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Influences on pupils' self-perceptions in primary school: Enjoyment of school, Anxiety and Isolation, and Self-image in Year 5

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Executive Summary

This report presents the results of analyses of pupils' self-perceptions in primary school. It is part of the longitudinal Effective Pre-school and Primary Education 3-11 (EPPE 3-11) research project funded by the Department for Children, Schools and Families (DCSF). The focus of this report is pupils' self-perceptions in Year 5 (age 10) in four key areas: 'Enjoyment of school'; 'Academic self-image'; 'Behavioural self-image' and 'Anxiety and Isolation'. Reports on pupils' cognitive and social/behavioural development at this age have been published separately (Sammons et al., 2007a; 2007b).

The original EPPE sample was recruited to the study at age 3 years plus and monitored to the end of Key Stage 1 (Year 2) in primary school. An additional 'home' sample of children (who had not attended a pre-school setting) was recruited when the pre-school sample started primary school. The EPPE 3-11 extension is following up the sample to the end of primary school (age 11 years plus). In addition to exploring pre-school influences, EPPE 3-11 research identifies the influence of primary school on a range of pupils' educational outcomes, as well as investigating any continuing pre-school effects.

EPPE 3-11 involves the collection and analysis of a range of data about pupils' development, child, family and home learning environment (HLE) characteristics and the characteristics of the schools attended. Additional value added measures of primary school academic effectiveness have been derived from independent statistical analyses of National data sets conducted for all primary schools in England (Melhuish et al., 2006) as part of the study. These have been incorporated into the EPPE 3-11 child database to provide indicators of the academic effectiveness of primary schools attended which complement the measures on pre-school settings. Thus, it is possible to explore both pre-school and primary school influences on pupils' outcomes in Year 5.

Questionnaires were administered to children asking their views about school and classroom life. These provided measures of pupils' self-perceptions in Year 2 and again in Year 5 in terms of 'Enjoyment of school', 'Anxiety and Isolation' and 'Academic self-image' and 'Behavioural self-image'. A range of statistical methods have been used to investigate results for 2520 pupils for whom at least one self-perception outcome measure was collected in Year 5.

The aims of the analyses were:
- To explore the relationships between child, parent and home learning environment (HLE) characteristics on pupils' self-perceptions at the end of Year 5.
- To explore pupils' self-perceptions and change in self-perceptions over Key Stage 2.
- To investigate any continuing impact of pre-school, including any variations in pupils' outcomes for those who attended different types of pre-school (and those who attended no pre-school provision i.e. 'home' children).
- To explore relationships between measures of pre-school processes (e.g. quality or effectiveness) on pupils' later self-perceptions in primary school.
- To investigate the influence of primary school academic effectiveness on self-perceptions and change in self-perceptions (controlling for child, family and HLE characteristics).
- To investigate the combined effect of pre-school experience and primary school experience on pupils' self-perceptions in Year 5.

Key findings

The self-perceptions of 2520 children were measured in Year 2 (age 7) and Year 5 (age 10). Four factors (to be used as outcomes in subsequent analyses) at Year 2 and four at Year 5 were identified after performing exploratory and confirmatory factor analysis on the questionnaire data. Both questionnaires yielded robust measures of pupils' self-perceptions.

Pupils' self-perceptions in Year 2

The analysis of the Year 2 pupil questionnaire produced four pupils' self-perception factors that were used as outcomes. The first factor, 'Enjoyment of school', included items reflecting how much pupils liked and found school interesting, liked individual subjects (English, Mathematics and Science) and liked answering questions in class. The second factor, 'Behavioural self-image', included items about pupils' views of their own behaviour in school. The third factor, 'Academic self-image', related to how clever or able pupils felt they were. The last factor was 'Alienation', the degree to which the child feels tired, fed up or/and angry at school. Appendix 3 shows the items that were found to be associated with each of these dimensions.

Pupils' self-perceptions in Year 5

The analyses of the Year 5 pupil questionnaires produced four pupils' self-perception factors or outcomes, most of them overlapping with the Year 2 measures. The first factor, 'Enjoyment of school', again reflected how much pupils liked and found school interesting, liked individual subjects (English, Mathematics and Science), liked answering questions in class, but also how much they felt they got tired and fed up at school. The second factor, 'Anxiety and Isolation', reflected how much pupils felt lonely, upset, worried or were bullied at school. The third factor, 'Behavioural self-image', again related to pupils' views of their own behaviour in school. Lastly, the fourth factor, as in Year 2, 'Academic self-image', reflected how clever or able pupils feel they are. Appendix 5 shows the items that were found to be associated with each of these dimensions.

At a younger age (in Year 2, age 7) pupils were found to have generally more positive self-perceptions than in Year 5 on all of the measures analysed. Pupils tend to report enjoying school somewhat less as they get older although most still have positive views. The results also suggest that 'Academic self-image' tends to decrease over time. In addition the way they view their behaviour in school also becomes less favourable over time. Nonetheless the majority of children still have fairly positive self-perceptions in Year 5. For example, fifty-four per cent of Year 2 pupils reported liking school 'all the time' compared to twenty-four per cent of Year 5 pupils. There are also differences in reports of a) how happy they are at school (45% of Year 2 pupils report being happy at school 'all the time' compared to 29% of Year 5 pupils), b) whether they feel they are less clever than other pupils and c) are less likely to want to answer questions in class.

When asked about individual subjects, pupils' liking of English, Mathematics and Science reduced significantly between Year 2 and Year 5, but not their liking of Art and Physical Education (see table E.1 below). Nonetheless, the majority of pupils (around 70%) liked English and Mathematics all or most of the time compared with lower figures for Science (60%). 'Behavioural self-image' changed the least over the three years. The finding that pupils' self-perceptions are less positive over time has been commonly observed in a range of studies in different contexts (see Morrison-Gutman & Feinstein, 2008; Mortimore et al., 1988; Thomas et al., 2000; Keys & Fernandez, 1992).

Table E.1 Year 2 and Year 5 views about school subjects

Questionnaire Items	Time point	Responses			
		All of the time	Most of the time	Some of the time	Never
		%	%	%	%
I like Reading/ English	Year 2	67	18	9	6
	Year 5	31	38	22	9
I like number work/ Mathematics	Year 2	58	22	12	8
	Year 5	43	28	18	9
I like Science	Year 2	55	24	12	8
	Year 5	31	30	27	12
I like Art	Year 2	85	10	3	2
	Year 5	79	14	5	2
I like P.E	Year 2	76	16	5	2
	Year 5	74	18	6	2

By Year 5, the degree of pupils' 'Enjoyment of school' is found to be more closely associated with their 'Academic self-image' and their 'Behavioural self-image' than was the case in Year 2 (correlations rising from around 0.3 in Year 2 to 0.4 in Year 5). This could reflect the changes in the 'Enjoyment of school' measure or possibly the changing impact 'Academic self-image' and 'Behavioural self-image' has on their 'Enjoyment of school'.

The impact of child, family and home characteristics on pupils' self-perceptions at the end of Year 5

This report highlights the importance of a range of pupil, family and home learning environment (HLE) characteristics that are related to pupils' self-perceptions. An analysis that contextualised pupils' outcomes in terms of these characteristics was carried out. The results show that taken together such child or family background factors have much weaker relationships with pupils' self-perceptions than with their academic outcomes (see Sammons et al., 2007a), and also that relationships are generally weaker than those found with different aspects of pupils' social behaviour (Sammons et al., 2007b).

Pupil background

Girls' self-perceptions are significantly different from boys' in terms of their 'Enjoyment of school', 'Anxiety and Isolation' and 'Behavioural self-image'. These results suggest that girls enjoy school more in Year 5 and tend to have a better 'Behavioural self-image' than boys, but also tend to feel more anxious and isolated. However, boys and girls do not differ significantly in terms of 'Academic self-image' at this age.

There were some differences related to ethnicity. Pupils of Indian and Pakistani heritage reported enjoying school more than pupils of White UK heritage and Pakistani pupils also had a higher 'Academic self-image'. Pupils of Black Caribbean, Black African and 'Any other ethnic minority' heritage also, on the whole, had a higher 'Academic self-image' than pupils of White UK heritage. Pupils of Pakistani and Bangladeshi heritage, on the whole, had a more positive 'Behavioural self-image' than the White UK pupils, whereas the Black Caribbean pupils were found to have a lower 'Behavioural self-image'. These differences are statistically significant but given the small numbers must be interpreted with caution.

There were no significant differences in self-perceptions for pupils who had English as an Additional Language (EAL) as a whole. However, there was a consistent pattern of poorer

self-perceptions related to need for EAL support. Pupils who still needed support for EAL in Year 5 reported higher levels of 'Anxiety and Isolation', lower 'Academic self-image' and poorer 'Behavioural self-image' than children who did not need EAL support but there were no significant differences related to 'Enjoyment of school'. Pupils who had previously been identified by their parents as having developmental problems at pre-school also had significantly higher scores for the 'Anxiety and Isolation' measure in Year 5.

Pupils who had low birth weights reported higher levels of 'Anxiety and Isolation' at age 10 than pupils who had normal birth weight. However, pupils with very low birth weight had higher 'Behavioural self-image' than pupils who had normal birth weight. Birth order also showed some significant differences. Second born pupils (with one older sibling) reported higher 'Enjoyment of school' than first born pupils (no older siblings), but second and third born pupils showed poorer 'Behavioural self-image' than first born pupils.

Lastly, pupils who were older in the year group (autumn born) tended to have a better 'Academic self-image' than younger children within the year group. This is still the case even when attainment level is taken into account (there is a well known association between age in months and levels of attainment within a year group, hence the development of age standardised tests). These results suggest that younger pupils may be comparing themselves unfavourably to older classmates in terms of academic ability or may receive less favourable feedback on their work.

Family background
Pupils eligible for Free School Meals (FSM an indicator of family poverty) reported that they enjoyed school more but also have somewhat poorer 'Behavioural self-image' than other children. This shows that the influences of social disadvantage appear to vary for different outcomes.

Pupils whose fathers have higher qualifications (18 academic, degree or higher degree) tended to have higher 'Academic self-image' than pupils whose fathers had no qualifications. By contrast children whose fathers have professional or vocational qualifications were found to have significantly higher scores in terms of 'Anxiety and Isolation' than pupils whose fathers had no qualifications.

Home learning environment (HLE)
The Early years home learning environment (HLE) has been found to be strongly positively associated with cognitive and social/behavioural outcomes for the EPPE sample at age 10 (Sammons et al., 2007a; 2007b). A positive association was found between pupils' Early years HLE scores (based on home learning activities measured at age 3 to 4) and their 'Academic self-image' in Year 5. This may relate to the boost to academic attainment and social behaviour, particularly 'Self-regulation', linked with higher Early years HLE, that in turn benefits 'Academic self-image'. This again confirms the wide-ranging influence of Early years HLE on many aspects of pupils' later development in primary school.

The net influences of different child, family and HLE characteristics are illustrated in table E.2. The Effect Sizes (ES) are presented without an algebraic sign, but the direction of change is explained in the text. 'Academic self-image' showed the largest amount of pupil background influences, although some of the largest effect sizes were found for

'Behavioural self-image'. Pupils' 'Enjoyment of school' was the self-perception factor least influenced by pupil background.

Table E.2: Summary of significant measures for contextualised Year 5 pupils' self-perceptions

'Enjoyment of school'		
Variable	*Effect size*	*Description*
Gender	**0.19**	Girls enjoy school more than boys
Ethnicity	**0.34/0.44**	Indian and Pakistani pupils enjoy school more than White UK pupils
Birth position	**-0.16**	Second born children enjoy school less than first born
Eligible for free school meals (FSM)	**0.26**	Pupils eligible for FSM reported enjoying school more than those not eligible for FSM
'Anxiety and Isolation'		
Variable	**Effect size**	**Description**
Gender	**0.15**	Girls report being more anxious and isolated than boys
Birth weight	**0.29**	Low birth weight pupils report being more anxious and isolated
Developmental problems	**0.16**	Pupils who had Early developmental problems report being more anxious and isolated
EAL support needed	**0.38**	Pupils who continue to need EAL support (Year 5) report being more anxious and isolated
Father's qualification	**0.23/0.60**	Pupils whose fathers have vocational qualifications report being more anxious and isolated (compared to those with none)
'Academic self-image'		
Variable	**Effect size**	**Description**
Ethnicity	**0.39/0.49/0.36 /0.32**	Black Caribbean, Black African, Pakistani and 'Any other minority' pupils have higher 'Academic self-image' than White UK pupils
Age within year group	**0.15**	Older pupils have higher 'Academic self-image'
EAL	**0.37**	Pupils with EAL have lower 'Academic self-image'
Father's qualifications	**0.24/0.19/0.27**	Pupils whose fathers have higher qualifications (18 academic, degree or higher degree) have higher 'Academic self-image' (compared to those who have none)
Early years HLE	**0.24/0.18/0.19**	All HLE index groups except bottom group have lower 'Academic self-image' than highest group
KS1 HLE: Outings	**0.18/0.16**	Pupils taken on less outings (low and moderate) had lower 'Academic self-image' than those taken on a very high number of outings
'Behavioural self-image'		
Variable	**Effect size**	**Description**
Gender	**0.53**	Girls have better 'Behavioural self-image' than boys
Ethnicity	**0.4/0.42/ -0.24**	Pakistani and Bangladeshi pupils have better 'Behavioural self-image' and Black Caribbean pupils have worse 'Behavioural self-image' than White UK pupils
EAL support needed	**0.29**	Pupils who continue to need EAL support (Year 5) have poorer 'Behavioural self-image'
Birth position	**-0.17/-0.13**	Second and third born children have poorer 'Behavioural self-image' than first born children
Birth weight	**0.43**	Very low birth weight pupils have better 'Behavioural self-image' than pupils who had a normal birth weight
FSM	**0.11**	Pupils eligible for FSM have poorer 'Behavioural self-image' those not eligible for FSM
Early years HLE	**-0.12**	Pupils who were read to several times a week during the pre-school period have poorer 'Behavioural self-image' in Year 5 than those whose parents read to them daily
	0.16	Pupils who went to the library fortnightly during the pre-school period have better 'Behavioural self-image' in Year 5 than those who never went.

Estimate tables including full effect sizes can be found in Appendix 7.

Relationships between pupils' self-perceptions and academic attainment

Academic attainment is significantly associated with most pupils' self-perception measures. 'Enjoyment of school' was the only measure that did not relate significantly to attainment in either Reading or Mathematics at the two time points. However, the majority of the correlations in Year 2 were low (around 0.1), suggesting that the cognitive and self-perception aspects of pupils' development are not closely related. Other studies have similarly shown that attainment and self-perceived measures are only weakly associated (see Tymms, 2001). However, the link was more evident for 'Academic self-image' as might be anticipated. By Year 5, the association between pupils' 'Academic self-image' and their attainment in Reading and Mathematics has increased (to r=0.2), indicating that pupils are more influenced by their own attainment when assessing their abilities at older ages.

When the influence of pupils' background characteristics was taken into account within a multilevel analysis of the four Year 5 self-perception measures, earlier attainment in Reading or Mathematics in Year 2 was found to be a significant predictor of later self-perceptions for both 'Academic self-image' and 'Behavioural self-image'. In addition, better attainment in Mathematics was a significant predictor of lower self-reported 'Anxiety and Isolation'. Children with higher attainment were more likely to have a higher 'Academic self-image', lower levels of 'Anxiety and Isolation' and a somewhat better 'Behavioural self-image'. There were similar findings when prior attitude as well as pupil background was also taken into account in the analyses.

Relationships between pupils' self-perceptions and Special Educational Needs

Pupils who had ever been identified as having a special educational need (SEN) at school generally had less favourable self-perceptions. When a pupils' Year 5 position on the SEN code of practice was taken into account, pupils within the SEN process (School Action or School Action Plus) had more negative self-perceptions and school experiences. However, pupils who had a full[1] statement of SEN had similar self-perceptions to pupils not on the SEN register for 'Enjoyment of school' and 'Behavioural self-image'. When their actual attainment was taken into account, children with a full statement actually had a relatively higher 'Academic self-image' than all the other groups of children, including children without any kind of special need. This suggests that the identification and additional support they are receiving may perhaps benefit their 'Academic self-image'.

Changes in pupils' self-perceptions over time

Multilevel value added analyses were conducted for the four Year 5 pupils' self-perceptions factors using them as outcomes in order to explore changes in pupils' self-perceptions, (sometimes called 'progress') from Year 2 to Year 5. For these analyses the contextualised multilevel models included measures of pupils' prior self-perceptions, collected at Year 2 in addition to the background factors presented above. These analyses were undertaken to explore whether the child, family and HLE characteristics, found to be significant in predicting aspects of pupils' self-perceptions measured at the end of Year 5 were also associated with differential progress or change in these self-perceptions between Year 2 and Year 5 of primary school education.

The generally weak relationships found between pupils' prior self-perceptions (Year 2) to those in Year 5 may be in part a reflection of the high fluctuation in pupils' self-perceptions that seems to be occurring over time (this may reflect measurement difficulties or real

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[1] A full statement of SEN legally requires additional support to be made available to the pupil (often on a one-to-one basis to address the specifically identified need).

changes in a pupils' views and feelings). For example, when individual questions were analysed that were identically worded at the two time points, the highest correlation was found for the question 'I behave in class' (0.29), the lowest correlation was for 'I am horrible to other children' (0.02). Overall pupils' self-perceptions show greater variability and are less stable than measures of their cognitive and social/behavioural outcomes. Thus we find that correlations between pupils' self-perceptions in Year 2 and Year 5 are relatively low compared to those for attainment or social behaviour across years ('Enjoyment of school' r=0.20, 'Academic self-image' r=0.16, 'Behavioural self-image'=0.28).

As well as assessing differences in pupils' self-perceptions in Year 5, changes in pupils' self-perceptions from Year 2 to Year 5 were explored. Self-perceptions in Year 2 were used as a baseline, to assess the degree of change over the three year period. Where the corresponding measure was available, this proved to be the best predictor of later self-perceptions, although it usually accounted for only a small proportion of total variance in the Year 5 measure, reflecting the lower correlations.

Pre-school quality and school effectiveness

Continuing pre-school influences
There was some evidence of a continued pre-school influence upon pupils' later self-perceptions, although the influence is relatively weak. The 'educational' quality of the pre-school (measured by the ECERS-E, Sylva et al., 2006; Sylva, Siraj-Blatchford & Taggart, 2006) was more likely to give a boost to pupils' subsequent 'Enjoyment of school' compared to children who attended a low quality pre-school (ES=0.18, p<0.05). However, there were no significant differences between children who had attended high quality pre-school and 'home' children on these outcomes. Likewise just attending or not attending a pre-school setting did not appear to have any lasting impact on pupils' self-perceptions at age 10. There was some evidence that children who attended pre-schools with higher scores for the 'care' quality of staff interaction and care routines (ECERS-R, Harms et al., 1998) had a higher 'Behavioural self-image' in Year 5 (care interactions ES=0.10, care routines ES=0.13).

All four indicators of pre-school centre effectiveness, measured in terms of promoting pupils' earlier social behaviour, were tested to see if they had any continuing impact on EPPE 3-11 pupils' later self-perceptions in Year 5. For 'Academic self-image' there were significant differences between the 'home' children and those who had attended pre-schools highly effective in reducing 'Anti-social' behaviour, but no significant differences were seen for any other outcomes. These findings are in contrast to results for academic outcomes and social/behavioural outcomes in Year 5 where pre-school effectiveness measures still showed a significant positive influence (Sammons et al., 2007a; 2007b).

Primary school academic effectiveness (value added)
Multilevel analyses revealed statistically significant school-level variance (Year 5) in pupils' self-perceptions and changes in self-perceptions, even when account is taken of pupil intake differences and pupils' prior self-perceptions in Year 2.

However, the amount of school-level variation was lower for some outcomes ('Behavioural self-image' and 'Anxiety and Isolation'). 'Enjoyment of school' showed the highest school-level variation for both the contextualised and complex value added models (9% and 11%) followed by 'Academic self-image' (8% for the contextualised model and 7% for the

complex value added model). The school level variation for 'Behavioural self-image' and 'Anxiety and Isolation' was lower at only three per cent for both the contextualised models and four per cent and five per cent respectively for the value added models. These results suggest that individual primary schools have more influence on pupils' self-perceptions in terms of 'Enjoyment of school' and 'Academic self-image' than on their 'Anxiety and Isolation' and 'Behavioural self-image'. As many of the primary Year 5 schools had only one EPPE pupil in attendance, the school level variation from this analysis should be interpreted with caution. Nonetheless, an additional analysis of the non-EPPE 3-11 case study children with an average class size of 22 found very similar intra-school correlations providing stronger evidence for a 'school effect' on pupils' self-perceptions and again indicating greater variation for the 'Enjoyment of school' outcome.

National assessment data for all primary schools in England for three cohorts (2002-2004) were used to create value added measures of the primary schools' academic effectiveness for English, Mathematics and Science (Melhuish et al., 2006). These effectiveness measures were then linked to the 990 plus primary schools attended by EPPE 3-11 pupils. They were found to be significant predictors of better academic outcomes for pupils in the sample, and also better outcomes in terms of 'Self-regulation' and reduced 'Anti-social' behaviour. By contrast, pupils' 'Enjoyment of school', 'Anxiety and Isolation' and 'Academic self-image' were not significantly associated with the academic effectiveness of the primary school attended. The data do however show that those who attended more academically effective primary schools tend to have more positive 'Behavioural self-image'

Summary and Implications

Pupils' self-perceptions are important as developmental outcomes in their own right, and there is a growing body of research that is beginning to address this topic (Marsh et al., 1985; Marsh & Hau, 2003; Marsh et al., 2006; Openakker & Van Damme, 2000; Smees & Thomas, 1999; Sainsbury & Schagen, 2004; Tymms, 2001). This report complements the analyses of cognitive and social/behavioural outcomes in Year 5 reported elsewhere (Sammons et al., 2007a; 2007b). A number of distinct self-perceptions can be identified based on pupils' self reports in primary school in both Year 2 and Year 5. These measures are relevant to policy particularly the Excellence and Enjoyment agenda, because they relate to pupils' self reported levels of 'Enjoyment of school' as well as their 'Academic self-image' and 'Behavioural self-image' and feelings of 'Anxiety and Isolation'. Encouragingly, most children have very favourable self-perceptions in Year 5, although in line with other research these self-perceptions tend to be somewhat less positive for older pupils (Year 5 versus Year 2); pupils' 'Academic self-image' tends to reduce with age. This suggests that teachers could give more attention to providing positive feedback (Williams & Black, 1999) and encouragement in the later primary years to boost 'Academic self-image' (Bandura, 1978; 1986; Marsh & Yeung, 1997).

The evidence presented in this report suggests that there is significant variation between schools in terms of their pupils' self-perceptions, especially for 'Enjoyment of school' and 'Academic self-image'. 'Anxiety and Isolation' showed the least amount of variation between schools, only just reaching statistical significance.

Overall the analyses reported here indicate only modest associations between pupils' cognitive attainments in Reading and Mathematics in Year 5 and their self-perceptions or their social behaviour. Nonetheless, associations are positive and statistically significant

indicating that more favourable cognitive outcomes tend to be associated with more positive self-perceptions at the child level.

Overall, the results reveal that girls tend to have more favourable self-perceptions in terms of 'Enjoyment of school' and 'Behavioural self-image' in Year 5. However, there are no gender differences for 'Academic self-image', although girls are more likely to have higher scores for 'Anxiety and Isolation'. Pupils requiring support for English as an additional Language (EAL) showed higher 'Anxiety and Isolation', and poorer 'Academic self-image' and 'Behavioural self-image'. These findings suggest that the impact of difficulties related to EAL (needing extra support in school) on a pupil may extend beyond attainment to self-perceptions. The results show that older children in the year group have a more positive 'Academic self-image', which is not just a function of their higher average attainment. Older children in many classes may find the curriculum and demands of school easier than younger children and as a consequence may compare themselves more favourably with younger children in the classroom. They are also likely to get more favourable feedback from class teachers who are unlikely to consider the impact of age within a year group especially in Key Stage 2. In earlier analyses (Sammons et al., 2004) we found that significantly more of the summer born children in the EPPE sample (34%), than of autumn born (21%), were identified as having some form of SEN during Key Stage 1. This could have a long lasting impact on young for their year (summer born) pupils' 'Academic self-image'. The findings suggest that reliance on teacher assessment may disadvantage some pupil groups (e.g. summer born).

The results also support the finding in academic and social/behavioural analyses that a better Early years home learning environment (HLE) has a protective influence on later outcome via its relationship to higher 'Academic self-image' and 'Behavioural self-image'. Pupils of fathers with higher (academic) qualifications also have higher 'Academic self-image'.

A number of pupil and family background indicators of disadvantage are related to lower self-perceptions and this is in line with findings for both cognitive and social/behavioural outcomes. These results again confirm that young children from disadvantaged backgrounds are at a higher risk of poor all round development. Ways of addressing the educational consequences of disadvantage and targeting interventions to such groups and communities are needed from a young age to ameliorate the adverse consequences on longer term outcomes. One important exception to this is the positive link between family disadvantage (FSM, Multiple disadvantage index) and greater 'Enjoyment of school' where pupils eligible for FSM reported more 'Enjoyment of school'. This may be the result of poorer home circumstances and pupils who view school as a more pleasant place to be by comparison. Pupils with a special educational need (SEN), especially those without a statement of SEN, appear to be more vulnerable than other pupils on all outcomes; however, this not the case for 'Enjoyment of school'.

As well as exploring differences between pupil groups, the change in pupils' self-perceptions was examined across Key stage 2. There was a great deal of fluctuation, much greater than found for the cognitive and social/behavioural outcomes reported elsewhere (Sammons et al., 2007a; 2007b). This is not unusual when studying self-perceptions but where prior self perception measures were available they proved to be the best predictor of later self-perceptions. The high fluctuation in pupils' self-perceptions makes change in self-perceptions more difficult to measure and interpret.

These findings also provide some evidence of continuing pre-school influences on later outcomes in Year 5, although results are weaker than those found for cognitive and social/behavioural outcomes. Overall attending pre-school versus not attending was not associated with any of the pupils' self-perceptions studied, nor did age at starting pre-school show an impact. However, children who had previously attended pre-school full time had higher levels of enjoyment of primary school at age 10.

There were some differences related to pre-school quality with those pupils who had attended low quality pre-school showing slightly lower levels of 'Enjoyment of school' than the 'home' children. Those pupils who had attended low quality also showed poorer later outcomes in terms of 'Anxiety and Isolation' by age 10, than those pupils who had attended high quality pre-school. Again these results suggest that poor quality pre-school (experienced by around 14% of the EPPE 3-11 sample) is not likely to confer long term benefits. This finding is generally in line with results of similar analyses of EPPE 3-11 pupils' academic and social/behavioural outcomes in Year 5 (Sammons et al., 2007a; 2007b).

All EPPE 3-11 indicators of pre-school centre effectiveness in terms of promoting pupils' earlier social behaviour, as well as five indicators of pre-school centre effectiveness in terms of promoting pupils' earlier cognitive attainment, were tested for continuing impact on pupils' self-perceptions. There were only significant differences for 'Academic self-image' between the 'home' children and those who had attended pre-schools that were highly effective in reducing 'Anti-social' behaviour. For 'Academic self-image', when change over Key stage 2 was investigated there were significant differences between 'home' children and children who had attended highly effective pre-schools for all the social/behavioural measures of effectiveness. This suggests that highly effective pre-schools boost the development of later 'Academic self-image' and that 'home' children are at a disadvantage in comparison.

Overall the academic effectiveness of the primary school attended (measured in terms of national value added measures, see Melhuish et al., 2006) was not significantly related to three of the four self-perception outcomes studied here. However, in line with results for teachers' assessments of pupils' social behaviour (see Sammons et al., 2007b) there was a significant positive link between the academic effectiveness of the primary school and better 'Behavioural self-image'. There are indications therefore that more academically effective schools tend to promote better social/behavioural outcomes for pupils. No evidence of any link with reduced 'Enjoyment of school', 'Academic self-image' or increased 'Anxiety and Isolation' was found. In other words, pupils' self-perceptions in these areas were not associated with the academic effectiveness of the primary school attended. This has some interesting implications for the Excellence and Enjoyment primary education policy agenda. Some commentators have argued that schools' emphasis on academic effectiveness and results would lead to poorer attitudes and lower enjoyment levels. The findings provide no evidence to support the view that pupils in academically more effective schools reported lower 'Enjoyment of school' or increased anxiety (or indeed the reverse). The data do however show that those who attended more academically effective primary schools tend to have more positive 'Behavioural self-image' and other analyses have shown significant benefits for academic outcomes in Reading and Mathematics and reductions in teacher ratings of 'Anti-social' behaviour, in Year 5 (Sammons et al., 2007a; 2007b).

There is some evidence to suggest that pupils' self-perceptions differ significantly from school to school, especially for 'Enjoyment of school' and 'Academic self-image'. This is still the case when the attainment of the children is taken in to account. These results suggest that individual schools can differ in the impact they have on a child's self-perceptions. Research elsewhere, exploring attitudes as pupil outcomes in the British context, has also found significant school and classroom effects (Smees and Thomas, 1999; Daly and Deft, 2002; Sainsbury and Shagen, 2004; Thomas et al., 2000).

Introduction

This report presents analyses of pupils' self-perceptions within the longitudinal Effective Pre-school and Primary Education 3-11 (EPPE 3-11) research. The study is funded by the Department for Children, Schools and Families (DCSF). This report focuses on pupils' self-perceptions in four key areas: 'Enjoyment of school', 'Academic self-image', 'Behavioural self-image' and 'Anxiety & Isolation' in Year 5 (age 10). Results from analyses of pupils' cognitive and social/behavioural development at this age are reported separately (Sammons et al., 2007a; Sammons et al., 2007b). The original EPPE pre-school child sample was recruited to the study at age 3 years plus and their attainment and developmental progress was monitored to the end of Key Stage 1 (Year 2) in primary school. An additional 'home' sample of children (who had not attended a pre-school setting) was recruited when the pre-school sample started primary school. The EPPE 3-11 research is designed to identify the influence of primary school on a range of pupils' educational outcomes, as well as to investigate any continuing pre-school effects and follows the sample across Key Stage 2 up to age 11 years.

Background

EPPE 3-11 involves the collection and analysis of a wide range of data about pupils' development, child, family and home learning environment (HLE) characteristics and the characteristics of the pre-school centres and primary schools attended. Additional value added measures of primary school academic effectiveness have been derived from independent statistical analyses of National assessment data conducted for all primary schools in England (Melhuish et al., 2006). These have been incorporated into the EPPE 3-11 child database to provide indicators of the academic effectiveness of the primary school a child attends and complement the measures collected earlier on the quality and effectiveness of the pre-school setting attended. Thus, it is possible to explore both pre-school and primary school influences on pupils' developmental outcomes in Year 5 separately and jointly.

Questionnaires were designed to explore pupils' self-perceptions and views about school and classroom life. These provide self-report measures of pupils' self-perceptions and views of school in Year 2 and again in Year 5 using age appropriate items and wording. A range of statistical methods have been used to investigate results for 2520 children for whom sufficient data were collected to create measures for at least one self-perception outcome in Year 5, representing 85 per cent of the EPPE 3-11 pupils for whom valid baseline data had been collected on pupils' self-perceptions in Year 2.

Aims
The aims of the analyses were:
- To explore the relationships between child, parent and home learning environment (HLE) characteristics on pupils' self-perceptions at the end of Year 5.
- To explore pupils' self-perceptions and change in self-perceptions over Key Stage 2.
- To investigate any continuing impact of pre-school, including any variations in pupils' outcomes for those who attended different types of pre-school (and those who attended no pre-school provision i.e. 'home' children).
- To explore relationships between measures of pre-school processes (measures of quality and effectiveness) on pupils' later self-perceptions in primary school.
- To investigate the influence of primary school academic effectiveness on self-perceptions and change in self-perceptions (controlling for child, family and HLE characteristics).
- To investigate the combined effect of pre-school experience and primary school experience on pupils' self-perceptions in Year 5.

Methods
The findings in this report rely on both simple statistics such as descriptive analyses and more complex techniques such as confirmatory factor analysis and multilevel regression analysis. Initially, principal components analysis was used to examine underlying dimensions in pupils' self-perceptions

to enable us to group questionnaire items together that form separate aspects of pupils' self-perceptions. Confirmatory factor analysis was then used to refine the results and create a more robust overall model of pupils' self-perceptions at the two time points. Multilevel analyses (that take into account the clustering in the sample of pupils in primary schools) were used to simultaneously analyse the impact of pupil background characteristics (including child, family, HLE) and the impact of both the pre-school and the primary school attended.

The analyses employ a range of statistical techniques from descriptive statistics and correlation analysis to multilevel (hierarchical) regression methods to examine the potential influences on pupils' self-perceptions. The paper focuses on four self-perception measures based on questionnaires that included many items drawn from existing primary pupil surveys. Questionnaires were administered to EPPE 3-11 pupils at the end of Year 5 (age 10). At the end of Year 2 a questionnaire of EPPE 3-11 pupils' views at age 7 years had been administered, so comparable measures of EPPE 3-11 pupils' prior self-perceptions are available.

Multilevel models provide more accurate estimates of the impact of different child or primary school characteristics on pupil outcomes (Goldstein, 1995) than other forms of analysis. They can be used to explore institutional influences by partitioning variance into individual and higher levels (e.g. pre-school centre or school), thus reflecting clustering in the child sample. Earlier analyses over the pre-school period enabled the calculation of value added estimates (residuals) of individual pre-school centre effects for children in the EPPE 3-11 child sample that had attended a pre-school centre (see Sammons et al., 2002; 2003 for details). These value added measures of pre-school centre effectiveness have been included in subsequent analyses of pupils' outcomes, at the end of Year 5 in primary school, to establish whether the effectiveness of the pre-school centre previously attended, in terms of promoting pupils' cognitive and/or social/behavioural development, continues to show any predictive relationships with pupils' self-perceptions in primary school. To examine the impact of primary school on pupils' later outcomes in Year 5, measures of primary school academic effectiveness in English and Mathematics have been derived from independent value added analyses of pupil progress for full cohorts using National assessment data for all primary schools in England matched between Key Stage 1 (KS1) and Key Stage 2 (KS2) over three years (see Melhuish et al., 2006).

Background information about child, parent and family characteristics was obtained initially through parent interviews conducted soon after children were recruited to the EPPE study. The parent interviews were designed to obtain information about a child's health and care history, details of family structure and parents' own educational and occupational backgrounds as well as some indications of parent-child activities and routines, particularly the home learning environment.[2] Subsequently parents were again asked to provide further information about child, parent and family characteristics when the children were in Key Stage 1 of primary school (age approximately 6 years) and this time information was obtained via a parent questionnaire. Details were sought regarding any change in background information (in employment, family structure, number of siblings etc.) as well as information on aspects of the HLE in KS1. The corrected response rate obtained was good at eighty-one per cent[3].

Overview of the report
This report is divided into six sections. The first section gives details about the characteristics of the EPPE 3-11 sample. The second section describes how the baseline (Year 2) and outcome (Year 5) pupils' self-perception measures were created using exploratory and confirmatory analysis of the

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[2] In most cases the parent interviews were conducted within 10 weeks of recruiting a child to the study and an excellent response rate (97%) was achieved. It should be noted that most interviews were with pupils' mothers and usually took place at the child's pre-school centre, although for some working parents telephone interviews were found to be more convenient.

[3] Between the initial assessment at entry to pre-school and the Reception assessment 139 children dropped out of the study. The response rate is based on the corrected sample of 3032 children.

'pupil self-report questionnaire items. We have reported on cognitive and social/behavioural outcomes at Year 5 (age 10) for this sample in separate reports (Sammons et al., 2007a; 2007b).

The third section investigates whether particular groups of pupils show differences in their self-perceptions at the end of Year 5 of primary school according to their background characteristics. This section also explores the predictive power of different child, family and home learning environment (HLE) background characteristics in accounting for variations in pupils' self-perceptions and experiences of school. Further analyses identify the unique (net) contribution of particular characteristics to variation in pupils' self-perception while other influences are controlled. Thus, for example, the impact of family socio-economic status (SES) is established while taking into account the influence of other factors such as mother's qualification levels, low income, ethnic group, birth weight, HLE etc. Results are reported in terms of effect sizes (ES); a statistical measure of the relative strength of different predictors. It is of policy interest to establish the nature and strength of such background influences individually and in total, because they are relevant to issues of equity and social inclusion.

In section four the effects of pre-school and primary school characteristics on pupils' subsequent self-perceptions are investigated. The first phase of the EPPE 3-11 research had shown that pre-school experience gave children a better start to school, in terms of higher cognitive attainments and improved social/behavioural outcomes. For more vulnerable groups of young children, in particular, lack of pre-school experience was found to be an additional disadvantage. As well as modelling the effect of pre-school attendance, in these analyses measures of pre-school centre influence including quality (measured by the ECERS-E, Sylva et al., 2006; Sylva, Siraj-Blatchford & Taggart, 2006) and centre effectiveness (measured by value added residual estimates based on pupils' cognitive progress during the pre-school period, Sammons et al., 2002; 2003) are tested to explore any possible continuing effects of pre-school at the end of Year 5. This section also addresses the question of differential pre-school effects for different groups of children.

Further analyses sought to establish the impact of primary school academic effectiveness on pupils' self-perceptions in Year 5, based on value added academic effectiveness measures for primary schools that were calculated independently of the EPPE 3-11 study (Melhuish et al., 2006). The last part of Section 4 deals with the combined impact of different characteristics of pre-school experience (quality and effectiveness) and primary school academic effectiveness.

The fifth section investigates whether particular groups of pupils show differences in the extent of change in their self-perceptions from Year 2 to Year 5 of primary education and whether pre-school and primary school experiences are associated with such changes during KS2.

The final section summarises the results drawing together the main findings and conclusions.

Section 1: Characteristics of the EPPE 3-11 sample at the end of Year 5

The educational effectiveness research design used for the original EPPE study is described in EPPE Technical Paper 1 (Sylva et al., 1999). Further discussion of the mixed methods approach is given by Sammons et al., 2005 and Siraj-Blatchford et al., 2006. In summary, six English Local Authorities (LAs), in five regions, participated in the research with children recruited from six main types of pre-school provision: nursery classes, playgroups, private day nurseries, local authority day nurseries, nursery schools and integrated centres (that combine care and education). In order to enable comparison of centre and type of provision effects the project sought to recruit 500 children, 20 in each of 20-25 centres, from the various types of provision. In some LAs certain forms of provision were less common and others more typical. Within each LA, centres of each type were selected by stratified random sampling and, due to the small size of some centres in the project (i.e. rural playgroups) more of these centres were included than originally proposed, bringing the sample total to 141 centres. In all, there were 2,857 children in the pre-school sample. An additional sample of 315 'home' children (who had not attended a pre-school setting) was added at entry to primary school, for comparison with those who had attended a pre-school, bringing the total sample to 3,172.

While in primary school EPPE 3-11 pupils were asked their views about school life at two time points: Year 2 (age 7) and Year 5 (age 10). This section provides descriptive statistics for the sample at the end of Year 5 for whom information on views had been obtained at age 10.

Tables 1.1a to 1.1c provide a brief summary of the characteristics of the EPPE 3-11 sample at the end of Year 5 for whom pupils' self-perceptions factors were available (created from individual questionnaire items, n = 2520).

In all, fifty-one per cent of children were male, and a quarter of children in the sample were from an ethnic background other than White UK. Ten per cent of the children had a first language other than English, although the number of children who still needed support because of English being an additional language (EAL) was smaller at the end of Year 5 (3.8 %) than at previous time points.

With respect to family structure, fifteen per cent of the children lived in large families defined as those with 3 or more siblings. Table 1.1a also shows the distribution of the Early years home learning environment (HLE) index which is a combined indicator of aspects of the quality of the home learning environment in the early years. A number of measures collected at the entry to study from the parent interviews provided information about aspects of the HLE in the early years. These are based on the frequency of engagement in specific activities involving the child, such as teaching the alphabet, reading to the child, listening to the child read, taking the child to the library etc. (as reported by the parents). Table 1.1a shows that forty-three per cent of the children in the sample belong to the two highest HLE categories, indicating that the Early years HLE was good or very good for these children. At the lower end of the scale thirty per cent had a relatively poor Early years HLE.

Just under one in ten (237) children (9.4% of the total sample) had not attended any type of pre-school, being part of the 'home' group.

Table 1.1a: Selected characteristics of children who have valid self-perception data at Yr 5 (N = 2520)
Some figures do not include non-response to questions therefore the total is not always 2520 (100 %)

	n	%
Gender		
Male	1283	50.9
Female	1237	49.1
Ethnicity		
White UK Heritage	1892	75.1
White European Heritage	76	3.0
Black Caribbean Heritage	94	3.7
Black African Heritage	50	2.0
Indian Heritage	57	2.3
Pakistani Heritage	51	2.0
Bangladeshi Heritage	129	5.1
Mixed Heritage	28	1.1
Any Other Ethnic Minority Heritage	141	5.6
English as an Additional Language (EAL)	240	9.5
Child needs EAL support at Year 5	96	3.8
3 or more siblings (pre-school)	376	14.9
Early years Home Learning Environment (HLE) Index		
0 – 13	225	8.9
14 – 19	526	20.9
20 – 24	577	22.9
25 – 32	794	31.5
33 – 45	295	11.5
Type of Pre-School		
Nursery class	475	18.8
Playgroup	484	19.2
Private day nursery	435	17.3
Local authority day nursery	323	12.8
Nursery school	426	16.9
Integrated (Combined) centre	140	5.6
'Home' sample	237	9.4

In terms of occupational social class, eighteen per cent of the mothers and twenty-nine per cent of the fathers were in the professional categories. The proportion of mothers who were classified as skilled (non-manual or manual) was twenty-four per cent, for fathers this proportion was significantly higher (36.4%). In total, a fifth of the mothers but only five per cent of the fathers were classified in the semi skilled or unskilled manual work groups. Also, thirty-one per cent of the mothers, but only seven per cent of the fathers were reported to be unemployed or not working. For seventeen per cent of the sample there was no information about the SES status of the father available.

Table 1.1b: Selected characteristics of children who have valid self-perception data at Yr 5 (n = 2520)
Some figures do not include non-response to questions therefore the total is not always 2,520 (100 %)

	n	%
Socio-economic status (SES) of Mother (during Key Stage 1 or earlier):		
Professional Non Manual	120	4.8
Other Professional Non Manual	323	12.8
Skilled Non Manual	393	15.6
Skilled Manual	217	8.6
Semi-Skilled	425	16.9
Unskilled	71	2.8
Unemployed / Not working	788	31.3
Socio-economic status (SES) of Father (during Key Stage 1 or earlier):		
Professional Non Manual	283	11.2
Other Professional Non Manual	436	17.3
Skilled Non Manual	250	9.9
Skilled Manual	668	26.5
Semi-Skilled	87	3.5
Unskilled	33	1.3
Unemployed / Not working	178	7.1
No father information	434	17.2

Table 1.1c shows details on the combined family SES measure. Nearly a fifth (19.8%) of children were identified as eligible for free school meals (FSM), and over a third (36.7%) were growing up in families whose annual salary was reported to be low (less than £17,500) when they were in Key Stage 1 (collected in the summer of 2001).

An index of multiple disadvantage[4] related to pupils' background characteristics was created in the original EPPE research. Table 1.1c indicates that twenty-two per cent of the sample was recorded as low disadvantage on this whereas, thirteen per cent of the sample was highly disadvantaged with a score of 4 or more factors identified as increasing the risk of low attainment.

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[4] The index combines poor child, family and home learning environment (HLE) characteristics individually associated with lower attainment.

Table 1.1c: Selected characteristics of children who have valid self-perception data at Yr 5 (n = 2520)
Some figures do not include non-response to questions therefore the total is not always 2520 (100 %)

	n	%
Family Highest Socio-economic status (SES) (during Key Stage 1 or earlier):		
Professional Non Manual	337	13.4
Other Professional Non Manual	556	22.1
Skilled Non Manual	448	17.8
Skilled Manual	514	20.4
Semi-Skilled	189	7.5
Unskilled	42	1.7
Unemployed / Not working	403	16.0
FSM (at Year 5 or earlier)		
Free School Meals	503	19.8
Salary of family during KS1		
No salary	501	19.9
£ 2,500 – 17,499	423	16.8
£ 17,500 – 29,999	377	15.0
£ 30,000 – 37,499	245	9.7
£ 37,500 – 67,499	416	16.5
£ 67,500 – 132,000+	158	6.3
No salary data	400	15.9
Employment status of mother during pre-school period:		
Not working	1206	47.9
Working part-time	746	29.6
Working full-time	393	15.6
Self-employed / Combination of part-time & self-employed	113	4.5
Total Multiple Disadvantage Index		
0 (low disadvantage)	552	21.9
1	656	26.0
2	503	20.0
3	288	11.4
4	185	7.3
5 plus (high disadvantage)	148	5.9

In general, only a small proportion of children had missing data (< 5 %) even for the measures of social background, which is a consequence of detailed procedures for tracking children, liaison with primary schools and quality data checks. Higher proportions of missing values occur for income related variables like salary, or the eligibility for free school meals (FSM), which is also an additional low income indicator (25.0% of data was missing for salary information collected during Key stage 1). A somewhat higher proportion of missing values for these kinds of measures is a typical response pattern also found in other questionnaire studies[5].

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[5] To prevent loss of sample size missing values for no. of siblings, FSM and SES where imputed using 'the last observation carried forward' method. Family SES was calculated by recording the highest parental occupational categories (family SES data was missing for 1.3% of the sample after imputation).

Section 2: Pupils' self-perceptions and data analysis

Information about pupils' self-perceptions was collected through self-report questionnaires administered by class teachers in Year 2 and Year 5. The items were derived from a study of existing measures and adapted for use with this age group. Some questions have been taken or adapted from The School Climate Assessment Instrument (Grosin and McNamara, 2001) and from Teddlie and Stringfield's Louisiana ABC+ model (Teddlie et al., 1984; Teddlie and Stringfield, 1993).

Pupils' self-perceptions at the end of Year 2

Statistical analyses were used to explore the variation in pupils' responses to the questionnaire items and to see whether robust measures of their self-perceptions could be identified. The results revealed a number of underlying dimensions (factors) that reflect patterns of associations amongst the questionnaire items. The descriptive details for the full Year 2 questionnaire are shown in Appendix 2. Four main factors were found through the combined principal components analysis followed by confirmatory factor analysis:

Box 1: The specific items associated with each pupils' self-perception factor in Year 2 (age 7)

'Enjoyment of school' ($\alpha=0.69$)	**'Behaviour self-image'** ($\alpha=0.62$)
1. I like school	1. I try to do my best at school
2. I like answering questions in class	2. I am kind to other children
3. I like Reading	3. I behave well in class
4. I like doing number work	
5. I like Science	
6. School is interesting	
'Academic self-image' ($\alpha=0.57$)	**'Alienation'** ($\alpha=0.52$)
1. I am clever	1. I get tired at school
2. My teacher thinks I am clever	2. I get fed up at school
3. I do my work properly	3. I get angry at school

α= Cronbach's Alpha

Five factors were extracted from the original principal components analysis that accounted for forty-three per cent of the variance. This was reduced to four because the fifth factor had a poor Cronbach's Alpha ($\alpha=0.40$). Full details of the principal components analysis and confirmatory factor analysis are shown in Appendix 3. The factors were weighted (see Appendix 3 for details) and where data were missing for an individual item the results were imputed.

Table 2.1 show the pupils' overall responses for the questions used in the factors. Pupils were generally very positive about most features of their experiences, leading to a high degree of skew in the factors (figures A3.1-A3.3 in Appendix 3 show their respective distributions graphically). This is not unusual for attitude scales.

Table 2.1 Percentage response rate for Year 2 pupils' self-perceptions factor questions

Factor 1: 'Enjoyment of school'	All of the time %	Most of the time %	Some of the time %	Never %
I like school	54	31	10	4
I like answering questions in class	52	27	16	6
I like Reading	67	18	9	6
I like number work	58	22	12	8
I like Science	55	24	12	8
School is interesting	59	27	10	5
Factor 2: 'Behavioural self-image'	All of the time %	Most of the time %	Some of the time %	Never %
I try to do my best at school	63	29	7	1
I am kind to other children	64	27	8	1
I behave well in class	51	37	11	2
Factor 3: 'Academic self-image'	All of the time %	Most of the time %	Some of the time %	Never %
I am clever	39	44	14	3
My teacher thinks I am clever	42	41	15	2
I do my work properly	55	35	9	1
Factor 4: 'Alienation'	A lot %		Sometimes %	Never %
I get tired at school	20		49	31
I get fed up at school	9		34	57
I get angry at school	7		34	59

Note that a high score on the factors 'Enjoyment of school', 'Behavioural self-image', and 'Academic self-image' relates to more positive outcomes, whereas a high score on the factor 'Alienation' relates to higher levels of negative attitudes[6].

Table 2.2 shows the correlations (a measure of statistical association which ranges from +1 to –1) between pupils' scores on the different Year 2 factors. All are highly statistically significant. The strongest statistical association is between pupils' scores on 'Behavioural self-image' and 'Academic self-image' followed by a negative association between 'Alienation' and 'Enjoyment of school', whilst the weakest correlation is between 'Academic self-image' and 'Alienation'.

Table 2.2 Correlations between pupils' self-perception factors at Year 2

	'Enjoyment of school'	'Behavioural self-image'	'Academic self-image'	'Alienation'
'Enjoyment of school'	1.00**	0.28**	0.31**	- 0.41**
'Behavioural self-image'		1.00**	0.45**	- 0.29**
'Academic self-image'			1.00**	- 0.20**

** Statistically significant at the 0.01 level

The analyses also indicate that there are only weak but statistically significant associations between pupils' self-perceptions at the end of Year 2 and their cognitive attainments at this age. In Table 2.3 the correlations between pupils' self-perception factors and their cognitive attainments in different areas are reported with the associations strongest for 'Behavioural self-image' and cognitive attainments at the end of Year 2 (stronger for Reading).

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[6] The 'Enjoyment of school', 'Behaviour self-image', and 'Academic self factors were rated on a 1-4 scale where 1= all the time, 2=most of the time, 3=some of the time, 4=never. The 'Alienation factor was rated on a 1-3 scale where 1= a lot, 2=sometimes, 3=never.

Table 2.3 Correlations between pupils' self-perceptions factors and cognitive attainment at Year 2

	Year 2 Reading score	Year 2 Mathematics score
'Enjoyment of school'	0.05**	Ns
'Behavioural self-image'	0.14**	0.10**
'Academic self-image'	0.09**	0.09**
'Alienation'	-0.10**	-0.05*

* Statistically significant at the 0.05 level, ** Statistically significant at the 0.01 level Ns – Not significant

Correlations between pupils' self-perception factors and social behaviour are generally higher (see Table 2.4).

Table 2.4 Correlations between pupils' self-perceptions factors and social behaviour at Year 2

	Year 2 'Self-regulation'	Year 2 'Pro-social' behaviour	Year 2 'Anti-social' behaviour	Year 2 'Anxious' behaviour	Year 2 'Social isolation'
'Enjoyment of school'	0.07**	0.12**	-0.03	-0.02	-0.06**
'Behavioural self-image'	0.28**	0.32**	-0.32**	0.02	-0.27**
'Academic self-image'	0.15**	0.17**	-0.10**	-0.00	-0.13**
'Alienation'	-0.14**	-0.18*	0.20**	0.04*	0.16**

* Statistically significant at the 0.05 level, ** Statistically significant at the 0.01 level

Due to a relatively low Cronbach's Alpha, the 'Alienation' factor is omitted from the multilevel analyses.

Pupils' self-perceptions at the end of Year 5

The statistical analysis of the Year 5 questionnaire items was conducted in a similar way to that in Year 2 and again identified a number of underlying dimensions (factors) which reflect patterns of associations amongst the questionnaire items. The descriptive details for the full Year 5 questionnaire are shown in Appendix 4. Four factors were revealed by the combined principal components analysis and the confirmatory factor analysis and were broadly similar to those found in Year 2.

Box 2: The specific items associated with each pupils' self-perception factor in Year 5 (age 10)

'Enjoyment of school' (α=0.76)
1. Lessons are interesting
2. I like going to school
3. I get fed up at school
4. I get tired at school
5. I like English
6. I like Mathematics
7. I like Science

'Anxiety and Isolation' (α=0.74)
1. I feel lonely
2. I get upset
3. I feel worried
4. Other children bully me

'Academic self-image' (α=0.74)
1. I am clever
2. I know how to cope with my school work
3. I am good at school work
4. My teacher thinks I'm clever

'Behavioural self-image' (α=0.62)
1. I try to do my best at school,
2. I behave in class,
3. I talk to my friends when I should be doing my work
4. I hit other children

α= Cronbach's Alpha

The 22 factors that were extracted from the original principal components analysis (exploratory factor analysis) accounted for 53 per cent of the variance, and the 13 used accounted for 42 per cent of the variance. Details of the principal components analysis and confirmatory factor analysis can be found in Appendix 5. The Cronbach's Alphas are generally higher than in Year 2. The factors were

weighted (see Appendix 5 for details) and results were imputed for cases where data were missing for individual questions. Table 2.5 shows the percentage responses to the questions that made up the pupils' self-perception factors (shown above). Year 5 pupils were somewhat less positive than Year 2 pupils about individual subjects of English, Mathematics and Science (Albone and Tymms, 2004, found a similar results for Mathematics), and general liking of school, although most children still had positive views. Interestingly more pupils had a very favourable view of Mathematics than other subjects (43%); overall seventy-one per cent of pupils like Mathematics all or most of the time compared to sixty-nine per cent for English and sixty-one per cent for Science.

Table 2.5: Percentage response rate for Year 5 pupils' self-perception factor questions

Factor 1: 'Enjoyment of school'	All of the time %	Most of the time %	Some of the time %	Never %
Lessons are interesting	23	45	27	5
I like going to school	24	43	26	7
I like doing English	31	38	22	9
I like doing Mathematics	43	28	18	11
I like doing Science	31	30	27	12
Factor 1: 'Enjoyment of school' continued	Never %	Some of the time %	Most of the time %	All of the time %
I get fed up at school	33	50	15	2
I get tired at school	62	29	8	1
Factor 2: 'Anxiety and Isolation'	Never %	Some of the time %	Most of the time %	All of the time %
I feel lonely	52	39	6	2
I get upset	45	45	7	3
I feel worried	32	59	7	2
Other children bully me	60	29	7	4
Factor 3: 'Academic self-image'	All of the time %	Most of the time %	Some of the time %	Never %
I am clever	18	51	27	4
I know how to cope with my school work	24	43	26	7
I am good at school work	29	49	19	3
My teacher thinks I'm clever	18	51	27	4
Factor 4: 'Behavioural self-image'	All of the time %	Most of the time %	Some of the time %	Never %
I try to do my best at school	61	33	5	0
I behave in class	39	46	13	2
I talk to my friends when I should be doing my work	12	22	53	13
I hit other children	1	1	16	82

Figures A5.2-A5.5 in Appendix 5 show the respective distributions of the four Year 5 pupils' self-perception factors graphically. The distributions of 'Anxiety and Isolation', 'Academic self-image' and 'Behavioural self-image' show a high degree of skew often found in attitude rating scales. **Note that a high score on the Year 5 factors 'Enjoyment of school', 'Academic Self image' and 'Behaviour Self image' relates to more positive self-perceptions**, whereas a high score on the Year 5 factor 'Anxiety and Isolation' relates to more negative self-perceptions (i.e. higher levels of Anxiety and

Isolation). The scales were recoded into normalised scores with a mean of 100 and standard deviation of 15[7].

Table 2.6 shows the correlations between pupils' scores on the different Year 5 factors. All are highly statistically significant but weak to moderate in size. The strongest statistical association is between pupils' scores on 'Enjoyment of school' and 'Academic self-image' whilst the weakest correlation is between 'Behavioural self-image' and 'Anxiety and Isolation'.

Table 2.6: Correlations between pupils' self-perceptions factors on four pupil factor scores at Year 5

	'Enjoyment of school'	'Anxiety and Isolation'	'Academic self-image'	'Behavioural self-image'
'Enjoyment of school'	1.00**	0.24**	0.42**	0.42**
'Anxiety and Isolation'		1.00**	0.19**	0.17**
'Academic self-image'			1.00**	0.37**

** Statistically significant at the 0.01 level

The analyses also indicate that there are weak but statistically significant associations between pupils' self-perceptions at the end of Year 5 and their cognitive attainments at this age. In Table 2.7 the correlations between pupils' factor scores and their cognitive attainments in different areas are reported, with the associations strongest for 'Academic self-image' and cognitive attainments at the end of Year 5 (for Reading, r=0.17, for Mathematics, r=0.21). The strongest relationships between social/behavioural outcomes and pupils' self-perception were found for 'Behavioural self-image' and 'Hyperactivity', where the correlation was negative (r=-0.45), and 'Pro-social' behaviour (r=0.30). 'Academic self-image' was also found to be associated with 'Self-regulation' (r=0.24).

Table 2.7: Correlations[#] between pupils' self-perceptions factors and attainment in Year 5

Year 5 outcomes		'Enjoyment of school'	'Anxiety and Isolation'	'Academic self-image'	'Behavioural self-image'
Cognitive outcomes	Reading	Ns	-0.08**	0.17**	0.11**
	Mathematics	Ns	-0.11**	0.21**	0.09*
Social/ behavioural outcomes	'Hyperactivity'	0.14**	-0.15**	-0.15**	-0.45**
	'Pro-social' behaviour	0.12**	-0.07**	0.15**	0.30**
	'Self-regulation'	0.05*	-0.11**	0.24**	0.14**
	'Anti-social' behaviour	-0.07**	0.09**	-0.06**	-0.21**

* Statistically significant at the 0.05 level ** Statistically significant at the 0.01 level Ns – Not significant
[#]These are pupil level correlations, not school level.

Higher scores indicate better pupils' self-perceptions for all the factors. Note that scores on all measures are skewed towards the desirable end of the scale. This shows that most children are responding positively about their school experiences, which is in line with other research.

The following background measures have been used in the multilevel models as potential predictors of different aspects of pupils' self-perceptions:
- Child characteristics (e.g. gender, birth weight, mother tongue and ethnicity).
- Family characteristics (e.g. socio-economic status [SES], parent's qualification level, family earned income, marital status).
- Early years Home Learning Environment (HLE).
- Pre-school experience and pre-school characteristics (e.g. type, duration, quality, effectiveness).

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[7] The Year 5 factors were rated on a 1-4 scale on the original questionnaire, where 1= all the time, 2=most of the time, 3=some of the time, 4=never.

- Primary school academic effectiveness (derived independently from value added analyses of pupil progress using National assessment data sets for all primary schools over three years, 2002-2004).

Contextualised multilevel analyses are used to investigate whether the patterns of association between self-perception outcomes and these child, family and HLE characteristics remain statistically significant when children reach the end of Year 5. These analyses are used to identify and quantify the unique (net) contribution of particular characteristics to variation in pupils' self-perceptions, after other influences are controlled. For example, the impact of gender was established while taking into account the influence of mother's qualification levels, low income, ethnicity, birth weight, HLE etc. The nature and strength of such background influences have been explored individually and in total, because they are relevant to issues of equity and social inclusion. The influence of pre-school is likewise calculated net of the influence of background factors and will be reported in Section 4. The overall analysis strategy for pupils' self-perception outcomes is similar to that adopted for the analysis of cognitive and social/behavioural outcomes at Year 5 for the same pupil sample.

Multilevel model estimates for Year 5 pupils' self-perception outcomes

Table 2.8 shows the null models with no explanatory variables included for the four outcomes. The intra-school correlation measures the extent to which the scores of pupils in the same primary school resemble each other as compared with those from pupils at different schools. The intra-school correlation for 'Enjoyment of school' is the highest at approximately nine per cent, followed by 'Academic self-image' at approximately seven per cent. 'Behavioural self-image', and 'Anxiety and Isolation', have relatively smaller intra-school correlations at approximately five and three per cent respectively.

Table 2.8: Null model showing primary school and child level variance of Year 5 pupils' self-perceptions

	'Enjoyment of school'	'Anxiety and Isolation'	'Academic self-image'	'Behavioural self-image'
Child level variance (se)	198.674	217.903	208.880	212.677
School level variance (se)	24.800	7.615	15.986	10.685
Intra-school correlation	0.111	0.034	0.071	0.048
Number of children	2519	2519	2519	2519
Number of schools	959	959	959	959

The results from a contextualised analysis are reported in Table 2.9. Predictor variables related to child, family and home learning environment (HLE) characteristics are added to the multilevel model to control for the influence of background characteristics. The intra-school correlation represents the extent to which variation in pupils' outcomes is associated with individual schools. However, as the number of EPPE 3-11 pupils in each primary school is extremely small, the results must be interpreted with caution. There may be significant school influences on pupils' self-perceptions but further research on larger samples is needed to confirm this. However, the findings on school differences (variation) are broadly in line with other school effectiveness studies.

An additional analysis of the views of the peers of EPPE 3-11 pupils from the 125 case study schools was investigated where the average number of pupils per class was 21.9 (ranging from 12 to 32). Additional background information was not available for these children, but a null model could be run on the data to compare the intra-school correlation with the EPPE 3-11 sample (see Appendix 6). Intra-school correlations were in line with the findings shown in Table 2.9, with the largest intra-school correlation being found for 'Enjoyment of school' (0.150) and smallest for 'Anxiety and Isolation'

(0.024). The intra-school correlation for 'Academic self-image' was 0.048 and for 'Behavioural self-image' was 0.057. This adds support to the finding for the EPPE 3-11 sample that pupils from different schools or classes reported significantly different self-perceptions.

Table 2.9: Contextualised models of pupils' self-perceptions at Year 5 showing primary school and child level variance

	'Enjoyment of school'	'Anxiety and Isolation'	'Academic self-image'	'Behavioural self-image'
Child level variance (se)	196.3783	213.5156	201.0280	196.9261
School level variance (se)	20.4072	7.5662	16.0165	7.7364
Intra-school correlation	0.094	0.034	0.073	0.038
% Reduction in school level variance	13.9%	0.8%	0.8%	16.2%
% Reduction in child level variance	1.2%	2.0%	3.4%	6.8%
% Reduction total variance	3.0%	2.0%	3.2%	8.4%

In later sections of this report it is explained that the academic effectiveness of the primary school a child attends (based on national assessment data for whole cohorts) was tested as a predictor for Year 5 self-perceptions.

The proportion of variance at the child level accounted for by child, family and home characteristics is very low for 'Enjoyment of school', 'Anxiety and Isolation', and 'Academic self-image' (at between 1-3%). Far more of the school level variance is accounted for by pupils' background characteristics for 'Enjoyment of school' and 'Behavioural self-image'. However, even the proportion of school variance explained for these two outcomes is much smaller than is found in equivalent analyses of these pupils' cognitive outcomes in Year 5. The pattern of results is consistent with Tymm's (2001) analysis of attitudes to school which were based on 21,000 seven year olds and related attitudes and their Mathematics and Reading attainments. We can conclude that background characteristics are generally only weak predictors of pupils' self-perceptions, in contrast to stronger effects on academic outcomes at the same age.

Section 3: Links between Child and Family Characteristics and Pupils' self-perceptions in Year 5

This section presents the results of a contextualised multilevel analysis establishing the pattern of relationships between child, family and home environment characteristics and pupils' self-perceptions at the end of year 5. The four Year 5 pupils' self-perception factors discussed in Section 2 are employed as outcomes in the contextualised multilevel model. Background details about pupils' earlier child care experiences, health, family and home learning environment were obtained from parental interviews conducted when children entered the EPPE study as well as selected details from parent questionnaires at other time points.

Differences in pupils' self-perceptions for different groups of children

The contextualised models indicate that, for all 4 outcomes, a number of child, family and home environment characteristics show statistically significant relationships with pupils' self-perceptions at the end of Year 5. The net influence of different child, family and home environment characteristics is illustrated in Tables 3.1 to 3.9. In addition to the factors, the effect sizes (ES) for the single factors are given. An effect size is a statistical measure representing the strength of the single effect of each predictor on pupils' outcomes. An ES of 0.2 can be seen as representing a relatively weak influence, that of 0.3 to 0.4 is moderate, while a relatively strong influence would be an ES of 0.6+. See Appendix 8 for how effect sizes were calculated.

This section explores associations between the pupils' self-perceptions in Year 5 and selected background characteristics. Differences in raw scores are examined alongside differences in 'net' impact (effect sizes), showing the unique contribution of a given predictor to a pupil's outcome once all other predictors are taken into account. The net effects of particular child, family and Home Learning Environment (HLE) characteristics reported in this section were derived by contextualised multilevel analyses and therefore take into account any clustering related to the primary school attended. As we shall see, due to the inter-relationship between the different predictors some raw differences between sub-groups of children disappear and some become accentuated once the influences of other factors are partialled out. Presenting raw and net differences side by side helps to show how demographic factors taken together affect the relative strength of estimates of the unique influence of particular factors.

The following measures were used in the analyses:
- Child factors (e.g. gender, birth weight, ethnicity, EAL)
- Family factors (e.g. eligibility for free school meals [FSM], socio-economic status [SES], parent's qualification, family earned income),
- Home Learning Environment (HLE) in the early years (how often parents read to the child, teach the child the alphabet, play with letters and numbers, teach songs and nursery rhymes, paint and draw etc.) before starting primary school,
- Parental activities during Key Stage 1 (KS1) such as the frequency of reading to the child, taking the child out on educational visits, computing activities, play, etc.

3.1 Child Measures

Gender
At the end of Year 5 we found significant gender effects for all pupils' self-perception outcomes except 'Academic self-image' with girls views being more positive than boys in general (see Table 3.1, note a higher score indicates more favourable responses). The gender effect is much stronger for 'Behavioural self-image' than other measures (ES=-0.53). This is line with recent research elsewhere (Gray & McLellan, 2006).

Table 3.1: Gender differences in pupils' self-perceptions at the end of Year 5*

		Male	Female	Total
'Enjoyment of school'	Mean	98.6	101.4	100.00
	S.d.	15.7	14.1	15.00
	Net ES	**-0.19**	**0**	
'Anxiety and Isolation'	Mean	101.0	99.0	100.00
	S.d.	15.6	14.4	15.00
	Net ES	**0.15**	**0**	
'Academic self-image'	Mean	100.0	100.0	100.00
	S.d.	15.6	14.4	15.00
	Net ES	**ns**	**ns**	
'Behavioural self-image'	Mean	96.1	103.8	100.00
	S.d.	15.0	13.9	15.00
	Net ES	**-0.53**	**0**	
Total n		1275	1229	2520

* 'Female' as the comparison category

Birth weight

A child's weight at birth was found to be a significant predictor of both later 'Anxiety and Isolation' and 'Behavioural self-image' at the end of Year 5. Pupils who had a low birth weight reported higher levels of 'Anxiety and Isolation' relative to pupils who had a normal birth weight[8] (ES=-0.29). By contrast pupils who had a very low birth weight reported better 'Behavioural self-image' relative to pupils who had a normal birth weight (ES=0.43).

Language

Children classified as having English as an Additional Language (EAL) when they entered pre-school were found to have higher scores for 'Academic self-image' and 'Behavioural self-image', but much lower 'Enjoyment of school', although differences were not statistically significant in the multilevel analysis. At age 10 many of these pupils were fluent in English. However, forty per cent of the pupils in the original EAL sample were identified as still needing EAL support in Year 5. Therefore, further analysis was conducted using 'Need of EAL support' as an indicator of poor English skills. Need of EAL support was also found to be an important predictor of cognitive outcomes at age 10 (see Sammons et al., 2007).

Table 3.3 presents differences in pupils' self-perceptions between pupils who are in need of EAL support and those who are not. The raw mean differences between the groups are larger for 'Anxiety and Isolation' and 'Academic self-image' while differences for 'Enjoyment of school' and 'Behavioural self-image' are relatively small. Nevertheless, when all other factors are taken into account, differences between the groups were statistically significant (and moderately large) for 'Anxiety and Isolation' (ES=-0.38); 'Academic self-image' (ES=-0.37) and 'Behavioural self-image' (ES=-0.29). The findings indicate that children still in need of EAL support at age 10 are 'at risk' not only of poorer cognitive outcomes in Reading and Mathematics and some aspects of social behaviour but also have poorer self-perceptions.

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[8] Babies born weighing 2500 grams or less are defined as below normal birth weight: foetal infant classification is below 1000 grams, very low birth weight is classified as 1001-1500 grams and low birth weight is classified as 1501-2500 grams (Scott & Carran, 1989).

Table 3.2: Children with EAL and differences in pupils' self-perceptions at the end of Year 5*

English as an Additional Language (EAL)		Not EAL	EAL	Unknown	Total
'Enjoyment of school'	Mean	105.3	99.4	111.9	100
	S.d.	14.9	14.9	6.3	15
	Net ES	ns	ns	ns	
'Anxiety and Isolation'	Mean	100.1	99.4	89.7	100
	S.d.	14.8	16.8	14.0	15
	Net ES	**ns**	**ns**	ns	
'Academic self-image'	Mean	99.8	102.0	105.8	100
	S.d.	15.0	15.0	3.2	15
	Net ES	ns	ns	ns	
'Behavioural self-image'	Mean	99.6	103.2	97.6	100
	S.d.	14.8	15.9	25.6	15
	Net ES	ns	ns	ns	
Total n		2285	233	2	2520

*Not EAL as the comparison category

Table 3.3: EAL support and differences in pupils' self-perceptions of school at the end of Year 5*

Need of EAL support		No	Yes	Unknown	Total
'Enjoyment of school'	Mean	100.1	102.7	98.0	100
	S.d.	15.0	13.6	15.5	15
	Net ES	ns	ns	ns	
'Anxiety and Isolation'	Mean	100.3	95.4	99.4	100
	S.d.	14.8	16.8	15.6	15
	Net ES	0	**-0.38**	ns	
'Academic self-image'	Mean	100.5	97.4	97.2	100
	S.d.	14.9	15.8	15.5	15
	Net ES	0	**-0.37**	ns	
'Behavioural self-image'	Mean	100.0	98.1	98.8	100
	S.d.	15.0	15.1	14.2	15
	Net ES	0	-0.29	ns	
Total n		2152	272	96	2520

*'No need of EAL support' as the comparison category

Ethnicity

Investigating differences in pupils' self-perceptions by ethnicity reveals some statistically significant but small differences in average scores for some groups. In a similar analysis of cognitive attainment in Year 5 Pakistani and Bangladeshi pupils were shown to have particularly low attainment in Reading and Mathematics, whilst pupils of Indian heritage were doing particularly well.

For views and experiences of school, pupils of Indian and Pakistani heritage reported enjoying school the most, whilst Pakistani and Bangladeshi pupils gave the most positive responses about their behaviour. In contrast, White UK pupils had relatively lower scores for school enjoyment.

Pakistani pupils reported slightly greater levels of 'Anxiety and Isolation' (although this was not statistically significant when other background characteristics were taken into account). Once other background characteristics had been taken into account, pupils of Black Caribbean and Black African heritage had higher 'Academic self-image' than White UK pupils, as did 'pupils of Indian, Pakistani and 'Any other ethnic minority' heritage. Pupils of Black Caribbean heritage had relatively poorer scores in terms of their 'Behavioural self-image'.

It should be noted the differences should be interpreted with caution due to the small numbers of some ethnic minorities in the sample.

Table 3.4: Ethnic groups and differences in pupils' self-perceptions at the end of Year 5*

Ethnic groups		White UK	White European	Black Caribbean	Black African	Other Ethnic	Indian	Pakistani	Bangladeshi	Mixed Race
'Enjoyment of school'	**Mean**	99.1	99.5	101.4	103.9	100.9	103.9	107.6	103.5	99.5
	S.d.	14.9	15.5	14.4	14.8	14.2	16.2	13.7	16.1	14.8
	Net ES	0	ns	ns	ns	ns	0.34	0.44	ns	ns
'Anxiety and Isolation'	**Mean**	100.4	101.1	99.6	98.7	97.6	95.2	102.0	93.1	97.9
	S.d.	14.9	15.5	14.3	14.5	14.5	16.4	16.4	16.2	14.8
	Net ES	0	ns	ns	ns	ns	ns	ns	ns	ns
'Academic self-image'	**Mean**	99.4	98.6	104.4	106.8	103.8	102.1	102.5	100.3	98.7
	S.d.	14.8	13.8	15.1	16.1	16.5	16.5	15.2	13.6	15.2
	Net ES	0	ns	0.39	0.49	0.32	ns	0.36	ns	ns
'Behavioural self-image'	**Mean**	99.8	97.8	96.2	98.9	98.5	103.4	104.1	104.1	98.7
	S.d.	14.8	14.4	15.2	15.8	15.4	17.1	15.1	16.8	14.4
	Net ES	0	ns	-0.24	ns	ns	ns	0.44	0.42	ns
Total n		1892	76	94	50	57	51	129	28	141

* White UK as the comparison category[9]

Health, behavioural and developmental problems and Special Education Needs (SEN)

EPPE 3-11 collected details on whether EPPE 3-11 pupils' class teachers reported that they had been identified as having any form of Special Educational Need (SEN) at each data collection point during Key Stage 1 and again in Year 5. Pupils' SEN status was not tested within the main contextualised analysis, but was tested in a separate analysis, to assess its net effect on pupils' self-perceptions after child, family and home environment characteristics had been taken into account. Pupils identified as being on the SEN Code of practice (School Action and Action Plus) had significantly lower scores for all outcomes compared with children not on the SEN Code of practice. By contrast, pupils with a statement of SEN tended to have similar self-perceptions in terms of 'Enjoyment of school' and 'Academic self-image' as children without SEN (not on SEN Code of practice), but tended to have higher levels of anxiety.

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[9] Any category of a predictor variable can be used as a reference group. The overall calculations (e.g. model's variance, BIC, etc.) are not affected by the choice of reference group; the absolute differences (in terms of effect size) between the different categories of the predictor variable also remain the same. The statistical models show the relative differences between categories in relation to the outcome measure. We select the category as a reference group that would show the pattern of association between the predictor variable and the outcome measure in the clearest possible way, the only restriction that the reference category is of a reasonable size. When the relationship is linear we would typically choose the lowest or the highest performing group as a reference category (e.g. highest qualification or none). If the relationship is non-linear we would select the largest category (e.g. ethnicity: White UK as the reference group). Occasionally we would select the category that is of most interest (e.g. pre-school quality: low quality) regardless of the type of association.

Table 3.5: Pupils on SEN Code of practice and differences in pupils' self-perceptions at the end of Year 5*

SEN		Unknown	School Action	School Action plus	Statement of SEN	Not on COP	Total
'Enjoyment of school	Mean	99.3	97.9	98.3	101.0	100.4	100.0
	S.d.	17.3	17.0	17.2	17.8	14.1	15.0
	Net ES	ns	-0.15	ns	ns	0	
'Anxiety and Isolation'	Mean	99.4	96.8	95.1	96.9	101.0	100.0
	S.d.	15.8	16.7	17.4	16.9	14.2	15.0
	Net ES	ns	0.27	0.40	0.30	0	
'Academic self-image'	Mean	96.6	96.0	95.6	103.5	101.2	100.0
	S.d.	16.4	15.5	17.8	19.0	14.2	15.0
	Net ES	-0.21	-0.30	-0.32	ns	0	
'Behavioural self-image'	Mean	99.0	95.1	95.9	97.6	101.2	100.0
	S.d.	16.2	16.3	17.1	16.8	14.1	15.0
	Net ES	ns	-0.33	-0.24	ns	0	
Total n		153	314	134	65	1854	2520

* 'Not on SEN Code of practice (COP)' as the comparison category

Pupils identified by primary school teachers as having at least one special educational need in Year 5 or earlier in primary school showed significantly lower average scores for 'Enjoyment of school', higher levels of 'Anxiety and Isolation', lower 'Academic self-image' and 'Behavioural self-image'.

Table 3.6: Pupils identified as SEN and differences in self-perceptions of school at the end of Yr 5*

SEN		Unknown	Yes	No	Total
'Enjoyment of school	Mean	98.7	98.4	100.6	100.0
	S.d.	17.7	16.7	14.1	15.0
	Net ES	ns	-0.16	0	
'Anxiety and Isolation'	Mean	101.7	96.5	101.3	100.0
	S.d.	14.7	16.7	14.1	15.0
	Net ES	**ns**	**0.33**	**0**	
'Academic self-image'	Mean	96.0	96.8	101.4	100.0
	S.d.	15.4	16.5	14.2	15.0
	Net ES	ns	-0.25	0	
'Behavioural self-image'	Mean	98.3	96.3	101.4	100.0
	S.d.	15.4	16.6	14.0	15.0
	Net ES	ns	-0.25	0	
Total n		78	676	1766	2520

* 'No SEN' as the comparison category

Pupils may be identified as having SEN for a variety of reasons. Specific information about health, behavioural and developmental problems was obtained from the parents at the start of the study, and it is these data that are used as predictors in the contextualised models rather than the overall measure of current SEN. The self-perceptions of pupils whose parents had reported they had early developmental problems at the beginning of the study indicated higher levels of 'Anxiety and Isolation' later in Key Stage 2, at age 10 (ES=0.16).

Birth position
Second born children reported that they enjoyed school significantly less than singletons, although this effect was relatively small (ES=-0.16). Second and third born children also reported significantly poorer 'Behavioural self-image' than singletons, although again the size of the effect was relatively modest (ES=-0.17, ES=-0.12).

Age within the year group
Older pupils within the year group had a better 'Academic self-image' (ES=0.15). This ties in with findings on the higher attainment of children who are old for their school year (i.e. autumn born) at younger ages (see Sammons et al., 2004). For further discussion of age effects and SEN (see Grabbe et al., 2008).

3.2 Family measures

Socio-economic status (SES) and eligibility for free school meals (FSM)
Family SES is measured by the highest of mother or father's current or most recent employment status and it showed a significant association with pupils' self-perceptions at the end of Year 5. Pupils whose parents are in high SES (professional non-manual) employment have the lowest levels of 'Anxiety and Isolation', highest 'Academic self-image' and most positive 'Behavioural self-image' of any SES group, while pupils whose parents are unemployed have the highest levels of 'Enjoyment of school' but also somewhat higher levels of 'Anxiety and Isolation' and lower 'Academic self-image' scores.

A pupil's eligibility for free school meals (FSM) provides an indicator of low family income (although it is recognised that not all children take up their entitlement). Pupils who are eligible for FSM have higher average scores for 'Enjoyment of school' but lower 'Behavioural self-image'.

Father's qualification
The measure of fathers' highest qualification level predicts differences in pupils' self-perceptions in 'Anxiety and Isolation' and 'Academic self-image', once background factors have been taken into account. 'Enjoyment of school' and 'Behavioural self-image' was lower, in raw terms, for pupils whose fathers had 'Other professional' qualifications, but not once other background characteristics were taken into account. Differences between the medium and high qualification categories are less pronounced, except for 'Academic self-image'. Children of more highly qualified fathers with '18 Academic' qualifications, degree or higher degree had significantly higher 'Academic self-image' than children whose fathers had none (ES=0.24, ES=0.19, ES=0.27 respectively). Children with fathers with 'other professional' qualifications were more likely to have poorer 'Anxiety and Isolation' scores, even once other background characteristics were taken into account.

Table 3.7: Father's qualifications and differences in pupils' self-perceptions at the end of Year 5*

Father's Highest Qualification level		None	Vocational	16 Academic	18 Academic	Degree	Higher degree	Other professional	Father absent
'Enjoyment of school'	Mean	100.2	98.8	98.8	101.6	100.1	101.1	96.1	101.2
	S.d.	17.4	14.1	14.8	14.8	12.9	12.3	11.9	15.3
	Net ES	ns	ns	ns	ns	ns	ns	Ns	ns
'Anxiety & Isolation	Mean	101.4	98.2	99.8	101.9	101.4	99.9	93.3	99.2
	S.d.	15.6	14.3	15.6	14.4	13.2	12.9	15.6	15.8
	Net ES	0	**-0.23**	ns	ns	ns	ns	-0.60	ns
'Academic self-image'	Mean	95.3	98.6	98.9	99.1	102.8	102.1	96.9	100.2
	S.d.	15.1	16.6	14.6	15.3	15.0	13.0	14.5	15.0
	Net ES	0	ns	ns	0.24	0.19	0.27	Ns	ns
'Behavioural self-image'	Mean	99.1	99.8	101.3	101.3	101.6	101.1	97.9	99.0
	S.d.	15.9	15.5	14.8	14.8	13.2	12.9	16.4	15.9
	Net ES	ns	ns	ns	ns	ns	ns	Ns	ns
Total n		391	288	556	187	315	130	23	571

* 'No qualifications' as the comparison category

Multiple Disadvantage
The indicator created to measure level of multiple disadvantage does not appear to be associated with pupils' self-perceptions, except for 'Enjoyment of school'. Table 3.8 shows the mean scores for different levels of multiple disadvantage by 'Enjoyment of school', 'Anxiety & Isolation', 'Academic self-

image' and 'Behavioural self-image'. 'Enjoyment of school' steadily increases with increasing multiple disadvantage. When multiple disadvantage is entered in the final contextualised model for 'Enjoyment of school', the observed raw differences between the groups is non-significant for all but one disadvantage group (4+ disadvantages, ES=0.20). This suggests that once the influence of individual more specific predictors (child, family and HLE) are taken into account there is still some evidence that the most disadvantaged tend to have a more favourable self-perception in terms of 'Enjoyment of school'.

Table 3.8: Total Multiple Disadvantage and differences in pupils' self-perceptions at the end of Year 5

Multiple disadvantage		0	1	2	3	4+	Unknown
'Enjoyment of school'	Mean	98.1	99.4	99.7	99.1	103.9	102.1
	S.d.	13.5	14.2	14.7	16.3	17.0	16.0
	Net ES	0	ns	ns	ns	0.20	ns
'Anxiety & Isolation'	Mean	99.9	100.4	100.6	99.5	99.3	99.8
	S.d.	14.1	14.2	15.5	15.5	16.6	15.4
	Net ES	0	ns	ns	ns	Ns	ns
'Academic self-image'	Mean	100.1	100.2	100.9	98.1	100.6	98.6
	S.d.	14.2	14.0	15.8	16.1	15.7	15.4
	Net ES	0	ns	ns	ns	Ns	ns
'Behavioural self-image'	Mean	101.2	100.2	99.9	97.6	100.2	98.3
	S.d.	13.9	14.2	14.3	16.6	17.1	15.1
	Net ES	0	ns	ns	-0.18	Ns	ns
Total n		552	656	503	288	333	188

* 'No disadvantages' as the comparison category

3.3 Home Learning Environment (HLE)

Early years Home Learning Environment (HLE)

Table 3.9: Early years HLE and differences pupils' self-perceptions at the end of Year 5*

Early years HLE index score		0-13	14-19	20-24	25-32	33-45	Unknown
'Enjoyment of school'	Mean	100.5	99.8	100.4	99.0	100.4	103.2
	S.d.	17.3	16.2	14.8	14.0	13.3	16.7
	Net ES	ns	ns	ns	ns	ns	ns
'Anxiety & Isolation'	Mean	98.7	99.8	99.6	100.5	101.2	99.7
	S.d.	16.2	16.0	15.1	14.3	13.6	15.3
	Net ES	ns	ns	ns	ns	ns	ns
'Academic self-image'	Mean	100.6	99.0	99.7	99.9	103.1	97.3
	S.d.	15.6	16.0	14.8	14.7	13.3	15.1
	Net ES	ns	-0.24	-0.18	-0.19	0	ns
'Behavioural self-image'	Mean	97.9	99.5	99.4	100.3	102.6	98.6
	S.d.	16.0	16.2	14.9	14.1	13.7	14.9
	Net ES	ns	ns	ns	ns	ns	ns
Total n		225	526	577	794	295	103

*Low Early years HLE score (0-13) as comparison group

A number of measures provide an indication of aspects of the Early years home learning environment (HLE). These are based on the frequency of specific activities involving the child, as reported by parents when children were recruited to the study (i.e. teaching the child the alphabet, playing with letters and numbers, library visits, reading to the child, teaching the child songs or nursery rhymes). These measures were combined to create an overall Early years HLE index with scores between 0 (Low Early years HLE) to 45 (High Early years HLE) (see Melhuish et al., 2008).

When the Early years HLE index was tested, only the highest level of HLE (33-45) remains a powerful predictor for higher 'Academic self-image' but not for the other outcomes. Pupils with lower Early years HLE scores tend to have a poorer 'Academic self-image' although results were not significantly different for the lowest HLE group.

Key Stage 1 (KS1) Home Learning Environment (HLE)
During KS1, parents were again given a questionnaire about their interactions at home with their EPPE 3-11 child. They reported on activities such as the frequency of reading to the child, taking the child out on educational visits, computing activities, sport activities, dance, etc.

The individual measures were aggregated to form four factors representing different activities during Key Stage 1 (KS1): 'Home computing', 'One-to-one interaction', 'Enrichment outings' and 'Expressive Play' (for further details about the KS1 HLE factors see Sammons et al., 2007a; 2007b). These factors were tested with respect to their possible influence on pupils' self-perceptions at the end of Year 5 (age 10)[10].

None of the four KS1 HLE factors showed a significant association with later 'Enjoyment of school', 'Anxiety and Isolation' or 'Behavioural self-image'. However, for 'Academic self-image', although the Early years HLE remains a predictor, the frequency of 'Enrichment outings' in KS1 (low ES=-0.18, moderate ES=-0.16) shows a weak influence; children taken on more outings had better 'Academic self-image'.

3.4 Relationship between pupils' self-perceptions and other pupil outcomes

In a series of separate analyses, pupils' academic attainment and social/behavioural scores were tested to see whether they predicted pupils' later self-perceptions. Attainment at previous time points as well as concurrent attainment was tested.

Relationships between pupils' self-perceptions and attainment
Earlier attainment in Year 2 significantly predicted pupils' later self-perceptions in Year 5 for all outcomes except 'Enjoyment of school'. 'Anxiety and Isolation' (Reading ES=-0.14, combined prior attainment in Year 2 ES=-0.24), and 'Behavioural self-image' (Mathematics ES=-0.17, Reading ES=0.29) showed relatively weak associations whilst 'Academic self-image' showed moderate associations for combined prior attainment (Mathematics ES=0.17, Reading ES=0.28, combined prior attainment in Year 2 ES=0.45)[11].

In Year 5, concurrent attainment was found again to predict all the outcomes, with 'Enjoyment of school' only being weakly significant for the combined attainment measures (combined attainment ES=0.12). Pupils with higher scores in Reading and combined attainment were associated with lower levels of 'Anxiety and Isolation' in Year 5 (Reading ES=-0.19, combined attainment ES=-0.24), higher 'Academic self-image' (Reading ES=0.39, Mathematics ES=0.15, combined attainment ES=0.53), and higher 'Behavioural self-image' (Reading ES=0.10ns, Mathematics ES=0.12, combined attainment ES=0.23). However, although significant, the effect sizes were fairly modest for 'Anxiety and Isolation'

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[10] KS1 HLE factors were not aggregated into a single HLE Index as was done with the Early years HLE since the types of extra curricular activities children are engaged in at this age do not form a simple additive scale. This is for two reasons: first, each of the HLE factors shows a unique pattern of association with different outcome measures, certain activities show a linear relationship (e.g. 'Enrichment outings' during KS1) while others show an inverted U shape function (e.g. 'Home computing during KS1 , suggesting an optimum level of engagement that is neither high nor low). Second, they are differentially and strongly influenced by gender, for example boys are significantly more likely to be reported by their parents to play with computers whereas girls are significantly more likely to be reported as engaging in expressive play. Combining these distinct types of activities into a single scale would cancel out contrasting or disparate influences. Consequently, the resulting scale might show no statistically significant associations with outcomes.
[11] Earlier attainment in Year 2 just failed to reach significance for 'Anxiety and Isolation' and Year 2 Mathematics (ES=-0.10), and 'Behavioural self-image' and combined Year 2 attainment (ES=0.10).

and 'Behavioural self-image', indicating that higher academic attainment is only a moderate predictor of better outcomes in these measures of pupils' self-perceptions. Larger effects were found for 'Academic self-image', especially for Reading[12].

Attainment, although predictive, only accounts for a small amount of the remaining pupil variance (the percentage of variance accounted for increased by: 'Enjoyment of school'=1.0%, 'Anxiety and Isolation'=1.8%, 'Academic self-image'=5.9%, 'Behavioural self-image'=0%). Other research has found the link between attainment and self-image to be small but positive and significant (Crocker & Park, 2004; Marsh & Craven, 2006) and also 'Academic self-image' to be mediated by the ability level of the class (Marsh & Hau, 2003).

Figures 3.1 and 3.2 show the effect sizes when current attainment is grouped into low, middle and high categories.

Figure 3.1: Year 2 attainment as a predictor of pupils' self-perceptions
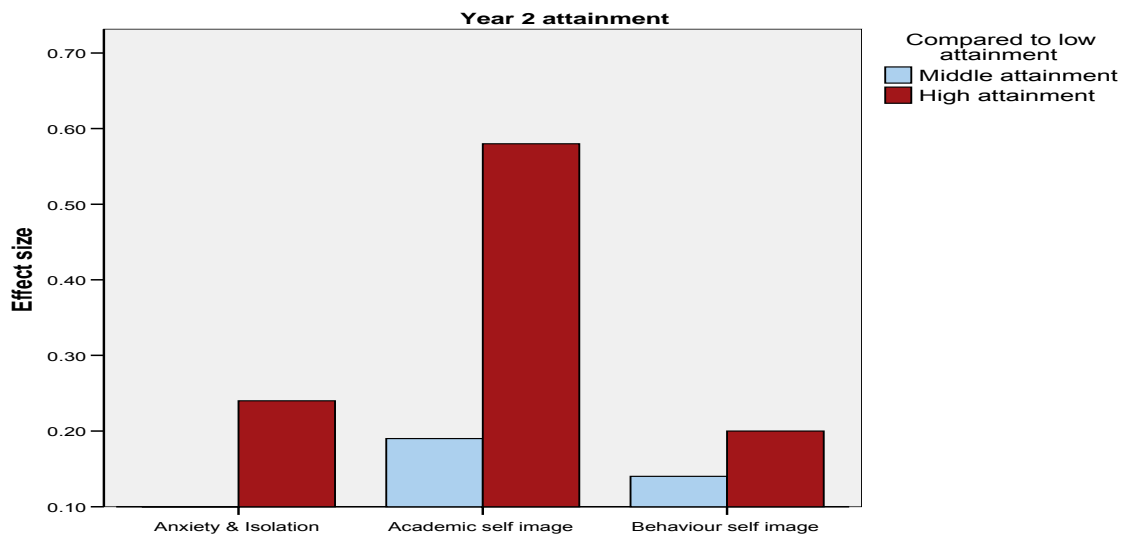
Figure 3.2: Year 5 attainment as a predictor of pupils' self-perceptions
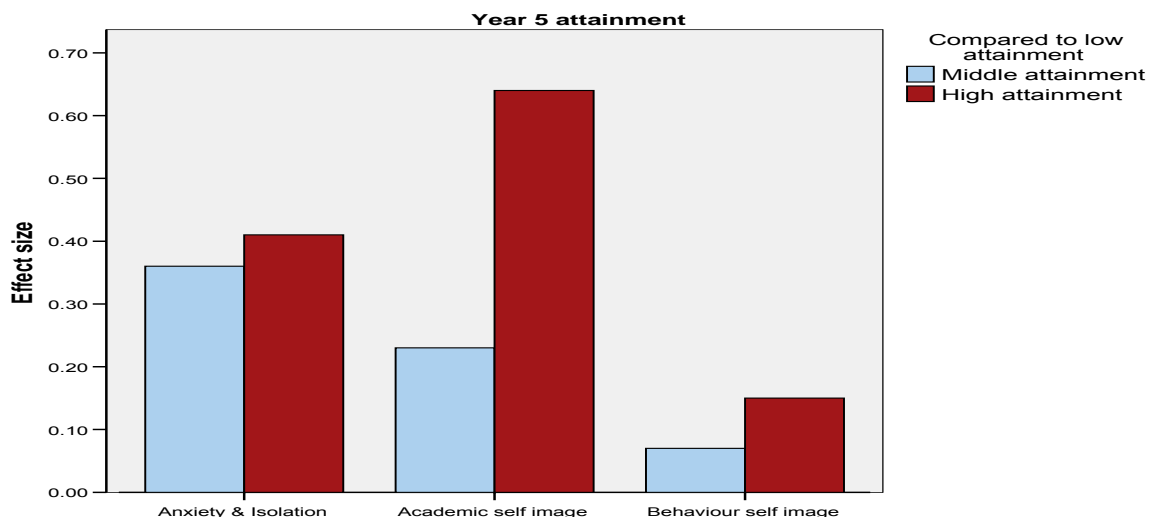
High attainment represents pupils with a combined attainment of one standard deviation or more above the mean, middle attainment represents pupils with combined attainment within one standard

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[12] Concurrent attainment in Year 5 just failed to reach significance for 'Behavioural self-image' and Year 5 Reading (ES=0.10).

deviation of the mean, and low attainment represents pupils one standard deviation or more below the mean.

Relationship between pupils' self-perceptions and social/behavioural outcomes

Pupils' social/behavioural scores in Year 5 (collected via individual teacher assessments) were used as predictors. The results indicated that they helped predict pupils' self-perceptions. For 'Enjoyment of school' pupils', 'Hyperactivity' predicted most strongly (ES=-0.31); those pupils rated higher on 'Hyperactivity' reporting lower 'Enjoyment of school'. Pupils with higher 'Pro-social' behaviour ratings reported higher 'Enjoyment of school'.

Higher levels of 'Hyperactivity' predicted higher levels 'Anxiety and Isolation'. Pupils with higher levels of teacher rated 'Pro-social' behaviour tended to report higher levels of 'Anxiety and Isolation' (ES=0.19), possibly because more anxious pupils may be more conforming in their behaviour.

Year 5 pupils' 'Self-regulation' scores (teacher rated) predicted their 'Academic self-image' most (ES=+0.39), with higher 'Self-regulation' predicting a higher 'Academic self-image' rating. Pupils with lower 'Hyperactivity' ratings had higher 'Academic self-image'. Pupils with lower levels of 'Pro-social' behaviour, as rated by their teachers, tended to report higher levels of 'Academic self-image' (ES=-0.09) although the effects are very weak. Lastly, 'Hyperactivity' (teacher rated) was found to be an extremely strong predictor of a poorer 'Behavioural self-image' in children at age 10 (ES=-0.90).

'Hyperactivity' is a particularly strong predictor of poorer self-perceptions in all outcomes. On the other hand, how the teacher rates the pupil in terms of 'Anti-social' behaviour seems generally not to predict pupils' self-perceptions. Teacher ratings of 'Pro-social' behaviour only positively predict 'Enjoyment of school' and 'Behavioural self-image'. This suggests that 'Enjoyment of school' and 'Behavioural self-image' are both more closely linked with positive social interactions with peers than with academic aspects.

Table 3.10: Effect sizes for social/behavioural outcomes as predictors of Pupils' self-perceptions at Year 5

Year 5 social/behavioural outcomes	Pupils' self-perceptions in Year 5			
	'Enjoyment of school'	'Anxiety and Isolation'	'Academic self-image'	'Behavioural self-image'
'Self-regulation'	ns	ns	0.39	ns
'Hyperactivity'*	-0.31	0.18	-0.20	-0.90
'Pro-social' behaviour	0.23	0.19	-0.09	0.22
'Anxious' behaviour*	-0.10	0.21	-0.09	-0.25
'Social isolation'*	0.20	0.44	0.15	0.14
'Positive social' behaviour	ns	-0.14	ns	ns
'Anti-social' behaviour*	ns	Ns	ns	ns

* Negatively scaled, i.e. higher score represents more negative behaviour
N.B. Year 5 social/behavioural outcomes were tested as continuous variables

Section 4: Pupils' self-perceptions at the end of Year 5 in Primary School: The Impact of Pre-school and Primary School

The aim of this section is to assess whether any features of the pre-school setting a child attended (between the ages of 3 and 5) have a continuing impact on their self-perceptions at the end of Year 5. In addition, differences between children who had not attended pre-school ('home' children) to those who had attended a pre-school setting were investigated in relation to their self-perceptions at the end Year 5.

For each of the four pupils' self-perception outcomes, the possible influence of a number of process measures related to pre-school experience were tested; attendance at pre-school or not (pre-school versus 'home'), duration of pre-school, quality of pre-school, and effectiveness of pre-school.

Testing the impact of different aspects of pre-school within the contextualised model

The contextualised models described in Section 3 took account of the impact of child, family and home learning environment (HLE) characteristics. By testing for the impact of the pre-school after these factors had been taken into account differences in intake to different pre-school settings could be separated from the pre-school effects.

Children with no pre-school experience ('home' children) were found to have similar self-perceptions in comparison with those who had not attended pre-school (when taken as a whole). In addition, children who started pre-school at an earlier age did not have significantly different self-perceptions compared with other children in Year 5.

The quality of pre-school was originally assessed through observations of each setting using the ECERS-R, ECERS-E, and CIS instruments. The ECERS-R (Harms et al., 1998) assessed many of the process and structural aspects of the pre-school setting such as 'space and furnishings' and 'activities'[13]. ECERS-E supplemented these areas to cover the curriculum areas of Literacy, Mathematics, Science and environment and Diversity (Sylva et al., 2006; Sylva, Siraj-Blatchford & Taggart, 2006).

The CIS (Arnett, 1989) assessed the interaction between children and staff in more detail[14]. The quality of the pre-school based on the CIS was not found to relate to pupils' self-perceptions at the end of Year 5, and neither was quality as assessed by the ECERS-R instrument. This is in contrast to findings for attainment in Reading and Mathematics and teacher reports of social behaviour in Year 5 where quality was found to show a significant positive continued impact on a range of child outcomes.

Pre-school provision versus no pre-school experience
When children who had not attended a pre-school ('home' children) were compared to children who attended the varying types of pre-school provision, no significant differences emerged. When individual types of pre-school were compared to 'home' children, very few significant differences were found. Only children who had previously attended Local authority day nurseries reported enjoying school more than 'home' children in Year 5. There were indications that children who had attended Playgroups (ES=-0.15, p=0.07) and Nursery classes (ES=-0.17) reported enjoying school less at the end of Year 5 than children who had attended Local authority day nurseries. Children who attended Local authority day nurseries also had a higher 'Academic self-image' in Year 5 than children who attended Nursery classes, Private day nurseries, Nursery schools and 'home' children, although these effects were relatively weak.

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[13] ECERS-R collected information on the following areas: Space and furnishings, Language reasoning, Personal care routines, Activities, Interaction, Programme structure, Parents and staff (Harms et al., 1998).
[14] The CIS observation looked at the following areas: Detachment, Positive relationships, Permissiveness, and Punitiveness (Arnett, 1989).

The Impact of Pre-school Centre Quality (ECERS-E, ECERS-R and CIS)
The sample was divided into four groups of children whose pre-school experience could be classified as ranging from no quality (i.e. the 'home' group, approx 9% of the sample) through low (14%), medium (54%) and high quality (22%), based on individual pre-school centres' ECERS-E scores. The ECERS-E assesses the quality of provision for pupils' learning within the cognitive aspects of the curriculum. The results in Year 5 indicate that there are statistically significant differences in pupils' self-perceptions between the low quality pre-school group and the high quality pre-school group for 'Enjoyment of school' and 'Behavioural self-image'. The experience of high quality pre-school provision shows a relatively weak but continuing positive impact at the end of Year 5 for 'Enjoyment of school' (ES=0.18) or 'Behavioural self-image' (ES=0.13, p=0.08) compared to the experience of a low quality pre-school centre.

Children who did not attend pre-school settings ('home' children) show no worse outcomes in 'Anxiety and Isolation', 'Academic self-image' or 'Behavioural self-image' (no statistically significant differences) to those children who went to a low quality pre-school. For 'Enjoyment of school' however, there is a positive effect for 'home' children when compared to the low quality provision (ES=0.21). Children who stayed at home before starting school show statistically significant differences to the low quality pre-school group, suggesting they enjoy school more at the end of Year 5 than children from low quality provision. When 'home' children were compared to those who had attended medium and high quality pre-school provision, no significant differences were found. These findings suggest that low quality pre-school (as measured by ECERS–E) does not confer long-term benefits and the results are in accord with those found for academic and social/behavioural outcomes in Year 5, although not for 'Pro-social' behaviour.

There were no significant relationships identified for the total ECERS-R scores or the Caregiver Interaction Scale (CIS, Arnett, 1989).

Observations on the ECERS-E and R individual sub-scales were also tested. Children who had attended a pre-school with higher ECERS-R scores for 'Personal care routines' (ES=0.13) and 'Interaction' (ES=0.10) sub-scales had better 'Behavioural self-image' in Year 5. Children who had higher 'Programme structure' (a subscale on the ECERS-R) scores also enjoyed school more at the end of Year 5 (ES=0.13) compared with 'home' children.

The Impact of Pre-school Centre Effectiveness
In the pre-school phase of the EPPE research, value added analyses of the cognitive and social/behavioural outcomes of children who had attended a pre-school (controlling for their prior attainment at entry to the study and background influences) were used to produce estimates of pre-school centre effectiveness for each of the 141 pre-school centres in the sample. These value added indicators (residuals) estimate pupils' relative gains over the pre-school period compared to those predicted by the multilevel model[15]. For details of these analyses, see EPPE Technical Papers 8a and 8B (Sammons et al., 2002; 2003). In order to establish whether the effectiveness of the pre-school setting attended shows any continuing impact on pupils' self-perceptions further multilevel analyses were conducted on the Year 5 outcomes.

Two cognitive pre-school effectiveness scores were tested: Pre-reading and Early number concepts, and all four social/behavioural effectiveness indicators: 'Independence and Concentration', 'Peer Sociability', 'Co-operation and Conformity', and 'Anti-social / Worried'. Analyses showed no strong clear positive link between Pre-school effectiveness (on any of the outcomes) and pupils' later Year 5 self-perceptions, when pre-schools were split into three groups: above expectation, as expected, below expectation and compared to 'home' children. Only one significant finding emerged; for 'Academic self-image' there were significant differences between the 'home' children and those who had attended pre-schools highly effective in terms of reducing 'Anti-social' behaviour, but no

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[15] Cognitive outcomes: Pre-reading, Total Verbal, Early Number concepts, Picture Similarities, Pattern Construction. Social/behavioural outcomes: 'Independence and Concentration', 'Peer Sociability', 'Co-operation and Conformity', and 'Anti-social / Worried'.

significant differences were seen for any other outcomes. These findings are in contrast to results for academic outcomes and social/behavioural outcomes in Year 5 where pre-school effectiveness measures still showed a significant positive influence (Sammons et al., 2007a; 2007b).

The Impact of Primary School Effectiveness
Further analyses were conducted to explore whether the academic effectiveness of the primary school a child attends is associated with pupils' self-perceptions (taking into account significant background, HLE and child characteristics). The value added academic effectiveness measures for primary schools were calculated independently of EPPE 3-11 using national data sets for all primary schools in England, linking KS1 and KS2 National assessment results, and the separate indicators for English, Mathematics and Science were combined into an overall academic effectiveness measure (Melhuish, et al., 2006). Unfortunately no national data sets are available to estimate school effects on other child outcomes (e.g. affective or social/behavioural). These measures, therefore, provide an estimate of the academic effectiveness of the primary school that we can use to explore possible relationships with pupils' self-perceptions.

The analyses show that the combined academic effectiveness of the primary school attended did not significantly predict pupils' self-perceptions for three dimensions: 'Enjoyment of school', 'Anxiety and Isolation' and 'Academic self-image'. However, for 'Behavioural self-image' pupils who attended more academically effective primary schools had a significantly better 'Behavioural self-image' (comparison of high and low groups ES=0.13). Overall the findings support the view that academic and affective outcomes are relatively distinct. Nonetheless, the weak but positive effect suggests that behavioural outcomes can benefit from attending an academically effective school. There is no evidence of any negative effect on pupils' self-perceptions from attending a more academically effective primary school.

The analyses of pupils' teacher rated social/behavioural outcomes in Year 5 (described in a separate report, Sammons et al., 2007b) also found that the academic effectiveness of the primary school attended showed a positive link with reduced scores for 'Anti-social' behaviour. While the associations may be reciprocal these results support findings from school effectiveness research that point to links between achieving a positive behavioural climate in school and better academic results.

The combined impact of pre-school experience and primary school effectiveness
We also sought to establish whether attending a high quality or more effective pre-school had a protective impact, in terms of pupils' self-perceptions, compared to attending a less effective primary school, or whether 'home' children or those who went to a less effective or low quality pre-school did better later if they went to a more effective primary school. However, there were no statistically significant findings. This is in contrast to results identified in equivalent analyses of pupils' cognitive and social/behavioural outcomes in Year 5 for this sample (Sammons et al., 2007a; 2007b).

Section 5: Changes in pupils' self-perceptions over time: Value added analyses from Year 2 to Year 5

We investigated changes in pupils' self-perceptions from Year 2 (age 7) to Year 5 (age 10) at primary school. The factors from the Year 2 pupil questionnaire provide the baseline measures for these analyses of pupil change over three school years (Year 2 to Year 5). The models allow for the multilevel structure of the data by including the primary school attended at level 2. This is important in value added analyses of pupil progress commonly used in school effectiveness studies. The models examined are (i) *simple value added models* controlling for pupils' prior self-perceptions only and (ii) *complex value added models* controlling for pupils' prior self-perceptions and, in addition, any significant child, family and home learning environment (HLE) characteristics. Section 2 of this report describes the prior self-perception measures used.

Table 5.1 reports the correlations between the prior pupils' self-perceptions factors at the end of Year 2 and the pupils' self-perceptions factors collected at the end of Year 5. The correlations between the factors at the different time points are very low, although they are generally statistically significant. It is important to note that the lower correlations are likely to reflect a number of influences, including real changes in pupils' self-perceptions at different ages, measurement error in terms of the assessments, and differences in the instruments (in terms of number of points on the rating scales used). The most stable factor was 'Behavioural self-image'; the least stable factor was 'Academic self-image'. Changes in the instrument mean that the Year 2 factor 'Alienation' did not correspond exactly to the Year 5 factor 'Anxiety and Isolation', so the two factors cannot be compared directly. It was also decided that 'Alienation' should not be used in the models due to the relatively low Cronbach's Alpha (0.52) for this scale.

Table 5.1 Correlations between pupils' scores on self-perceptions in Year 2 and Year 5

Year 2 pupils' self-perception factors	Year 5 pupils' self-perception factors			
	'Enjoyment of school'	'Anxiety and Isolation'	'Academic self-image'	'Behavioural self-image'
'Enjoyment of school'	0.19**	Ns	0.06**	0.09**
'Behavioural self-image'	0.06*	0.09**	0.09**	0.28**
'Academic self-image'	0.13**	0.09**	0.16**	0.15**
'Alienation'	-0.10**	-0.06**	Ns	-0.16**

** Statistically significant at the 0.01 level   * Statistically significant at the 0.05 level Ns – non-significant

Simple value added models

The multilevel analyses of pupils' attitude 'changes' over the primary school period use the four factor scores at the end of Year 5 as outcome measures. Table 5.2 shows the results of the simple value added model of attitude gains for the four factors when fitting only prior pupils' self-perceptions.

The best fit in the simple value added models are achieved by inclusion of the prior pupils' self-perception measures described in Table 5.3. Only statistically significant effect sizes have been reported.

Table 5.2 Simple value added models showing school and child level variance

	'Enjoyment of school' at Year 5	'Anxiety and Isolation' at Year 5	'Academic self-image' at Year 5	'Behavioural self-image' at Year 5
Child level variance:	194.984	216.663	204.665	199.619
School level variance:	23.937	5.812	14.411	10.753
Intra-school correlation	0.1093	.0364	.0658	.0511
% Reduction in school level variance	7.9%	+1.7%*	4.3%	0.8%
% Reduction in child level variance	3.8%	0.1%	2.4%	8.1%
% Reduction in total variance	4.3%	1.0%	2.5%	3.1%
Number of children	2139	2139	2139	2139

* The variance increased

Table 5.3 Gains over the primary Period in self-perceptions (Simple value added models)

Year 2 pupils' self-perception factors	Year 5 pupils' self-perception factors			
	'Enjoyment of school'	'Anxiety and Isolation'	'Academic self-image'	'Behavioural self-image'
'Enjoyment of school'	0.37			
'Behavioural self-image'		0.12		0.61
'Academic self-image'	0.17	0.14	0.34	

Complex value added model

Further multilevel analyses were conducted to investigate the continuing impact of background, while taking account of the links with prior pupils' self-perceptions reported above. The results show that a number of statistically significant relationships with pupils' background remain. Descriptive statistics for the complex value added models are shown in Table 5.4.

Table 5.4 Complex value added models showing school and child level variance

	'Enjoyment of school' at Year 5	'Anxiety and Isolation' at Year 5	'Academic self-image' at Year 5	'Behavioural self-image' at Year 5
Child level variance:	193.303	212.431	196.209	188.392
School level variance:	20.385	5.449	13.836	6.726
Intra-school correlation	.0954	.0250ns	.0659	.0345
% Reduction in school level variance	21.5%	4.7%	8.2%	38.0%
% Reduction in child level variance	4.7%	3.1%	6.4%	13.5%
% Reduction in total variance	6.6%	3.0%	6.6%	14.6%
Number of children	2139	2139	2139	2139

N.B. these models include missing categories

As reported previously for the contextualised models (see Section 2) and the simple value added models, the size of the intra-school correlation is interpreted with caution due to the large number of schools with very few EPPE 3-11 pupils. It can be seen that for this sample there are nonetheless indications of greater variation between schools for 'Enjoyment of school' followed by 'Academic self-image'. Overall, background factors are more important predictors for variations in 'Behavioural self-

image' (accounting for an additional 11.5% of total variance when the two models are compared). The significant pupil background characteristics that were controlled for were the same as in the contextualised models (see Table E.2 in the Executive Summary). Effect sizes for various predictors in these models can be found in Appendix 7.

The impact of Pre-school and Primary school
We also tested the impact of possible pre-school and primary school influences within the complex value added models described above, which took account of the impact of child, family and home learning environment characteristics and also pupils' self-perceptions at the end of Year 2. By testing for the impact of the pre-school after these factors had been taken into account, differences in intake to different pre-school settings could be separated from any possible continuing pre-school effects.

Measuring pre-school effects in these models is in essence, the change in disposition from Year 2 to Year 5. Any positive effect found would suggest that more positive or negative change in disposition occurred for pupils who had certain kinds of pre-school experience. There was no evidence that just attending a pre-school or not was associated with greater or less change in dispositions over the three years, except for 'Academic self-image', where children who had not attended pre-school ('home' children) showed less positive change from Year 2 to Year 5 (ES=-0.34) compared with those who had attended a pre-school.

When measures of the quality of pre-school experience were tested (grouped into low, medium and high quality and compared to home children,) results indicated that pupils who had previously attended high and medium quality pre-school (as measured by the ECERS-E) made more positive change in their 'Academic self-image' from Year 2 to Year 5 than pupils who had not attended a pre-school, the 'home' children (medium ES=0.21, p=0.05, High ES=0.27). These findings are in line with those found for analyses of pupils' academic progress in English and Mathematics across the same time period where those who had higher quality pre-school experience made more gains (Sammons et al., 2007a).

The predictive power of the effectiveness of the pre-school on changes in pupils' self-perceptions was also investigated. Pre-school effectiveness measures were available for social/behavioural outcomes in the following areas: 'Co-operation and Conformity', 'Independence and Concentration', 'Peer Sociability', and 'Anti-social / Worried'. When pre-school effectiveness was treated as a continuous scale there are indications that children who had attended a pre-school with higher effectiveness scores for 'Independence and Concentration' made more positive change in terms of reductions in the 'Anxiety and Isolation' levels between Year 2 and year 5 than children who had attended pre-schools with lower scores ('Independence and Concentration' ES=-0.10). This result however is weak. The effectiveness scores were also grouped into three groups: high effectiveness, medium effectiveness, and low effectiveness to allow comparisons with the 'home' children.

Children who had attended a pre-school that had a low, medium or high effectiveness score for 'Co-operation and Conformity', 'Independence and Concentration', 'Peer Sociability', and 'Anti-social / Worried' showed more positive change in their 'Academic self-image' than 'home' children from Year 2 to Year 5. Children who had attended high effectiveness pre-schools showed an especially clear pattern of positive change in 'Academic self-image' compared with 'home' children ('Co-operation and Conformity' ES=0.27, 'Independence and Concentration' ES=0.24, 'Peer Sociability' ES=0.29, 'Anti-social / Worried' ES=0.31).

Chart 5.1: Value Added effectiveness in pre-school and later improvement in 'Academic self-image' (social/behavioural outcomes)
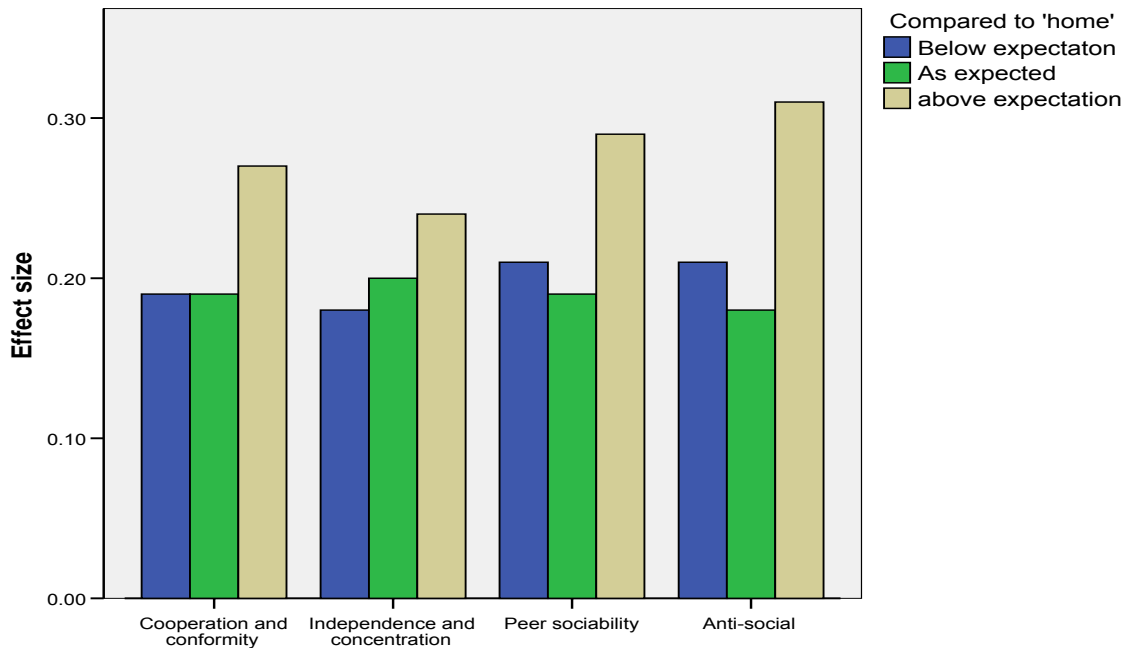
The number of sessions a child had attended per week at pre-school was also examined. Children who had previously attended 5 or more sessions a week made more positive change in their 'Academic self-image' from Year 2 to Year 5 than children who had not attended pre-school (ES=0.26). Children who had attended 9-10 pre-school sessions a week made more positive change in their 'Anxiety and Isolation' levels than children who had attended 6-8 sessions a week (ES=-0.17). Taken together, these findings suggest that children who had attended more sessions at pre-school may be more likely to show improved self-perceptions in the longer term.

The final step in the analysis of change in pupils' self-perceptions was to test the impact of the academic effectiveness of the primary school they were currently attending. Highly effective and medium academically effective primary schools were compared to low. Attending a more academically effective primary school predicted more positive change in 'Behavioural self-image' than children attending low effective schools (Medium ES=0.15, High ES=0.17, p=0.09) but there were no significant differences for change in other self-perception outcomes.

Taken together the results of the value added analyses of changes in pupils' self-perceptions across Year 2 to Year 5 provide some indications of weak to moderate positive continued pre-school effects. In addition there is some evidence of differences in outcomes related to the primary school attended.

Section 6: Summary and Conclusions

EPPE 3-11 is a 10 year longitudinal research study that consists of a number of separate but related sub-studies. The overall objective of the research was to investigate the factors that influence young pupils' educational outcomes during pre-school and on into primary school. A broad range of outcomes has been explored at different stages of pupils' educational careers: academic, social/behavioural and self-perceptions. An educational effectiveness research design was adopted to investigate the influence of a range of child, family and home environment influences and to identify the nature and extent of any pre-school and primary school influences on such outcomes at different ages (Sammons et al., 2005; Siraj-Blatchford et al., 2006).

The original EPPE sample was recruited to the study at age 3 years plus and their development studied to the end of Key Stage 1 (Year 2) in primary school. An additional 'home' sample of children (who had not attended a pre-school setting) was recruited when the pre-school sample started primary school. The EPPE 3-11 extension to the original study followed up the full sample to the end of primary schooling (age 11 years plus). In addition to exploring pre-school influences, the EPPE 3-11 research is designed to identify the influence of primary school on pupils' educational outcomes, as well as to investigate any continuing pre-school effects. This report presents the results of a range of analyses related to the Key Stage 2 primary school phase of the research. The focus has been on analysing pupils' self-perceptions in Year 5 of primary education (age 10 years). Reports on pupils' cognitive and social/behavioural development at this age are published separately (Sammons et al., 2007a; 2007b).

EPPE 3-11 involved the collection and analysis of a wide range of data about pupils' development, child, family and home learning environment (HLE) characteristics and the characteristics of the pre-schools attended. Additional value added measures of primary school academic effectiveness have been derived from independent statistical analyses of National Assessment data conducted for all primary schools in England (Melhuish et al., 2006) as part of the study. Data were extracted from these value added results for all schools for the subset of 990 plus primary schools attended by EPPE 3-11 pupils. These data have been incorporated into the existing EPPE 3-11 data base to provide indicators of the academic effectiveness of primary schools attended by EPPE 3-11 pupils to complement the measures on the pre-school settings collected in the original pre-school phase of the study. Thus, it is possible to explore both the separate and joint pre-school and primary school influences on pupils' self-perceptions in Year 5.

Self-report questionnaires were administered to children asking about their self-perceptions and views about different aspects of school and classroom life. These provided measures of pupils' self-perceptions in Year 2 and again in Year 5 in terms of several important dimensions: 'Enjoyment of school', 'Anxiety and Isolation' and 'Self-image' (Academic and Behavioural). A range of statistical methods has been used to investigate results for 2520 children for whom at least one of these self-perception outcome measures was collected in Year 5.

The aims of the analyses were:
- To explore the relationships between child, parent and home learning environment (HLE) characteristics on pupils' self-perceptions at the end of Year 5.
- To explore pupils' self-perceptions and change in self-perceptions over Key Stage 2.
- To investigate any continuing impact of pre-school, including any variations in pupils' outcomes for those who attended different types of pre-school (and those who attended no pre-school provision i.e. 'home' children).
- To explore relationships between measures of pre-school processes (measures of quality and effectiveness) on pupils' later self-perceptions in primary school.
- To investigate the influence of primary school academic effectiveness on self-perceptions and change in self-perceptions (controlling for child, family and HLE characteristics).
- To investigate the combined effect of pre-school experience and primary school experience on pupils' self-perceptions in Year 5.

This paper complements the analyses of pupils' academic and social/behavioural outcomes (Sammons et al., 2007a; 2007b). Results indicate that a number of distinct dimensions of self-perceptions can be identified based on pupils' self-reports in primary school in both Year 2 and Year 5. These measures are relevant to the Excellence and Enjoyment agenda, because they relate to 'Enjoyment of school' as well as 'Academic self-image' and 'Behavioural self-image' and feelings of 'Anxiety and Isolation'. Most pupils are found to have very favourable self-perceptions, although in line with other research there are indications that pupils' self-perceptions tend to be somewhat less positive for older than younger age groups for 'Academic self-image'.

Pupils' self-perceptions can be seen as important outcomes in their own right, and there is a growing body of research that is beginning to address this. The evidence in this report suggests that there is a significant variation between schools in the self-perceptions of their pupils, especially for 'Enjoyment of school' and 'Academic self-image'. 'Anxiety and Isolation' showed the least amount of variation between schools, only just reaching statistical significance.

The Impact of Child, Family and Home Learning Environment (HLE) Characteristics

Information about pupils' background characteristics was collected at the beginning of the project and later during KS1. This data was used to investigate any links between pupils' backgrounds (child, family and HLE characteristics) and their self-perceptions in Year 5. Detailed information on the differences between pupils' self-perceptions for different sub-groups of pupils in Year 5 were reported in Section 2 of this report (e.g. divided by key characteristics including gender, ethnicity, family SES, language, background etc).

Statistical analyses (multilevel models) investigated the influence of different child, family and home learning environment (HLE) characteristics on pupils' self-perceptions in Year 5. These contextualised analyses identified the unique (net) contribution of particular characteristics to variation in pupils' self-perceptions, while other background influences are controlled. Thus, for example, the predictive power of family SES is established while taking into account the influence of mother's qualification levels, low income, ethnicity, birth weight, HLE etc (see Section 2).

Overall we find only modest associations between pupils' cognitive attainments in Reading and Mathematics in Year 5 and their self-perceptions or their social behaviour. Nonetheless associations are positive and statistically significant indicating that more favourable outcomes in one developmental area tend to be associated with more positive outcomes in other areas.

Taken together, the results show that girls tend to have more favourable self-perceptions in terms of 'Enjoyment of school' and 'Behavioural self-image'. However there are no differences for 'Academic self-image' and girls are more likely to have raised scores for 'Anxiety and Isolation'.

Children requiring EAL support showed signs of general exclusion from school with high 'Anxiety and Isolation', poorer 'Academic self-image' and 'Behaviour self-image'. These findings suggest that the impact of difficulties in school linked to the need for EAL support for a child extends beyond attainment to a range of outcomes.

The results show that older pupils in the year group (associated with the autumn born versus summer born distinction) have a boosted 'Academic self-image', which is not just a function of the higher average attainment older children show. It is likely that older pupils in a class tend to find the work easier than their younger classmates and as a consequence are more likely to compare themselves more favourably to younger pupils in the classroom. They may get more positive feedback on their work than younger classmates as their teachers may not take account of differences in age within a class. This could have a longer lasting impact on younger pupils' 'Academic self-image'.

Other findings reveal significant differences in pupils' self-perceptions for different ethnic groups, and pupils of low birth weight. Family background was found to exert an influence on some of the outcomes, with eligibility for Free School Meals (FSM, used as an indicator of family poverty) being

associated with higher 'Enjoyment of school', but poorer 'Behavioural self-image'. Father's qualifications also influenced the 'Academic self-image' of pupils, with children of higher qualified fathers having higher 'Academic self-image'. The Early years home learning environment (HLE) has been found to be strongly positively associated with other cognitive and social/behavioural outcomes at age 10 (Sammons et al., 2007a; 2007b). This was also the case but less marked for 'Academic self-image' in Year 5. A number of pupil and family background indicators related to disadvantage show poorer outcomes in terms of pupils' self-perceptions, and this is in line with findings for both cognitive and social/behavioural outcomes. These results again confirm that young children with more disadvantaged backgrounds are at significant risk of poor all round developmental outcomes and this has implications for the social inclusion agenda. Ways of addressing the educational consequences of disadvantage and targeting interventions to such groups and communities are needed from a young age to ameliorate the adverse consequences on longer term outcomes. One exception to this is the link between family disadvantage (FSM and Multiple Disadvantage index) and greater 'Enjoyment of school'.

As well as exploring differences in self-perceptions between various pupil sub-groups, the change in pupils' self-perceptions over time was also investigated across Key Stage 2. There was a great deal of fluctuation, much greater than that found for the cognitive and social/behavioural outcomes (Sammons et al., 2007a; 2007b). This is not unusual when studying self-perceptions outcomes because these are likely to be more transient and less stable features and more difficult to measure reliably. Nonetheless, where pupils' prior self-perceptions measures were available related to the same dimension, they proved to be the best predictor of later pupils' self-perceptions (in other words though fairly modest earlier 'Academic self-image' in Year 2 is a significant predictor of 'Academic self-image' in Year 5). The high fluctuation in pupils' self-perceptions makes change in attitudes over time more difficult to measure.

The impact of attainment and Special Educational Needs (SEN)

Overall there are indications that there are only modest associations between pupils' cognitive attainments in Reading and Mathematics in Year 5 and their self-perceptions or their social behaviour (based on teacher ratings). Nonetheless, associations are positive and statistically significant indicating that more favourable outcomes in one area tend to be associated with more positive outcomes in other areas.

Earlier attainment in cognitive assessments in Year 2 (age 7) was found to be a significant and positive although fairly modest predictor of pupils' later self-perceptions for 'Academic self-image', 'Behaviour self-image' and 'Anxiety and Isolation'. In addition current attainment in Year 5 was moderately strongly associated with better 'Academic self-image', as might be expected (for further discussion of the predictive reciprocal relationships between attainment and academic self-image see Marsh & Yeung, 1997).

Pupils with a special educational need (SEN), especially those without a statement of SEN, show relatively less favourable self-perceptions for all outcomes. Although pupils with a special educational need (SEN) were more vulnerable to less favourable self-perceptions, there were indications that pupils with a full statement of SEN may benefit from the additional support they receive in terms of reporting more 'Enjoyment of school', and better 'Academic self-image' and 'Behavioural self-image' than other SEN groups.

Educational influences

EPPE 3-11 is this first large scale longitudinal study to investigate both pre-school and primary school influences on young pupils' attainment and progress. In addition to investigating the influence of background characteristics, analyses explored the impact of pre-school experience and that of the academic effectiveness of the primary school, as well as their combined impact. The aim of these analyses was to investigate questions such as whether children who did not go to pre-school or who had attended a less effective pre-school benefited more if they went on to attend a more academically effective primary school? Another hypothesis tested was that attending a high quality or high effective pre-school setting would have a protective effect on pupils' later self-perception outcomes if they went on to attend less academically effective primary schools (see Section 4).

The importance of earlier educational experiences in shaping pupils' cognitive and social/behavioural outcomes at Year 5 has been shown elsewhere (Sammons et al., 2007a; 2007b). The evidence of a continuing impact of the pre-school that pupils attended appears to be much smaller for pupils' self-perceptions than for pupils' social behaviour (as rated by teachers) or their academic outcomes. All four EPPE 3-11 indicators of pre-school centre effectiveness in terms of promoting pupils' earlier social behaviour, as well as five indicators of pre-school centre effectiveness in terms of promoting pupils' earlier cognitive attainment, were tested for continuing impact on pupils' self-perceptions in Year 5. There were only significant differences for 'Academic self-image' between the 'home' children and those who had previously attended pre-schools highly effective in terms of reducing 'Anti-social' behaviour. When change over Key stage 2 was looked at, there was a significant difference between 'home' children and children who had attended a high effective pre-school for all the social/behavioural measures of effectiveness, suggesting previously attendance at a highly effective pre-school gives a significant longer term boost to the development of later 'Academic self-image'.

There was some evidence to suggest that pupils' self-perceptions differ significantly between primary schools especially for 'Enjoyment of school' and 'Academic self-image' (the school accounting for around 9% and 7% of the total variance respectively). This is still the case when the attainment of the children is taken in to account. These results suggest that schools can differ in their impact on these important features of pupils' self-perceptions. Research elsewhere, exploring pupils' attitudes as outcomes in the British context, has also found significant class effects (Smees and Thomas, 1999; Daly & Deft, 2002; Sainsbury & Shagen, 2004; Thomas et al., 2000).

Results have demonstrated that the academic effectiveness of the primary school attended has an additional positive and statistically significant impact on pupils' attainment and social/behavioural outcomes in Year 5 of primary school (Sammons et al., 2007a; 2007b). The findings on pupils' self-perceptions in Year 5 provide no evidence to support the view that pupils in academically more effective schools reported lower or higher 'Enjoyment of school' nor was their evidence that this related to either reduced or increased anxiety levels. The data did however indicate that those pupils who attended more academically effective primary schools tend to have more positive 'Behavioural self-image' in Year 5. This is in accord with findings in Year 5 on teacher reports for individual pupils' behaviour where there is evidence that pupils who attended a more academically effective primary school showed reduced 'Anti-social' behaviour. In interpreting these results it is important to recognise that the measures of academic effectiveness were derived for all primary schools in England from analyses of the progress of different pupil cohorts National assessment data using value added approaches and provide *independent* measures not based on the EPPE 3-11 sample.

Assessing changes in pupils' self-perceptions over time

Multilevel value added analyses were conducted for the four outcomes to explore changes in pupils' self-perceptions from Year 2 to Year 5 (section 5). These reveal the extent of fluctuations in pupils' self-perceptions that seems to be occurring over time, at the individual question and factor level. The greatest stability was found for 'Behavioural self-image'.

Overview and discussion of Findings on Home, Pre-School, and Primary School Influences on Pupils' self-perceptions in Year 5

- These analyses have identified the strongest net effects of background factors on self-perceptions for different groups of pupils. The main findings indicate that many of the differences between pupil groups that exist in pupils' self-perceptions are related to gender, ethnicity and English as an additional language (EAL), although other child, family and home learning environment (HLE) influences do also exist. These findings are relevant to the focus of Department for Children, Schools and Families (DCSF)'s Social and Emotional Aspects of Learning (SEAL) program, suggesting that gender and other background influences need to be taken into account in the implementation of SEAL. Nonetheless, these background effects were generally weaker than those found for cognitive and social/behavioural outcomes in Year 5 (Sammons et al., 2007a; 2007b) and are in line with research elsewhere (Morrison-Gutman & Feinstein, 2008).

- The strongest net effects of background characteristics on pupils' self-perceptions as a whole at Year 5 are for measures of gender, ethnicity and need for EAL support, where influences were found for three out of the four pupils' self-perception outcomes. Other effects were found for free school meals (FSM), birth weight, father's qualification, Early years home learning environment (HLE), followed by birth position, developmental problems, outings during KS1, Reading to child in early years and library visits in the early years. It is encouraging that disadvantaged groups show good 'Enjoyment of school'.

- There is a significant link between attainment and pupils' self-perceptions. Pupils with higher attainment in Year 2 had more favourable self-perceptions in Year 5 for all outcomes except 'Enjoyment of school'. However, pupils' attainment did not predict their 'Enjoyment of school'. This is an important finding at both the child level and in terms of school academic effectiveness.

- The analyses of cognitive and social/behavioural outcomes reported separately (Sammons et al, 2007a; 2007b) produced evidence of continuing pre-school effects. This is less evident in relation to pupils' self-perceptions, which are more vulnerable to change between Year 2 and Year 5. Nonetheless the quality and effectiveness of the pre-school do show long term positive effects on pupils' later self-perceptions in Year 5.

- The academic effectiveness of the primary school a pupil attends (measured independently by value added analyses using National assessment data) is a significant influence on 'Behavioural self-image' at Year 5. Those pupils who attended a more academically effective primary school showed significantly better 'Behavioural-self image' at Year 5. Moreover, there was no evidence of any negative effect on pupils' self-perceptions from attending a more academically effective primary school.

Implications

The current research provides new evidence concerning the effects of background characteristics, pre-school and primary school in shaping pupils' self-perceptions. The results show that some pupil groups are more likely to show less favourable self-perceptions, and that these vulnerable or at risk groups may benefit from additional social and emotional guidance at school. The research reveals the continued strength of the influence of Early years home learning environment (HLE) on later 'Academic self-image'. In line with findings related to cognitive outcomes this points to the important role of parents and other carers in providing rich home learning experiences during the sensitive pre-school period of young children's development.

We can conclude that the influences on pupils' self-perceptions vary depending on the outcome studied. For example girls, pupils receiving EAL support, pupils with developmental problems, and pupils with Special Educational Needs (SEN), are more vulnerable to 'Anxiety and Isolation'.

Whereas higher 'Academic self-image' is predicted more by home learning environment (HLE) activities in the early years and KS1, fathers with higher qualifications, ethnicity and whether pupils need EAL support.

In summary, the results provide no evidence to support the idea that pre-schools or primary schools that foster better academic outcomes are less successful at fostering pupils' self-perceptions in school. In contrast, pupils in these schools are more favourable about their 'Behavioural self-image'. The emerging findings from this paper and the previous analyses at Year 5 indicate that pupils' cognitive, social/behavioural and self-perception outcomes are boosted by academically effective primary schools. This has important messages for the achievement of the Every Child Matters agenda, because it shows that the promotion of better academic outcomes is not at variance with the development of better social/behavioural development. Boosting pre-school quality is also likely to raise 'Academic self-image' in the long term (this may be because of the boost it gives to Reading and Mathematics attainment and pupils' 'Self-regulation').

The implication of these findings is that policy development should seek to promote strategies to support pupils' non-academic outcomes as well as emphasising academic attainment and progress because these domains are complementary and are both important for all round child development. School policies and classroom practices should seek to encourage and promote the development of positive self-perceptions in pupils, especially targeting more vulnerable groups.

Results from further analyses (Sammons et al., 2008) found pupils' self-perceptions (particularly in terms of 'Academic self-image' and 'Behavioural self-image') help to predict pupils' social/behavioural and cognitive outcomes at age 10. Pupils' 'Academic self-image' was the strongest predictor of cognitive outcomes in Reading, Mathematics and 'Self-regulation', whereas pupils' 'Behavioural self-image' was the strongest predictor of 'Hyperactivity', 'Pro-social' and 'Anti-social' behaviour in Year 5.

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Appendix 1: Percentage responses to Year 2 and Year 5 pupil questionnaires

Table A1.1 Responses to Year 2 pupil questionnaires

	All of the time %	Most of the time %	Some of the time %	Never %
1. I like school	54	31	10	4
2. I try to do my best in school	63	29	7	1
3. I feel happy at school	45	37	14	3
4. I have lots of friends	61	27	10	2
5. I feel safe in the playground	51	30	14	5
6. I am kind to other children	64	27	8	1
7. I like to do better than other children	39	28	20	13
8. I am clever	39	44	14	3
9. I like answering questions in class	52	27	16	6
10. My teacher thinks I am clever	42	41	15	2
11. I behave well in class	51	37	11	2
12. I do my work properly	55	35	9	1
13. I like Reading	67	18	9	6
14. I like Number Work	58	22	12	8
15. I like Science	55	24	12	8
16. I like Art	85	10	3	2
17. I like P.E.	76	16	5	2
18. School is interesting	59	27	10	5

	A lot %	Sometimes %	Never %
19. I feel unhappy at school	9	54	37
20. I feel tired at school	20	49	31
21. I feel angry at school	7	34	59
22. I get fed up at school	9	34	57
23. I talk in class when I should be doing my work	13	49	37
24. Other children bully me	11	40	49
25. I am horrible to other children	2	19	79

Table A1.2 Responses to Year 5 pupil questionnaires

a) ME AT SCHOOL	All of the time %	Most of the time %	Some of the time %	Never %
1 I like going to school.	24	43	26	7
2 I try to do my best at school.	61	33	5	0
3 I feel happy at school.	29	49	19	3
4 I am clever.	18	51	27	4
5 The things I learn are important to me.	57	31	11	1
6 I know how to cope with my school work.	24	43	26	7
7 What I learn will be useful.	61	33	5	0
8 I am good at school work.	29	49	19	3
9 My teacher thinks I'm clever.	18	51	27	4
10 People trust me in school.	57	31	11	1
	Never %	Some of the time %	Most of the time %	All of the time %
12 I get fed up at school.	33	50	15	2
13 I get tired at school.	62	29	8	1
14 I feel unhappy at school.	20	59	18	2
b) ME IN CLASS	All of the time %	Most of the time %	Some of the time %	Never %
1 I like doing English.	31	38	22	9
2 I like doing Mathematics.	43	28	18	11
3 I like doing Science.	31	30	27	12
4 I like doing art.	79	14	5	2
5 I like doing P.E.	74	18	6	2
6 I like answering questions in class.	32	41	21	5
7 People can depend on me.	32	48	18	3
8 I do my work properly.	39	49	11	1
9 I behave in class.	39	46	13	2
10 I talk to my friends when I should be doing my work.	12	22	53	13
11 I have lots of friends.	64	24	9	3
12 I have a best friend in my class.	76	10	6	8
	Never %	Some of the time %	Most of the time %	All of the time %
15 I feel lonely.	52	39	6	2
16 I get upset.	32	59	7	2
17 I feel worried.	45	45	7	3
18 Other children bully me.	60	29	7	4
19 I am horrible to other children.	75	23	2	1
20 I hit other children.	82	16	1	1
c) WHAT I THINK IS IMPORTANT	Very important %	A bit important %	Not very important %	Not at all important %
1 Being able to work with other people.	66	29	4	1
2 Helping a friend who is in trouble.	83	13	2	2
3 Making sure strong people don't pick on weak people.	85	12	2	1
4 Telling the truth.	91	8	1	0
5 Sorting out arguments without fighting.	77	18	3	2
6 Respect for the views of others.	76	22	2	1
7 Understanding that I am not always right.	68	26	4	1
8 Knowing when I've done wrong.	79	18	3	1
9 Praising other children when they have done well.	64	29	6	2

Table A1.2 Responses to Year 5 pupil questionnaires (continued)

d) ME AT HOME	All of the time %	Most of the time %	Some of the time %	Never %
1 When I get home my parents talk to me about what I have been doing at school.	39	33	22	6
2 My parents think I am good at learning.	54	39	6	2
3 My parents think trying hard is important.	88	9	2	0
4 My parents are interested in the marks I get at school.	81	13	4	1
e) OUTSIDE OF SCHOOL	All of the time %	Most of the time %	Some of the time %	Never %
1 Somebody at home will help me with my school work.	47	31	18	4
2 I have lessons on school subjects outside of school.	15	15	25	44
3 I read books from the library outside of school.	24	25	29	23
4 I have a computer at home.	82	6	4	9
5 I use the internet for learning outside of school.	30	21	25	24
6 I learn to play a musical instrument outside of school.	21	10	16	53
7 I take part in sport outside of school, e.g. football or swimming	54	17	15	15
8 I take part in dance outside of school	15	5	10	70
9 I go to a Saturday/Sunday School	8	4	6	83
10 I go to Brownies, Cubs, Woodcraft or similar groups	19	6	9	67

N. B. These responses are for the full dataset that returned data. Pupil 'N' ranged from 2276 to 2516.
The total number of children returning surveys was 2533.

Appendix 2: Descriptive analysis of the Year 2 Pupils' self-perceptions data

Descriptive statistics were computed for each item to assess for normality.   Missing data for the individual items ranged from 6.2% to 5.2%

	Sample size	Mean	Standard deviation	Skew
Q1 - I like school	2407	1.65	0.834	1.178
Q2 - I try to do my best at school	2407	1.45	0.653	1.320
Q3 - I feel happy at school	2407	1.75	0.815	0.855
Q4 - I have lots of friends	2407	3.47	0.737	-1.227
Q5 - I feel safe in the playground	2407	3.27	0.881	-0.992
Q6 - I am kind to other children	2407	1.45	0.678	1.367
Q7 - I like to do better than other children	2407	2.08	1.057	0.529
Q8 - I am clever	2407	1.82	0.790	0.714
Q9 - I like answering questions in class	2407	1.76	0.920	0.935
Q10 - My teacher thinks I am clever	2407	1.78	0.776	0.685
Q11 - I behave well in class	2407	1.64	0.738	0.926
Q12 - I do my work properly	2407	1.56	0.697	1.017
Q13 - I like Reading	2407	1.54	0.889	1.549
Q14 - I like doing number work	2407	1.69	0.958	1.173
Q15 - I like Science	2407	1.74	0.971	1.088
Q18 - School is interesting	2407	1.61	0.847	1.310
Q19 - I feel unhappy at school	2407	2.28	0.612	-0.253
Q20 - I get tired at school	2407	2.11	0.705	-0.157
Q21 - I get angry at school	2407	2.53	0.622	-0.957
Q22 - I get fed up at school	2407	2.48	0.654	-0.890
Q23 - I talk to my friends when I should be doing my work	2407	2.23	0.670	-0.309
Q24 - Other children bully me	2407	2.38	0.676	-0.644
Q25 - I am horrible to other children	2407	2.77	0.458	-1.821

Appendix 3: The exploratory and confirmatory factor analyses of the Year 2 Pupils' Self-perceptions questionnaire

The exploratory factor analysis of Year 2 questionnaire

A five factor structure was identified after a range of exploratory analyses[16]. These five factors accounted for forty-three per cent of the variance. The first factor contained 7 items related to 'Enjoyment of school' and accounted for eleven per cent of the variance. The second factor related to how the child viewed their own behaviour contained four items and accounted for eleven per cent of the variance. The third factor related to how the child viewed their own academic ability, contained four items and accounted for seven per cent of the variance. Lastly, the fifth factor related to feelings of negative affect and alienation, contained four items and accounted for seven per cent of the variance. A more stringent cut off of .45 revealed three more items that could be deleted from the analysis. Examination of the Scree plot (See Figure A3.1) revealed that, although five factors could be accepted, three main factors were visible.

Figure A.3.1 Exploratory factor analysis Scree plot completed on 23 Year 2 questionnaire items

Scree Plot

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[16] The fifth factor 'Unhappy victim' had poor Cronbach's Alpha reliability and so was dropped from any subsequent analyses.

Table A3.1: Analysis of skew and cross-loading of Year 2 questionnaire items

	Extreme Skew	Loading < 0.45	Loads on more than one factor
Q1 - I like school	X (1.2)		
Q2 - I try to do my best at school	X (1.3)		
Q3 - I feel happy at school	X (-1.2)	X (.38)	X (.38 & .36)
Q4 - I have lots of friends	X (1.4)		
Q5 - I feel safe in the playground			
Q6 - I am kind to other children	X (1.0)		
Q7 - I like to do better than other children			
Q8 - I am clever			
Q9 - I like answering questions in class			
Q10 - My teacher thinks I am clever			
Q11 - I behave well in class			
Q12 - I do my work properly	X (1.5)	X (.43)	X (.40 & .43)
Q13 - I like Reading			
Q14 - I like doing number work	X (1.2)		
Q15 - I like Science	X (1.1)		
Q18 - School is interesting	X (1.3)		
Q19 - I feel unhappy at school			
Q20 - I get tired at school			
Q21 - I get angry at school		X (.41)	X (.34, .36 & .41)
Q22 - I get fed up at school			X (.40 & .53)
Q23 - I talk to my friends when I should be doing my work	X (-1.8)		
Q24 - Other children bully me			
Q25 - I am horrible to other children			

Table A3.2: Principal component factor loadings for the exploratory factor analysis using varimax rotation

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q1 - I like school	.65 (.59)				
Q3 - I feel happy at school	*.38 (.37)*		-.36 (-.26)		
Q9 - I like answering questions in class	.56 (.42)				
Q13 - I like Reading	.60 (.45)				
Q14 - I like doing number work	.51 (.39)				
Q15 - I like Science	.54 (.41)				
Q18 - School is interesting	.67 (.62)				
Q2 - I try to do my best at school		.53 (.33)			
Q6 - I am kind to other children		.74 (.73)			
Q11 - I behave well in class		.69 (.58)			
Q25 - I am horrible to other children		.64 (.51)			
Q4 - I have lots of friends			.47 (.26)		
Q5 - I feel safe in the playground			.52 (.31)		
Q19 - I feel unhappy at school			.53 (.34)		
Q24 - Other children bully me			.70 (.56)		
Q7 - I like to do better than other children				.59 (.28)	
Q8 - I am clever				.63 (.53)	
Q10 - My teacher thinks I am clever				.62 (.56)	
Q12 - I do my work properly				*.43 (.36)*	.40 (.28)
Q20 - I get tired at school					.62 (.32)
Q21 - I get angry at school		-.34 (-.27)			*.41 (.36)*
Q22 - I get fed up at school	-.40 (-.41)				.53 (.41)
Q23 - I talk to my friends when I should be doing my work		-.40 (-.30)			.56 (.44)

( ) Principal factor loadings are shown in brackets.
N.B. Factors 3 and 4 are reversed in the principal factor analysis.

The confirmatory factor analysis of Year 2 questionnaire

The confirmatory factor analysis began with the factor structure extracted from the exploratory factor analysis, without the 'Unhappy victim' factor that had poor Cronbach's Alpha reliability. The model statistics for this factor structure can be seen in Table A3.3. These model statistics did not reach the recommended criteria, so the model modifications suggested by the program were followed. Items that either loaded on other factors or cross loaded with other items were taken out through a series of re-runs of the model.

The model statistics still failed to reach acceptable criteria, so a number of models were tried pulling out different combinations of questions. Question 3, 'I feel happy at school' was taken out of the 'Enjoyment of school' factor as this increased the factor loading of 'I like number work'. It must be noted that the four factor solution reached eventually reached the acceptable statistical criteria, but the modification indexes suggested a three factor model maybe more appropriate, as two of the three items in 'Alienation' loaded on 'Behavioural self-image' to a small but significant degree.

Table A3.3: Model statistics for the Year 2 questionnaire confirmatory factor analysis

Initial model statistics		Final model statistics	
Statistic type	**Statistic**	**Statistic type**	**Statistic**
Chi	1031.070	Chi	455.423
Probability	<0.0001	Probability	<0.0001
Df	146	Df	84
Chi/df	7.062	Chi/df	5.422
GFI (Goodness of fit Index)	0.956	GFI (Goodness of fit Index)	0.975
CFI (Comparative fit Index)	0.877	CFI (Comparative fit Index)	0.931
NFI (Non-normed fit Index)	0.860	NFI (Non-normed fit Index)	0.917
RMSEA (Root Mean Squared)	0.050	RMSEA (Root Mean Squared)	0.043

Table A3.4: Factor weightings taken from the confirmatory factor analyses

Pupil factors	Pupil factors
Question	**Weighting**
'Enjoyment of school':	
I like school	.691
I like answering questions in class	.437
I like Reading	.461
I like doing number work	.393
I like Science	.437
School is interesting	.655
'Behavioural self-image':	
I try to do my best at school	.417
I am kind to other children	.633
I behave well in class	.735
'Academic self-image':	
I am clever	.511
My teacher thinks I am clever	.536
I do my work properly	.633
'Alienation':	
I get tired at school,	.415
I get fed up at school	.666
I get angry at school	.509

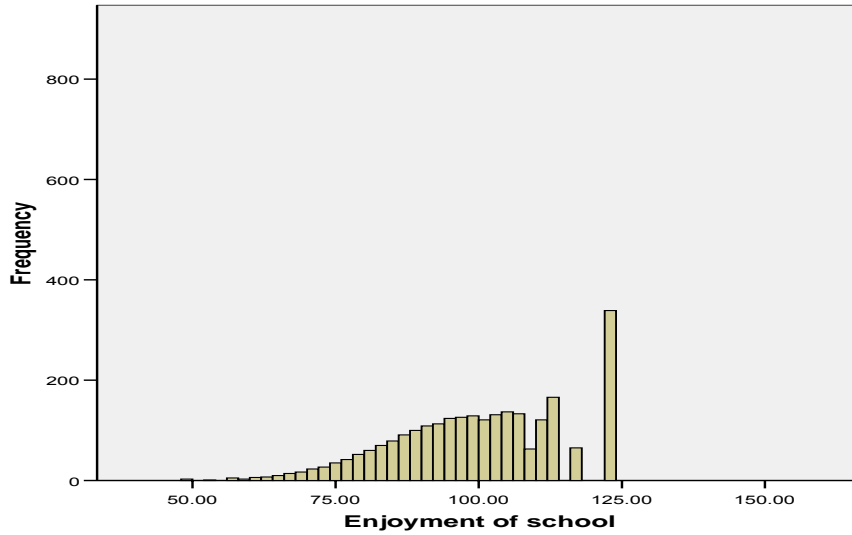**Figure A3.2: Histogram of pupils' self-perception factor: 'Enjoyment of school' in Year 2**

Figure A3.3: Histogram of pupils' self-perception factor: 'Behavioural self-image' in Year 2
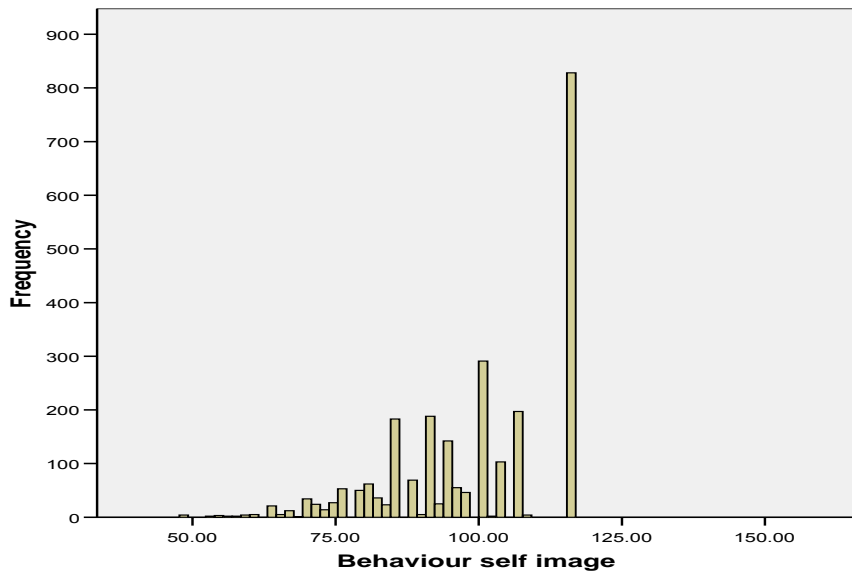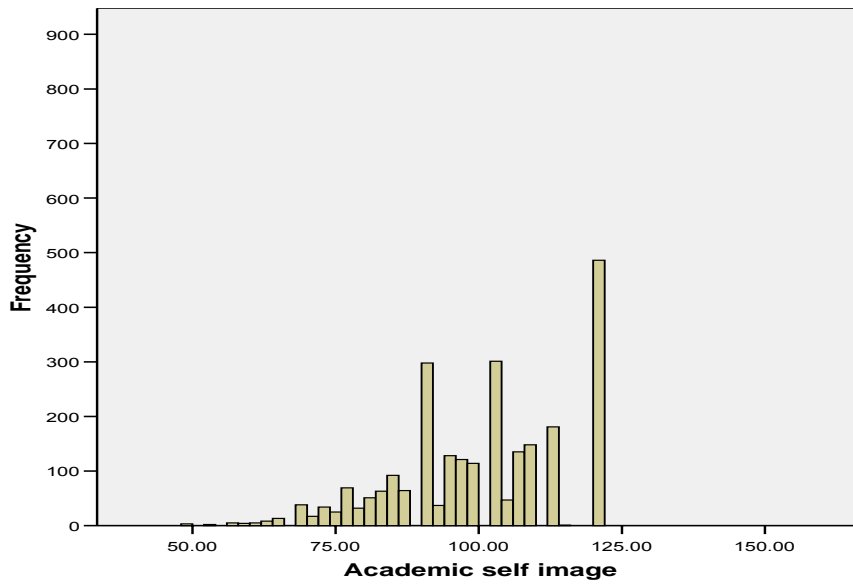
Figure A3.4: Histogram of pupils' self-perception factor: 'Academic self-image' in Year 2

Appendix 4: Descriptive analysis of the Year 5 questionnaire data: 'All About Me and My School' and 'All About Me in Year 5'

Table A4.1 Descriptive statistics for the Year 5 'All About Me and My School' questionnaire

'Me and my school'	M	SD	Skew	Large skew
I am expected to do well	1.57	.674	1.840	X
I am told by my teacher that I can do well	1.88	.758	.496	
Children who are late are told off	2.84	.943	-.499	
It is quiet during lessons	2.69	.739	-.234	
If I get stuck someone helps me	1.88	.843	.543	
If I make mistakes I get told off	3.57	.669	-	X
The Lessons are interesting	2.14	.822	1.682	
If I do well I get praised	2.17	.924	.252	
If I don't understand my work someone will explain it to me	1.72	.793	.288	
Children are treated fairly	1.66	.806	.750	X
I am told how I am getting on with my work by my teacher	1.99	.837	1.005	
I am helped to do my best	1.75	.813	.383	
I get homework (question not on cohort 1 booklet)	1.64	.761	.792	
The Head teacher is very interested in the children	1.64	.817	.854	X
The head teacher makes sure children behave well	1.19	.498	1.126	X
The head teacher is really interested in how much we learn at school	1.40	.706	3.014	
Children who get good marks and work hard get teased by other children	3.00	.905	1.818	
Most children at this school are interested in learning	2.02	.732	-.550	
We have some after-school (or lunch time) clubs run by the teachers	1.41	.697	.587	
The children in this school are really friendly	1.95	.742	1.920	
Children get involved in organising things like discos and events to raise money	1.69	.811	.586	
There is not much bullying or name calling at this school	2.35	.921	1.049	
I feel safe at school in lesson time	1.40	.646	.230	X
I feel safe at school during break and lunch times	1.64	.757	1.738	X
children get rewards for working hard or getting better at their work	1.42	.629	1.086	X
Older children help younger children in this school	1.91	.831	1.555	
children are asked about what rules we should have	1.81	.809	.790	
Pupils have enough books	1.51	.690	.864	X
The computers in this school are good	1.47	.708	1.335	X
The sports equipment and playground areas are good	1.60	.773	1.545	X
The toilets are well cared for and clean	2.38	1.01	1.240	
I am usually taught by my regular teachers and not by supply teachers	1.66	.730	.210	X
We have a good school library	1.54	.759	1.040	X
The teachers in the school know the subjects they teach really well	1.44	.619	1.441	X
My parents often get to know how I am doing at school through teachers telling them about how I am getting on	1.54	.687	1.401	
			1.210	X
If I were to behave badly at school, the teachers would soon tell my parents	1.56	.701	1.258	X

**Table A4.2: Descriptive statistics for the Year 5 'All About Me in Year 5' questionnaire**

'Me in year 5'	M	SD	Skew	Large Skew
I like going to school	2.16	.875	.333	
I try to do my best at school	1.45	.612	1.128	
I feel happy at school	1.95	.772	.474	
I am clever	2.17	.772	.274	
The things I learn are important to me	1.56	.735	1.099	
I know how to cope with my school work	1.85	.729	.507	
What I learn will be useful	1.48	.687	1.253	X
I am good at school work	2.02	.685	.362	
My teacher thinks I'm clever	2.09	.776	.330	
People trust me in school	1.85	.792	.683	
I get fed up at school	2.01	.816	.779	
I get tired at school	2.13	.875	.657	
I feel unhappy at school	1.73	.776	1.062	
I like doing English	2.09	.938	.462	
I like doing Mathematics	1.97	1.021	.663	
I like doing Science	2.20	1.013	.286	
I like doing art	1.29	.639	2.425	X
I like doing P.E	1.36	.698	2.034	X
I like answering questions in class	2.01	.867	.493	
People can depend on me	1.91	.774	.516	
I do my work properly	1.73	.673	.517	
I behave in class	1.77	.731	.628	
I talk to my friends when I should be doing my work	2.66	.856	-.492	
I have lots of friends	1.51	.773	1.458	X
I have a best friend in my class	1.45	.914	1.920	X
I feel lonely	1.59	.716	1.194	
I get upset	1.80	.660	.702	
I feel worried	1.68	.729	1.013	
Other children bully me	1.54	.788	1.470	X
I am horrible to other children	1.29	.539	2.062	X
I hit other children	1.22	.522	2.837	X
Being able to work with other people	1.39	.612	1.553	X
Helping a friend who is in trouble	1.22	.562	2.930	X
Making sure strong people don't pick on weak people	1.19	.504	3.067	X
Telling the truth	1.11	.372	4.102	X
Sorting out arguments without fighting	1.31	.636	2.422	X
Respect for the views of others	1.28	.525	2.039	X
Understanding that I am not always right	1.38	.632	1.770	X
Knowing when I've done wrong	1.25	.538	2.356	X
Praising other children when they have done well	1.46	.705	1.576	X
When I get home my parents talk to me about what I have been doing at school	1.96	.923	.558	
My Parents think I am good at learning	1.55	.671	1.133	
My parents think trying hard is important	1.14	.431	3.428	X
My parents are interested in the marks I get at school	1.25	.581	2.518	X
Somebody at home will help me with my school work	1.80	.887	.790	
I have lessons on school subjects outside of school	2.99	1.090	-.671	
I read books from the library outside of school	2.50	1.087	-.035	
I have a computer at home	1.39	.911	2.185	X
I use the internet for learning outside of school	2.43	1.148	.052	
I learn to play a musical instrument outside of school	3.00	1.218	-.720	
I take part in sport outside of school, e.g. football or swimming	1.90	1.123	.812	
I take part in dance outside of school (question not on cohort 1 booklet)	3.36	1.099	-1.417	X
I go to a Saturday/Sunday School (question not on cohort 1 booklet	3.64	.872	-2.309	X
I go to Brownies, Cubs, Woodcraft or similar groups (not on cohort 1 booklet)	3.23	1.199	-1.109	X

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Appendix 5: The exploratory and confirmatory factor analyses of the Year 5 'All About Me and My School' and 'All About Me in Year 5' questionnaires

Exploratory factor analysis of the Year 5 survey data

An exploratory factor analysis was carried out using a rotated principal components extraction method with varimax rotation, and 22 factors were extracted using an eigenvalues cut off of 1. All items from both surveys were used in this analysis (90 items).

Figure A5.1: Scree plot of the two Year 5 questionnaires combined

Scree Plot
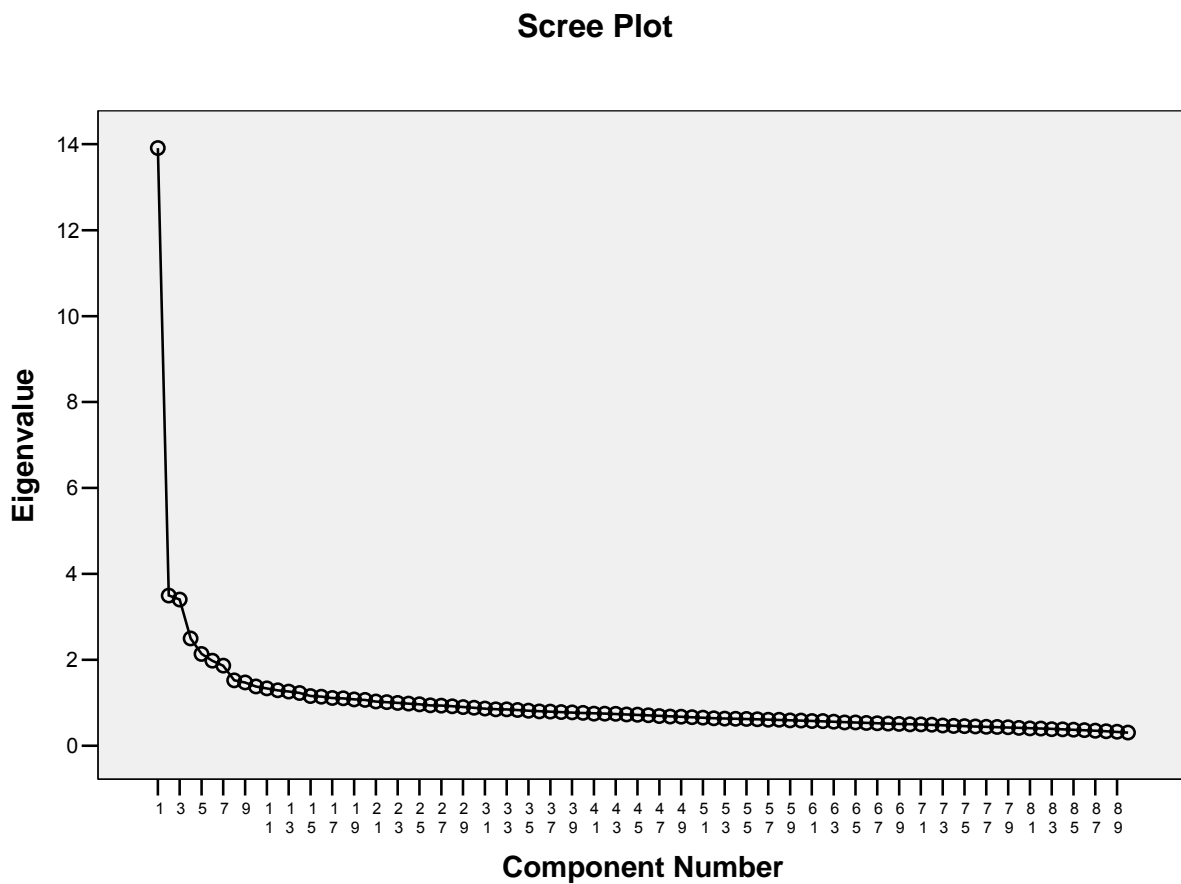
As the principle components analysis results appeared too unweilding to test as a theoretical structure in confirmatory factor analysis, they were split into three main groups: pupil' self-perceptions factors, pupils' views of primary school factors and 'other' factors.

Table A5.1: Re-structuring of the factors splitting them into three sets of factors

Pupils' self-perception factors (6):
1 Enjoyment of school (Cronbachs=0.83) 2 Confidence in self (Cronbachs=0.83) 4 Pupil values (Cronbachs=0.75) 6 Anxiety and Isolation (Cronbachs=0.77) 7 Behaviour (Cronbachs=0.68) 13 Friendships (Cronbachs=0.50)
Pupils' views of primary school factors (5):
3 Teachers' support for pupils' learning (Cronbachs=0.75) 5 School resources (Cronbachs=0.74) 8 Headteacher qualities (Cronbachs=0.68) 9 Positive social environment (Cronbachs=0.67) 10 General pupil ethos (Cronbachs=0.63)
Other factors (2):
11 Pupils' external activities (Cronbachs=0.55) 12 Parental support (Cronbachs=0.49)

The confirmatory factor analysis of Year 5 questionnaire data

To begin with, two separate analyses were run on the pupil factors using a six factor structure and a four factor structure. The 'Friendship' factor was omitted for the four factor model due to low Cronbach's Alpha and the pupil values factor was omitted due to the items not relating to the pupils' school experience. The results were unsatisfactory in terms of model fit.

To find a new solution to the problem a factor analysis was conducted of the pupil items only. The following pupil items were omitted:
- 'I like art', 'I like P.E': They formed a small, poor factor
- Items related to what pupils thought was important: most highly skewed and didn't relate to experience of school
- 'I think learning is important', 'What I learn will be useful to me', 'I feel unhappy at school' and 'I do my work properly' were taken out as they load heavily on more than one factor
- 'I am expected to do well' and 'My teacher expects me to do well' were omitted due to low factor loading (<0.45)

Confirmatory factor analysis of the five factor structure without modifications was not an acceptable fit. Taking out two items that cross loaded on other factors: 'I am horrible to other children' and 'I am happy at school' produced a better solution. When the 'Friendship' factor was taken out, the best solution was found.

The 'Friendship' factor had one main problem: The item 'I have lots of friends' covaried with 'I am lonely' in the 'Anxiety and Isolation' factor, making it load on that factor as well. Taking it out improved the model but left the 'Friendship' factor with only 3 items (Cronbach's=0.50). The final model after modifications can be seen in table A5.2 below.

Table A5.2: Initial & final solutions to confirmatory factor analysis of 4 pupils' self-perception factors (Year 5)

Initial solution		Final solution	
Statistic type	**Statistic**	**Statistic type**	**Statistic**
Chi	1092.148	Chi	455.423
Probability	<0.0001	Probability	<0.0001
Df	183	Df	146
Chi/df	5.968	Chi/df	4.296
GFI (Goodness of fit Index)	0.923	GFI (Goodness of fit Index)	0.951
CFI (Comparative fit Index)	0.874	CFI (Comparative fit Index)	0.919
NFI (Non-normed fit Index)	0.853	NFI (Non-normed fit Index)	0.898
RMSEA (Root Mean Squared)	0.060	RMSEA (Root Mean Squared)	0.049

N.B. 'Behavioural self-image' would have had a Cronbach's alpha of 0.68 with 'I am horrible to other children' in but it co-varies strongly with 'I hit other children' and loads on 'Anxiety & Isolation'. However, taking out 'I have lots of friends' made the item 'I have a best friend in my class' load very poorly on the factor.

Table A5.3: Factor loadings for Year 5 pupils' self-perception factors

Pupils' self-perception factors	Weighting
Question	
'Enjoyment of school':	
Lessons are interesting	.590
I like school going to school	.724
I get fed up at school	.702
I get tired at school	.572
I like English	.482
I like Mathematics	.389
I like Science	.484
Cronbachs= 0.76	
'Anxiety and Isolation':	
I feel lonely	.666
I get upset	.733
I feel worried	.635
Other children bully me	.566
Cronbachs= 0.74	
'Academic self-image':	
I am clever	.691
I know how to cope with my school work	.507
I am good at school work	.777
My teacher thinks I'm clever	.625
Cronbachs= 0.74	
'Behavioural self-image':	
I try to do my best at school,	.561
I behave in class,	.689
I talk to my friends when I should be doing my work*	.483
I hit other children	.452
Cronbachs= 0.62	

* 'I talk to my friends when I should be doing my work' is related to positive behaviour

Figure A5.2: Histogram of the pupils' self-perception factor: 'Enjoyment of school' in Year 5
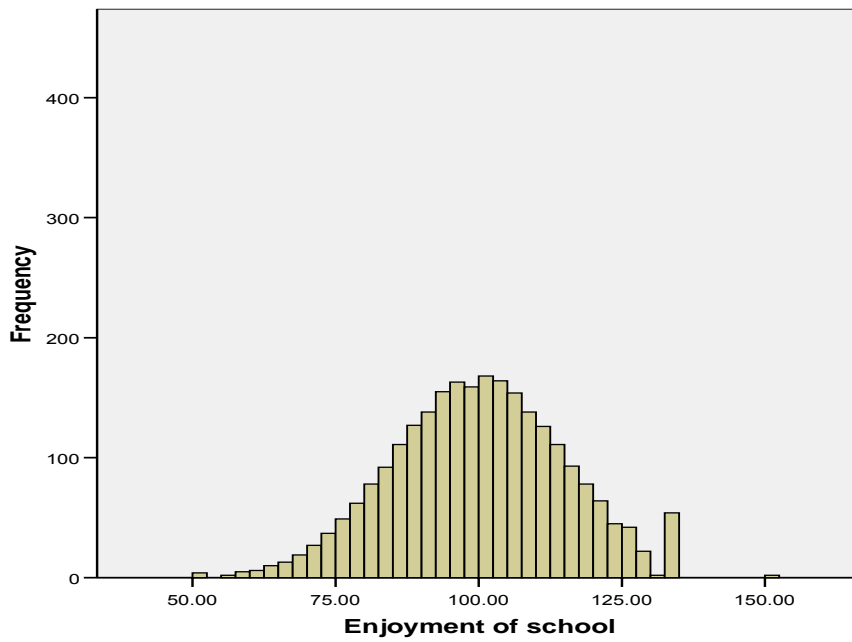
Figure A5.3: Histogram of the pupils' self-perception factor: 'Anxiety and Isolation' in Year 5
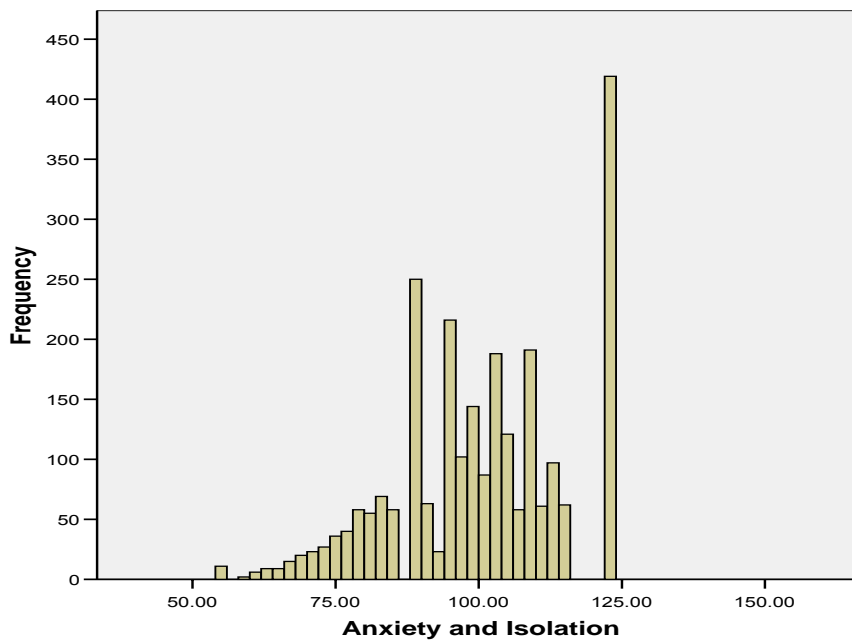
Figure A5.4: Histogram of the pupils' self-perception factor: 'Academic self-image' in Year 5
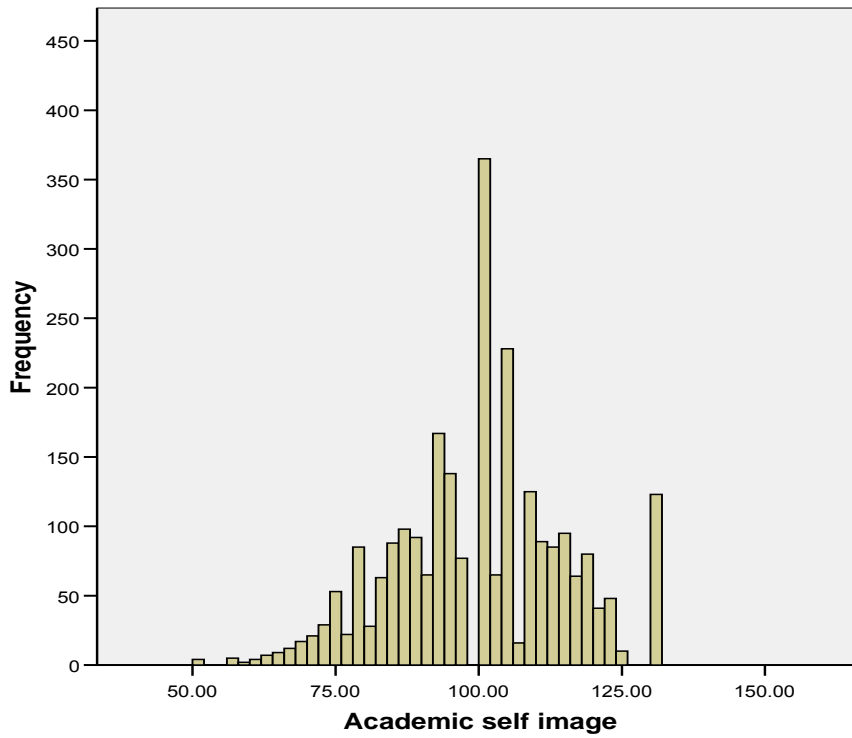
Figure A5.5: Histogram of the pupils' self-perception factor: 'Behavioural self-image' in Year 5
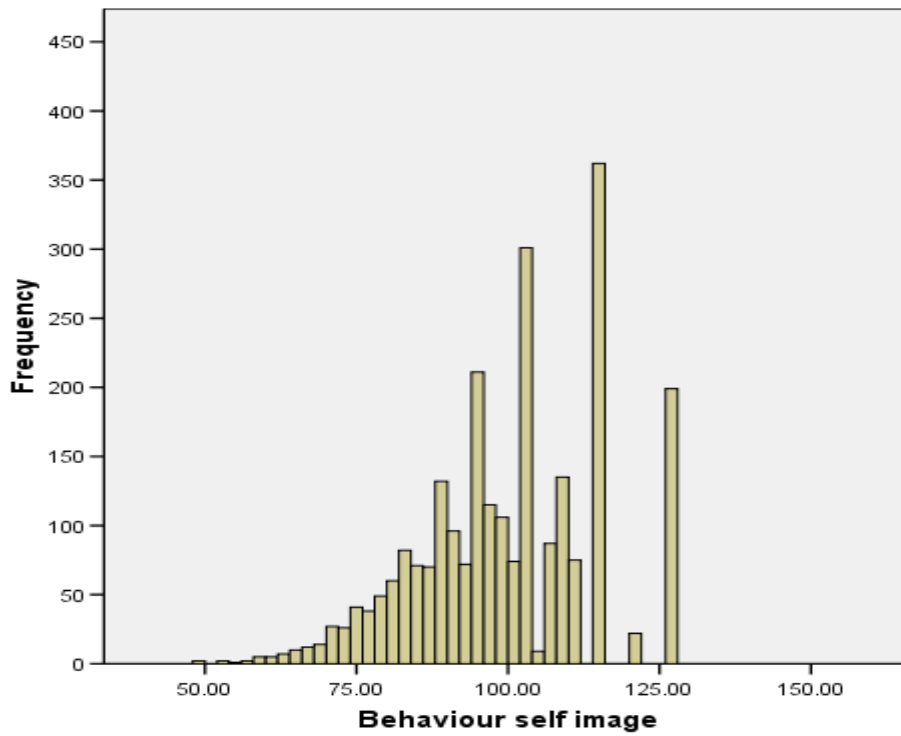
Appendix 6: Results of null multilevel analyses for EPPE 3-11 pupils' peers

Table A.6.1: 'Enjoyment of school' Null Model (n=2689)

	Estimate	SE
Intercept	100.134	0.582
Pupil level variance	33.112	5.367
School level variance	187.550	5.237
Intra-school correlation	0.150	

Table A.6.2: 'Anxiety and Isolation' Null Model (n=2689)

	Estimate	SE
Intercept	99.983	0.355
Pupil level variance	5.369	6.148
School level variance	220.113	2.023
Intra-school correlation	0.024	

Table A.6.1: 'Academic self-image' Null Model (n=2689)

	Estimate	SE
Intercept	100.015	0.411
Pupil level variance	10.884	5.988
School level variance	214.299	2.722
Intra-school correlation	0.048	

Table A.6.1: 'Behavioural self-image' Null Model (n=2689)

	Estimate	SE
Intercept	99.988	0.428
Pupil level variance	12.736	2.868
School level variance	212.616	5.933
Intra-school correlation	0.057	

Appendix 7: Results of contextualised & Value Added multilevel analyses

Table A.7.1: 'Enjoyment of school' Contextualised Model (impact of child, parent, home learning environment (HLE) and other measures on Year 5 normalised 'Enjoyment of school')
*Statistically significant at 0.05 level **Statistically significant at 0.01 level

		Estimate	SE	Effect Size
Gender (girls compared to boys)		2.635**	0. 582	0.19**
Ethnic group (compared to White UK)	White European	-0.114	1.713	-0.01
	Black Caribbean	0.931	1.595	0.07
	Black African	3.085	2.131	0.22
	Any other ethnic minority	0.125	2.000	0.01
	Indian	4.756*	2.210	0.34*
	Pakistani	6.113**	1.632	0.44**
	Bangladeshi	3.753	2.900	0.27
	Mixed Race	-0.552	1.290	-0.04
Free School Meal Eligibility (compared to not eligible)	Missing	-2.666	2.148	-0.19
	FSM eligibility	3.618**	0.751	0.26**
Birth Position (compared to first born)	Missing	-1.179	1.923	-0.12
	Sixth born	-2.273	2.740	-0.16
	Fifth born	-1.889	2.665	-0.13
	Fourth born	-0.205	1.436	-0.02
	Third born	-0.441	0.885	-0.03
	Second born	-2.235*	0.672	-0.16*

Table A.7.2: 'Anxiety & Isolation' Contextualised Model (impact of child, parent, home learning environment (HLE) and other measures on Year 5 normalised 'Anxiety & Isolation')
*Statistically significant at 0.05 level **Statistically significant at 0.01 level

		Estimate	SE	Effect Size
Gender (girls compared to boys)		2.118**	0.596	0.15*
Birth weight (compared to normal birth weight)	Missing data	3.102	2.290	0.21
	Very low birth weight (<= 1500g)	1.771	2.616	0.12
	Low birth weight (1501g – 2500g)	4.210**	1.194	0.29**
Need of EAL support in year 5	Missing data	0.811	0.978	0.06
(compared to no need of EAL support)	EAL support needed	5.576*	1.605	0.38*
Father's highest level of qualification	Missing data	5.487	5.425	0.38
(compared to no qualifications)	Vocational	3.293*	1.159	0.23*
	Academic age 16	1.733	0.985	0.12
	Academic age 18	-0.553	1.328	-0.04
	Degree	0.256	1.134	0.02
	Higher Degree	1.650	1.520	0.11
	Other professional	8.719*	3.191	0.60*
	No father information	1.998	0.978	0.14
Developmental problems	Missing	-6.872	5.567	-0.47
	Any	2.274*	0.922	0.16*

Table A.7.3: 'Academic self-image' Contextualised Model (impact of child, parent, home learning environment (HLE) and other measures on Year 5 normalised 'Academic self-image')
*Statistically significant at 0.05 level **Statistically significant at 0.01 level

		Estimate	SE	Effect Size
Age within year group (centred around mean)		0.019**	.006	0.15**
Ethnic group (compared to White UK)	White European	-1.655	1.731	-0.12
	Black Caribbean	5.489*	1.613	0.39*
	Black African	6.946*	2.160	0.49*
	Any other ethnic minority	4.536*	2.018	0.32*
	Indian	4.268	2.220	0.30
	Pakistani	5.095*	1.686	0.36*
	Bangladeshi	3.307	2.939	0.23
	Mixed Race	-0.903	1.307	-0.06
Need of EAL support in year 5	Missing data	-3.427	0.979	-0.24
(compared to no need of EAL support)	EAL support needed	-5.259*	1.671	-0.37*
Father's highest level of qualification	Missing data	-1.194	2.696	-0.08
(compared to no qualifications)	Vocational	0.131	1.157	0.01
	Academic age 16	0.468	0.988	0.03
	Academic age 18	3.471*	1.338	0.24*
	Degree	2.636*	1.166	0.19*
	Higher Degree	3.783*	1.552	0.27*
	Other	-1.756	3.146	-0.12
	No father information	0.976	0.979	0.07
Early years HLE (compared to 33-45)	Missing data	-4.447	2.193	-0.31
	0-13	-2.269	1.390	-0.16
	14-19	-3.361*	1.119	-0.24*
	20-24	-2.522*	1.080	-0.18*
	25-32	-2.648*	1.009	-0.19*
KS1 HLE: Outings (compared to very high)	Missing data	-3.439*	1.269	-0.24*
	Low	-2.561	1.337	-0.18
	Moderate	-2.308*	1.151	-0.16*
	High	-0.988	1.080	-0.07

Table A.7.4: 'Behavioural self-image' Contextualised Model (impact of child, parent, home learning environment (HLE) and other measures on Year 5 normalised 'Behavioural self-image')
*Statistically significant at 0.05 level **Statistically significant at 0.01 level

		Estimate	SE	Effect Size
Gender (girls compared to boys)		7.470**	0.573	0.53**
Birth weight (compared to normal birth weight)	Missing data	-2.259	2.209	-0.17
	Very low birth weight (<= 1500g)	6.104*	2.520	0.43*
	Low birth weight (1501g – 2500g)	-0.127	1.157	-0.01
Ethnic group (compared to White UK)	White European	-1.433	1.685	-0.10
	Black Caribbean	-3.404*	1.547	-0.24*
	Black African	-0.096	2.091	-0.01
	Any other ethnic minority	-0.928	1.962	-0.07
	Indian	3.803	2.117	0.27
	Pakistani	6.194**	1.577	0.44**
	Bangladeshi	5.940*	2.869	0.42*
	Mixed Race	-1.471	1.261	-0.10
Birth Position (compared to first born)	Missing	-5.858	3.984	-0.42
	Sixth born	-0.088	2.698	-0.01
	Fifth born	-1.199	2.642	-0.09
	Fourth born	-0.798	1.416	-0.06
	Third born	-1.833*	0.873	-0.12*
	Second born	-2.363*	0.666	-0.17*
Early years library visits (compared to none)	Missing	3.476	6.317	0.25
	Special occasions	1.646	1.018	0.12
	Monthly	1.165	0.852	0.08
	Fortnightly	2.179*	0.980	0.16*
	Weekly	1.549	1.028	0.11
Early years Reading (compared to daily)	Missing	0.034	5.618	0.02
	Twice a day	-1.446	0.965	-0.10
	Rarely	-0.304	1.707	-0.02
	Once a week	1.584	1.972	0.11
	Several times a week	-1.698*	0.740	-0.12*
Free School Meal Eligibility (compared to not eligible)	Missing	-3.603	2.096	-0.26
	FSM eligibility	-1.545*	0.746	-0.11*
Need of EAL support in year 5	Missing data	-0.124	0.943	-0.01
(compared to no need of EAL support)	EAL support needed	-4.127*	1.622	-0.29*

Table A.7.5: 'Enjoyment of school' Complex Value Added Model (impact of prior self-perceptions, child, parent, home learning environment [HLE] and other measures on Year 5 normalised 'Enjoyment of school')

*Statistically significant at 0.05 level **Statistically significant at 0.01 level

		Estimate	SE	Effect Size
Prior self-perceptions	'Enjoyment of school'	0.158**	0.225	0.34**
	'Academic self-image'	0.073*	0.223	0.16*
Gender (girls compared to boys)		2.606**	0. 628	0.19**
Ethnic group (compared to White UK)	White European	-0.575	1.862	-0.04
	Black Caribbean	1.833	1.784	0.13
	Black African	3.811	2.490	0.27
	Any other ethnic minority	1.010	2.175	0.07
	Indian	5.457*	2.398	0.39*
	Pakistani	6.020*	1.765	0.43*
	Bangladeshi	3.207	3.352	0.23
	Mixed Race	-.644	1.429	-0.05
Free School Meal Eligibility (compared to not eligible)	Missing	-2.246	2.684	-0.16
	FSM eligibility	2.995**	0.816	0.22**
Birth Position (compared to first born)	Missing	-1.145	2.160	-0.08
	Sixth born	-0.248	2.931	-0.02
	Fifth born	-2.691	2.893	-0.19
	Fourth born	-1.491	1.582	-0.11
	Third born	-1.145	0.948	-0.08
	Second born	-1.972*	0.726	-0.14*

Table A.7.6: 'Anxiety & Isolation' Complex Value Added Model (impact of prior self-perceptions, child, parent, home learning environment [HLE] and other measures on Year 5 normalised 'Anxiety & Isolation')

*Statistically significant at 0.05 level **Statistically significant at 0.01 level

		Estimate	SE	Effect Size
Prior self-perceptions	'Behavioural self-image'	-0.067*	0.024	-0.14*
	'Academic self-image'	-0.074*	0.025	-0.15*
Gender (girls compared to boys)		2.767**	0.656	0.19**
Birth weight (compared to normal birth weight)	Missing data	2.907	2.498	0.20
	Very low birth weight (<= 1500g)	1.331	2.846	0.09
	Low birth weight (1501g – 2500g)	4.021**	1.324	0.28**
Need of EAL support in year 5	Missing data	0.174	1.058	0.01
(compared to no need of EAL support)	EAL support needed	5.044*	1.828	0.35*
Father's highest level of qualification	Missing data	1.963	5.755	0.13
(compared to no qualifications)	Vocational	2.995*	1.245	0.21*
	Academic age 16	1.462	1.055	0.10
	Academic age 18	-0.701	1.465	-0.05
	Degree	-0.422	1.240	-0.03
	Higher Degree	0.786	1.652	0.05
	Other professional	6.978*	3.264	0.48*
	No father information	1.668	1.056	0.11
Developmental problems	Missing	-6.407	5.907	-0.44
	Any	2.265*	1.007	0.16*

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Table A.7.7: 'Academic self-image' Complex Value Added Model (impact of prior self-perceptions, child, parent, home learning environment [HLE] and other measures on Year 5 normalised 'Academic self-image')

*Statistically significant at 0.05 level **Statistically significant at 0.01 level

		Estimate	SE	Effect Size
Prior self-perceptions	'Academic self-image'	0.144**	0.024	0.33**
Age within year group (centred around mean)		0.354**	.0093	0.76**
Ethnic group (compared to White UK)	White European	-3.615	1.868	-0.26
	Black Caribbean	5.890*	1.783	0.42*
	Black African	5.971*	2.494	0.43*
	Any other ethnic minority	5.059*	2.166	0.36*
	Indian	3.882	2.377	0.28
	Pakistani	5.544*	1.777	0.40*
	Bangladeshi	4.573	3.359	0.33
	Mixed Race	-0.319	1.431	-0.02
Need of EAL support in year 5	Missing data	-3.392	1.054	-0.24
(compared to no need of EAL support)	EAL support needed	-5.945*	1.880	-0.42*
Father's highest level of qualification	Missing data	-1.790	2.896	-0.13
(compared to no qualifications)	Vocational	-0.444	1.231	-0.03
	Academic age 16	0.602	1.050	0.05
	Academic age 18	4.340*	1.461	0.31*
	Degree	2.777*	1.263	0.20*
	Higher Degree	4.066*	1.673	0.29*
	Other	-0.394	3.192	-0.03
	No father information	1.255	1.047	0.09
Early years HLE (compared to 33-45)	Missing data	-4.209	2.258	-0.30
	0-13	-2.394	1.494	-0.17
	14-19	-3.369*	1.186	-0.24*
	20-24	-2.085	1.146	-0.15
	25-32	-2.308*	1.059	-0.16*
KS1 HLE: Outings (compared to very high)	Missing data	-3.976*	1.393	-0.27*
	Low	-2.155	1.428	-0.15
	Moderate	-2.653*	1.232	-0.19*
	High	-0.998	1.155	-0.07

Table A.7.8: 'Behavioural self-image' Complex value added Model (impact of prior self-perceptions, child, parent, home learning environment [HLE] and other measures on Year 5 normalised 'Behavioural self-image')

*Statistically significant at 0.05 level **Statistically significant at 0.01 level

		Estimate	SE	Effect Size
Prior self-perceptions	'Behavioural self-image'	0.219**	0.022	0.48**
	'Alienation'	-0.073*	0.021	-0.16*
Gender (girls compared to boys)		6.242**	0.619	0.45**
Birth weight (compared to normal birth weight)	Missing data	-0.287	2.392	-0.02
	Very low birth weight (<= 1500g)	8.826*	2.727	0.64*
	Low birth weight (1501g – 2500g)	0.423	1.256	0.03
Ethnic group (compared to White UK)	White European	-1.693	1.791	-0.12
	Black Caribbean	-1.327	1.689	-0.10
	Black African	0.365	2.393	0.03
	Any other ethnic minority	-1.278	2.085	-0.09
	Indian	2.687	2.203	0.20
	Pakistani	7.554**	1.657	0.55**
	Bangladeshi	7.177*	3.249	0.52*
	Mixed Race	-1.029	1.375	-0.07
Birth Position (compared to first born)	Missing	-4.535	4.076	-0.33
	Sixth born	1.931	2.843	0.14
	Fifth born	-1.085	2.829	-0.08
	Fourth born	-2.149	1.538	-0.16
	Third born	-2.192**	0.919	-0.16**
	Second born	-2.668*	0.704	-0.19*
Early years library visits (compared to none)	Missing	-0.556	6.535	-0.04
	Special occasions	1.588	1.076	0.12
	Monthly	1.952*	.899	0.14*
	Fortnightly	1.796	1.049	0.13
	Weekly	0.967	1.077	0.07
Early years Reading (compared to daily)	Missing	1.099	5.982	0.08
	Twice a day	-0.837	1.028	-0.06
	Rarely	-1.107	1.863	-0.08
	Once a week	1.738	2.103	0.13
	Several times a week	-1.567*	0.778	-0.11*
Free School Meal Eligibility (compared to not eligible)	Missing	-3.505	2.563	-0.26
	FSM eligibility	-1.750*	0.792	0.13*
Need of EAL support in year 5	Missing data	-0.193	0.999	0.01
(compared to no need of EAL support)	EAL support needed	-4.898*	1.814	0.36*

N.B. A high score on the 'Alienation' scale corresponds to greater alienation

Appendix 8: Effect Sizes

Effect sizes

To illustrate the impact of different factors on attainment or social behaviour effect sizes (ES) were calculated. Effect sizes are most commonly used in experimental studies and essentially measure the strength of mean differences. Glass et al., (1981) define ES as:

ES = (mean of experimental group)-(mean of control group)/pooled standard deviation

Or $\quad \Delta = \dfrac{X_{Exp} - X_{Cont}}{SD_{pooled}}$

Effect sizes were calculated for different child outcomes, using both the child level variance and coefficients for predictors included in the multilevel statistical models adopting the formulae outlined by Tymms et al., (1997).

For categorical predictors (e.g. gender or ethnicity) the effect size was calculated as:

ES = categorical predictor variable coefficient ∕ √child level variance

Or
$\Delta = \dfrac{\beta_1}{\sigma_e}$

For continuous predictor variables (e.g. child age in months), the effect size describes the change on the outcome measure produced by a change of +/-one standard deviation on the continuous predictor variable, standardised by the within school SD, adjusted for covariates in the model – the level 1 SD:

$\Delta = \dfrac{2\,\beta_1 * SD_{x1}}{\sigma_e}$ $\quad$ where $_{x1}$=continuous predictor variable

Effect sizes can be useful for comparisons between different studies but interpretations must be made with caution and with reference to the outcomes concerned and controls used in models (Elliot & Sammons, 2004). For further discussion of effect sizes see Coe (2002). Effect sizes for some categorical measures in the EPPE research are large but apply to small numbers of children (e.g. the very low birth weight group or specific ethnic groups).