions, views of the curriculum and teaching, school and classroom culture, sense of belonging, motivation and enjoyment, and relationships with teachers and peers, including experiences of bullying.

6 Discussion and implications for EOPS-B

The review has provided evidence that the attainment of primary-aged children is influenced by a wide range of factors relating to their cognitive and non-cognitive capabilities and mental and physical health; SEND and experiences of adversity and social services; home environment; and experiences of school. There is consistent evidence of the adverse impact of poverty and low parental education. Children who have SEND, experience ACEs, are looked after, or are otherwise in need of social services support are particularly at risk of poorer outcomes, yet early intervention and access to support can help to mitigate this. There is considerable scope to improve children's outcomes by developing their cognitive and non-cognitive capabilities, and mental and physical health (including attention, conscientiousness, self-regulation, self-esteem, physical activity, nutrition and sleep). The school has a key role to play here particularly through the provision of extra-curricular activities, supportive learning environments, personalised teaching and cultures of high expectations for all children.

The review has provided insights that have implications for the EOPS-B study. This includes identifying areas where the evidence on factors influencing the attainment of the primary age group is limited and would benefit from robust longitudinal measurement. The evidence base relating to cognitive and non-cognitive capabilities and early symptoms of poor mental health in this age group is limited. There are also gaps in evidence on the school-based and wider forms of support for children with SEND, looked-after children and CiN. There is limited evidence on the specific role of fathers in children's home environment. Finally, there are gaps in understanding how children's experiences of school are related to their attainment outcomes (including the influence of teacher and peer relationships).

The review also reaffirms the need to measure key variables that are widely understood as being influential on attainment outcomes in order to provide a rich data source for evaluating the impact of developments in policy and practices that seek to address these factors to enable more equitable attainment outcomes.

Given the limitations identified in other studies, EOPS-B needs to prioritise quality of measures and avoidance of bias and attrition, as far as possible. There will inevitably be more variables identified as important than can be accommodated. While some issues must be addressed through primary data collection, others may be accessible through linkage to other data sets, such as the NPD. However, there may be a case for collecting primary data on key variables even when secondary data is available, given the inevitable data loss incurred by withheld permission and difficulty in matching data from EOPS with that held in other databases.

The implications for EOPS-B data collection and instruments are set out below in a series of tables.

Table 1: Implications for EOPS-B – Sampling

Variable/factor/perspective	Details
Disadvantaged pupils	Endorsement of the strategy to over sample disadvantaged pupils to ensure sufficient representation and allow for attrition.
SEND	Consideration of a sufficient sample to represent children with SEND and attending different types of school (mainstream or special).
Parents	Importance of data collection from fathers as well as mothers, including parents (often fathers) living in a separate household. Consideration of collecting data about/from step-parents.

Table 2: Implications for EOPS-B – Demographics

Variable/factor/perspective	Details
Disadvantage	Include multiple measures, such as: FSM eligibility, household income, parental education, parental employment/worklessness and hours worked, area-level deprivation, housing quality, experience of poverty before the age of 5 and persistence of poverty over time.
Gender	Girl/boy/nonbinary.
Family structure	Presence/involvement of father, mother and own-household parent, presence/involvement of step-parents, number of older siblings.
Ethnicity	White/Asian/Chinese/Black Caribbean/Black African/Irish Traveller/Gypsy Roma Heritage/mixed/other.
English as an Additional Language	EAL, language(s) spoken at home.
Special Educational Needs and Disabilities	Parental perceptions of whether their child has a SEND (which may not yet be officially recognised). Whether the child has an EHCP.
Children in need/children in care	Children in receipt of social services care.
School-level characteristics	Demographic characteristics of the child's school (including proportion of pupils eligible for FSM and area-level deprivation indicators such as Income Deprivation Affecting Children Index (IDACI)).

Table 3: Implications for EOPS-B – Home environment

Variable/factor/perspective	Details
Parental involvement in learning activities at home	Especially reading to and with the child and having regular discussions with the child about their feelings, maternal reading for enjoyment, number of books in the home.
Parental support for education and involvement in schooling	Parental support for education and aspirations for their child's attainment at school. Parental involvement in school activities.
Child's participation in extra-curricular activities	Whether the child takes part in extra-curricular activities (at school/out of school) and which type of activities.
Screen time and use	Access to screens at home, amount of time spent on screen and type of content.
Parenting style	Indications of warmth and consistency, parent-child attachment, support for child's persistence and self-regulation, expectations and aspirations for the child.
Child's sleep patterns	Extent of regular bedtimes.
Child/family nutrition	Basic nutrition and indicators of food insecurity.
Child's physical health	General health and amount of physical activity and exercise. Long term health conditions requiring medical treatment (such as diabetes, epilepsy).
Child's exposure to ACEs	Parental (especially maternal) mental illness. Being the victim of abuse (emotional, physical, sexual), neglect, parental alcohol/drug misuse, exposure to domestic violence. Parent incarcerated, losing a parent through divorce, death or abandonment, death of a household member, homelessness.
Child's mental health and behaviour	Internalising behaviours (such as depression, loneliness and anxiety) and externalising behaviours (such as dysregulated behaviour, conduct disorder, oppositional defiant disorder and anti-social behaviour). This review provides endorsement for measurement of children's mental health and wellbeing using the Strengths and Difficulties Questionnaire (SDQ) which can be completed by children, parents or teachers and measures a wide range of behaviours and emotions.

Table 4: Implications for EOPS-B – Early years experiences

Variable/factor/perspective	Details
Health	Pre-natal and infant health conditions. Mother smoking during pregnancy, birthweight.
Breastfeeding	Whether or not the child was breastfed as an infant.
Participation in group ECEC	Age at first attendance at ECEC and length of participation.

Table 5: Implications for EOPS-B – Young person survey

Variable/factor/perspective	Details
Cognitive capabilities	Especially attention, memory and language skills.
Non-cognitive capabilities	Especially self-concept, self-regulation, conscientiousness and persistence.
Expectations and aspirations	Perceptions of own capability to succeed, strengths and limitations, own expectations and aspirations.
Experience of teachers/staff	Perceptions of classroom climate, teacher feedback, warmth and support.
Views of school and schoolwork	Engagement with and perceived value in attending school and schoolwork. Engagement with the curriculum. Sense of belonging.
Peer relationships	Friendships, extent of positive/negative influence of peers, experience of bullying, perceived academic values and behaviour of peers.
Views on transition	Positive and negative expectations for transition from primary to secondary school.
ACEs	Child's exposure to ACEs. Being the victim of abuse (emotional, physical, sexual), neglect, parental alcohol/drug misuse, exposure to domestic violence, parent incarcerated, parental mental illness, losing a parent through divorce, death or abandonment, death of a household member, homelessness. Note that due to the evidence that experiencing multiple adversities has an even greater negative impact on attainment, it will be important to capture as many of these factors as possible.

Table 6: Implications for EOPS-B – School/teacher survey

Variable/factor/perspective	Details
School leadership style	Strong, clear vision for every child to succeed, effective use of data and collaboration/partnerships with other schools.
Parental involvement	Attitudes towards parental involvement, strategies to engage parents with the school.
Transition	Transition management and support for at-risk pupils.
Extra-curricular activities	Breadth of extra-curricular activities provided by the school, accessibility for disadvantaged groups.
Support for pupils with particular needs	Support provided for pupils (for example, SEND, CiN, looked-after children, mental health needs). SEND inclusivity.
Strategies to avoid structural barriers for summer-born pupils	Use of age-adjusted assessments.
Ability groups and placement	Use of ability groups, child's placement in high or low ability groups (for maths and English).
Attendance	School-level attendance.
Classroom climate	Indications of the quality of instructional support, socio-emotional support, and classroom organisation and management.
Teaching style	Teacher feedback, warmth and support. Expectations and aspirations for pupils. Use of peer/collaborative learning.
Strengths and difficulties	Child's strengths and difficulties, indicators of good/poor mental health.

Table 7: Implications for EOPS-B – Pupil-level questions for school/teacher survey

Variable/factor/perspective	Details
Attendance	Attendance records of the individual child.
Individualised and differentiated support	Extent of individualisation and differentiation of support (both emotional and academic).
Additional support	Whether the pupil has received additional support (academic or behavioural).
Assessment of the pupil	Assessment of the pupil's capability, persistence and attention. Assessment of the pupil's relationships with school, teachers and peers.
Parental support	Extent of pupil's parents' interest in the child's education and their engagement with school.

7 References

Allee-Herndon, K. A., & Roberts, S. K. (2019). Poverty, self-regulation and executive function, and learning in K-2 classrooms: A systematic literature review of current empirical research. *Journal of Research in Childhood Education*, *33*(3), 345–362. https://doi.org/10.1080/02568543.2019.1613273

Allen, T., Riley, K., & Coates, M. (2020). *Belonging, behaviour and inclusion in schools: What does research tell us?* https://neu.org.uk/media/13036/view

Andrews, J., Robinson, D., & Hutchinson, J. (2017). *Closing the gap? Trends in educational attainment and disadvantage*. https://epi.org.uk/wp-content/uploads/2017/08/Closing-the-Gap_EPI-.pdf

Anti-Bullying Alliance. (2021). *Reducing Bullying in School: A summary of findings from the independent evaluation of the All Together programme 2017-2021*. https://anti-bullyingalliance.org.uk/sites/default/files/uploads/attachments/All_Together_Report_2021%20-%20REBRANDED_0.pdf

Ashworth, E., & Humphrey, N. (2020). More than the sum of its parts: Cumulative risk effects on school functioning in middle childhood. *British Journal of Educational Psychology*, *90*(1), 43–61. https://doi.org/10.1111/bjep.12260

Axford, N., Vashti, B., Lloyd, J., Moore, D., Rogers, M., Hurst, A., Blockley, K., Durkin, H., & Minton, J. (2019). *How can schools support parents' engagement in their children's learning? Evidence from research and practice*. https://d2tic4wvo1iusb.cloudfront.net/documents/pages/Parental_Engagement_-_Evidence_from_Research_and_Practice.pdf?v=1631189626

Baars, S., Shaw, Bart, Mulcahy, E., & Menzies, L. (2018). *School cultures and practices: Supporting the attainment of disadvantaged pupils*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/730628/London_Effect_Qual_Research_-_Research_Report_FINAL_v2.pdf

Batcheler, R., Ireland, E., Oppenheim, C., & Rehill, J. (2022). *Time for parents. The changing face of early childhood in the UK*. https://www.nuffieldfoundation.org/wp-content/uploads/2022/05/Time-for-parents-Nuffield-Foundation.pdf

Bellis, M. A., Lowey, H., Leckenby, N., Hughes, K., & Harrison, D. (2014). Adverse childhood experiences: Retrospective study to determine their impact on adult health behaviours and health outcomes in a UK population. *Journal of Public Health*, *36*(1), 81–91. https://doi.org/10.1093/pubmed/fdt038

Berridge, D., Luke, N., Sebba, J., Strand, S., Cartwright, M., Staples, E., McGrath-Lone, L., Ward, J., & O'Higgins, A. (2020). *Children in need and children in care: Educational attainment and progress*. https://www.nuffieldfoundation.org/wp-content/uploads/2020/04/Main-report-children-in-need-and-children-in-care.pdf

Cambron, C., Catalano, R. F., & Hawkins, J. D. (2018). The social development model. In D. P. Farrington, L. Kazemian, & A. R. Piquero (Eds.), *The Oxford handbook of Developmental and Life-course Criminology*. https://doi.org/10.1093/oxfordhb/9780190201371.013.13

Campbell, T., Gambaro, L., & Stewart, K. (2019). *Inequalities in the experience of early education in England: Access, peer groups and transitions*. http://eprints.lse.ac.uk/103460/1/CASEpaper214.pdf

Carroll, H. C. M. (Tim). (2022). The relative effect of pupil absenteeism on literacy and numeracy in the primary school. *Educational Studies*, *48*(5), 625–641. https://doi.org/10.1080/03055698.2020.1793302

Chanfreau, J., Tanner, E., Callanan, M., Laing, K., Skipp, A., & Todd, L. (2023). *Out of school activities during primary school and KS2 attainment*. ERIC. https://cls.ucl.ac.uk/wp-content/uploads/2017/04/CLS-WP-2016-1.pdf

Child Law Advice. (2022). *Child in need*. https://childlawadvice.org.uk/information-pages/child-in-need-services/

Children and Families Act 2014 (2014). https://www.legislation.gov.uk/ukpga/2014/6/contents/enacted

Chowdry, H., & McBride, T. (2017). *Disadvantage, behaviour and cognitive outcomes: Longitudinal analysis from age 5 to 16*. https://www.eif.org.uk/report/disadvantage-behaviour-and-cognitive-outcomes

Classick, R., Hope, C., & Sharp, C. (2021). *IELS thematic report: Young children's development and deprivation in England*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1001552/IELS_Deprivation_Report.pdf

Cox, F. M., & Marshall, A. D. (2020). Educational engagement, expectation and attainment of children with disabilities: Evidence from the Scottish Longitudinal Study. *British Educational Research Journal*, *46*(1), 222–246. https://doi.org/10.1002/berj.3576

Crawford, C., Dearden, L., & Greaves, E. (2013). *When you are born matters: Evidence for England* (IFS Report 180). https://doi.org/10.1920/re.ifs.2013.0080

Deer, L. K., Hastings, P. D., & Hostinar, C. E. (2020). The role of childhood executive function in explaining income disparities in long-term academic achievement. *Child Development*, *91*(5), e1046–e1063. https://doi.org/10.1111/cdev.13383

Department for Education. (2018). *What works to improve the educational outcomes of Children in Need of help and protection: A literature review*. https://www.gov.uk/government/publications/improving-outcomes-of-children-in-need-literature-review

Department for Education. (2019). *Teaching schools: A guide for potential applicants*. GOV.UK. https://www.gov.uk/guidance/teaching-schools-a-guide-for-potential-applicants

Department for Education. (2022a). *Pupil attendance in schools, Week 50 2022*. https://explore-education-statistics.service.gov.uk/find-statistics/pupil-attendance-in-schools

Department for Education. (2022b). *Special educational needs and disability: An analysis and summary of data sources*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1082518/Special_educational_needs_publication_June_2022.pdf

Department for Education. (2022c). *Special Educational Needs in England dataset*. GOV.UK. https://explore-education-statistics.service.gov.uk/data-tables/fast-track/70d4fccf-7ebf-4eda-1660-08da47b0392d

Department for Education. (2022d). *State of the nation 2021: Children and young people's wellbeing*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1053302/State_of_the_Nation_CYP_Wellbeing_2022.pdf

Department for Education. (2022e). *Children looked after in England including adoptions*. https://explore-education-statistics.service.gov.uk/data-tables/children-looked-after-in-england-including-adoptions#subjectTabs-createTable

Department for Education. (2022f). *Outcomes for children in need, including children looked after by local authorities in England*. https://explore-education-statistics.service.gov.uk/find-statistics/outcomes-for-children-in-need-including-children-looked-after-by-local-authorities-in-england#dataBlock-a1c028dd-0dbe-4bc5-b877-2f9d9f3fa69d-tables

Department for Education. (2022g). *Key stage 2 attainment, academic year 2021/22*. https://explore-education-statistics.service.gov.uk/find-statistics/key-stage-2-attainment/2021-22

Department for Education. (2022h). *Characteristics of children in need*. https://explore-education-statistics.service.gov.uk/find-statistics/characteristics-of-children-in-need#releaseHeadlines-tables

Department for Education. (2023). *Key Stage 2 attainment academic year 2022/23*. https://explore-education-statistics.service.gov.uk/find-statistics/key-stage-2-attainment

Department for Education. (2023). *Free school meals: Guidance for local authorities, maintained schools, academies and free schools*. GOV.UK. https://www.gov.uk/government/publications/free-school-meals-guidance-for-schools-and-local-authorities

Dickerson, A., & Popli, G. K. (2016). Persistent poverty and children's cognitive development: Evidence from the UK Millennium Cohort Study. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *179*(2), 535–558. https://doi.org/10.1111/rssa.12128

Donati, G., Meaburn, E. L., & Dumontheil, I. (2019). The specificity of associations between cognition and attainment in English, maths and science during adolescence. *Learning and Individual Differences*, *69*, 84–93. https://doi.org/10.1016/j.lindif.2018.11.012

Edossa, A. K., Schroeders, U., Weinert, S., & Artelt, C. (2018). The development of emotional and behavioral self-regulation and their effects on academic achievement in childhood. *International Journal of Behavioral Development*, *42*(2), 192–202. https://doi.org/10.1177/0165025416687412

Education Endowment Foundation. (2015). *Intra-cluster correlation coefficients*. https://educationendowmentfoundation.org.uk/public/files/Evaluation/Writing_a_Protocol_or_SAP/ICC_2015.pdf

Education Endowment Foundation. (2022). *Teaching and learning toolkit*. https://educationendowmentfoundation.org.uk/education-evidence/teaching-learning-toolkit

Equality Act 2010 (2010). https://www.legislation.gov.uk/ukpga/2010/15/contents

European Commission. (2022). *Early childhood education and care*. European Education Area Quality Education and Training for All. https://education.ec.europa.eu/node/1118

Evans, A., Hardcastle, K., Bandyopadhyay, A., Farewell, D., John, A., Lyons, R. A., Long, S., Bellis, M. A., & Paranjothy, S. (2020). Adverse childhood experiences during childhood and academic attainment at age 7 and 11 years: An electronic birth cohort study. *Public Health*, *189*, 37–47. https://doi.org/10.1016/j.puhe.2020.08.027

Evans, D., & Field, A. P. (2020). Predictors of mathematical attainment trajectories across the primary-to-secondary education transition: Parental factors and the home environment. *Royal Society Open Science*, *7*(7). https://doi.org/10.1098/rsos.200422

Filges, T., Sonne-Schmidt, C. S., & Nielsen, B. C. V. (2018). Small class sizes for improving student achievement in primary and secondary schools: A systematic review. *Campbell Systematic Reviews*, *14*(1), 1–107. https://doi.org/10.4073/csr.2018.10

Fleming, M., McLay, J. S., Clark, D., King, A., Mackay, D. F., Minnis, H., & Pell, J. P. (2021). Educational and health outcomes of schoolchildren in local authority care in Scotland: A retrospective record linkage study. *PLOS Medicine*, *18*(11), e1003832. https://doi.org/10.1371/journal.pmed.1003832

Ford, T., Vostanis, P., Meltzer, H., & Goodman, R. (2007). Psychiatric disorder among British children looked after by local authorities: Comparison with children living in private households. *The British Journal of Psychiatry: The Journal of Mental Science*, *190*(4), 319–325. https://doi.org/10.1192/bjp.bp.106.025023

Fry, D., Fang, X., Elliott, S., Casey, T., Zheng, X., Li, J., Florian, L., & McCluskey, G. (2018). The relationships between violence in childhood and educational outcomes: A global systematic review and meta-analysis. *Child Abuse & Neglect*, *75*, 6–28. APA PsycInfo. https://doi.org/10.1016/j.chiabu.2017.06.021

Gough, D. (2007). Weight of Evidence: A framework for the appraisal of the quality and relevance of evidence. *Research Papers in Education*, *22*(2), 213–228. https://doi.org/10.1080/02671520701296189

Greenhalgh, T., & Taylor, R. (1997). How to read a paper: Papers that go beyond numbers (qualitative research). *BMJ*, *315*(7110), 740–743. https://doi.org/10.1136/bmj.315.7110.740

Halliday, S., Gregory, T., Taylor, A., Digenis, C., & Turnbull, D. (2021). The impact of bullying victimization in early adolescence on subsequent psychosocial and academic outcomes across the adolescent period: A systematic review. *Journal of School Violence*, *20*(3), 351–373. https://doi.org/10.1080/15388220.2021.1913598

Hargreaves, E., Quick, L., & Buchanan, D. (2022). Persevering for a cruel and cynical fiction? The experiences of the 'low achievers' in primary schooling. *British Journal of Educational Studies*, *70*(4), 397–417. https://doi.org/10.1080/00071005.2021.1998340

Harland, J., Sharp, C., Flemons, L., Bradley, E., Haux, T., Garwood, E., Mahati, S., Keenan, C., Nugent, R., Watson, R., & Strange, L. (Forthcoming). *Factors influencing educational outcomes of secondary school pupils: Literature review*.

Hartas, D. (2012). Inequality and the home learning environment: Predictions about seven-year-olds' language and literacy. *British Educational Research Journal*, *38*(5), 859–879. https://doi.org/10.1080/01411926.2011.588315

Hartas, D. (2015). Parenting for social mobility? Home learning, parental warmth, class and educational outcomes. *Journal of Education Policy*, *30*(1), 21–38. https://doi.org/10.1080/02680939.2014.893016

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, *112*, 64–105. https://doi.org/10.1037/0033-2909.112.1.64

Hjetland, H. N., Brinchmann, E. I., Scherer, R., & Melby-Lervåg, M. (2017). Preschool predictors of later reading comprehension ability: A systematic review. *Campbell Systematic Reviews*, *13*(1), 1–155. https://doi.org/10.4073/csr.2017.14

Huat See, B., & Gorard, S. (2015). The role of parents in young people's education—A critical review of the causal evidence. *Oxford Review of Education*, *41*(3), 346–366. https://doi.org/10.1080/03054985.2015.1031648

Humphrey, N., Wigelsworth, M., Barlow, A., & Squires, G. (2013). The role of school and individual differences in the academic attainment of learners with special educational needs and disabilities: A multi-level analysis. *International Journal of Inclusive Education*, *17*(9), 909–931. https://doi.org/10.1080/13603116.2012.718373

Hutchinson, J. (2021). *Identifying pupils with special educational needs and disabilities*. https://epi.org.uk/wp-content/uploads/2021/03/SEND-Indentification_2021-EPI.pdf

Hutchinson, J., Bonetti, S., Crenna-Jennings, W., & Akhal, A. (2019). *Education in England: Annual report 2019*. https://epi.org.uk/wp-content/uploads/2019/07/EPI-Annual-Report-2019.pdf

Jackson, M. I. (2015). Cumulative inequality in child health and academic achievement. *Journal of Health and Social Behavior*, *56*(2), 262–280. https://doi.org/10.1177/0022146515581857

Jay, M. A., & Mc Grath-Lone, L. (2019). Educational outcomes of children in contact with social care in England: A systematic review. *Systematic Reviews*, *8*(1), 155. https://doi.org/10.1186/s13643-019-1071-z

Jones, D. E., Greenberg, M., & Crowley, M. (2015). Early social-emotional functioning and public health: The relationship between kindergarten social competence and future wellness. *American Journal of Public Health*, *105*(11), 2283–2290. https://doi.org/10.2105/AJPH.2015.302630

Jones, E., Gutman, L., & Platt, L. (2013). *Family stressors and children's outcomes*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/219639/DFE-RR254.pdf

Joseph Rowntree Foundation. (2022a). *UK poverty 2022: The essential guide to understanding poverty in the UK*. https://www.jrf.org.uk/report/uk-poverty-2022

Joseph Rowntree Foundation. (2022b). *What is poverty?* Joseph Rowntree Foundation (JRF). https://www.jrf.org.uk/our-work/what-is-poverty

Joseph Rowntree Foundation. (2023). *UK Poverty 2023*. https://www.jrf.org.uk/work/uk-poverty-2023-the-essential-guide-to-understanding-poverty-in-the-uk

Julius, J., & Ghosh, A. (2022). *Investigating the changing landscape of pupil disadvantage*. https://www.nfer.ac.uk/media/4762/nfer_investigating_the_changing_landscape_of_pupil_disadvantage.pdf

Kelly, Y., Kelly, J., & Sacker, A. (2013). Time for bed: Associations with cognitive performance in 7-year-old children: a longitudinal population-based study. *Journal*

Epidemiology & Community Health, *67*(11), 926–931. https://doi.org/10.1136/jech-2012-202024

Kettlewell, K., Sharp, C., Lucas, M., Gambhir, G., Classick, R., Hope, C., Charalambos, K., & Rutt, S. (2020). *International early learning and child well-being study (IELS): National report for England*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1000508/IELS_national_report_FINAL_Dec_2020_revised.pdf

Kim, S. W., & Hill, N. E. (2015). Including fathers in the picture: A meta-analysis of parental involvement and students' academic achievement. *Journal of Educational Psychology*, *107*(4), 919–934. https://doi.org/10.1037/edu0000023

Klein, M., Sosu, E. M., & Dare, S. (2022). School absenteeism and academic achievement: Does the reason for absence matter? *AERA Open*, *8*, 1–14. https://doi.org/10.1177/23328584211071115

Kuhn, L., Norris, I., Sawyer, G., Schwendel, G., & Twist, L. (2022). *Children and young people's wellbeing and mental health during the Covid-19 pandemic*. NFER. https://www.nfer.ac.uk/media/5155/children_and_young_peoples_wellbeing_and_mental_health_during_the_covid19_pandemic.pdf

Lacey, R. E., & Gondek, D. (2021). *Adverse childhood experiences and mental health*. https://www.ucl.ac.uk/epidemiology-health-care/sites/epidemiology_health_care/files/aces_mentalhealth_policybrief_0.pdf

Lacey, R. E., Howe, L. D., Kelly-Irving, M., Bartley, M., & Kelly, Y. (2022). The Clustering of adverse childhood experiences in the avon longitudinal study of parents and children: Are gender and poverty important? *Journal of Interpersonal Violence*, *37*(5–6), 2218–2241. https://doi.org/10.1177/0886260520935096

Lam, K. K. L., & Zhou, M. (2019). Examining the relationship between grit and academic achievement within K-12 and higher education: A systematic review. *Psychology in the Schools*, *56*(10), 1654–1686. https://doi.org/10.1002/pits.22302

Leonard, J. A., Garcia, A., & Schulz, L. E. (2020). How adults' actions, outcomes, and testimony affect preschoolers' persistence. *Child Development*, *91*(4), 1254–1271. https://doi.org/10.1111/cdev.13305

Lereya, S. T., Patel, M., Dos Santos, J. P. G. A., & Deighton, J. (2019). Mental health difficulties, attainment and attendance: A cross-sectional study. *European Child & Adolescent Psychiatry*, *28*(8), 1147–1152. https://doi.org/10.1007/s00787-018-01273-6

Lockwood Estrin, G., Milner, V., Spain, D., Happe, F., & Colvert, E. (2021). Barriers to autism spectrum disorder diagnosis for young women and girls: A systematic review. *Review Journal of Autism and Developmental Disorders*, *8*, 454–470. https://doi.org/10.1007/s40489-020-00225-8

Macleod, S., Sharp, C., Bernardinelli, D., Skipp, A., & Higgins, S. (2015). *Supporting the attainment of disadvantaged pupils: Articulating success and good practice*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/473974/DFE-RR411_Supporting_the_attainment_of_disadvantaged_pupils.pdf

Macmillan, L., & Tominey, E. (2021). *Parental inputs and socio-economic gaps in early child development* (CEPEO Working Paper Series 20–04). https://repec-cepeo.ucl.ac.uk/cepeow/cepeowp20-04r1.pdf

Major, L. E., & Parsons, S. (2022). *The forgotten fifth: Examining the early education trajectories of teenagers who fall below the expected standards in GCSE examinations at age 16* [CLS working paper number 2022/6]. https://cls.ucl.ac.uk/wp-content/uploads/2017/02/CLS-Working-Paper-2022-6-The-forgotten-fifth.pdf

Mammadov, S. (2022). Big five personality traits and academic performance: A meta-analysis. *Journal of Personality*, *90*(2), 222–255. https://doi.org/10.1111/jopy.12663

McGeown, S. P., Johnston, R. S., Walker, J., Howatson, K., Stockburn, A., & Dufton, P. (2015). The relationship between young children's enjoyment of learning to read, reading attitudes, confidence and attainment. *Educational Research*, *57*(4), 389–402. https://doi.org/10.1080/00131881.2015.1091234

Melhuish, E., & Gardiner, J. (2023). *Equal hours? The impact of hours spent in early years provision on children's outcomes at age five, by socio-economic background*. https://www.suttontrust.com/wp-content/uploads/2023/01/Equal-Hours.pdf

Melhuish, E., & Gardner, J. (2021). *Study of Early Education and Development (SEED): Impact study on early education use and child outcomes up to age seven years*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1029539/SEED_Age_7_Research_Brief.pdf

Montacute, R. (2022). *The cost of living crisis and its impact on education*. Sutton Trust. https://www.suttontrust.com/news-opinion/all-news-opinion/the-cost-of-living-crisis-and-its-impact-on-education/

Morrison Gutman, L., & Vorhaus, J. (2012). *The impact of pupil behaviour and wellbeing on educational outcomes* (DFE-RR253). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/219638/DFE-RR253.pdf

Muijs, D. (2015). Improving schools through collaboration: A mixed methods study of school-to-school partnerships in the primary sector. *Oxford Review of Education*, *41*(5), 563–586. ERIC. https://doi.org/10.1080/03054985.2015.1047824

Murphy, R., & Weinhardt, F. (2018). *Top of the class: The importance of ordinal rank* (NBER Working Paper Series). https://www.nber.org/system/files/working_papers/w24958/w24958.pdf

Nelson, J., Lynch, S., & Sharp, C. (2021). *Recovery during a pandemic: The ongoing impacts of Covid-19 on schools serving deprived communities*. https://www.nfer.ac.uk/media/4614/recovery_during_a_pandemic_the_ongoing_impacts_of_covid_19_on_schools_serving_deprived_communities.pdf

Newlove-Delgado, T., Marcheselli, F., Williams, T., Mandalia, D., Davis, J., McManus, S., Savic, M., Treloar, W., & Ford, T. (2022a). *Mental health of children and young people in England 2022, wave 3 follow up to the 2017 survey*. https://digital.nhs.uk/data-and-information/publications/statistical/mental-health-of-children-and-young-people-in-england/2022-follow-up-to-the-2017-survey

Newlove-Delgado, T., Marcheselli, F., Williams, T., Mandalia, D., Davis, J., McManus, S., Savic, M., Treloar, W., & Ford, T. (2022b). *Mental health of children and young people in England 2022—Wave 3 follow up to the 2017 survey*. https://digital.nhs.uk/data-and-information/publications/statistical/mental-health-of-children-and-young-people-in-england/2022-follow-up-to-the-2017-survey#

Newlove-Delgado, T., McManus, S., Sadler, K., Thandi, S., Vizard, T., Cartwright, C., & Ford, T. (2021). Child mental health in England before and during the COVID-19 lockdown. *The Lancet Psychiatry*, *8*(5), 353–354. https://doi.org/10.1016/S2215-0366(20)30570-8

Nicoletti, C., Salvanes, K. G., & Tominey, E. (2020). *Mothers working during preschool years and child skills: Does income compensate?* [CEPEO Working Paper Series]. https://repec-cepeo.ucl.ac.uk/cepeow/cepeowp20-08.pdf

Office for National Statistics. (2024). *Cost of living latest insights*. https://www.ons.gov.uk/economy/inflationandpriceindices/articles/costofliving/latestinsights

O'Higgins, A., Sebba, J., & Gardner, F. (2017). What are the factors associated with educational achievement for children in kinship or foster care: A systematic review. *Children and Youth Services Review*, *79*, 198–220. https://doi.org/10.1016/j.childyouth.2017.06.004

O'Higgins, A., Sebba, J., & Luke, N. (2015). *What is the relationship between being in care and the educational outcomes of children? An international systematic review*. https://www.basw.co.uk/system/files/resources/basw_33005-5_0.pdf

Oliver, B. R., Kretschmer, T., & Maughan, B. (2014). Configurations of early risk and their association with academic, cognitive, emotional and behavioural outcomes in middle childhood. *Social Psychiatry and Psychiatric Epidemiology*, *49*(5), 723–732. https://doi.org/10.1007/s00127-013-0756-1

Outhwaite, L. (2020). *Inequalities in resources in the home learning environment* [Briefing note]. https://repec-cepeo.ucl.ac.uk/cepeob/cepeobn2.pdf

Ozyildirim, G. (2021). Time spent on homework and academic achievement: A meta-analysis study related to results of TIMSS. *Educational Psychology*, *28*(1), 13–21. https://doi.org/10.5093/psed2021a30

Panagi, L., Newlove-Delgado, T., White, S. R., Bennett, S., Heyman, I., Shafran, R., & Ford, T. (2022). Trends in comorbid physical and mental health conditions in children from 1999 to 2017 in England. *European Child & Adolescent Psychiatry*, 1–6. https://doi.org/10.1007/s00787-022-02112-5

Panayiotou, M., & Humphrey, N. (2018). Mental health difficulties and academic attainment: Evidence for gender-specific developmental cascades in middle childhood. *Development and Psychopathology*, *30*(2), 523–538. https://doi.org/10.1017/S095457941700102X

Parsons, S., & Hallam, S. (2014). The impact of streaming on attainment at age seven: Evidence from the Millennium Cohort Study. *Oxford Review of Education*, *40*(5), 567–589. https://doi.org/10.1080/03054985.2014.959911

Parsons, S., & Platt, L. (2017). The early academic progress of children with special educational needs. *British Educational Research Journal*, *43*(3), 466–485. https://doi.org/10.1002/berj.3276

Parsons, S., Schoon, I., & Vignoles, A. (2013). Parental worklessness and children's early school achievement and progress. *Longitudinal and Life Course Studies*, *5*(1), Article 1. https://doi.org/10.14301/llcs.v5i1.230

Patalay, P., Fink, E., Fonagy, P., & Deighton, J. (2016). Unpacking the associations between heterogeneous externalising symptom development and academic attainment in middle childhood. *European Child & Adolescent Psychiatry*, *25*(5), 493–500. https://doi.org/10.1007/s00787-015-0758-5

Pearce, A., Sawyer, A. C. P., Chittleborough, C. R., Mittinty, M. N., Law, C., & Lynch, J. W. (2016). Do early life cognitive ability and self-regulation skills explain socio-economic inequalities in academic achievement? An effect decomposition analysis in UK and Australian cohorts. *Social Science & Medicine*, *165*, 108–118. https://doi.org/10.1016/j.socscimed.2016.07.016

Puglisi, M. L., Hulme, C., Hamilton, L. G., & Snowling, M. J. (2017). The home literacy environment is a correlate, but perhaps not a cause, of variations in children's language and literacy development. *Scientific Studies of Reading*, *21*(6), 498–514. https://doi.org/10.1080/10888438.2017.1346660

Quigley, M. A., Hockley, C., Carson, C., Kelly, Y., Renfrew, M. J., & Sacker, A. (2012). Breastfeeding is associated with improved child cognitive development: A population-based cohort study. *The Journal of Pediatrics*, *160*(1), 25–32. https://doi.org/10.1016/j.jpeds.2011.06.035

Quílez-Robres, A., Moyano, N., & Cortés-Pascual, A. (2021). Motivational, emotional, and social factors explain academic achievement in children aged 6–12 years: A meta-analysis. *Education Sciences*, *11*(9), 513. https://doi.org/10.3390/educsci11090513

Renaissance Learning & Education Policy Institute. (2022). *Understanding progress in the 2020/21 academic year extension report covering the first half of the autumn term 2021/22*. DfE. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1063488/Understanding_Progress_in_the_2020_to_2021_Academic_Year_Extension_report_covering_the_first_half_of_the_autumn_term_2021.pdf

Reuben, A., Arseneault, L., Belsky, D. W., Caspi, A., Fisher, H. L., Houts, R. M., Moffitt, T. E., & Odgers, C. (2019). Residential neighborhood greenery and children's cognitive development. *Social Science & Medicine*, *230*, 271–279. https://doi.org/10.1016/j.socscimed.2019.04.029

Reynolds, D. (2007). *Schools learning from their best. The Within School Variation (WSV) project*. https://dera.ioe.ac.uk/7381/1/download%3fid=17377&filename=schools-learning-from-their-best.pdf

Rollè, L., Gullotta, G., Trombetta, T., Curti, L., Gerino, E., Brustia, P., & Caldarera, A. M. (2019). Father involvement and cognitive development in early and middle childhood: A systematic review. *Frontiers in Psychology*, *10*, 2405. https://doi.org/10.3389/fpsyg.2019.02405

Rose, S., Badr, K., Fletcher, L., Paxman, T., Lord, P., Rutt, S., Styles, B., & Twist, L. (2021). *Impact of school closures and subsequent support strategies on attainment and socio-emotional wellbeing in Key Stage 1*. https://d2tic4wvo1iusb.cloudfront.net/documents/pages/projects/Impact-on-KS1-Closures-Report.pdf?v=1638448453

Rose, S., Lord, P., Ager, R., Liht, J., Paxman, T., Schwendel, G., Styles, B., & Twist, L. (2023). *Impact of school closures in Key Stage 1 on attainment and social skills of pupils in Year 3 and Year 4 in academic year 2022/2023*. https://d2tic4wvo1iusb.cloudfront.net/production/documents/projects/Impact-of-KS1-school-closures-longitudinal-FINAL-2023.pdf?v=1696582859

Sammons, P., Toth, K., & Sylva, K. (2015). *Subject to background. What promotes better achievement for bright but disadvantaged students?* https://www.suttontrust.com/wp-content/uploads/2020/01/SUBJECT-TO-BACKGROUND_FULL-REPORT.pdf

Sayal, K., Washbrook, E., & Propper, C. (2015). Childhood behavior problems and academic outcomes in adolescence: Longitudinal population-based study. *Journal*

of the American Academy of Child & Adolescent Psychiatry, *54*(5), 360–368. https://doi.org/10.1016/j.jaac.2015.02.007

Schoon, I., Jones, E., Cheng, H., & Maughan, B. (2012). Family hardship, family instability, and cognitive development. *Journal of Epidemiol Community Health*, *66*(8), 716–722. https://doi.org/10.1136/jech.2010.121228

Sénéchal, M., Whissell, J., & Bildfell, A. (2017). Starting from home: Home literacy practices that make a difference. In K. Cain, D. L. Compton, & R. K. Parrila (Eds.), *Theories of Reading Development* (pp. 383–408). https://benjamins.com/catalog/swll.15.22sen

Shankar, P., Chung, R., & Frank, D. (2017). Association of food insecurity with children's behavioral, emotional, and academic outcomes: A systematic review. *Journal of Developmental and Behavioral Pediatrics*, *38*(2), 135–150. https://doi.org/10.1097/DBP.0000000000000383

Sinclair, I., Luke, N., Fletcher, J., O'Higgins, A., Strand, S., Berridge, D., Sebba, J., & Thomas, S. (2020). The education of children in care and children in need: Who falls behind and when? *Child & Family Social Work*, *25*(3), 536–547. https://doi.org/10.1111/cfs.12719

Siraj-Blatchford, I., Mayo, A., Melhuish, E., Taggart, B., Sammons, P., & Sylva, K. (2013). The learning life course of at 'risk' children aged 3-16: Perceptions of students and parents about 'succeeding against the odds'. *Scottish Educational Review*, *45*(2), 5–17. https://doi.org/10.1163/27730840-04502002

Stokes, L., Rolfe, H., Hudson-Sharp, N., & Stevens, S. (2015). *A compendium of evidence on ethnic minority resilience to the effects of deprivation on attainment*. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/435780/Ethnic_minorities_and_attainment_the_effects_of_poverty.pdf

Strand, S. (2016). Do some schools narrow the gap? Differential school effectiveness revisited. *Review of Education*, *4*(2), 107–144. https://doi.org/10.1002/rev3.3054

Sullivan, A., Moulton, V., & Fitzsimons, E. (2017). *The intergenerational transmission of vocabulary* [Working paper 2017/14]. https://cls.ucl.ac.uk/wp-content/uploads/2017/11/CLS-WP-201714-The-intergenerational-transmission-of-vocabulary.pdf

Sullivan, A., Moulton, V., & Fitzsimons, E. (2021). The intergenerational transmission of language skill. *The British Journal of Sociology*, *72*(2), 207–232. https://doi.org/10.1111/1468-4446.12780

Susperreguy, M. I., Davis-Kean, P. E., Duckworth, K., & Chen, M. (2018). Self-concept predicts academic achievement across levels of the achievement distribution: Domain specificity for math and reading. *Child Development*, *89*(6), 2196–2214. https://doi.org/10.1111/cdev.12924

Sutcliffe, A. G., Gardiner, J., & Melhuish, E. (2017). Educational progress of looked-after children in England: A study using group trajectory analysis. *Pediatrics*, *140*(3), e20170503. https://doi.org/10.1542/peds.2017-0503

Sutherland, A., & Ilie, S. (2015). *Factors associated with achievement: Key stage 2*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/473674/RR486_-_Factors_associated_with_achievement_-_key_stage_2.pd

Sutton Trust. (2011). *Improving the impact of teachers on pupil achievement in the UK – interim findings*. https://www.suttontrust.com/wp-content/uploads/2019/12/2teachers-impact-report-final-1.pdf

Sylva, K., Melhuish, E., Sammons, P., Siraj, I., Taggart, B., Toth, K., Welcomme, W., Smees, R., & Hollingworth, K. (2014). *Students' educational and developmental outcomes at age 16*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/351496/RR354_-_Students__educational_and_developmental_outcomes_at_age_16.pdf

Talaee, E., Sylva, K., Evangelou, M., & Noroozi, O. (2018). Longitudinal impacts of home computer use on primary school children's reading and mathematics achievement. *International Electronic Journal of Elementary Education*, *11*(2), 125–134. https://doi.org/10.26822/iejee.2018541301

Tan, C. Y. (2017). Examining cultural capital and student achievement: Results of a meta-analytic review. *Alberta Journal of Educational Research*, *63*(2), Article 2. https://doi.org/10.11575/ajer.v63i2.56285

Tanskanen, A., & Erola, J. (2017). Do nonresident fathers compensate for a lack of household resources? The associations between paternal involvement and children's cognitive and educational assessments in the UK. *Research in Social Stratification and Mobility*, *48*, 32–40.

Tenenbaum, H. R., Winstone, N. E., Leman, P. J., & Avery, R. E. (2020). How effective is peer interaction in facilitating learning? A meta-analysis. *Journal of Educational Psychology*, *112*(7), 1303–1319. https://doi.org/10.1037/edu0000436

Tomlinson, C., Bond, C., & Hebron, J. (2020). The school experiences of autistic girls and adolescents: A systematic review. *European Journal of Special Needs Education*, *35*(2), 203–219. https://www.tandfonline.com/doi/full/10.1080/08856257.2019.1643154

Tracey, L., Bowyer-Crane, C., Bonetti, S., Nielsen, D., D'Apice, K., & Compton, S. (2022). *The impact of the Covid-19 pandemic on children's socio-emotional wellbeing and attainment during the Reception year*. https://d2tic4wvo1iusb.cloudfront.net/documents/projects/EEF-School-Starters.pdf

Twist, L., Jones, E., & Treleaven, O. (2022). *The Impact of Covid-19 on pupil attainment. A summary of research evidence*. National Foundation for Educational Research. https://www.nfer.ac.uk/media/4876/the_impact_of_covid_19_on_pupil_attainment.pdf

Vasilopoulos, F., & Ellefson, M. R. (2021). Investigation of the associations between physical activity, self-regulation and educational outcomes in childhood. *PLOS ONE*, *16*(5), e0250984. https://doi.org/10.1371/journal.pone.0250984

Von Stumm, S. (2017). Socioeconomic status amplifies the achievement gap throughout compulsory education independent of intelligence. *Intelligence*, *60*, 57–62. https://doi.org/10.1016/j.intell.2016.11.006

Von Stumm, S., Cave, S. N., & Wakeling, P. (2022). Persistent association between family socioeconomic status and primary school performance in Britain over 95 years. *Npj Science of Learning*, *7*(4), Article 1. https://doi.org/10.1038/s41539-022-00120-3

Von Stumm, S., Smith-Woolley, E., Ayorech, Z., Mcmillan, A., Rimfeld, K., Dale, P., & Plomin, R. (2019). Predicting educational achievement from genomic measures and socioeconomic status. *Developmental Science*, *23*(5), e12925. https://doi.org/10.1111/desc.12925

Wang, M.-T., L. Degol, J., Amemiya, J., Parr, A., & Guo, J. (2020). Classroom climate and children's academic and psychological wellbeing: A systematic review and meta-analysis. *Developmental Review*, *57*, 100912. https://doi.org/10.1016/j.dr.2020.100912

Warren, F., Mason-Apps, E., Hoskins, S., Devonshire, V., & Chanvin, M. (2019). The relationship between implicit theories of intelligence, attainment and socio-demographic factors in a UK sample of primary school children. *British Educational Research Journal*, *45*(4), 736–754. https://doi.org/10.1002/berj.3523

Washbrook, E., Gregg, P., & Propper, C. (2013). *A decomposition analysis of the relationship between parental income and multiple child outcomes*. http://www.bristol.ac.uk/cmpo/publications/papers/2013/wp313.pdf

Wentzel, K. R., Jablansky, S., & Scalise, N. R. (2021). Peer social acceptance and academic achievement: A meta-analytic study. *Journal of Educational Psychology*, *113*(1), 157–180. https://doi.org/10.1037/edu0000468

Yoshikawa, H., & Hsueh, J. (2001). Child development and public policy: Toward a dynamic systems perspective. *Child Development*, *72*(6), 1887–1903. https://doi.org/10.1111/1467-8624.00384

8 Appendix A: Theoretical underpinning for the study

This review is underpinned by a theoretical framework of human behaviour and development and how this is influenced by risk and protective factors. The identification of risk and protective factors for antisocial behaviour (Hawkins et al., 1992) has contributed to the evidence base in a range of areas, including criminology and health. The underlying theoretical frame for this work is the social development model (Cambron et al., 2018) which seeks to understand how differing experiences of social relationships can result in behaviours that are conducive or antithetical to an individual's wellbeing and their impact on wider society. The dynamic systems approach (Yoshikawa & Hsueh, 2001) builds on this, seeking to identify a general theory of human behaviour that integrates research on risk and protective factors into a coherent model that proposes general mechanisms for how public policies may influence child development.

9 Appendix B: Literature review methods

This appendix presents the EOPS-B rapid literature review plan which formed the basis for the searches and was agreed with the collaborators, DfE and expert advisors. In practice, some of the intentions set out here were subsequently amended in discussion with the collaborators, DfE and expert advisors.

Education and Outcomes Panel Study: Rapid literature review plan for EOPS-B

9.1 Purpose of the review

The aim of the rapid literature review for EOPS-B is to further inform the DfE and research team's understanding of the full range of potential key factors affecting the attainment outcomes of primary school pupils. The review will capture evidence on pupils' attainment and progress throughout the primary school years, including children's readiness for school at the start of primary education and the manifestation of the attainment gap. The review will also provide contextual data on the impact of COVID-19 on the attainment gap.

The review will adopt an initial open approach to searching for relevant literature on the influences on primary pupils' attainment outcomes, progressing to explore in greater depth the factors at the pupil, home, neighbourhood and school level that are widely evidenced as being influential, as well as gaps in the evidence and new areas for exploration. This will provide a basis from which influential factors can be measured longitudinally and help to inform policy development to address inequalities in educational attainment.

The over-arching research question will be:

- How and to what extent do risk and protective factors influence children's attainment and progress during the primary school years, including the manifestation of the attainment gap?

The review aims to explore the following potential influences on primary pupils' educational outcomes and covers areas of interest identified by the DfE and in consultation with the three collaborating organisations and academic experts (note that section 9.3 below gives further details on the content of each theme). The review will seek to identify the best evidence (in terms of robust findings) for each theme.

1. Pupils' wellbeing, cognitive and non-cognitive capabilities
2. Special Educational Needs and Disabilities (SEND), experience of social services and adverse childhood experiences
3. Home environment

4. Socio-economic attributes[53]
5. Experiences of school.

The review will also aim to capture the extent to which there is evidence of any additional or alternative factors of influence on the attainment of primary school pupils, which may be related to, but distinctive to the factors outlined above. These are likely to have been identified as potentially important risk or protective factors (for example, in qualitative research) but have been less thoroughly evidenced to date.

The team recognises that the above themes are inter-related and will seek to explore these connections within the literature review report (for example, by including literature using complex statistical modelling to identify moderators and mediators of attainment).

9.2 Out of scope

The review will focus on children's attainment and progress during the primary school years. For this reason, it will not treat the themes above as outcomes in their own right. For example, it will focus on how pupils' mental health and wellbeing is associated with their progress and attainment at primary school, but it will not seek to identify the risk and protective factors affecting children's mental health and wellbeing. Specific areas to be excluded from the review are detailed below in section 9.6 'Inclusion and exclusion criteria'.

9.3 Defining the main themes of the review

Table 8 below provides further details of each theme grouped into three domains within the child's microsystem: individual-level, home and neighbourhood level and school-level. Note, however, that the themes, rather than the domains, will form the main focus of the review to ensure coverage of all themes prioritised by the DfE.

[53] Most of the studies included in the review reported the influence of socio-economic attributes on attainment (for example, as control variables). For this reason, studies originally identified in relation to this theme were analysed and reported in relation to the other 4 themes. As socio-economic factors relate primarily to household income and parental education, studies that focus on this are mainly considered in the report chapter focusing on the home environment.

Table 8: Main themes of the review

Domain	Theme	Working definition/scope	Examples of risk and protective factors that may be related to attainment and progress
Individual level	Demographic characteristics (cutting across themes)	Key characteristics	Sex, ethnicity, English as an Additional Language (EAL), age/stage of development, month of birth. Note that area-based characteristics are included under 'Home and neighbourhood' below.
Individual level	Wellbeing, cognitive and non-cognitive capabilities	Mental health, wellbeing, physical and emotional development – indicators of a pupil's emotional, psychological, social and physical wellbeing	Mental health/wellbeing, including positive mental health, referral to mental health support, diagnosed and undiagnosed mental health issues. Physical health, (for example, being physically active/inactive, un/healthy lifestyles) and cognitive development (in general and including language development).
Individual level	Wellbeing, cognitive and non-cognitive capabilities	Character and behaviour - indicators of a pupil's non-cognitive skills, character and behaviour	Non-cognitive and social-emotional skills, such as self-concept, self-control/behaviour, empathy, confidence and motivation. Behaviour at school (not including specific behavioural special educational needs and disabilities such as ADHD). Bullying and life online.

Domain	Theme	Working definition/scope	Examples of risk and protective factors that may be related to attainment and progress
Individual level	SEND and experience of social services	Children with special educational needs and disabilities (SEND), children in need (CIN), looked-after children (LAC), excluded from school, attending alternative provision	Special educational needs and disabilities – whether or not officially identified (for example, with an Education, health and care plan (EHCP), school action/school action plus or SEN statement). Looked-after children/care experienced, children identified through child protection as at risk, children who have been supported by social services as part of a Child Protection plan, designation as a Child in Need, persistent absence/school exclusion and alternative provision, young carers.
Home and neighbourhood - level	Home environment	The nature of the family and resources in the home.	Family relationships; home learning environment (including the physical characteristics of the home and the quality of the implicit and explicit learning support they receive from the caregivers); parental engagement with school; parent-child interaction; parental aspirations for their children; homework support. Safety and quality of the home physical environment and resources (including access to books in the home, technology and life online).

Domain	Theme	Working definition/scope	Examples of risk and protective factors that may be related to attainment and progress
Home and neighbourhood - level	Socio-economic attributes	Indicators of access to economic resources and social position	Eligibility for free school meals (FSM)/pupil premium (PP), disadvantaged. Household income, parental education, parental employment status. Level of deprivation in the local area/region (such as Income Deprivation Affecting Children Index (IDACI)). The nature of the neighbourhood and resources in the local area. Influence of place types and amenities, including access to green space, sport and cultural experiences. Socio-economic characteristics of school intake. (Note overlap with home factors and experiences of school.)
School-level	Experiences of school	Pupils' experiences of and attitudes towards learning and school.	Pupils' experiences of and attitudes towards learning and school and their attendance. (Note that persistent absence is covered as part of the SEND and experience of social services theme.) Experience of additional support for learning. Influence of peers and relationships with school staff (including teacher attitudes and expectations). Pupils' views on the curriculum, extra-curricular activities, assessment, teachers and school (including, school ethos/climate, sense of belonging). School type (for example, academy/local authority/selective/independent) and quality (such as Ofsted rating).

9.4 Review process

The literature review is a rapid review with systematic searching. The search and selection process will be systematic in the sense that it will involve specifying, recording and reporting criteria and decisions as well as applying consistent procedures at each stage of the review. The review is rapid in the sense that it is constrained by time, to enable it to contribute to the development of the longitudinal data-collection.

The review aims to identify, in a timely and efficient way, the best evidence in terms of relevance to the EOPS-B and the most robust study designs. It will also aim to identify literature on emerging factors that may indicate gaps in the evidence base about the influences on primary aged pupils' attainment, thus helping to inform the development of the EOPS-B instruments. This will be achieved by identifying:

- gaps and unexpected themes in the search results, including gaps in terms of the themes covered (for example, only a small number of items of literature[54] are identified in relation to a theme)
- a paucity of robust evidence relating to a particular theme (for example, a number of items are identified in relation to a theme but they are not robust studies)
- a potential new/unanticipated risk/protective factor (for example, from qualitative studies) based on the initial open searching on the factors influencing primary pupils' attainment outcomes

The review will involve the following steps.

9.4.1 Searching and initial sifting

- **Initial search strategy** drawn up by NFER information specialists with input from research team.
- **Agree search strategy and parameters with collaborators and DfE.** The team will provide a document outlining the search parameters (such as date range and type of literature); sources (key databases and websites); selection process during the searches (including prioritisation of reviews and longitudinal studies, and specifying certain types/content of literature that will be excluded from the review, such as single studies unless they offer the best evidence available on a relevant theme); and lists of 'key words' and phrases that will be used to search databases. (The proposed search strategy is set out below.)
- NFER's information specialists will conduct the searches according to the strategy and parameters and will initially sift the anticipated high volume (1000s) of potentially relevant research to achieve a high level of precision.
- The sifting process will **result in a 'long-list' of approximately 300 items of literature.** NFER will record key information on each of the selected items in an

[54] An item of literature means a single written source, such as a journal article or report.

Excel document. This will include a full reference and link (where available), date, country, search source and abstract/summary. This will be shared with the collaborating organisations and the DfE for information. Collaborators, experts and the DfE will also be invited to contribute suggestions for items of literature to be included on this list that meet the selection criteria once this literature review plan and search strategy has been agreed.

9.4.2 Screening

- A team of experienced NFER researchers will code the titles and abstracts/summaries of the 'long list' of 300 items.
- For each item, the researchers will identify the primary theme of interest to the review and rate the extent of relevance to the study aims in terms of measurement of risk/protective factors associated with the academic attainment of pupils. They will also rate the type of study. Meta-analysis, systematic reviews, literature reviews and longitudinal/cohort studies will receive a higher rating than individual empirical studies in relation to the main themes. Within each 'theme', items with the highest combined rating will be short-listed for full review. However, qualitative studies with high relevance in a new thematic area, UK-focused, and addressing a key gap in the evidence will be considered within scope and will receive a specific code to enable a small number of such studies (for example up to 10 per cent) to be selected.
- The team will be briefed to ensure consistency. Initially, NFER will conduct an inter-coder reliability check whereby individuals independently review a small selection of the same items (up to 10 per cent) to ensure robustness and consistency in the coding approach. Further QA checks will be conducted during the process to ensure a consistent approach to coding and item selection.
- The screening process will result in identifying a 'shortlist' of approximately 60 items which will be reviewed by the collaboration and the DfE.
- The shortlist will identify the selected items in relation to each of the main themes of the review, plus other factors considered relevant to primary pupils' attainment but where the evidence is less well established. This means that there will be approximately 12 items in the short-list relating to each of the main themes.

9.4.3 Additional material

- The review team will invite the DfE and experts to recommend key evidence to consider for inclusion in the shortlist. This could include seminal evidence which was published before 2012 or single empirical studies which address a gap in the evidence.
- The review team will undertake reference harvesting (also known as 'snowballing') to identify additional references from shortlisted literature. In cases where this finds a similar but better (for example more relevant, comprehensive, up to date, better quality) example than an original shortlisted item, we will substitute the new

item for another on the shortlist. We are also willing to expand the list (by up to 10 per cent), to accommodate key literature of particular value to the study.

9.4.4 Reviewing

- A team of experienced researchers from across the collaborating organisations – NFER, NatCen and NCB – will review the shortlisted items relating to their area of expertise.
- Reviewing items will involve completing a structured template to summarise: the main findings in relation to each of the themes and any additional emerging themes; methods; and implications for further investigation. The review template will also record the names of relevant measures used in the studies, which will be passed to NatCen to inform instrument development.
- In addition, the review will adopt a 'Weight of Evidence' approach (Gough, 2007) to evaluate the quality and relevance of the evidence. This will involve assigning a rating for each of the following:

    a) Methodological quality: a non-review specific rating about the coherence and integrity of the evidence (based on assessment of aspects such as clear purpose, representativeness, validity of measures, sample size, interpretation of the findings, and sources of limitation and bias, such as attrition)[55]
    b) Methodological relevance/precision: a review-specific rating of the appropriateness of the form of evidence for addressing the review question
    c) Topic relevance: a review-specific rating about the relevance of the evidence to the review question

These ratings will be combined to form an overall assessment of the weight of evidence to address the review question.

In order to promote consistency, researchers will attend an initial briefing and will then review a sample of items independently. NFER will check the approach and information extracted is consistent. They will also QA a sample of reviews during the reviewing process and once all reviews are completed.

9.4.5 Analysis and reporting

- The team of researchers will synthesise the evidence in relation to each of the key themes and any additional topics of interest. (Items offering insights of potential influences on primary pupils' attainment that are not covered by the main themes of the review will also be identified.) The process will entail assessing the quality of evidence, analysing the extent of variation in findings relating to each theme, the direction and magnitude of the relationship of each factor with attainment, and the relationship/s between factors.

[55] Note that the quality of qualitative studies will be assessed using different criteria – see Greenhalgh and Taylor (1997).

- Collaborators will meet to discuss the emerging findings from their analysis, explore interpretations and identify key messages for the report. This will include consideration of how factors become more or less important as children age and the implications for data collection. Key emerging findings will also be presented to DfE and the team will draft a structure for reporting findings for agreement.
- The team will draft a written report of the literature review findings which will present the evidence in relation to each of the key themes, as well as relevant contextual evidence and emerging evidence on factors of influence. The report will be refined and finalised for publication, based on review by collaborators, the DfE and the steering group and technical advisory group.
- The literature in the shortlist will be reviewed in two tranches to enable initial focus on priority themes, particularly in areas where the identification of measures and development of new question items may be required. This will allow us to draw on the literature with sufficient time to develop and cognitively test questions prior to the pilot. The themes that will be reviewed as a priority will be agreed following feedback on the shortlist. At this point, we suggest prioritising: home environment; pupils' cognitive and non-cognitive capabilities (part of Theme 1); and SEND and experience of social services; plus any key emerging new evidence. In this scenario, the second tranche of themes would be socio-economic attributes; experiences of school; and mental health, wellbeing and physical development (part of Theme 1).

9.5 Roles in the review

The three organisations of the collaboration will have the following roles in relation to the literature review.

9.5.1 NFER

- lead and manage the literature review, with input from collaborators and DfE and experts at specific points (such as nominating key items and reviewing the list of shortlisted items)
- design search parameters, conduct searches and identify the most relevant items (screening)
- design templates, brief reviewers and lead QA
- allocate items of literature to these and coordinate contributions from the collaboration, experts and DfE
- review literature, analyse and write report, incorporating sections from NatCen and NCB

- review, analyse and report on the following themes: pupils' cognitive and non-cognitive capabilities (part of Theme 1); socio-economic attributes; experiences at school; and new and emerging factors

9.5.2 NatCen and NCB

- review search parameters and shortlisted items – recommend changes/additions
- review literature, analyse and write report sections related to specific themes
- NatCen will review, analyse and report on literature on the following themes: home environment; mental health, wellbeing and physical development (part of Theme 1)
- NCB will review, analyse and report on the theme of SEND, experience of social services and adverse childhood experiences

9.5.3 Department for Education

- comment on the search parameters
- review the list of 60 shortlisted items (in relation to long list of 300). Suggest changes and recommend additional items for consideration that are seminal or fill important gaps in the evidence-base
- attend an emerging findings meeting and provide a steer on findings of particular interest and importance to the study
- collate responses from colleagues across the DfE to an initial report outline and the draft literature review report. In cases where opinions differ, provide guidance to the review team on which comment(s) takes precedence

9.5.4 EOPS-B Technical Advisory Group and Steering Group

- The members of the EOPS-B Technical Advisory Group and Steering Group will be invited to comment on the draft literature review report.

9.6 Inclusion and exclusion criteria

Inclusion and exclusion criteria are set out in Table 9 below.

Table 9: Summary of inclusion and exclusion criteria

Criteria	Include	Exclude	Rationale
Date range	Literature published 2012 – 2022	Literature published before 2012 (except older literature synthesised in reviews, or identified as seminal and highly relevant, for example via expert recommendation or widely cited)	Literature published in the last ten years is most likely to reflect the context and environment experienced by the population intended to take part in EOPS-B.
Geographic location	England, UK and international literature reviews/meta-analysis (English-speaking and/or comparator jurisdictions)	Primary studies conducted outside the UK.	Studies conducted in England/UK are likely to be most relevant to the EOPS-B study population. International literature is less likely to be directly relevant to the English context but could identify other key risk/protective factors.
Language	Published in English	Published in languages other than English	Most likely to be relevant (see geographic coverage) and including literature published in other languages is not cost-effective within the time and resources available for this rapid review.

Criteria	Include	Exclude	Rationale
Type of publication	Research-based literature reviews, meta-analyses and longitudinal studies conducted in England and the UK. Large-scale quantitative and qualitative studies conducted in England/UK. International literature reviews/meta-analysis in English-speaking and/or comparator jurisdictions. Peer reviewed and grey literature.	Individual, small-scale primary studies (except in the case of evidence gaps). Policy documents (except if reporting data not available from other sources); opinion pieces.	These types of literature are likely to provide the best evidence for the purposes of this rapid review.
Participants	Pupils in Reception, key stage 1 and 2 in England (age 4-11) and international equivalents	Pupils younger than 4 or older than 11. Studies focused on specific interventions	To reflect the focus of EOPS-B on the primary phase of education. Other EOPS studies are exploring early years and secondary education.
Reported outcomes	Risk and protective factors for academic attainment and progress	Non-academic attainment or progress	To reflect the focus of the EOPS-B study on pupils' attainment outcomes. The review will explore the factors influencing this outcome rather than the factors as distinctive outcomes themselves, given the time and resources available for the review and the breadth of influential factors.

Criteria	Include	Exclude	Rationale
Content of interest	Evidence on the influence of the following factors on primary pupils' attainment: demographic characteristics; pupils' wellbeing (including health), cognitive and non-cognitive capabilities; SEND and experience of social services; home environment; socio-economic attributes; experiences of school.	Highly specific aspects within these factors, such as works focused on specific medical/health conditions; and wider societal factors (for example crime, changes to benefits system).	To ensure the review covers the breadth of influences on primary pupil attainment and with sufficient depth in relation to each main theme and emerging areas within the time and resources available for the review.
Setting	Primary schools of all types (for example first, infant, junior, middle deemed primary); primary classes in all-through schools, including special schools and alternative provision; primary pupils' home and locality	Early childhood education and care (ECEC) settings; children educated exclusively at home	To ensure the review findings are relevant to the majority of the primary school population. ECEC settings will be covered by the EOPS-A study.

9.7 Search parameters

9.7.1 Sources of evidence:

- **education databases:** British Education Index (BEI) and Educational Resources Information Center (ERIC)
- **mental health and social care databases:** Child and Adolescent Development Studies, PsycInfo, Pubmed (Medline) and Social Care Online
- **international systematic review libraries:** Cochrane Library, Campbell Collaboration, What Works Clearinghouse (IES)[56]
- **NFER's in-house database** which extensively covers UK government-commissioned research, outputs of leading UK research organisations and peer-reviewed literature published since 2018
- **selected UK websites** (for deeper searches of grey literature since 2012):
    - Government education departments & oversight: Department for Education, Welsh Government, Scottish Government; Education Select Committee, National Audit Office
    - Research organisations: Anna Freud National Centre for Children and Families, Early Intervention Foundation, Education Endowment Foundation, Education Policy Institute, Institute of Fiscal Studies, Institute for Social and Economic Research, LSE Department of Social Policy, Mental Health Foundation, National Foundation for Educational Research, Ofcom, ONS[57], Sutton Trust, UCL Institute of Education (Centre for Longitudinal Studies [CLS], Centre for Education Policy and Equalising Opportunities [CEPEO], Centre for Learning and Life Chances in Knowledge Economies and Societies [LLAKES], UCL Centre for Inclusive Education and Thomas Coram Research Unit and the Effective Pre-school, Primary and Secondary Education Project [EPPSE – out of date range but seminal]), University of Cambridge (Developmental Psychopathology), Young Minds
- **websites of selected key UK educational research and psychology journals** for new research not yet indexed in the databases where specific journals are identified to be particularly valuable sources in the database searching
- **recommendations** from NFER, NCB and NatCen thematic experts, academic partners and from DfE experts
- **reference harvesting**

[56] While we anticipate the database searches will include some outputs from these organisations, we also searched the individual libraries for additional or newly added pieces.
[57] Ofcom and ONS are included to cover children's life online.

9.8 Selection process

NFER information specialists will screen the high volume (1000s) of search results against the search parameters prioritising works that can give the most robust and precise insights into pupil experiences during primary education across the themes of the review to arrive at 300 items for systematic coding. The inclusion and exclusion criteria outlined above in Table 9 will be applied.

The risk of missing key literature (lack of sensitivity) will be mitigated by inviting expert recommendations from DfE, NatCen, NCB, NFER and academic partners as well as consulting the reference lists of shortlisted items.

The search process, initial sifting and selection of 300 items for systematic coding will be quality assured by Amanda Taylor, Head of Knowledge Team, with 20+ years of experience in conducting and managing literature reviews in educational research.

9.9 Keywords for database searches

Search terms will be tailored to each database's vocabulary (those in the tables below reflect the ERIC thesaurus[58]). Keyword sets and free text (FT) searches will be combined as follows in Tables 10-12 to achieve comprehensive targeted results across the wide range of areas.

The keyword sets have been constructed to reflect the main themes of the review. In addition, the 'educational outcomes' set of keywords will be run first to facilitate a more 'open search' for relevant factors explored in relation to attainment in the primary phase. The theme specific search sets will ensure we pick up key literature relevant to the review on factors that influence outcomes but may not be as explicitly indexed as relating to primary attainment.

The search strategy is designed such that all UK primary research and reviews will be screened. The methods set is included to limit international works to be screened to synthesised works such as reviews or longitudinal studies.

[58] Note that use of 'student' here reflects the US thesaurus terms in ERIC. We substituted student for pupil or child where free text searching was needed to reflect this being the predominant terminology in the UK.

Table 10: Keyword set combinations for database searches (based on ERIC)

Results targeted	Themes (see tables below for full keywords) + Educational outcomes	Limited to primary[59] phase	Limited by
UK primary research (including qualitative studies) & reviews/meta-analysis	Educational outcomes Demographic Pupils' wellbeing, cognitive and non-cognitive capabilities (including mental health, character, behaviour and physical development) SEND and experience of social services Socio-economic attributes Home environment Experiences of school	Elementary education Elementary school students Elementary schools First schools (FT) Infant(s) school(s) (FT) Junior school(s) (FT) Key stage 1/one/KS1 (FT) Key stage 2/one/KS1 (FT) Middle schools (FT) Primary education Primary school(s) (FT) Reception classes (FT) School readiness	United Kingdom *or*

[59] Searches also identify literature which covers other phases in addition to primary.

Results targeted	Themes (see tables below for full keywords) + Educational outcomes	Limited to primary[60] phase	Limited by
International reviews & meta-analysis	Educational outcomes Demographic Pupils' wellbeing, cognitive and non-cognitive capabilities (including mental health, character, behaviour and physical development) SEND and experience of social services Socio-economic attributes Home environment Experiences of school	Elementary education Elementary school students Elementary schools First schools (FT) Infant(s) school(s) (FT) Junior school(s) (FT) Key stage 1/one/KS1 (FT) Key stage 2/one/KS1 (FT) Middle schools (FT) Primary education Primary school(s) (FT) Reception classes (FT) School readiness	Methods: Literature reviews Longitudinal studies Meta-analysis Rapid review(s) (FT) Systematic review(s) (FT)

The keyword sets which follow are based on the ERIC thesaurus terms supplemented by free text key words (denoted FT) as an illustration.

[60] Searches also identify literature which covers other phases in addition to primary.

Table 11: Keyword lists for review theme (listed alphabetically)

Educational outcomes	Demographics	Mental Health, wellbeing and physical development	Character, capabilities and behaviour
Academic achievement Achievement Achievement gains Achievement gap Closing /close the gap (FT) Cognitive development Early language development (FT) Education outcome(s) (FT) Educational attainment Educational outcome(s)(FT) High achievement Language acquisition (used for language development) Levelling / level up (FT) Low achievement Mathematics achievement Narrowing/narrow the gap (FT) Outcomes of education Prior attainment (FT) Pupil outcome(s) (FT) Reading achievement School readiness	English as an Additional Language (EAL) (FT) Ethnic Groups Gender differences Minority Groups Month of birth (FT) Season of birth (FT) Sex Summer born (FT)	Anxiety CAMHS (FT) Child and adolescent mental health services (FT) Children and young people mental health services Depression (Psychology) Emotional disturbances (used for emotional disorder Emotional problems Healthy lifestyle (FT) Mental health Mental health service(s) (FT) Physical development Physical health Resilience (Psychology) Well being Well being services (s) (FT)	Academic aspiration Achievement need Aspiration Behavior Behaviour (FT) Bullying (covers cyber bullying) Character (FT) Coping Emotional intelligence Emotional response (used for emotional regulation) Interpersonal competence (used for social skills) Learning disposition (FT) Learning motivation Locus of control Metacognition Non-cognitive (FT) Online behaviour Persistence Personality Personality traits Problem solving Resilience (Psychology) Self control Self efficacy Self esteem (self confidence)

Educational outcomes	Demographics	Mental Health, wellbeing and physical development	Character, capabilities and behaviour
			Self motivation Self regulation Social behaviour Social skills (FT) Student behavior Student motivation

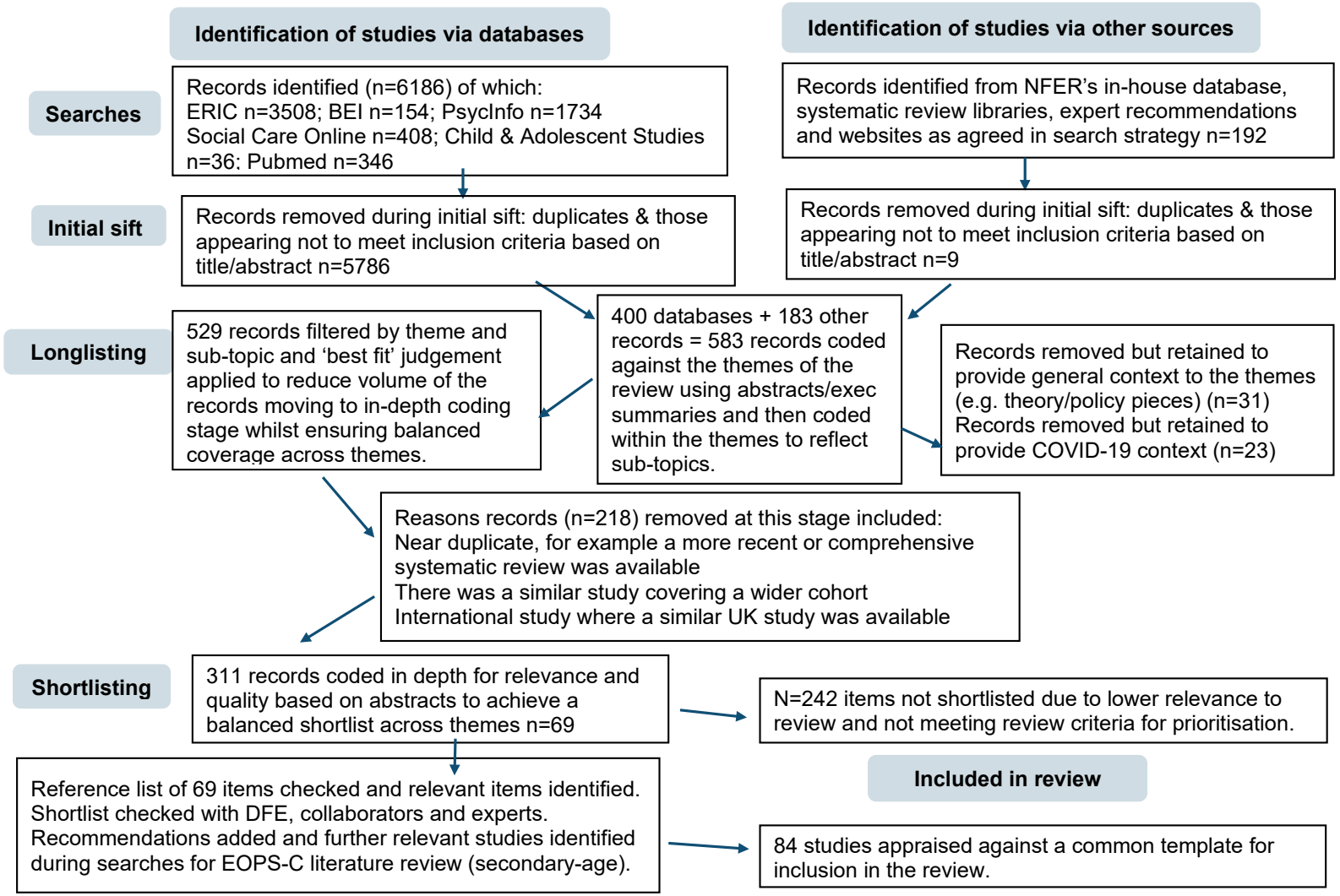
Table 12: Keyword lists for review theme (listed alphabetically) (continued)

SEND and experience of social services	Home environment	Socio-economic attributes	Experiences at school
Adoption Additional learning needs (FT) Additional support needs (FT) Adverse childhood experience(s) (FT) Alternative provision (FT) At risk students Care experienced (FT) Children in need (FT) Child protection (FT) Child safety (used for child protection) Child welfare Children in care (FT) Disabilities EHCP or EHC plan (FT) Expulsion Foster care Hard to reach (FT) Individual learning plan (FT) Intellectual disab* (FT) Internal exclusion Learning disabilities Learning difficulties (FT) Looked after child(ren) (FT)	Access to computers Digital access (FT) Digital divide (FT) Family characteristics Family environment Family involvement Family life Family literacy Family problems Family relationship Family school relationship Home learning environment (FT) Home school partnerships Home school relations/ships (FT) Homework Life online (FT) Parent aspiration Parent attitudes Parent child relationship Parent participation Parent school relationship Parent student relationship Parent teacher cooperation Parental engagement (FT)	Disadvantaged Disadvantaged schools Disadvantaged youth Economically disadvantaged Educationally disadvantaged Educational mobility Free school meals (FT) Homeless people Housing needs Index of Multiple Deprivation (FT) Low income Low income groups Low income students Poverty Pupil premium (FT) Parent education Parent background Parent income Parental employment (FT) Deprivation Deprived areas Disadvantaged areas (FT) Disadvantaged environment Education investment areas (FT) Neighborhoods	Ability grouping Attendance Attendance patterns Behaviour management (FT) Classroom environment Collaborative learning (FT) Cooperative learning Discipline Educational environment Educational quality Extra-curricular activities Friendship Learner engagement Peer acceptance Peer groups Peer influence Peer relationship School attitudes School attachment School belonging (FT) School bonding (FT) School climate (FT) School connectedness (FT) School connection School culture School environment (FT) School ethos (FT)

SEND and experience of social services	Home environment	Socio-economic attributes	Experiences at school
Mental retardation[61] Out of school youth Persistent absence (FT) Pupil referral unit (FT) Safeguarding (FT) School Action (FT) School action plus (FT) School exclusion (FT) SEN support (FT) Social care (FT) Social services Special education Special needs students Special education needs (FT) Special educational needs (FT) Statement of special educational needs (FT) Suspension Truancy Vulnerable child(ren) (FT) Vulnerable pupil(s) (FT) Young carer(s)		Neighbourhood (FT) Opportunity areas (FT) Postcode lottery (FT Social capital Socioeconomic Status Rural areas Urban areas	Student attitudes Student school relationship Teacher attitudes Teacher expectations of students Teacher student relationship Teaching methods Teaching styles Tutoring

[61] This outdated terminology still forms part of the ERIC database hence its inclusion.

10 Appendix C: Identifying optimal evidence for the rapid review[62]



[62] Page, M.J. et al. (2021) 'The PRISMA 2020 statement: an updated guideline for reporting systematic reviews', *BMJ*, 372, p. n71. Available at: https://doi.org/10.1136/bmj.n71.

Annex 1 Glossary of terms

Research terms

Independent variable – a variable/factor manipulated in a study that is believed to have an effect on the dependent variable.

Dependent variable – a variable/factor for which the value is dependent on/affected by another variable and is believed to change as a result of the independent variable.

Confounding variable – a variable that influences both an independent variable and dependent variable.

Effect size – An effect size is a value measuring the strength of the relationship between two variables or the size of difference between group means. There are different ways to calculate effect sizes, including from the standardised mean difference (for instance, Hedges g, Cohen's d), odds ratios or correlation coefficients (for instance, Pearson's r). Adjusted odds ratio (AOR) have controlled for other variables. This report includes relevant effect size statistics and interpretations where these are available in the original sources.

Mediating variable – a variable through which the independent variable has an effect on the dependent variable.

Moderating variable – a variable that affects the strength and/or direction of relationship between the independent and dependent variable.

Protective factor – a factor that is regarded as having the effect of improving an outcome.

Risk factor – a factor that is regarded as having the effect of worsening an outcome.

Statistical significance – indicates the probability that a finding has occurred by chance. It is usually assumed that if this probability is less than or equal to 5%, the result is statistically significant.

Demographic terms

Attainment gap – the gap in the attainment outcomes of disadvantaged pupils compared to their peers.

Disadvantaged pupils – pupils identified by DfE as being eligible for free school meals (FSM) or have been in the past six years, pupils who have been adopted from care or have left care and young people who are looked after by a local authority.

Special Educational Needs and Disability (SEND) – a child or young person has SEND if he or she has a learning difficulty or disability which calls for special educational provision

(Children and Families Act, 2014). A disability is defined as a ‘physical or mental impairment that has a ‘substantial’ and ‘long-term’ negative effect on your ability to do normal daily activities’ (Equality Act, 2010).

Education health and care plan (EHCP) – identifies educational, health and social needs and the additional support required to meet the needs of children and young people identified with a special educational need or disability (SEND) and who need more support than is available through SEN support. It is applicable for children and young people aged up to 25.

Free school meals (FSM) **–** economically disadvantaged pupils are eligible for free school meals (FSM). Since April 2018, all pupils whose families are in receipt of Universal Credit (UC) and have a household income of £7,400 or less are eligible to claim FSM. This is alongside pupils who met the eligibility requirements for FSM as part of a number of legacy schemes (DfE, 2023).

Socio-economic status (SES) – a measure of an individual’s or family’s economic situation and social position in relation to others. The studies included in this review measure different dimensions of SES, including eligibility for FSM, parental education, social class (based on parental occupation), household income and neighbourhood deprivation.

Educational institutions

Early childhood education and care (ECEC) – ‘any regulated arrangement that provides education and care for children from birth to compulsory school age’ (European Commission, 2022). This includes nannies, childminders, pre-schools and nurseries.

Teaching schools – a previous government initiative in which schools rated as ‘outstanding’ by Ofsted provided staff training, development and support to other schools (Department for Education, 2019).

Longitudinal cohort studies and national data sets referred to in this report

Avon Longitudinal Study of Parents and Children (ALSPAC) – a birth cohort study run by the University of Bristol. It tracks 14,000 women who were pregnant between April 1991 and December 1992, their children and their partners over two decades. The study provides data on the environmental and genetic factors that affect a person’s health and development.

British Cohort Study (BCS) – a cohort study that follows the lives of around 17,000 people born in England, Scotland and Wales in 1970. It has collected information on participants’ health, physical, educational and social development and economic circumstances.

Children in Need and Children Looked After data sets – compiled by the Department for Education based on annual children in need and looked-after children censuses completed by local authorities. The data sets provide data on episodes when a child is identified as in need or subject to a Child Protection Plan, referrals and assessments of need, and social work interventions, such as care and placements.

The Effective Pre-School, Primary and Secondary Education project (EPPSE) – a cohort study tracking more than 3,000 children from the start of pre-school (3 years old), through primary school (ages 6, 7, 10 and 11) and secondary school (ages 14 and 16). It focuses on the effectiveness of early years education by comparing outcomes to children with no pre-school experience.

Millennium Cohort Study (MCS) – a cohort study following the lives of around 19,000 young people born in England, Scotland, Wales and Northern Ireland in 2000-02. It collects information on young people's physical, socio-emotional, cognitive and behavioural development, daily life, behaviour and experiences, economic circumstances, parenting, relationships and family life.

National Child Development Study (NCDS) – a cohort study that follows the lives of more than 17,000 people born across England, Scotland and Wales in 1958. It has collected information about participants' health, physical, cognitive and social development, education, employment, home lives, and social participation and attitudes.

National pupil database (NPD) – a data set compiled by the Department for Education covering education, skills and children's services data for individual learners in England. It provides data on children's attainment, demographics, absence and exclusion from school, and whether they are identified as children in need or looked-after children.

The Study of Early Education and Development (SEED) – a longitudinal study following nearly 6,000 children from across England from the age of 2. It started in 2013 and is intended to continue until 2029. It explores the characteristics of a child's early environment and ECEC and how this relates to child development over time.

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