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**Effective Pre-school and Primary Education 3-11 Project (EPPE 3-11):
Influences on children's development and progress in key stage 2: Social/
behavioural outcomes in year 5**

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Effective Pre-school and Primary Education 3-11 Project (EPPE 3-11): Influences on children's development and progress in key stage 2: Social/behavioural outcomes in year 5

Abstract

Research brief: The Effective Pre-School and Primary Education 3-11 project (EPPE 3-11) investigates the impact of pre-school provision on a national sample of young children in England between the ages of 3 and 11 years. This Research Brief focuses on the relationships between various child, family, home, pre-school and primary school characteristics and measures of children's social/behavioural development collected at age 10 in Year 5 of primary school. It compares the findings at age 10 with the influence of the same factors when the children were in Year 1 (age 6). The Brief also reports findings about the combined influence of pre-school and primary school experience on children's social/behavioural development in Year 5. Four dimensions of social behaviour were identified based on teachers' ratings of children in the sample: 'Self-regulation', 'Pro-social' behaviour, 'Hyperactivity' and 'Anti-social' behaviour.

Keywords

school, primary, education, 3, 11, project, eppe, influences, children, development, progress, key, stage, 2, social, effective, behavioural, outcomes, year, 5, pre

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**EFFECTIVE PRE-SCHOOL AND PRIMARY EDUCATION 3-11 PROJECT (EPPE 3-11)
INFLUENCES ON CHILDREN'S DEVELOPMENT AND PROGRESS IN
KEY STAGE 2: SOCIAL/BEHAVIOURAL OUTCOMES IN YEAR 5**

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The Effective Pre-School and Primary Education 3-11 project (EPPE 3-11) investigates the impact of pre-school provision on a national sample of young children in England between the ages of 3 and 11 years. This Research Brief focuses on the relationships between various child, family, home, pre-school and primary school characteristics and measures of children's social/behavioural development collected at age 10 in Year 5 of primary school. It compares the findings at age 10 with the influence of the same factors when the children were in Year 1 (age 6). The Brief also reports findings about the combined influence of pre-school and primary school experience on children's social/behavioural development in Year 5. Four dimensions of social behaviour were identified based on teachers' ratings of children in the sample: 'Self-regulation', 'Pro-social' behaviour, 'Hyperactivity' and 'Anti-social' behaviour.

Key Findings

- Overall a child who has a good Home Learning Environment (HLE) in the early years, a high quality pre-school and who goes on to attend a medium or high academically effective primary school is more likely to show improved social/behavioural outcomes compared with children that have two, one or none of these experiences. The combination of these three aspects is important for promoting positive social/behavioural development in the longer term during KS2 and the three taken together produce a combination of 'protective' experiences that are likely to benefit all round social/behavioural development.

Child, Family and Background characteristics

- Child, family and Early HLE factors remain important influences on children's social/behavioural development at age 10, especially for 'Hyperactivity' and 'Self-regulation'. The factors with strongest effects across the set of four social/behavioural outcomes are gender, health and behavioural problems as reported by parents at entry to the study, need for support with English as an additional language (EAL) and Early years HLE.
- A good Early HLE still predicts better 'Self-regulation' at age 10, but on its own is not enough to ensure high 'Self-regulation' for children who attended poor quality pre-school settings.
- Higher levels of 'Self-regulation' were associated with higher levels of attainment, particularly in Reading, suggesting that 'Self-regulation' is an outcome with a strong cognitive aspect.

Pre-school and Primary school effects

- Simply attending pre-school still has a positive effect on 'Pro-social' behaviour at age 10, compared to staying at home. For other dimensions of social/behavioural development the effect of simply attending pre-school has washed out in the longer term.
- As with cognitive development it is the quality of pre-school experience that matters. Children who attended higher quality pre-schools show the most benefits in all round social behavioural development at age 10. Higher quality pre-school in curriculum terms is linked to increased 'Self-regulation' and higher quality in terms of caring/emotional relationships is linked to reduced 'Hyperactivity' and better 'Pro-social' behaviour.
- An early start at pre-school is still significantly associated with better 'Pro-social behaviour', but is no longer associated with increased 'Anti-social' behaviour at age 10, in contrast to findings at earlier ages.

- Children who attend a primary school identified as more academically effective in promoting pupils' progress in Reading and Mathematics during KS2 (measured by value added analyses of National data) show reduced 'Anti-social' behaviour at age 10. However, primary school academic effectiveness on its own did not show significant associations with the other aspects of social behaviour.
- The combination of pre-school quality and primary school academic effectiveness however is important for three outcomes. Attending medium or high quality pre-school helps protect a child against the disadvantage of later attending a low academically effective primary school at age 10 for 'Hyperactivity', 'Self-regulation' and 'Pro-social' behaviour.
- Pre-school and primary school effects are present for all social behavioural outcomes, however, pre-school measures are more strongly related to improvements in positive social behaviour ('Self regulation' and 'Pro-social'), while primary school measures seem to be more strongly associated with improvements in negative social behaviour ('Hyperactivity' and 'Anti-social').
- The combination of pre-school and primary school experiences that tend to benefit social/behavioural development are similar to those that benefit cognitive outcomes in the longer term. This has important implications for promoting good all round development for children and the Every Child Matters agenda.

The EPPE 3-11 Research: Background

The original EPPE study investigated children's intellectual and social/behavioural development between the ages of 3-7 years (Sylva et al., 2004). The EPPE 3-11 extension follows up the sample to the end of primary school (age 11 years). The EPPE website: www.ioe.ac.uk/projects/eppe gives further details about the study and the sample.

This Research Brief reports on a range of analyses related to the social/behavioural development of children in the EPPE 3-11 sample. The focus is on exploring the factors that predict children's later adjustment in four main dimensions of social/behavioural development: 'Hyperactivity', 'Self-regulation', 'Pro-social' behaviour and 'Anti-social' behaviour.

In addition to exploring the influence of background characteristics and any continuing pre-school effects, the study investigates the influence of primary school on children's outcomes at age 10, and the way primary school and pre-school influences jointly affect children's social/behavioural development.

For further details on the research and analyses used in this study see the full Research Report, (Sammons et al., 2007a). Another series of reports (Sammons et al., 2007b) are available which provide equivalent information about Reading and Mathematics attainment for the same child sample at age 10 in Year 5 (see www.ioe.ac.uk/projects/eppe for details).

Analysis Strategy

The findings reported here are based on analyses of data about children's social/ behavioural development, and relationships with a range of child, family and home learning environment (HLE) characteristics and the characteristics of the pre-schools and schools attended.

Social/behavioural development was assessed by class teachers using an extended version of the Goodman (1997) *Strengths and Difficulties Questionnaire*. This Research Brief reports on four dimensions of social/behavioural development: 'Hyperactivity', 'Self-regulation', 'Pro-social' behaviour and 'Anti-social' behaviour. The 'Child Profiles' were administered in the summer term in which the children were in Year 5, during 2003-2006.

Pre-school quality was measured using an internationally recognised observation instrument. ECERS-R focuses on aspects of emotional and social care and ECERS-E on aspects of the pre-school curriculum.

Effectiveness indicators for individual pre-school settings were calculated using value added models of children's progress during the pre-school period (age 3 to 5). Separate pre-school indicators were calculated for the four different social/behavioural dimensions at pre-school: 'Independence and concentration', 'Co-operation and conformity' 'Peer sociability' and 'Anti-social' behaviour.

Additional value added measures of overall primary school academic effectiveness have been derived from independent statistical analyses of National data sets conducted for all primary schools in England based on successive (2002-2004) pupil cohorts (Melhuish et al., 2006) as part of this study. These have been incorporated to provide indicators of the academic effectiveness of the primary school attended by each child in the EPPE 3-11 sample to complement the measures on pre-school settings.

Statistical analyses (using multilevel models) investigated the influence of different child, family and HLE background factors on children's social/behavioural development at the end of Year 5. These analyses (and all findings presented here) identify the unique (net) contribution of particular factors to variations in children's outcomes, while other background influences are controlled for. For example, the impact of family socio-economic status (SES) is established while taking into account the influence of mother's qualification levels, low

income, ethnic group, age, gender and HLE, etc. This is important because the research shows that much of the apparent difference in social/behavioural development associated with certain characteristics, for example, ethnic group membership, is attributable to the impact of other socio-economic and demographic factors. It also means that analyses of any continuing pre-school effects and primary school influences on children's outcomes in Year 5 as well as their joint effects include appropriate control for the influence of such background factors.

Similar analyses were conducted when the children were in Year 1 (age 6) enabling comparisons to be made with the latest results in Year 5. We investigated the development or progress made by different pupil groups during Key Stage 2 (KS2), and sought to establish the changing impact of individual background factors on social/behavioural development as children move through primary school.

The Findings

Links between child and family characteristics and children's social behaviour in Year 5

Child, family and early HLE factors remain important influences on children's social/behavioural development at age 10, especially for 'Hyperactivity' and 'Self-regulation'. The factors with strongest effects across the set of four social/behavioural outcomes are gender, health and behavioural problems reported by parents at entry to the study, need for EAL support and Early years HLE (see Table 1 for details on Effect sizes).

'Hyperactivity'

The highest levels of children's 'Hyperactivity' were associated with the following background characteristics: gender (higher for boys), health and behavioural problems reported by parents at entry to the study, mothers with lower qualifications and income. Increased 'Hyperactivity' was also associated with children of single/separated mothers, children still in need of EAL support in Year 5, those eligible for FSM and Black Caribbean children¹. Increased levels of 'Hyperactivity' were associated with children who were reported by parents as having more 'Enrichment outings' (which includes sports) in KS1, and those who were infrequently engaged in 'Expressive play' in KS1.

Whilst eligibility for FSM is a significant predictor of increased 'Hyperactivity', it is not as strong as some other background factors and is relatively small in comparison with family income or maternal qualifications.

¹ Several ethnic groups are small in size and therefore their results should be treated with caution. They are reported here because they are in line with other research.

Reduced 'Hyperactivity' was associated with children whose mothers were not working and those of Bangladeshi, Pakistani, or Indian ethnic origins.

'Self-regulation'

'Self-regulation' is a measure of pupil's autonomy, confidence and self-sufficiency related to behaviour in learning, rather than in a social context.

Higher levels of 'Self-regulation' were associated with children that had high Early years HLE scores, father's qualifications and family income. Lower levels of 'Self-regulation' were associated with needing EAL support, developmental problems reported by parents at entry to the study and low birth weight. Gender (poorer outcomes for boys), found to be the strongest predictor for 'Hyperactivity', 'Pro-social' and 'Anti-social' behaviour, had a weaker impact on 'Self-regulation'.

Higher 'Self-regulation' was also associated with higher attainment suggesting that 'Self-regulation' is an outcome with a strong cognitive aspect. Higher levels of 'Self-regulation' seem to foster the development of Reading skills, however it is possible that children whose Reading attainment is boosted at a younger age develop more autonomy and confidence in their learning, making improvements in both Reading and 'Self-regulation' mutually reinforcing.

'Anti-social' behaviour

Teachers' ratings indicated somewhat increased levels of 'Anti-social' behaviour for boys, Black African children, those eligible for FSM, those with absent fathers, those reported by parents at entry to the study as having behavioural problems, and those who had low levels of 'One-to-one interaction' with their parents during KS1. Reduced 'Anti-social' behaviour, by contrast, was associated with high maternal qualifications and with moderate levels of engagement in 'Expressive play' during KS1, rather than either high or low levels.

Eligibility for Free School Meals (FSM) was the strongest net family predictor of 'Anti-social' behaviour. Its impact on 'Anti-social' behaviour was also the strongest relative to its impact on the other social/behavioural dimensions.

'Pro-social' behaviour

Gender was the strongest predictor of 'Pro-social' behaviour, with girls having more positive scores, followed by family income, 'Expressive play' during KS1, maternal qualifications and eligibility for FSM. Eligibility for FSM was a weaker predictor suggesting that this measure of disadvantage has a lesser role to play in 'Pro-social' behaviour than in 'Anti-social' behaviour.

Children who used computers infrequently at home during KS1 also show increased 'Pro-social' behaviour.

Estimating changes in social/behavioural development (*progress*) over time (Year 1 to Year 5)

Analyses were undertaken to explore whether background characteristics were also associated with differential progress or change in social behaviour between Year 1 and Year 5. These analyses included the relevant social/behavioural outcomes collected at Year 1 in addition to the background factors presented above.

'Hyperactivity'

Girls, children of Indian, Pakistani, or Bangladeshi ethnic origins, children who have highly qualified mothers ('18 academic'+) and families with medium income show the greatest reductions in hyperactive behaviour over time. Children reported by parents at entry to the study as having behavioural problems and those with single/separated mothers, however, made less progress in this area between Year 1 and Year 5.

'Self-regulation'

Children with highly educated fathers, those from medium income families, and those with the highest Early years HLE scores showed most progress in this domain. Children with lower Early years HLE, those with one developmental problem during pre-school and those still needing EAL support at age 10 did not show as much progress in 'Self-regulation' between Year 1 and Year 5.

'Anti-social' behaviour

Increases in 'Anti-social' behaviour (i.e. poorer progress) were associated with boys, eligibility for FSM, children whose mothers had vocational level qualifications and those whose fathers were absent. Moderate levels of 'Expressive play' in KS1 were associated with reductions in 'Anti-social' behaviour by age 10.

'Pro-social' behaviour

Gender is the strongest indicator of progress in 'Pro-social' behaviour followed by family income and maternal qualifications. Girls, children from middle income families, those with mothers with higher qualifications and those reported to make moderate use of computers at home in KS1 showed better progress in 'Pro-social' behaviour. Children reported by parents at entry to the study as having behavioural problems and children who engaged infrequently in 'Expressive play' during KS1 showed poorer progress in 'Pro-social' behaviour during KS2.

Pre-school quality and effectiveness and primary school effectiveness

Continuing pre-school influences

As children move through primary school, we would expect pre-school influences to lose some of their potency, or to be masked by the effects of primary schools attended. Nevertheless, significant pre-school effects are still evident in children's social behaviour five years into primary education.

Simply attending pre-school still makes a difference to children's 'Pro-social' behaviour at the end of Year 5. In addition, those who started pre-school before the age of 3, show more 'Pro-social' behaviour at age 10. However, for other dimensions of social behaviour, the effect of simply attending a pre-school has washed out. The results however, show that the quality and effectiveness of the pre-school attended still made a significant difference to longer term developmental outcomes.

Pre-school effectiveness in promoting children's earlier social behaviour before they started primary school is still a significant predictor of later 'Self-regulation' (see Figure 1) and 'Pro-social' behaviour at age 10. However, there were no significant differences between those who did not attend pre-school (the 'Home' group) and those who had attended low effective pre-schools. For 'Hyperactivity' only pre-schools that were found to be more effective in reducing 'Anti-social' behaviour before children joined primary school continued to show positive effects in Year 5, while the 'Home' group showed slightly better scores for this outcome than those from medium or low effective pre-schools.

Pre-school quality is associated with later social behaviour, but different aspects of quality were found to be associated with different aspects of behaviour. The measure of quality associated with the academic aspects of pre-school education (ECERS-E see Sylva, 1999) was particularly associated with increased 'Self-regulation', while the measure of pre-school quality associated with the caring and emotional/relationship, (ECERS-R see Harms et al, 1998) was associated with reduced 'Hyperactivity' and increased 'Pro-social' behaviour.

A minority of children who attended low quality pre-school (14%) no longer show benefits and low quality pre-school is also associated with poorer 'Self-regulation' and increased 'Hyperactivity'. Quality and effectiveness of pre-school thus seem to be important for sustaining better longer term overall development.

Good Early years HLE is still a significant predictor of better 'Self-regulation' at age 10. Analyses investigated the combined effect of the Early years HLE and pre-school quality to explore the interplay between these two predictors and the relative contribution each makes to 'Self-regulation'. For this analysis the Early years HLE index was grouped into low, medium and high.

The greatest boost in 'Self-regulation' comes from the combined effect of medium or high pre-school quality and high Early years HLE. High Early years HLE alone is not enough - children who have high Early years HLE scores and attend low quality pre-schools have poorer 'Self-regulation' than children with medium Early years HLE scores who had attended high quality pre-school. Similarly, high quality pre-schools improve 'Self-regulation' but it is not enough by itself. Self-regulating behaviour in children who go to high quality pre-schools is still

affected by the Early years HLE. 'Home' children with high Early years HLE scores are doing well relative to 'Home' children with low and medium Early years HLE scores, but they are not doing as well as similar children who had also attended medium and high quality pre-school. Children who attended poor quality pre-schools had poorer social behavioural outcomes for each Early years HLE level than those from medium or high quality pre-schools.

Earlier EPPE reports (Sammons et al., 2003; Melhuish et al., 2001) have shown that an early start to centre-based child care before the age of 2 was associated with higher scores on 'Anti-social' behaviour at ages 3, 5 and 6. However, by age 10 there was no relationship between an early start in child care and higher rates of 'Anti-social' behaviour. The slightly increased risk of 'Anti-social' behaviour identified previously in children with an early start in group child care was no longer evident by age 10. By contrast the benefits of pre-school attendance including a longer duration (start under 3) still show for 'Pro-social' behaviour at age 10.

Primary school academic effectiveness

The 'academic effectiveness' of primary schools was calculated using value added analyses of National Assessment data for all primary schools in England linking individual pupils' KS1 and KS2 results for successive cohorts from 2002-2004; separate indicators were calculated for English, Mathematics and Science outcomes (see Melhuish et al., 2006). Higher primary school academic effectiveness is a significant predictor of lower 'Anti-social' behaviour development. However, it is not a significant predictor of the other aspects of social behaviour. It makes an identifiable and separate contribution to children's 'Anti-social' behaviour at Year 5, after controlling for child, family and HLE influences. This suggests that school organisation and classroom processes that are associated with better academic results may positively influence some aspects of the behavioural climate of the school.

The associations between school academic effectiveness and 'Anti-social' behaviour may also be bi-directional. Raised levels of 'Anti-social' behaviour are likely to impede teaching and result in lower academic effectiveness. Creating an orderly and positive behavioural climate, taking account of differences in intake, is a key characteristic of more effective schools (Teddlie & Reynolds, 2000) and improvement in behaviour climate is associated with improvements in academic results. Causal connections cannot be drawn but the results in Year 5 indicate that going to a more academically effective school shows positive benefits in reducing children's 'Anti-social' behaviour.

The combined influence of pre-school quality and primary school effectiveness

The combined effects of pre-school quality and primary school academic effectiveness are strongly

associated with better 'Self-regulation' and 'Pro-social' behaviour. When pre-school quality and primary school academic effectiveness are combined, the impact on behaviour is stronger compared with other predictors suggesting that pre- and primary school effects are additive and important (see Table 2 for details).

Children who attended low quality pre-school followed by a low academic effectiveness primary school show the poorest 'Self-regulation' and 'Pro-social' behaviour. The protective effects of pre-school quality are most clearly evident for children in medium effective primary schools, which represent the majority of children. High quality pre-school also offers some protection against the adverse influence of attending a low academically effective primary school in reducing 'Hyperactive' behaviour. The effects of pre-school quality on 'Hyperactivity', however, may be hidden in high academic effectiveness primary schools because both quality and effectiveness are having positive effects. 'Home' children who attended high academic effective primary schools showed the best outcomes for reduced 'Hyperactivity' and 'Anti-social' behaviour scores. By contrast, 'Home' children who went to low academically effective primary schools showed increased 'Anti-social' behaviour scores compared to all other groups including those who went to a low quality pre-school and a low academically effective primary. These results are similar to findings on cognitive attainment at age 10 (see Sammons et al., 2007b).

When we examine primary school academic effectiveness in relation to social/behavioural development the relationship between negative social behaviour and level of academic effectiveness appears to be reciprocal. The patterns associated with the 'Home' group suggest that pre-schools may have an important role to play in promoting later 'Self-regulation' and 'Pro-social' behaviour. On the other hand, differences between schools after prior (Year 1) developmental level is taken into account indicate that some primary schools have quite a significant impact on changes in children's positive social behaviour from age 6 to age 10. This is especially so for 'Self-regulation'. We also find moderate links between 'Self-regulation' and cognitive attainment in children in both KS1 and KS2; this also suggests that associations may be reciprocal. Further analyses are required to explore such links.

Implications

In line with findings for cognitive outcomes at age 10 (Sammons et al., 2007b) these findings support the conclusion that *good* (i.e. high quality and effective) pre-school still matters for children's social/behavioural development outcomes in the longer term. Therefore, improving access to high quality, effective pre-school is likely to offer substantial benefits for children by improving both later social adjustment and cognitive development in primary schools. These influences have the

potential to help raise overall educational standards and promote social inclusion.

The academic effectiveness of primary school is also a significant influence, particularly in combination with pre-school quality. Those children who went on to attend a more academically effective primary school show significantly better outcomes at age 10 than those who attended less academically effective schools. Academically effective primary schools are associated with reduced 'Anti-social' behaviour and better Reading and Mathematics attainment and progress, which is especially important for 'Home' children (whose academic outcomes tend to be poorer). There is no evidence of any negative impact of primary school academic effectiveness on social/behavioural development, and this is important because some claim that a focus by primary schools on promoting pupils' academic progress may lead to poorer outcomes in other aspects of development. The EPPE evidence at age 10 does not support such claims. We also suggest that there may be reciprocal effects between primary school academic effectiveness and reduced 'Anti-social' behaviour, as has been suggested in other studies in the school effectiveness and improvement tradition.

The EPPE research provides new evidence concerning the combined effects of pre-school and primary school in shaping children's later development. Raising the effectiveness and quality of both can help to improve children's all round development. However, no one factor should be seen as the key to enhancing outcomes in the longer term, it is the *combination of experiences over time* that matters. The child who has a better Early years HLE, high quality, effective pre-schooling and goes on to attend a more academically effective primary school has a combination of 'protective' experiences that are likely to benefit social/behavioural development as well as cognitive attainment.

Policies that promote improvements in the Early years HLE, especially for vulnerable groups, and also work to improve the quality and effectiveness of pre-school provision have the potential to enhance children's outcomes in the longer term. Pre-schools are well placed to identify children with a poor HLE and work with parents to improve this. Improving poorer quality pre-schools needs to be given a high priority, since poor quality provision does not appear to offer long term benefits in improved child outcomes.

The finding that both children's social/behavioural development and Reading and Maths attainment can be boosted by attending an academically more effective primary school also has important messages for the Every Child Matters agenda, because promoting better academic outcomes is not at odds with fostering better social/behavioural development. Further attention to supporting the improvement of less academically effective primary schools is important given the variation in practices

in Year 5 classrooms that we have previously identified (see Sammons et al., 2006).

As with cognitive outcomes, the social behavioural findings again suggest that, in order to help reduce the achievement gap for multiply disadvantaged groups, improving their Early years HLE, pre-school and primary school experiences will be needed in concert, since improvements to any one in isolation would be unlikely to boost outcomes sufficiently to help close the attainment or social behavioural 'gap' on its own.

Children who are behind their peers in cognitive or social/behavioural profiles at the start of primary school are likely to benefit from targeted interventions to ameliorate the risk of a widening of the attainment gap and adverse social/behavioural development during KS2. This has implications for policies and practices on baseline assessment and SEN identification and the development of well founded, evidence based interventions to support the most vulnerable children when they first start school, particularly if they have not attended pre-school or have had only poor quality or disruptive pre-school experiences.

Methodology

The EPPE 3-11 project contains a series of three 'nested' studies or 'tiers' which help answer specific research questions (www.ioe.ac.uk/projects/eppe).

Tier 1 answers the research question about the effectiveness of the 800+ primary schools the EPPE 3-11 children attended. It used statistical data (matched KS1 and KS2 National assessment results) for successive pupil cohorts derived from every primary school in the country (over three consecutive years 2002-2004) for English and Mathematics to provide value added estimates of the academic effectiveness of each school. Further information on Tier 1 can be found in Melhuish et al., (2006).

Tier 2, on which this research brief is based, involved the collection of information on academic and social/behavioural development for every child in the sample in Spring term of Year 5, during 2003-2006. The sample of 2520 pupils originated from 141 pre-school centres covering 6 types of provision (nursery classes, nursery schools, integrated settings, playgroups, private day nurseries and local authority day nurseries) and included a group of 'Home' pupils who had not attended pre-school.

The full report (Sammons et al., 2007a) on which this research brief is based can be found on the EPPE and DCSF websites.

Tier 3 explored classroom practice in a sample of 125 Year 5 classes through two different but complementary classroom observations. This addresses the question of what constitutes good classroom practice in Year 5 (see Sammons et al., 2006).

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Additional Information

Copies of the full report (DCSF-RR007) - priced £4.95 - are available by writing to DfES Publications, PO Box 5050, Sherwood Park, Annesley, Nottingham NG15 0DJ.

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The views expressed in this report are the authors' and do not necessarily reflect those of the Department for Children, Schools and Families.

Table 1 A summary of child, family and home learning environment influences on social behaviour (comparison groups in brackets)

	'Hyperactivity'	'Self-regulation'	'Pro-social'	'Anti-social'
Child Factors	Effect sizes			
Gender (girls)	0.68	-0.19	-0.63	0.32
Birth weight (very low)		-0.22		
Siblings (singletons)	-0.11			
Ethnicity (white UK)	0.35			0.39
Developmental problems (none)		-0.25		
Behavioural problems (none)	0.51		-0.21	0.22
Health problems (none)	0.56			
Need of EAL support	0.26	-0.53		
Family factors				
Mother's qualifications (none)	-0.36	0.21	0.19	-0.16
Father's Qualifications (none)		0.30		
Father absent		0.09		0.15
Marital Status (married)	0.23			
Maternal employment (employed)	-0.15			
Family earned income (none)	-0.33	0.25	0.24	
FSM	0.18	-0.17	-0.15	0.23
Home Learning Environment				
Early years HLE (low)		0.49		
Home computing (high)			0.22	
Enrichment outings (high)	-0.25			
One to one interactions (high)				0.18
Expressive play (high)	0.20		-0.24	-0.17

Only the largest effect sizes are reported for each factor
Blank cells indicate no statistically significant effect

Table 2 The combined impact of pre-school quality and primary school effectiveness on social/behavioural outcomes*

Primary school	Pre-school	n	'Hyperactivity'	'Self-regulation'	'Pro-social'	'Anti-social'
			Effect sizes			
Low Effectiveness	'Home'	44	-0.05	0.33	0.14	0.56
	Low quality	38	0	0	0	0
	Medium quality	210	-0.20	0.34	0.17	0.22
	High quality	87	-0.36	0.49	0.21	0
Medium Effectiveness	'Home'	126	-0.34	0.24	0.10	0.08
	Low quality	244	-0.14	0.37	0.27	0.06
	Medium quality	842	-0.24	0.44	0.35	0.12
	High quality	330	-0.27	0.46	0.45	0.07
High Effectiveness	'Home'	12	-0.65	0.10	0.35	-0.37
	Low quality	20	-0.20	0.12	0.28	0.13
	Medium quality	167	-0.20	0.57	0.37	0
	High quality [#]	46	-0.22	0.20	0.09	0.02

*Reference group: Low pre-school quality – Low primary school effectiveness

[#]The high effectiveness/ high quality group is small in size and consists of proportionally fewer children with high HLE (28%) relative to the rest of the sample (43%) and this may have contributed to the anomalous results for this particular group, since the interaction between early years HLE and pre-school quality is not controlled for here.