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The Impact of Pupil Behaviour and Wellbeing on Educational Outcomes

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Executive Summary

A review of previous literature suggests that wellbeing and learning are associated with one another; however, there is less information on how multiple dimensions of wellbeing simultaneously predict later changes in educational outcomes for children and teenagers. This project examines how various dimensions of children's wellbeing are associated with their educational outcomes, including a review of relevant literature and an analysis using data from the Avon Longitudinal Study of Parents and Children (ALSPAC).

The analysis of ALSPAC data investigates the association between dimensions of wellbeing at ages 7 to 13 and concurrent (i.e. measured at the same age) and later educational outcomes at ages 11 to 16, including academic achievement (i.e., national exam scores) and school engagement (i.e., being stimulated by school). The dimensions of wellbeing are:

- emotional (including fears, anxiety and mood),
- behavioural (including attention problems e.g., finds it hard to sit still; activity problems e.g., forgets things, makes careless mistakes; troublesome behaviour, e.g., plays truant, lies, steals things; and awkward behaviour, e.g., blames others for mistakes, is easily annoyed),
- social (including victimisation i.e., being bullied and having positive friendships), and
- school (including enjoyment i.e., likes school and engagement i.e., stimulated by school).

We also investigate whether the relationship between wellbeing and educational outcomes varies for different groups of children. There is consistent UK evidence that some groups of children experience more academic difficulties and have lower achievement than others. However, few studies have considered whether children's demographic (age and gender, for example) and other characteristics moderate the association between wellbeing and later educational outcomes.

Key Findings

- Children with **higher levels of emotional, behavioural, social, and school wellbeing**, on average, have higher levels of academic achievement and are more engaged in school, both concurrently and in later years.
- Children with **better emotional wellbeing** make more progress in primary school and are more engaged in secondary school.
- Children with **better attention skills** experience greater progress across the four key stages of schooling in England. Those who are engaged in **less troublesome behaviour** also make more progress and are more engaged in secondary school.
- Children who are **bullied** are less engaged in primary school, whereas those with **positive friendships** are more engaged in secondary school.

- As children move through the school system, **emotional and behavioural wellbeing** become more important in explaining school engagement, while demographic and other characteristics become less important.
- Relationships between **emotional, behavioural, social, and school wellbeing** and later educational outcomes are generally similar for children and adolescents, regardless of their gender and parents' educational level.

Review of Previous Research

The first part of the project is an overview of research examining the relationship between wellbeing and educational outcomes. Our review focuses on our own previous research undertaken by two centres at the Institute of Education, the Centre for Research on the Wider Benefits of Learning and the Childhood Wellbeing Research Centre, as well as recent studies which analyse UK data.

The key messages from our previous research are:

- Better emotional wellbeing is associated with higher achievement in primary school,
- Children's attention problems have been shown consistently to predict lower academic achievement at all ages,
- Problematic behaviour becomes associated with poorer academic achievement as children grow older,
- Being bullied is associated with lower achievement for both primary and secondary school pupils, and
- Children's measures of school wellbeing have been found to be associated with academic progress in secondary school, but not in primary school.

Research Questions

There is little previous research on how multiple dimensions of wellbeing simultaneously predict later changes in educational outcomes for children and teenagers. In order to fill this gap, the second stage of this project uses data analysis to examine four main research questions, which are:

1. How is **emotional, behavioural, social, and school wellbeing** associated with **concurrent educational outcomes**?
2. How is **emotional, behavioural, social, and school wellbeing** associated with **later educational outcomes**?
3. To what extent are **dimensions of wellbeing** associated with **changes in later educational outcomes** i.e., how is wellbeing associated with progress between two time points?
4. Do children's **demographic and other characteristics** (gender, social class, and SEN status) **moderate the association between their wellbeing and changes in**

their later educational outcomes (i.e., how different for different groups)? Are these patterns consistent over the primary and/or secondary school period?

Data and Methodology

ALSPAC is an ongoing longitudinal study of families in the former county of Avon in the west of England. More than 14,000 women enrolled in the study during pregnancy in 1991 and 1992. Primary sources of ALSPAC data collection include self-completion questionnaires for mothers and their partners administered during pregnancy and at regular intervals following the birth, assessments of children in a clinic-based setting, and questionnaires for the cohort members themselves.

In this study, we utilise parent-reported data as they are the only consistent measures of wellbeing available from ALSPAC that span the period from childhood to adolescence. Key stage scores were obtained from the National Pupil Database. Several control variables, including English as a first language, SEN status, and eligibility for free school meals, were obtained from the Pupil Level Annual School Census administrative data.

Measures

We examine the predictive power of four dimensions of wellbeing -- emotional, behavioural, social, and school wellbeing -- at three average age points: 7.5, 10.5, and 13.8 years. (In the remainder of this summary we simplify these ages to 7, 10, and 13 years).

The control variables include whether English is the first language, whether the child is eligible for free school meals, and whether any SEN is identified, highest parental educational level, parents' marital status, child's birth weight in grams, gender, and ethnicity.

The outcome measures are academic achievement and school engagement. Academic achievement is measured using the results in end-of-key-stage tests taken at age 7 (Key Stage 1), age 11 (Key Stage 2), age 14 (Key Stage 3), and the GCSE exams at age 16 (Key Stage 4). Key stage scores are finely graded input and output measures for contextual value-added models. Academic progression is measured between two successive key stages (i.e., Key Stage 1 to Key Stage 2, Key Stage 2 to Key Stage 3, and Key Stage 3 to Key Stage 4). School engagement is measured by the ALSPAC surveys at 7, 10, and 13 years.

Findings

1. How is wellbeing associated with concurrent educational outcomes?

Emotional, behavioural, social, and school wellbeing at ages 10 and 13 are significantly correlated with concurrent educational outcomes i.e., academic achievement at Key Stage 2 (age 11) and Key Stage 3 (age 14) and school engagement at ages 10 and 13. For academic achievement, attention problems show the strongest relationship with Key Stage 2

($r = .31$)² and Key Stage 3 ($r = .32$) scores, with fewer attention problems being associated with higher key stage scores. Levels of school enjoyment show the strongest relationship with engagement at ages 10 ($r = .66$) and 13 ($r = .71$), with more school enjoyment being associated with greater engagement.

2. How is wellbeing associated with later educational outcomes?

For academic achievement, emotional, behavioural, social, and school wellbeing at ages 7, 10 and 13 are significantly correlated with later academic achievement at Key Stage 2 (age 11), Key Stage 3 (age 14) and Key Stage 4 (age 16), with the exception of the relationship between school wellbeing at age 7 and later academic achievement at Key Stage 2. For school engagement, emotional, behavioural, social, and school wellbeing at ages 7 and 10 are significantly correlated with later engagement at ages 10 and 13.

3. How is wellbeing associated with changes in later educational outcomes i.e., progress between two time points?

When taking into account prior achievement, wellbeing measures, and control variables, we found that:

- Better emotional wellbeing at age 7 is a significant predictor of higher academic progression from Key Stage 1 to Key Stage 2. This relationship is not significant at other ages.
- Better attention skills at ages 7, 10, and 13 are a significant predictor of greater academic progression in both primary and secondary school, indicating that the ability to control and sustain attention is a consistent predictor of children's learning.
- Children who are not engaged in troublesome behaviours at ages 10 and 13 make more progress in secondary school (i.e., Key Stage 2 to Key Stage 3; Key Stage 3 to Key Stage 4). This relationship is not significant in primary school (i.e., Key Stage 1 to Key Stage 2).
- More school engagement at age 13 is a significant predictor of greater academic progression from Key Stage 3 to Key Stage 4, highlighting the importance of sustaining school motivation for academic achievement in adolescence.
- Children with SEN status make less progress, whereas those with married parents and those with more highly educated parents make greater progress. Boys make more progress from Key Stage 1 to Key Stage 2, whereas girls make greater progress from Key Stage 3 to Key Stage 4. Children eligible for free meals progress more slowly from Key Stage 2 to Key Stage 3.

² The correlation coefficient (r) shows the strength and direction of the linear relationship between two variables.

When taking into account prior school engagement, wellbeing measures, and control variables, we found that:

- Being bullied at age 7 is a significant predictor of lower school engagement from ages 7 to 10.
- Better emotional wellbeing, less troublesome behaviour, fewer activity and attention problems, and more positive friendships at age 10 are associated with greater school engagement from 10 to 13 years, highlighting the significant role of wellbeing in children's engagement as they enter secondary school.
- More school enjoyment at ages 7 and 10 is associated with greater school engagement from ages 7 to 10 and from ages 10 to 13, respectively, indicating that children who enjoy school are more likely to be motivated and engaged in their school work at a later point in time.
- Children with SEN status, those eligible for free meals, and boys are less engaged in school, whereas children whose first language is English are more engaged from ages 7 to 10. None of these demographic factors is significant from ages 10 to 13, however.

4. Does the association between dimensions of wellbeing and changes in later educational outcomes vary according to children's gender, SEN status and their parents' education level?

The relationships between dimensions of wellbeing and changes in later educational outcomes appear to be generally similar for children and adolescents, regardless of their gender and parents' educational level. We found, however, three significant interactions for SEN:

- Children with SEN who engage in awkward behaviour (e.g., blame others for mistakes, throw tantrums) make greater academic progress from Key Stage 1 to Key Stage 2 than children who do not engage in awkward behaviour. This finding suggests that more awkward behaviour does not generally have a negative association with lower academic progression for children, with or without SEN status, especially when compared to those children who might have other SEN difficulties.
- Children with SEN, however, make less progress from Key Stage 2 to Key Stage 3 when they have activity problems (e.g., forget things, make careless mistakes) compared to children who do not have such problems.
- Among children with more attention problems, those with SEN experience more school engagement from ages 10 to 13 compared to those without SEN. This may indicate that children with SEN are getting more help to deal with their attention difficulties than children with similar problems who are not SEN. Nevertheless,

children with attention problems have lower school engagement, with or without SEN, than children with fewer attention problems.

Overall, these findings suggest that the relationship between behavioural wellbeing and later educational outcomes is more complex for children categorised with SEN. This is not surprising, especially considering the diversity of behaviours linked to SEN.

Conclusions and Implications

Our study demonstrates the importance of wellbeing for children and adolescents throughout their primary and secondary school education. There are critical periods, however, when specific dimensions of wellbeing are most crucial. For academic progression, better emotional wellbeing is a key factor in primary school, whereas low levels of troublesome behaviour and more school engagement emerge as significant in adolescence. Good attention skills, on other hand, are important for academic progression in both primary and secondary school. For school engagement, victimisation appears to have a greater impact in primary school, whereas better emotional and behavioural wellbeing and positive friendships are supportive in secondary school. School enjoyment plays a significant role in encouraging engagement in both primary and secondary school.

1. Background

While there is evidence that academic achievement is linked to children's wellbeing (e.g., Gutman, Brown, Akerman, & Obolenskaya, 2009; Gutman & Feinstein, 2008), there is less research examining the association between wellbeing and children's later educational outcomes, particularly across multiple time points and dimensions of wellbeing. An investigation of multiple time points is important as the association between wellbeing and achievement may vary according to the schooling age of the child. For instance, the relationship between engagement in problem behaviour and academic achievement has been shown to become more important as children proceed through school (Trzesniewski, Moffitt, Caspi, Taylor, & Maughan, 2006). The examination of multiple dimensions of wellbeing is also critical given that different dimensions of wellbeing have been shown to be strongly associated with one another (Gutman et al., 2009). For example, children who are both bullies and victims of bullying (i.e., bully/victims) tend to have higher levels of hyperactivity and behavioural difficulties than children who are not bullies/victims (Gutman & Brown, 2008). As a result, an association between being a bully/victim and academic achievement may be due to another related factor such as attention problems. The simultaneous examination of different dimensions of wellbeing across primary and secondary school will help clarify their relative importance during the key stages of schooling.

More information is also needed regarding whether the relationship between wellbeing and educational outcomes varies for different subgroups of children. There is consistent UK evidence that some children suffer from more academic difficulties and have lower achievement than others. On average, boys are more likely to have special educational needs (SEN) and lower academic achievement than girls (Cassen & Kingdon, 2007; Gutman et al., 2009). Children from more economically disadvantaged backgrounds also have lower achievement than their more advantaged peers and this difference becomes more pronounced as they proceed through school (Barreau et al. 2008; Goodman & Gregg, 2010). Despite differences in children's achievement linked to gender, SEN status, and family socioeconomic status (SES), few studies have considered whether these characteristics moderate the association between wellbeing and later educational outcomes. It is expected that wellbeing may matter more for certain subgroups, particularly when examining their academic progression.

2. Aims

This report examines how dimensions of children's wellbeing (at ages 7 to 13) are associated with concurrent and later educational outcomes (at ages 11 to 16). The report first begins with a short summary of previous research examining how wellbeing is associated with educational outcomes. This provides a background to the second stage of our report. Using multivariate analyses, we explore whether children's emotional, behavioural, social, and school wellbeing is associated with their academic achievement and school engagement.

Drawing upon data from the Avon Longitudinal Study of Parents and Children (ALSPAC), the four main aims of the report are:

- To examine the relationship between children's emotional, behavioural, social, and school wellbeing and their concurrent academic achievement and school engagement;
- To investigate the relationship between children's emotional, behavioural, social, and school wellbeing and their later academic achievement and school engagement;
- To investigate whether children's emotional, behavioural, social, and school wellbeing is associated with changes in their later academic achievement and school engagement, when taking into account the prior educational outcome, other wellbeing measures and control variables; and
- To examine whether the association between children's emotional, behavioural, social, and school wellbeing and changes in their later educational outcomes is stronger for some children than for others, examining differences according to gender, SEN status, and parents' educational level.

3. Review of Previous Research

The first part of the report is an overview of research examining the relationship between wellbeing and educational outcomes. The review is structured according to the four dimensions of wellbeing examined in the report, namely, emotional, behavioural, social, and school wellbeing. For each dimension of wellbeing, we review recent research examining the association between wellbeing and academic achievement during childhood and adolescence and whether this association has been found to vary according to children's own and their family's characteristics.

3.1 Methodology

The review focuses on our own previous research undertaken by two centres at the Institute of Education, the Centre for Research on the Wider Benefits of Learning (CWBL) and the Childhood Wellbeing Research Centre (CWRC), drawing on evidence from these reports, and, in particular, the principal sources included in the accompanying literature reviews. A limited search of evidence was also undertaken, focusing on recent studies which analyse UK data. This is not a full-scale review; key messages are extracted from the most relevant publications and the evidence is collated to address the research questions specified in this report.

3.2 Emotional Wellbeing

This review of research focuses on the presence of children's internalising emotional mental disorders, such as their moods, fears and anxieties. The later analyses also focus on these aspects of children's emotional wellbeing.

The Office for National Statistics (ONS, 2005) describes the prevalence of mental disorders of children in 2004. It provides profiles of children in each of the main disorder categories, and provides sub-groups within these categories. The surveyed population consisted of children and young people, aged 5-16, living in private households in Great Britain. The ONS finds that 1 in 10 children and young people have an emotional mental disorder which includes separation anxiety, specific phobias and generalised anxiety disorder and depression. According to the ONS (2005), children and young people with more severe mental health and wellbeing issues are more likely to be excluded, to be truants or to become disengaged from education. Among children with emotional disorders, 44 per cent were behind in their overall intellectual development (compared with 24 per cent for children with no emotional disorder) and 35 per cent had officially recognised special educational needs (compared with 16 per cent for children with no emotional disorder). In the TellUs4 Survey of children in school years 6, 8 and 10 (Chamberlain, George, Golden, Walker, & Benton, 2010), furthermore, children who were disabled were less likely to report feeling happy compared to children without disabilities.

Research, however, indicates that the statistical association between emotional wellbeing and academic achievement may be relatively weak compared to other dimensions of wellbeing. Drawing upon longitudinal ALSPAC data for children in the Avon area, for example, Lindeboom and colleagues (2010) examined the influence of

Hyperactivity/Inattention, Conduct Problems, Peer Problems, Emotional Symptoms and Pro-social Behaviours at both 6-9 years and 11-13 years on later academic achievement. When dimensions were examined together in multivariate analyses, Hyperactivity/Inattention at both ages was the strongest predictor of lower GCSE (i.e., Key Stage 4) scores, whereas persistent emotional symptoms from childhood to adolescence did not predict lower GCSE scores at age 16. This finding highlights the importance of examining the relative strength of emotional wellbeing together with other dimensions of wellbeing. However, Lindeboom et al. (2010) did not examine whether emotional wellbeing was a significant predictor of achievement for younger children.

There is also evidence suggesting that emotional wellbeing may be more important for boys than girls. Rothon and colleagues (2009) assessed the effect of depressive symptoms at age 13-14 on GCSE performance at age 15-16, using a school based study of adolescents attending schools in East London in 2001, followed-up in 2003 and 2005. They found a negative association between depressive symptoms at age 13-14 and GCSE scores for boys, but not for girls. However, the significance of depressive symptoms disappeared in subsequent analysis which adjusted for achievement at age 13-14, suggesting that although depressive symptoms are associated with lower achievement for teenage boys, they do not predict lower academic progression. Further analysis needs to consider whether there are gender differences in the association between emotional wellbeing and academic achievement, as well as other demographic factors.

In summary:

- Emotional mental disorders have been found to be associated with worse educational outcomes.
- The association between emotional wellbeing and later academic achievement in adolescence appears to be relatively weak compared to effects from other dimensions of wellbeing.
- Emotional symptoms in adolescence were found to have a negative association with later academic achievement for boys, but not for girls. However, this association was not evident when controlling for pre-adolescent achievement and/or emotional wellbeing.
- There is little information about whether the relationship between emotional wellbeing and educational outcomes varies across key family and child characteristics as well as different ages of the child (i.e., primary versus secondary school).

3.3 Behavioural Wellbeing

This summary of research focuses on three elements of children's behavioural difficulties including attention problems, conduct disorders and antisocial behaviours. The later analyses focus on children's attention and activity problems and their awkward and troublesome behaviours.

In UK studies, behavioural wellbeing has been shown to have significant associations with children's progress in school (Barreau et al. 2008; Goodman & Gregg, 2010). Using the Avon Longitudinal Study of Parents and Children (ALSPAC), for example, Goodman and Gregg (2010) found children's exhibiting behavioural problems which included attention difficulties and conduct problems contributed to the gap in academic performance between poorer and better-off children in primary school. For secondary school, similar findings were documented to explain the socio-economic gradient observed in both cognitive and non-cognitive child outcome measures. Using LSYPE, Barreau and colleagues (2008) found that adolescents' behavioural problems played a significant role in explaining both the lower academic achievement and worse non-cognitive outcomes of teens from lower socioeconomic backgrounds.

For studies which have focused on children's involvement in problem and aggressive behaviours, there are mixed findings depending on the ages of children examined. Using LSYPE, Goodman and Gregg (2010) found that engagement in antisocial behaviours was a significant factor linking family's disadvantaged economic status to lower school achievement in the teenage years. However, a meta-analysis of six data sets, two of which are longitudinal UK data sets, found no effect of a child's early problem behaviour on their school entry-level achievement (Duncan et al, 2007). Together these findings suggest that children's achievement and problem behaviours may develop in tandem during the early primary school years and therefore may have a greater association as children proceed through school (Trzesniewski et al., 2006).

For studies which have focused on attention difficulties, evidence suggests attention problems consistently predicts lower achievement test scores and lower grades in primary school (see Duncan et al., 2007). Attention deficit hyperactivity disorder (ADHD) is estimated to affect between 3% and 9% of school-age children and young people in the United Kingdom (ONS, 2005). It is typically characterized by symptoms such as 'failure to give close attention to schoolwork', an 'inability to listen when spoken to directly' or 'an inability to follow through on instructions' and a 'tendency to leave a classroom without

permission'. Although ADHD is diagnosed three times more often in boys than girls, research suggests that girls with attention difficulties may be under-diagnosed compared to boys (see Hinshaw & Blachman, 2005, for a review). Boys are more likely to have hyper, impulsive and inattentive behaviours, so they are more likely to be disruptive and thus have their ADHD noticed. Girls, on the other hand, are more likely to have inattentive behaviours, so as many as 50 to 75 per cent of girls with ADHD are missed. Girls, on average, are diagnosed at age 12, while boys are diagnosed, on average, at age 7. As a result, girls tend to lose five critical years when they could be getting the help they need in school.

Studies which have examined children's involvement in problem behaviours and attention problems simultaneously in multivariate analyses have clarified the role of each in explaining their academic achievement. In general, research has found that children with high levels of attention problems are much more vulnerable to low academic achievement than those with more aggressive and problem behaviours, especially in studies focusing on younger samples (Duncan et al., 2007; Trzesniewski et al., 2006). However, attention problems and engagement in problem behaviours appear to be more important than emotional problems in predicting later achievement (Lindeboom et al., 2010).

Although boys and children from lower income families generally have higher rates of attention difficulties and engagement in problem behaviours, little evidence exists about whether the relationship between academic achievement and these aspects of behavioural wellbeing vary according to SEN status, gender and socioeconomic background (Duncan et al., 2007). However, a recent meta-analytic study of six data sets, which included two UK birth cohort studies, found that the importance of attention skills for school-entry achievement (i.e., ages 5 and 6) was similar across gender and family socioeconomic status (Duncan et al., 2007). Further evidence is needed to assess whether other aspects of behavioural wellbeing (e.g., engagement in problem behaviours) are predictors of academic achievement. Whether there are associations between behavioural wellbeing and academic achievement among older children and teens also needs to be researched.

In summary:

- Children's engagement in problem behaviours appears to have a greater negative association with their academic achievement as they proceed through school.
- Measures of children's attention problems have been shown consistently to predict lower academic achievement.

- Children's attention problems seem to be a stronger predictor of lower academic achievement compared to having aggressive and problem behaviours, especially in younger samples of children.
- Evidence suggests that there are no gender or SES differences in the association between attention problems and academic achievement. Further evidence is needed to assess whether differences exist for the association between engagement in problem behaviours and academic achievement.

3.4 Social Wellbeing

For social wellbeing, we focus on two measures including children's experiences of victimisation and their positive friendships, which are also examined in the later analyses.

Children's experiences at school with their friends and classmates play an important role in their academic achievement. The experience of being bullied at school has been found to be associated with lower achievement in children, whereas positive peer relationships foster higher achievement. For example, Gutman and Brown (2008) explored how children's peer clusters were associated with their later wellbeing and academic achievement using the longitudinal ALSPAC data. Their findings suggest that belonging to a peer cluster characterised by either bullying and/or victimisation was significantly related to worse levels of wellbeing, behaviour and later academic achievement compared to a child being in a positive friendship cluster. Children with many positive friendships, on the other hand, had the highest levels of wellbeing and achievement compared to the other groups. In another study using the same ALSPAC data, Gutman and Feinstein (2008) found that children with lower Key Stage 1 scores were more likely to be victims of bullying and have friends who were involved in antisocial activities. Together, these findings suggest that social relationships with peers are associated with academic achievement in primary school. However, these associations do not take into account previous achievement.

In the teenage years, UK research has also found that being a victim of bullying takes its toll on subsequent academic achievement and learning. Using LSYPE, Meschi and Vignoles (2010) found that pupils who were bullied at age 14 had significantly lower GCSE scores at age 16. Pupils who experienced bullying at age 14 were also much more likely to experience bullying at age 16. Therefore, early negative experiences, such as being bullied, indicate that the young person may be at risk of having later negative outcomes at age 16. Also using the LSYPE data, Foreman-Peck and Foreman-Peck (2007) found similar results examining the association between parent-reported bullying and students' academic

progress from Key Stage 2 to Key Stage 3 (ages 11 to 14). There is little information, however, about whether having positive friendships is associated with academic progression during secondary school.

Studies document differences in the incidence of victimisation according to gender and socioeconomic status. Recent studies using ALSPAC, for example, indicate that friendships tend to be highly gendered. Girls are more likely to have close friendships than boys (Gutman and Feinstein, 2008; Gutman and Brown, 2008). In the TellUs4 Survey of children in school years 6, 8 and 10 (Chamberlain et al., 2010), children with disabilities were less likely to report having friends and more likely to report being bullied recently. Boys, on the other hand, are more likely to be bullies and bully/victims than girls, whereas victims are equally likely among both genders (Gutman and Feinstein, 2008; Gutman and Brown, 2008). Some findings also indicate that victims, bullies and bully/victims may be more frequent among lower socio-economic groups (Gutman & Brown, 2008). Nevertheless, research has yet to examine whether the association between these aspects of social wellbeing and academic achievement varies across these key characteristics.

In summary:

- Children in primary school who are victims of bullying tend to have lower achievement than their classmates. However, these associations have not taken into account previous academic attainment.
- Being bullied in secondary school has been associated with lower academic achievement including Key Stage 3 and GCSE scores, even taking into account previous attainment.
- It remains unclear whether having positive friendships is associated with greater academic progression in primary and secondary school.
- Although gender and socioeconomic differences in children's relationships with their peers have been documented in previous studies, more research is required to understand whether the association between social wellbeing and academic achievement varies across these key characteristics.

3.5 School Wellbeing

For school wellbeing, this review, as well as the later analyses, focuses on two aspects of school wellbeing, namely, enjoyment of school (i.e., whether students say they like school) and engagement in school (i.e., whether students say they are stimulated by school work).

Many of the studies in the literature discussed below, however, examine measures which combine school enjoyment and engagement. It is difficult, therefore, to disentangle their unique effects in these previous studies.

Recent UK studies suggest that school enjoyment and engagement may play an important role in students' learning, especially during the teenage years. Drawing upon the LSYPE data, studies have documented a positive association between school enjoyment and academic progression among secondary school pupils. Gibbons and Silva (2008), for example, found a significant positive relationship between the pupil's progress between Key Stage 2 and Key Stage 3 and their enjoyment of school. Student enjoyment was measured by three variables that describe a) whether the child enjoys school, b) whether the child is bored at school and c) whether the child dislikes his teachers. Meschi and Vignoles (2010) used 12 questions from LSYPE to measure pupils' attitudes toward school which included questions about both school enjoyment (e.g., "On the whole, I like being at school.") and engagement (e.g., "I work as hard as I can in school."). They found that pupils who have more positive attitudes about school at age 14 have higher academic achievement by age 16. Equally, children who have higher achievement at age 11 go on to have more positive attitudes about school at age 16, although this was not as strong a relationship. In other words, positive attitudes about school and later academic achievement seem to be linked.

In the primary school years, school enjoyment has also been shown to be linked to academic achievement. In the Effective Provision of Pre-School Education (EPPE) Project, for example, students who reported they enjoyed school at age 11 had better attainment at Key Stage 3, especially for maths. However, there were no significant findings for school enjoyment when examining academic progression from Key Stage 2 to Key Stage 3 (Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2012). A study focusing on younger children using ALSPAC, furthermore, found that liking school and being able to talk to teachers in primary school were not associated with children's later academic progression from Key Stage 1 to Key Stage 2 (Gutman & Feinstein, 2008). Together, these findings indicate that school enjoyment may be associated with higher academic achievement, but not academic progression in primary school. Further studies should examine the link between school enjoyment and engagement and determine the importance of each for academic progression during primary and secondary school.

Previous research using ALSPAC suggests that boys have lower school wellbeing, measured with both aspects of enjoyment and engagement, than do girls (Gutman et al., 2009). Furthermore, children's levels of school wellbeing decrease as they proceed from

primary to secondary school and this decrease is greater for boys than girls (Gutman et al., 2009). For example, in the TellUs4 Survey (Chamberlain et al., 2010), younger children (Year 6) were more likely to feel positive about enjoying and achieving at school, compared to older children (Year 10). However, change in school wellbeing has not been found to vary according to the family's socioeconomic characteristics. This suggests that most pupils experience a decline in school wellbeing regardless of their economic background. Interestingly, being classified as having special educational needs was associated with having lower levels of school wellbeing in primary school for boys, but higher levels of school wellbeing across the transition to secondary school for boys and girls (Gutman et al., 2009). This suggests that the relationship between special educational needs and school wellbeing may vary according to a child's schooling age and gender. Nevertheless, there is little understanding of whether the association between school wellbeing and later educational outcomes varies according to these key demographic and other characteristics.

In summary:

- Children's measures of school wellbeing have been found to be associated with academic progression in secondary school, but not in primary school.
- There is little understanding of the link between school enjoyment and engagement and how each contributes to academic progression during primary and secondary school.
- There is little information regarding whether the association between children's school wellbeing and their achievement varies according to key demographic and other characteristics.

3.6 Measurement Issues

It is important to note that findings may also differ according to the type of measurement used. Research on children's wellbeing is typically based on either diagnostic data from a clinical setting, or on large-scale surveys which ask parents or teachers to assess the child's mental health using a structured questionnaire. The former approach is generally based on small unrepresentative groups and is hard to generalise to the wider population of young people, while the survey approach suffers from the problem of measurement error. Parents and teachers may not be accurate observers and reporters of the child's behaviour and mental state. These non-expert observers may be not only inaccurate but systematically so, either because they have only a partial picture of the child's behaviour or because they are subject to bias in some way.

Johnson et al. (2011) evaluates these measurement issues by using survey data which provide assessments from parents, teachers and children, together with an overall expert assessment which approximates the clinical diagnostic process. Johnson and colleagues (2011) conclude that parents, teachers and children are all biased reporters of children's mental health but that teacher assessments are the most reliable, followed by parents, with children's reports being the least reliable. Another study also addresses these issues with the Development and Wellbeing Assessment (i.e., DAWBA, which is the same assessment used in this report) in a large population-based sample of British children and adolescents (Meltzer, Gatward, Goodman & Ford, 2000). Using teacher and parent reports, the authors conclude that teachers contribute little, if anything, to the diagnosis of emotional disorders, but make a difference to the diagnoses of ADHD and conduct disorders, though for rather different reasons. For conduct disorders, some children are well-behaved at home, but more aggressive and confrontational at school. As far as ADHD is concerned, parental data may be inconclusive and input from teachers can tip the balance in one direction or another. As a result, a diagnosis of conduct disorders or ADHD may be missed if information is not sought from teachers about children's functioning in school. On the other hand, given that longitudinal teacher-reported data often necessitates different reporters each year, parent-reported data provide the most consistent view of children's functioning over a long period of time.

4 Research Questions

In order to conduct multivariate analyses – the second stage of this report –we examine four main research questions:

1. How is **emotional, behavioural, social, and school wellbeing** associated with **concurrent educational outcomes**?
2. How is **emotional, behavioural, social, and school wellbeing** associated with **later educational outcomes**?
3. To what extent are **dimensions of wellbeing** associated with **changes in later educational outcomes** i.e., how is wellbeing associated with progress between two time points?
4. Do children's **demographic and other characteristics** (gender, social class, and SEN status) **moderate the association between their wellbeing and changes in their later educational outcomes** (i.e., how different for different groups)? Are these patterns consistent over the primary and/or secondary school period?

5 Data

The Avon cohort data (ALSPAC) is an ongoing longitudinal study of families in the geographic area of Avon in the United Kingdom. More than 14,000 women enrolled in the study during pregnancy in 1991 and 1992. The ALSPAC data are unique amongst large sample UK longitudinal data-sets in surveying a cohort of children year on year into adolescence. Primary sources of ALSPAC data collection include self-completion questionnaires administered to mothers and their partners during pregnancy and at regular intervals following the birth and questionnaires and direct assessments of children in a clinic-based setting.

In this report, we utilise parent-reported data from the ALSPAC surveys. In the ALSPAC data set, parent-reported data are the only available consistent measures of wellbeing spanning from childhood to adolescence. Key Stage scores were obtained from the National Pupil Database (NPD) administrative data. Several control variables including English as a first language, SEN status, and eligibility for free school meals were obtained from the Pupil Level Annual School Census (PLASC) administrative data.

Due to a consenting process for matching the National Pupil Database (NPD) data, there were approximately 1185 children in the sample at Key Stage 2³, 4816 at Key Stage 3 and 5218 at Key Stage 4. For the measure of school engagement, there were 7622 children at age 10.5 and 6644 at age 13.8.

5.1 Predictors

We examine the predictive power of four dimensions of wellbeing -- emotional, behavioural, social and school wellbeing -- at three age points: 7.5, 10.5, and 13.8 years. (In the remainder of this report we simplify these ages to 7, 10, and 13 years).

Emotional wellbeing. This set of measures derives from the Development and Wellbeing Assessment (DAWBA) instrument answered by the parent about the child. It is a composite measure which includes questions about separation anxiety, fears, compulsions and obsessions, anxiety, and moods. Example questions about the child include: “Has he/she often worried about something unpleasant happening to someone or about losing them?” and “Does he/she worry a lot about past behaviour?” Emotional wellbeing is coded so that a

³ The n is smaller due to poorer linkage resources at Key Stage 2, which are not relevant for Key Stage 3 or Key Stage 4. Missing data analysis indicates that ALSPAC children with Key Stage 2 data, on average, have parents with higher educational qualifications than those who do not have Key Stage 2 data. However, there are no significant differences in their SEN status, eligibility for FSM, whether English is their first language, parents’ marital status, ethnicity and gender.

higher score indicates better emotional wellbeing, where (1 = yes, a lot more than others, 2 = a little more than others, 3 = no).

Behavioural wellbeing. This set of measures derives from the Development and Wellbeing Assessment (DAWBA) instrument answered by the parent. Measures are coded so that higher scores indicate more positive outcomes (e.g., better attention, less troublesome behaviour, etc.). There are four subscales which are examined separately including:

- *Attention problems* includes questions such as whether the child “found it hard to wait for a turn” and whether the child “found it hard to sit still for long in the past six months,” where (1= yes, a lot more than others, 2= a little more than others, 3 = no).
- *Activity problems* includes questions such as whether the child “does not complete jobs” and whether the child “often lost things needed for school in the past six months,” where (1= yes, a lot more than others, 2= a little more than others, 3 = no).
- *Awkward behaviour* includes questions such as whether the child “has blamed others for past mistakes” and whether the child “has been easily annoyed in the past six months,” where (1= yes, a lot more than others, 2= a little more than others, 3 = no).
- *Troublesome behaviour* includes questions such as whether the child “often played truant from school” and whether the child “stole things in the past six months,” where (1= yes, a lot more than others, 2= a little more than others, 3 = no).

Social wellbeing. This set of measures includes questions answered by the parent about the child. There are two subscales regarding children’s social relationships at school which are examined separately including:

- *Positive Friendships* is based on two questions; whether the child “has at least one good friend”; and whether the child “is liked by other children,” where (1 = no, 2 = somewhat, 3 = yes, a lot).
- *Victimisation* is a question about whether the child “is picked on and bullied at school,” where (0 = no, 1 = somewhat, 2= yes, a lot).

School wellbeing. This set of measures includes questions answered by the parent about the child. Two subscales were used to represent school wellbeing, which are examined separately. They are as follows:

- *School engagement* is based on two questions including whether child “is stimulated by school,” where (0=never, 3=always) and whether the child “is bored in school,” where (0=always, 3=never).
- *School enjoyment* is based on two questions including whether the child “enjoys school” and whether the child “looks forward to school,” where (0=never, 3=always).

5.2 Control Variables

We include in the multivariate regressions a number of covariates. The first set of covariates is taken from NPD/PLASC and includes pupils’ characteristics commonly available in administrative data. These are: whether English is the first language (1 = yes, 0 = no); whether the child is eligible for Free School Meals (FSM) (1 = yes, 0 = no) which is a marker of poverty; and whether any Special Education Need (SEN) is identified (1 = yes, 0 = no). In our main analysis, we do not distinguish between Statement and Action Plus and non-statemented SEN. The second set of covariates is taken from the ALSPAC carer questionnaires including: highest parental educational qualifications (1 = none/CSE, 2 = vocational, 3 = O-level, 4 = A-level, 5 = degree), parents’ marital status (1 = married, 0 = not married) as well as child’s birth weight in grams, gender (1 = boy, 0 = girl), and ethnicity (1 = White British, 0 = non-White).

5.3 Educational Outcomes

Academic Achievement is measured using the results in Key Stage test scores available from the National Pupil Database (NPD). The Key Stage tests are national achievement tests performed by all children in state schools. They are marked anonymously by external graders. Key Stage 1 is taken at age 7, Key Stage 2 at age 11, Key Stage 3 at age 14, and Key Stage 4 at age 16. Key Stage scores are finely graded input and output measures for contextual value-added models. Academic Progression is a measure of progress between two subsequent key stages (i.e., Key Stage 1 to Key Stage 2, Key Stage 2 to Key Stage 3, and Key Stage 3 to Key Stage 4).

Throughout Key Stage 1 to Key Stage 3, pupils are assessed in the core subjects. For Key Stage 1, the core subjects are Reading, Spelling, and Mathematics. For Key Stage 2 and Key Stage 3, the core subjects are English, Mathematics, and Science. Key Stage scores 1, 2 and 3 represent average point scores for the three core subjects, based on their test/exam results. At each key stage, points are allocated according to the National Curriculum test level. Each level is 6 points, representing one year of academic progress. Within each level, there are three sublevels for the three school terms in a year, where one term of progress is represented by 2 points (see Table 1). In our ALSPAC sample, the average score is 16.88 (SD = 3.09) for Key Stage 1, 29.58 (SD = 3.49) for Key Stage 2 and 37.09 (SD = 6.05) for Key Stage 3.

Table 1. Key Stage 1, 2 and 3 Point Scores

Points score	Terms worth of progress	Number of sublevels	Amount of increase between levels
2 points	One term	One sublevel	One third of a level
4 points	Two terms	Two sublevels	Two thirds of a level
6 points	One year	Three sublevels	One level

At Key Stage 4 (GCSE), pupils can take a variety of subjects (including English and Mathematics which are mandatory for all pupils). Key Stage 4 scores represent the total point score which is capped at the pupil's eight best GCSE (and equivalent) qualifications. For Key Stage 4, points are allocated based on the number of GCSEs taken and the grade obtained for each GCSE (see Table 2). In our ALSPAC sample, the average capped GCSE score is 341.54 (SD = 80.04).

Table 2. Key Stage 4 (GCSE) Point Scores

Qualification	Point score
GCSE - grade A*	58
GCSE - grade A	52
GCSE - grade B	46
GCSE - grade C	40
GCSE - grade D	34
GCSE - grade E	28
GCSE - grade F	22
GCSE - grade G	16

School Engagement. This measure includes ALSPAC questions addressed to parents asking whether the child “is stimulated at school,” where (0=never, 3=always) and whether the child “is bored at school” where (0=always, 3=never). School engagement is coded so higher scores equate to more school engagement (School engagement is also used as a predictor variable for other outcomes). The average score is 2.36 (SD = .60) for school engagement at age 7, 2.33 (SD = .55) at age 10 and 2.09 (SD = .63) at age 13.

6 Empirical Strategy

For the first research question, we investigate how dimensions of wellbeing are associated with concurrent educational outcomes, including academic achievement and school engagement. In order to do this, we examine correlations (i.e., statistical associations) between dimensions of wellbeing and concurrent educational outcomes (i.e., measured at the same age). The correlation coefficient shows the strength of the relationship between the wellbeing measure and the outcome variable. For academic achievement, we examine the correlations between dimensions of wellbeing at age 10 and Key Stage 2 scores (age 11) and between dimensions of wellbeing at age 13 and Key Stage 3 scores (age 14). For school engagement, we examine the correlations between dimensions of wellbeing at age 10 and the school engagement outcome at age 10 and between dimensions of wellbeing at age 13 and the school engagement outcome at age 13.

For the second research question, we investigate how dimensions of wellbeing are associated with later educational outcomes, including academic achievement and school engagement. In order to do this, we examine correlation coefficients between dimensions of wellbeing and later educational outcomes. For academic achievement, we examine the correlations between dimensions of wellbeing at age 7 and Key Stage 2 scores (age 11), between dimensions of wellbeing at age 10 and Key Stage 3 scores (age 14), and between dimensions of wellbeing at age 13 and Key Stage 4 (GCSE) scores (age 16). For school engagement, we examine the correlations between dimensions of wellbeing at age 7 and school engagement at age 10 and between dimensions of wellbeing at age 10 and school engagement at age 13.

For the third research question, we examine how dimensions of wellbeing are associated with changes in later academic progression and school engagement (i.e., after taking into account the prior educational outcome). In order to do this, we perform statistical regression models for each educational outcome at the different ages from childhood to adolescence. Statistical regression allows us to determine the strength of the relationship between a

predictor and an outcome, when all the other predictors in the model are taken into account (i.e., controlled). In these models, we use a value-added approach which shows the degree to which each predictor is associated with change in the outcome variable. The value-added specification allows us to control for the prior and often unobserved history of parental and school inputs by including a prior (lagged) educational measure in the model. Each model includes the lagged educational measure, the wellbeing measures and control variables, which were all measured prior to the relevant outcome measure. For academic achievement, we examine whether dimensions of wellbeing at age 7 predict academic progression from Key Stage 1 to Key Stage 2, whether dimensions of wellbeing at age 10 predict academic progression from Key Stage 2 to Key Stage 3 and whether dimensions of wellbeing at age 13 predict academic progression from Key Stage 3 to Key Stage 4 (i.e., GCSE). For school engagement, we examine whether dimensions of wellbeing at age 7 predict school engagement at age 10 taking into account school engagement at age 7 and whether dimensions of wellbeing at age 10 predict school engagement at age 13 taking into account school engagement at age 10.

For the fourth research question, we examine whether the associations between dimensions of wellbeing and changes in later educational outcomes (i.e., academic progression and school engagement) vary according to children's gender, SEN status, and their parents' education level. In order to do this, interaction terms between the wellbeing measures and key characteristics (i.e., gender, SEN and parents' education level) are included in the regression models (examined in the third research question) in a separate step, when statistically significant by a probability of .05 or less (i.e., less than 5 per cent likelihood of a chance finding).

7 Findings

The findings of the analyses are presented below according to each of the four research questions.

7.1 How is wellbeing associated with concurrent (i.e., measured at the same age) educational outcomes?

7.1.1 Academic Achievement

Table 3 shows the correlation coefficients (i.e., statistical associations) between emotional, behavioural, social, and school wellbeing at ages 10 and 13 and concurrent academic achievement at Key Stage 2 (age 11) and Key Stage 3 (age 14). The correlation coefficient

(*r*) indicates the strength and direction of the linear relationship between two variables. A correlation coefficient of 1 indicates a perfect positive fit, while a correlation coefficient of -1 indicates a perfect negative fit.

Table 3: Correlations between Wellbeing and Concurrent Academic Achievement*

Measure of wellbeing	Academic Achievement at:	
	KS2 (Age 11)	KS3 (Age 14)
Better Emotional Wellbeing	0.11	0.15
Less Awkward Behaviour	0.15	0.19
Less Troublesome Behaviour	0.15	0.21
Fewer Activity Problems	0.22	0.23
Fewer Attention Problems	0.31	0.32
More Positive Friendships	0.10	0.11
Experience of Victimization	-0.09	-0.14
More School Enjoyment	0.10	0.12
More School Engagement	0.13	0.19

*All correlations shown above are statistically significant at .001.

Dimensions of wellbeing are correlated significantly with concurrent academic achievement. The sizes of correlation coefficients, however, vary across both the dimension of wellbeing and the specific key stage examined. Among all of the indicators of wellbeing, attention problems show the strongest relationship with Key Stage 2 and Key Stage 3 scores, with fewer attention problems being associated with higher key stage scores. While the strength of the correlation is fairly stable for some of the dimensions of wellbeing across both Key Stages (e.g. activity problems, attention problems, positive friendships, and school enjoyment), the correlation size is higher at Key Stage 3 than Key Stage 2 for emotional wellbeing, awkward behaviour, troublesome behaviour, victimisation, and school enjoyment. This suggests that these dimensions of wellbeing may have a stronger concurrent relationship with academic achievement as children grow older.

7.1.2 School Engagement

Table 4 displays the correlation coefficients between emotional, behavioural, social, and school wellbeing at ages 10 and 13 and concurrent school engagement at ages 10 and 13.

Table 4: Correlations between Wellbeing and Concurrent School Engagement*

Measure of wellbeing	School Engagement at:	
	10	13
Better Emotional Wellbeing	0.15	0.16
Less Awkward Behaviour	0.18	0.24
Less Troublesome Behaviour	0.15	0.25
Fewer Activity Problems	0.17	0.20
Fewer Attention Problems	0.24	0.32

More Positive Friendships	0.12	0.11
Experience of Victimisation	-0.12	-0.10
More School Enjoyment	0.66	0.71

*All correlations shown above are statistically significant at .001.

Dimensions of wellbeing are significantly correlated with concurrent school engagement. The correlation coefficient, however, varies across both the dimension of wellbeing and the age at which school engagement was measured. School enjoyment shows the strongest relationship with school engagement at both ages 10 and 13, suggesting that these two variables are highly related to each other in the same direction (i.e., children who enjoy school also tend to be engaged in school). While the strength of the correlation is fairly stable for some dimensions of wellbeing (i.e., emotional wellbeing, positive friendships, and victimisation), the correlation coefficient size increases for activity problems, awkward behaviour, troublesome behaviour, attention problems, and school enjoyment from ages 10 to 13. This suggests that these dimensions of wellbeing appear to have a stronger concurrent relationship with school engagement as children grow older.

7.2 How is wellbeing associated with later educational outcomes?

7.2.1 Academic Achievement

Table 5 displays the correlation coefficients between emotional, behavioural, social, and school wellbeing at ages 7, 10 and 13 and later academic achievement at Key Stage 2 (age 11), Key Stage 3 (age 14), and Key Stage 4 (age 16).

Table 5: Correlations between Wellbeing and Later Academic Achievement*

Measure of wellbeing	Academic Achievement at:		
	KS2 (Age 11)	KS3 (Age 14)	KS4 (Age 16)
Better Emotional Wellbeing	0.13	0.17	0.10
Low Awkward Behaviour	0.13	0.17	0.22
Low Troublesome Behaviour	0.09	0.19	0.28
Low Activity Problems	0.25	0.24	0.22
Low Attention Problems	0.29	0.31	0.33
Positive Friendships	0.12	0.14	0.11
Victimisation	-0.14	-0.16	-0.14
High School Enjoyment	0.05	0.10	0.16
High School Engagement	0.05	0.13	0.22

*All correlations shown above are statistically significant at .001 with the exception of school enjoyment and school engagement at KS2 which are not statistically significant.

Dimensions of wellbeing are significantly correlated with later academic achievement, with the exception of school enjoyment and engagement at Key Stage 2. This finding indicates that, for the most part, wellbeing is associated with later achievement. Furthermore, the correlation coefficient varies across both the dimension of wellbeing and the specific key

stage examined. While the strength of the correlation is fairly stable for some dimensions of wellbeing across the key stages (e.g., activity problems, attention problems, victimisation, and friendships), the correlation coefficient increases for awkward behaviour, troublesome behaviour, school enjoyment, and school engagement from Key Stage 2 to Key Stage 4. This suggests that these dimensions of wellbeing appear to have a stronger relationship with later academic achievement as children get older.

7.2.2 School Engagement

Table 6 displays the correlation coefficients between emotional, behavioural, social, and school wellbeing at ages 7 and 10 and later school engagement at ages 10 and 13.

Table 6: Correlations between Wellbeing and Later School Engagement*

Measure of wellbeing	School Engagement at:	
	10	13
High Emotional Wellbeing	0.11	0.15
Low Awkward Behaviour	0.16	0.16
Low Troublesome Behaviour	0.13	0.16
Low Activity Problems	0.16	0.14
Low Attention Problems	0.21	0.22
Positive Friendships	0.12	0.12
Victimisation	-0.17	-0.09
High School Enjoyment	0.40	0.39

*All correlations shown above are statistically significant at .001.

Dimensions of wellbeing are significantly correlated with later school engagement, indicating that wellbeing is associated with later engagement in school. For the most part, the correlation coefficients between wellbeing and later school engagement are similar for both ages, although there was a slight increase in correlation size in the case of emotional wellbeing and troublesome behaviour and a slight decrease for victimisation and activity problems as children get older.

7.3 How is wellbeing associated with later changes in educational outcomes i.e., progress between two time points?

7.3.1 Academic Progression

Table 7 displays whether prior achievement, wellbeing measures and control variables are significant predictors of later academic achievement at Key Stage 2 (age 11), Key Stage 3 (age 14), and Key Stage 4 (age 16), controlling for all of the other variables in the model. In particular, we examine whether dimensions of wellbeing at age 7 predict academic

progression from Key Stage 1 to Key Stage 2, dimensions of wellbeing at age 10 predict academic progression from Key Stage 2 to Key Stage 3, and dimensions of wellbeing at age 13 predict academic progression from Key Stage 3 to Key Stage 4 (i.e., GCSE), taking into account all of the wellbeing measures and control variables listed in Table 5. In the Appendix, Tables 1 to 3 show the unstandardised and standardised coefficients and standard errors for each of the models.

Table 7: Significant Predictors of Academic Progression

Variables	Academic Progression from:		
	KS1 to KS2	KS2 to KS3	KS3 to KS4
Prior Key Stage Score	Positive	Positive	Positive
English First Language	No	No	No
Free School Meals	No	Negative	No
SEN Status	Negative	Negative	Negative
Parents Married	No	Positive	Positive
Higher Parental Education	Positive	Positive	Positive
White British	No	No	No
Boys	Positive	No	Negative
Higher Birth Weight	No	No	No
Better Emotional Wellbeing	Positive	No	No
Less Awkward Behaviour	No	No	No
Less Troublesome Behaviour	No	Positive	Positive
Fewer Activity Problems	No	No	No
Fewer Attention Problems	Positive	Positive	Positive
More Positive Friendships	No	No	No
Experience of Victimization	No	No	No
More School Enjoyment	No	No	No
More School Engagement	No	No	Positive

Note. No = not significant; negative = significant in a negative direction at .05 or below; positive = significant in a positive direction at .05 or below.

Our findings suggest that children’s wellbeing is associated with academic progression, but different dimensions are important at different stages in the schooling process. Better emotional wellbeing is a significant predictor of higher academic progression in primary school (i.e., from Key Stage 1 to Key Stage 2), but not in secondary school (i.e., from Key

Stage 2 to Key Stage 3 and from Key Stage 3 to Key Stage 4). For example, children who have no negative symptoms of emotional wellbeing have an average value-added Key Stage 2 score which is 2.46 points higher (i.e., representing more than one term of academic progress) compared to children who have many negative symptoms of emotional wellbeing (See Appendix, Table 1).

In line with previous research, better attention skills are a significant predictor of higher academic progression for children across all the key stages of schooling. For example, children with no attention problems have an average value-added score which is 2.08 points higher at Key Stage 2 and 2.10 points higher at Key Stage 3 (i.e., representing one term of academic progress), and a total value-added score which is 63.38 points higher at Key Stage 4 (i.e., equivalent to more than one extra GCSE at grade A*) compared to children with a lot of attention problems (see Appendix, Tables 1 to 3).

Troublesome behaviour has a more significant association with academic achievement as children progress in their schooling. Less troublesome behaviour is associated with higher academic progression from Key Stage 2 to Key Stage 3 and from Key Stage 3 to Key Stage 4, but not from Key Stage 1 to Key Stage 2. For example, young people who do not engage in troublesome behaviour have an average value-added score which is 3.44 points higher at Key Stage 3 (i.e., representing more than half a year of academic progression) and have a total value-added score which is 178.80 points higher at Key Stage 4 (i.e., equivalent to three extra GCSEs at grade A*) compared to young people who engage in a lot of troublesome behaviour (See Appendix, Tables 2 and 3).

More school engagement is a significant predictor of higher academic progression from Key Stage 3 to Key Stage 4, but not from Key Stage 1 to Key Stage 2 or from Key Stage 2 to Key Stage 3. Young people who are always engaged in school at age 13 have a total value-added score which is 26.04 points higher at Key Stage 4 (i.e., equivalent to one-half an extra GCSE at grade A) compared to those who are never engaged in school (see Appendix, Table 3).

Findings also highlight the significance of several demographic and other characteristics in explaining children's academic progression. Children who have special educational needs have lower academic progression, while children whose parents are married and have higher levels of educational qualifications have higher academic progression. Boys have higher academic progression than girls from Key Stage 1 to Key Stage 2, whereas girls have higher academic progression than boys from Key Stage 3 to Key Stage 4. Children who are

eligible for free school meals (FSM) have lower academic progression than those without FSM from Key Stage 2 to Key Stage 3.

Several factors are not significant at all in terms of explaining academic progression including children's birth weight, ethnicity, and whether the child's first language is English. However, it is important to note that ALSPAC has a low percentage of families who are ethnic minorities (i.e., about 3 per cent) and whose first language is not English (i.e., about 1 per cent) which may reflect the lack of significant findings.

In summary:

- Better emotional wellbeing at age 7 is a significant predictor of higher academic progression from Key Stage 1 to Key Stage 2. This relationship is not significant at other ages.
- Better attention skills at ages 7, 10, and 13 are a significant predictor of greater academic progression in both primary and secondary school, indicating that the ability to control and sustain attention is a consistent predictor of children's learning.
- Children who are not engaged in troublesome behaviours at ages 10 and 13 make more progress in secondary school (i.e., Key Stage 2 to Key Stage 3; Key Stage 3 to Key Stage 4). This relationship is not significant in primary school (i.e., Key Stage 1 to Key Stage 2).
- More school engagement at age 13 is a significant predictor of greater academic progression from Key Stage 3 to Key Stage 4, highlighting the importance of sustaining school motivation for academic achievement in adolescence.
- Children with SEN status make less progress, whereas those with married parents and those with more highly educated parents make greater progress. Boys make more progress from Key Stage 1 to Key Stage 2, whereas girls make greater progress from Key Stage 3 to Key Stage 4. Children eligible for free meals progress more slowly from Key Stage 2 to Key Stage 3.

7.3.2 School Engagement

Table 8 displays whether prior school engagement, wellbeing measures and control variables are significant predictors of later school engagement at ages 10 and 13, controlling for all of the other variables in the model. More specifically, we examine how dimensions of

wellbeing at age 7 predict school engagement at age 10 taking into account school engagement at age 7 and how dimensions of wellbeing at age 10 predict school engagement at age 13 taking into account school engagement at age 10, controlling for all of the wellbeing measures and control variables listed in Table 6. In the Appendix, Tables 4 and 5 show the unstandardised and standardised coefficients and standard errors for each of the models.

Table 8: Significant Predictors of Changes in School Engagement

Variables	Changes in School Engagement from:	
	7 to 10 years	10 to 13 years
Prior School Engagement	Positive	No
English First Language	Positive	No
Free School Meals	Negative	No
SEN Status	Negative	No
Parents Married	Positive	No
Higher Parental Education	No	No
White British	No	No
Boys	Negative	No
Higher Birth Weight	No	No
Better Emotional Wellbeing	No	Positive
Less Awkward Behaviour	No	No
Less Troublesome Behaviour	No	Positive
Fewer Activity Problems	No	Positive
Fewer Attention Problems	No	Positive
More Positive Friendships	No	Positive
Experience of Victimization	Negative	No
More School Enjoyment	Positive	Positive

Note. No = not significant; negative = significant in a negative direction at .05 or below; positive = significant in a positive direction at .05 or below.

Different dimensions of wellbeing are significant predictors of levels of school engagement at different ages. While a number of demographic and other key characteristics are significant predictors of school engagement at age 10, there are only two significant associations with wellbeing at this age (i.e., victimisation and school enjoyment). In contrast, none of the demographic or other key variables are significant at age 13. Rather, most of the wellbeing

dimensions are significant with the exception of awkward behaviour and victimisation. This suggests that as children's wellbeing becomes more important, demographic and other characteristics become less important, in explaining school engagement as children progress in their schooling.

For younger children, victimisation at age 7 is a significant predictor of less school engagement at age 10, taking into account school engagement at age 7. Children who are bullied at age 7 are less likely to be engaged in school three years later. However, being bullied at age 10 is not associated with school engagement at age 13, taking into account levels of school engagement at age 10.

For older children, higher emotional wellbeing, less troublesome behaviour, fewer activity and attention problems and more positive friendships at age 10 are associated with higher levels of school engagement at age 13, taking into account school engagement at age 10. These findings highlight the significant role of wellbeing in children's engagement as they get older. Since children's school engagement tends to decline from primary to secondary school (Gutman et al., 2010), this finding suggests that more positive indicators of wellbeing may help alleviate this documented decline for early teens.

For both younger and older children, more school enjoyment is associated with more school engagement at a later point in time, taking into account previous school engagement. This underscores the link between school enjoyment and later school engagement, indicating that children who enjoy school are more likely to be motivated and engaged in their school work at a later point in time.

Our findings show that demographic and other key characteristics have a significant association with school engagement at age 10, taking into account school engagement at age 7. Children who have special educational needs, those eligible for FSM, and boys are less engaged in school at age 10. Children whose first language is English are more engaged in school at this age. However, none of these factors, measured at age 10 are significant at age 13, taking into account school engagement at age 10.

In summary:

- Being bullied at age 7 is a significant predictor of lower school engagement from ages 7 to 10.

- Better emotional wellbeing, less troublesome behaviour, fewer activity and attention problems, and more positive friendships at age 10 are associated with greater school engagement from 10 to 13 years, highlighting the significant role of wellbeing in children's engagement as they enter secondary school.
- More school enjoyment at ages 7 and 10 is associated with greater school engagement from ages 7 to 10 and from ages 10 to 13, respectively, indicating that children who enjoy school are more likely to be motivated and engaged in their school work at a later point in time.
- Children with SEN status, those eligible for free meals, and boys are less engaged in school, whereas children whose first language is English are more engaged from ages 7 to 10. None of these demographic factors is significant from ages 10 to 13, however.

7.4 Does the association between prior dimensions of wellbeing and changes in later educational outcomes vary according to children's gender, SEN status and their parents' education level?

For our last question, we examine interaction terms between wellbeing measures and key characteristics (i.e., gender, SEN, and parents' education level) in the regression models for academic progression and school engagement. With the exception of a few significant interactions between SEN status and behavioural wellbeing, associations did not vary according to children's demographic and other key characteristics. This suggests that, for the most part, the relationships between dimensions of wellbeing and later educational outcomes are similar for children and adolescents, regardless of their gender and parents' educational level.

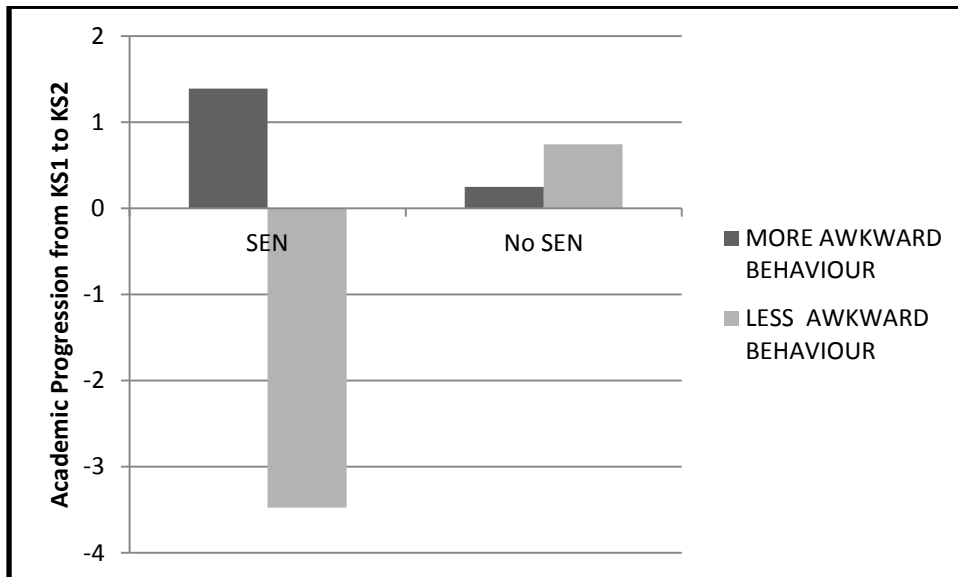
7.4.1 Academic Progression

There are two significant interactions for academic progression, which are described below. These significant interactions indicate that the association between behavioural wellbeing and academic progression varies according to SEN status.

For academic progression between Key Stage 1 and Key Stage 2, there is a stronger association between awkward behaviour (e.g., blames others for mistakes, throws temper tantrums) for children with SEN status compared to children without SEN status (see Figure 1). For children with SEN status, those with more awkward behaviour have higher academic progression from Key Stage 1 to Key Stage 2 compared to children with less awkward behaviour. This finding suggests that more awkward behaviour does not generally have a

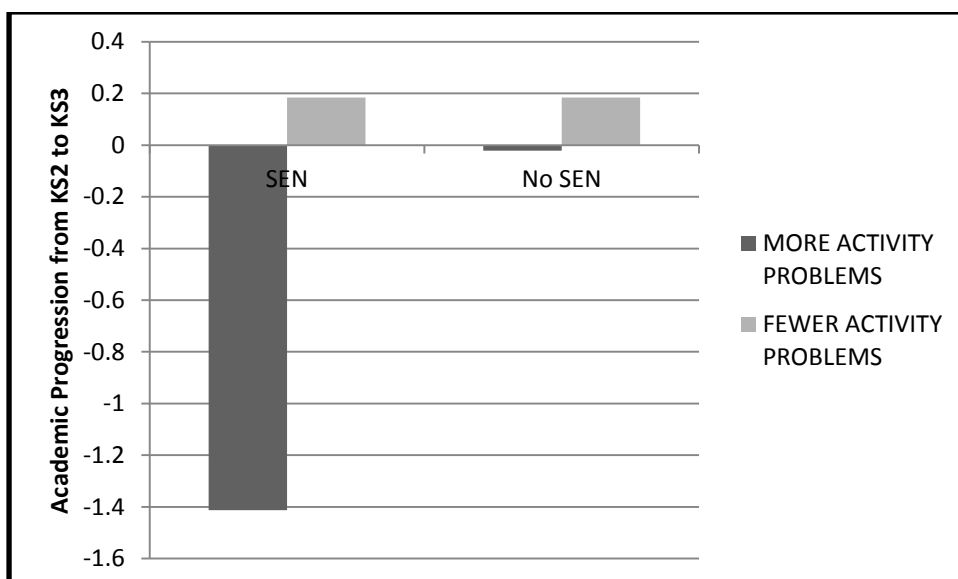
negative association with lower academic progression for children, especially when compared to those children who might have other SEN difficulties.

Figure 1: Interaction between SEN and Awkward Behaviour for Academic Progression from Key Stage 1 to Key Stage 2



As shown in Figure 2, there is also stronger association between activity problems (e.g., forgets things, makes careless mistakes) for children with SEN status than children without SEN status. For children with SEN status, those with more activity problems have much lower levels of academic progression from Key Stage 2 to Key Stage 3 than children with fewer activity problems. This finding suggests that activity problems are associated with lower academic progression, especially for those children who have SEN status.

Figure 2: Interaction between SEN and Activity Problems for Academic Progression between Key Stage 2 and Key Stage 3

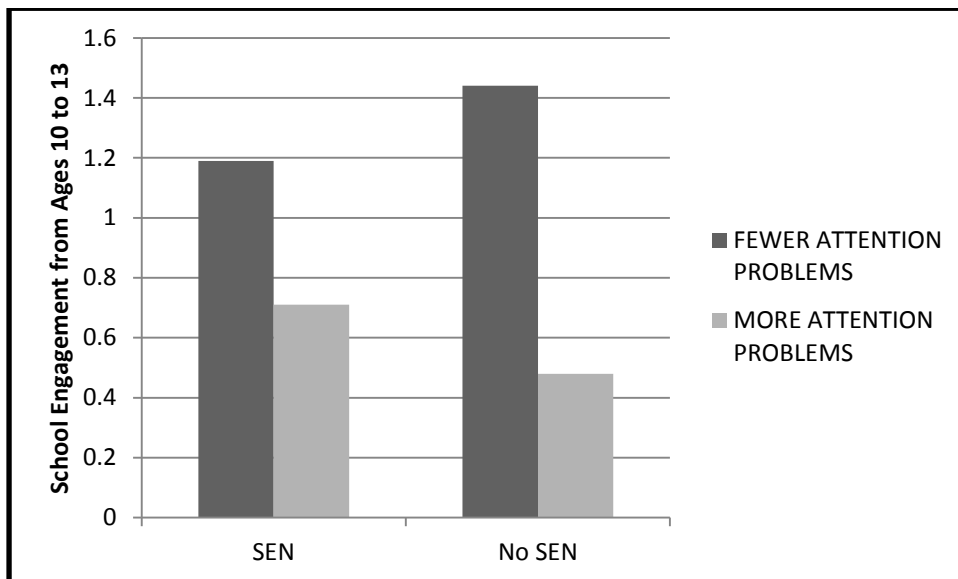


7.4.2 School Engagement

There is one significant interaction for school engagement, indicating that the association between behavioural wellbeing and school engagement varies according to SEN status.

As shown in Figure 3, there is a stronger association between attention problems (e.g., is easily distracted, does not pay attention) for children without SEN status than children with SEN status. For children with more attention problems, those with SEN status experience more school engagement at age 13, taking into account school engagement at age 10, than those without SEN status. Among children with more attention problems, this may indicate that children with SEN are getting more help to deal with their attention difficulties than children with similar problems who are not SEN. Nevertheless, children with attention problems have lower school engagement, with or without SEN status, than children with fewer attention problems.

Figure 3: Interaction between SEN and Attention Problems for Changes in School Engagement from ages 10 to 13



8 Summary

In summary, dimensions of children’s wellbeing are associated with both concurrent and later educational outcomes. That is, children who have higher levels of emotional, behavioural, social, and school wellbeing tend to have higher levels of academic achievement and school engagement both concurrently and at a later point in time. However, when examining multiple dimensions of wellbeing together, some dimensions are relatively more important predictors of later educational outcomes than others. In other

words, different indicators of wellbeing emerge as significant, after controlling for other factors, depending on the educational outcome and schooling age of the child.

Our findings suggest that emotional wellbeing is an important factor for the academic achievement of younger children. Children with better emotional wellbeing have higher academic progression from Key Stage 1 to Key Stage 2, even when other dimensions of wellbeing are taken into account. However, emotional wellbeing is not a significant predictor of academic progression in secondary school. Nonetheless, emotional wellbeing at age 10 is significantly associated with later school engagement at age 13, suggesting that positive mental health is an important factor for being motivated and engaged in secondary school which, in turn, predicts academic progression from Key Stage 3 to Key Stage 4.

Behavioural wellbeing is a significant predictor of both academic achievement and school engagement. For academic achievement, good attention skills are associated with greater academic progression across both primary and secondary school, indicating that the ability to sustain attention and focus on tasks plays a key role in sustaining academic achievement during childhood and adolescence. Troublesome behaviour emerges as significant for academic progression in secondary school, suggesting that children's disruptive behaviour may interfere with their achievement as they progress in their schooling. Attention and activity problems and troublesome behaviour are also significant predictors of later school engagement in secondary school but not in primary school. This suggests that as children with behavioural difficulties proceed through school, they are at greater risk of becoming disengaged, which is likely to perpetuate even lower academic progression.

There is also variation in the relationship between behavioural wellbeing and later educational outcomes according to SEN status. Results indicate that activity and attention problems are associated with lower educational outcomes for children with SEN. However, awkward behaviour does not generally have an association with lower academic progression for children, especially compared to those children who might have other SEN difficulties. Overall, these findings suggest that the relationship between behavioural wellbeing and later educational outcomes is more complex for children categorised with SEN. This is not surprising especially considering the diversity of behaviours and types of issues linked to SEN.

For social wellbeing, children who are victims of bullying at age 7 have lower school engagement at age 10, while children who have positive friendships at age 10 are more engaged in school at age 13. Interestingly, we found these two aspects of social wellbeing

are not associated with lower academic progression at any age. These findings indicate that children's social relationships play an important role in their engagement in school, but may not necessarily be associated with their academic learning.

For school wellbeing, school engagement at age 13 is associated with greater academic progression from Key Stage 3 to Key Stage 4 (GCSE) scores, but school engagement at ages 7 and 10 is not associated with greater academic progression from Key Stage 1 to Key Stage 2 and from Key Stage 2 to Key Stage, respectively. Furthermore, school enjoyment at ages 7 and 10 is a significant predictor of later school engagement at ages 10 and 13, respectively, when taking into account prior school engagement. This highlights the important link between school enjoyment and later school engagement, indicating that children who enjoy school are more likely to be motivated and engaged in their school work at a later point in time which, in turn, may predict greater academic progression in adolescence.

In terms of demographic and other key characteristics, children with special educational needs experience lower academic progression across every key stage of schooling and lower school engagement at age 10. Boys have higher progression from Key Stage 1 to Key Stage 2 than girls. However, girls have higher progression from Key Stage 3 to Key Stage 4 and more school engagement at age 10 than boys. Children eligible for FSM have lower academic progression from Key Stage 2 to Key Stage 3 and lower school engagement at age 10. Interestingly, while many of the wellbeing dimensions are significant predictors of school engagement at age 13, none of the demographic or other key variables are significant when taking into account school engagement at age 10. This suggests that as children's wellbeing becomes more important, demographic and other characteristics become less important, in explaining school engagement as children progress in their schooling.

Unexpectedly, associations do not vary according to children's demographic and other characteristics with the exception of the few significant interactions between SEN status and behavioural wellbeing. This suggests that, for the most part, the relationships between dimensions of wellbeing and later educational outcomes are similar for children and adolescents, regardless of their gender, SEN status, and parents' educational level.

9 Conclusions and Implications

Our study demonstrates the importance of wellbeing for children and adolescents throughout their primary and secondary school education. There are critical periods, however, when specific dimensions of wellbeing are most crucial. For academic progression, better emotional wellbeing is a key factor in primary school, whereas low levels of troublesome behaviour and more school engagement emerge as significant in adolescence. Good attention skills, on other hand, are important for academic progression in both primary and secondary school. For school engagement, victimisation appears to have a greater impact in primary school, whereas better emotional and behavioural wellbeing and positive friendships are supportive in secondary school. School enjoyment plays a significant role in encouraging engagement in both primary and secondary school.

Our findings highlight the significance of behavioural wellbeing or, rather, the lack of it. Attention problems and troublesome behaviours have a marked relationship with later educational outcomes. Strategies are needed to identify and support children with attention difficulties at an early stage in the schooling process, especially girls who are often under-diagnosed (Hinshaw and Blachman, 2005). Early interventions with primary-age children who exhibit signs of troublesome behaviour may also help prevent a downward spiral of disengagement and low achievement. Young children may also benefit from increased support for their emotional wellbeing.

Our findings could also contribute to policies regarding the transition from primary to secondary school. Earlier research has found that many children experience a decline in school wellbeing from childhood to adolescence (Gutman, Brown, Akerman, and Obolenskaya, 2009). This is especially worrisome as our findings suggest that school engagement during the early teenage years is a significant predictor of later GCSE achievement. Schools, however, may be able to boost motivation by encouraging teenagers' enjoyment of school and helping them build positive friendships, as well as supporting their emotional and behavioural wellbeing. These findings coincide with other longitudinal research focusing on strategies to ensure a successful transition to secondary school which include developing new friendships and showing an increasing interest in school and school work (see Evangelou, Taggart, Sylva, Melhuish, Sammons and Siraj-Blatchford, 2008, for a greater discussion of the secondary school transition).

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11 Appendices

Table 1: Unstandardised and Standardised Coefficients for Academic Progression from Key Stage 1 to Key Stage 2

Variables	Key Stage 2 (Age 11)			Significance
	Unstandardised B	Standard Error	Standardised B	
Constant	12.65	2.02		***
Key Stage 1	0.76	0.03	0.68	***
Eligible for FSM	0.32	0.38	0.02	
English first language	-0.41	1.23	-0.01	
SEN status	-1.06	0.31	-0.09	***
Parents married	-0.28	0.18	-0.04	
Highest education level	0.35	0.08	0.11	***
White British	-0.06	0.65	-0.00	
Birth weight	0.00	0.00	0.03	
Male	0.33	0.16	0.05	*
Emotional wellbeing at 7	1.23	0.57	0.05	*
Awkward behaviour at 7	-0.06	0.34	-0.00	
Troublesome behaviour at 7	-0.64	0.57	-0.03	
Activity problems at 7	0.12	0.38	0.01	
Attention problems at 7	1.04	0.40	0.09	**
Positive friendships at 7	-0.07	0.15	-0.01	
Victimisation at 7	-0.07	0.19	-0.01	
School enjoyment at 7	-0.02	0.11	-0.01	
School engagement at 7	0.01	0.13	0.00	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. $R^2 = .64^{***}$.

Table 2: Unstandardised and Standardised Coefficients for Academic Progression from Key Stage 2 to Key Stage 3

Variables	Key Stage 3 (Age 14)			Significance
	Unstandardised B	Standard Error	Standardised B	
Constant	-6.84	1.91		***
Key Stage 2	1.16	0.02	0.72	***
Eligible for FSM	-0.79	0.34	-0.03	*
English first language	-1.34	1.26	-0.01	
SEN status	-0.78	0.22	-0.04	***
Parents married	0.50	0.14	0.04	***
Highest education level	0.86	0.06	0.16	***
White British	0.48	0.58	0.01	
Birth weight	0.00	0.00	0.00	
Male	0.13	0.13	0.01	
Emotional wellbeing at 10	0.16	0.51	0.00	
Awkward behaviour at 10	-0.02	0.34	-0.00	
Troublesome behaviour at 10	1.72	0.47	0.05	***
Activity problems at 10	0.15	0.35	0.01	
Attention problems at 10	1.05	0.27	0.06	***
Positive friendships at 10	-0.18	0.13	-0.02	
Victimisation at 10	-0.04	0.14	-0.00	
School enjoyment at 10	0.07	0.08	0.01	
School engagement at 10	-0.06	0.10	-0.01	

Note. *p < .05, **p < .01, ***p < .001. $R^2 = .73^{***}$.

Table 3: Unstandardised and Standardised Coefficients for Academic Progression from Key Stage 3 to Key Stage 4

Variables	Key Stage 4 (GCSE)			Significance
	Unstandardised B	Standard Error	Standardised B	
Constant	-218.95	66.16		***
Key Stage 3	9.25	0.37	0.48	***
Eligible for FSM	-18.46	12.71	-0.03	
English first language	-19.68	45.09	-0.01	
SEN status	-36.12	8.46	-0.08	***
Parents married	17.25	5.02	0.06	***
Highest education level	23.73	2.28	0.18	***
White British	-6.91	19.91	-0.01	
Birth weight	-0.00	0.00	-0.00	
Male	-19.76	4.69	-0.07	***
Emotional wellbeing at 13	-6.66	17.53	-0.01	
Awkward behaviour at 13	-1.47	12.81	-0.00	
Troublesome behaviour at 13	89.40	15.79	-0.11	***
Activity problems at 13	-13.76	13.34	-0.02	
Attention problems at 13	31.69	9.78	0.07	***
Positive friendships at 13	-5.33	4.65	-0.01	
Victimisation at 13	-6.00	4.08	-0.03	
School enjoyment at 13	0.75	3.05	0.01	
School engagement at 13	8.68	3.45	0.06	**

Note. *p < .05, **p < .01, ***p < .001. $R^2 = .59^{***}$.

Table 4: Unstandardised and Standardised Coefficients for Changes in School Engagement from 7 to 10 years

Variables	School Engagement at Age 10			
	Unstandardised B	Standard Error	Standardised B	Significance
Constant	1.17	0.34		***
School engagement at 7	0.24	0.02	0.24	***
Eligible for FSM	-0.14	0.07	-0.03	*
English first language	0.48	0.24	0.03	*
SEN status	-0.12	0.04	-0.05	**
Parents married	0.04	0.03	0.02	
Highest education level	-0.01	0.01	-0.01	
White British	-0.11	0.12	-0.01	
Birth weight	-0.00	0.00	-0.01	
Male	-0.13	0.03	-0.08	***
Emotional wellbeing at 7	0.03	0.10	0.01	
Awkward behaviour at 7	0.04	0.07	0.01	
Troublesome behaviour at 7	0.15	0.09	0.03	
Activity problems at 7	0.01	0.06	-0.01	
Attention problems at 7	0.08	0.06	0.03	
Positive friendships at 7	-0.00	0.03	-0.00	
Victimisation at 7	-0.11	0.03	-0.06	***
School enjoyment at 7	0.18	0.02	0.20	***

Note. *p < .05, **p < .01, ***p < .001. $R^2 = .24^{***}$.

Table 5: Unstandardised and Standardised Coefficients for Changes in School Engagement from 10 to 13 years

Variables	School Engagement at Age 13			
	Unstandardised B	Standard Error	Standardised B	Significance
Constant	-0.54	0.44		
School engagement at 10	0.30	0.03	0.26	***
Eligible for FSM	-0.04	0.09	-0.01	
English first language	-0.28	0.32	-0.02	
SEN status	0.09	0.06	0.03	
Parents married	0.06	0.04	0.03	
Highest education level	0.02	0.02	0.02	
White British	-0.03	0.17	-0.00	
Birth weight	-0.00	0.00	-0.01	
Male	-0.06	0.03	-0.03	
Emotional wellbeing at 10	0.59	0.13	0.08	***
Awkward behaviour at 10	0.04	0.09	0.01	
Troublesome behaviour at 10	0.40	0.12	0.06	***
Activity problems at 10	0.23	0.09	0.06	**
Attention problems at 10	0.44	0.07	0.15	***
Positive friendships at 10	0.10	0.04	0.05	**
Victimisation at 10	0.03	0.04	0.02	
School enjoyment at 10	0.10	0.02	0.11	**

Note. *p < .05, **p < .01, ***p < .001. $R^2 = .20^{***}$.

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