



Department  
for Education

# **Study of Early Education and Development (SEED): Study of Quality of Early Years Provision in England (Revised)**

## **Technical Report**

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Study of Early Education  
& Development



Social Science in Government

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<sup>1</sup> This revised report, published May 2018, includes corrections to the multivariate analysis of process quality by structural characteristics for two-year-old settings and for three- to four-year-old settings

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# **1 Chapter 1: Introduction**

## **1.1 The purpose of the technical report**

This report is an adjunct to the SEED report “Study of Early Education and Development (SEED): Study of Quality of Early Years Provision in England: Research Report (2017)”. This Technical Report gives further details of the analyses given in the Research Report as well as the results of some additional analyses. It is intended to be read in conjunction with the Research Report.

## **1.2 Research aims**

The overall purpose of this component within SEED is to explore the relationship between the structural characteristics of settings and process quality.

The main objectives of this report are to explore:

- The distribution of quality of ECEC in different group settings for two-year-old and three- to four-year-old children in England
- The relationship between the characteristics of a setting and the quality of care and education it offers.

## 2 Chapter 2: Methods

### 2.1 Instruments

#### **Process quality**

For this report process quality was assessed for two year-old children using two measures:

- The revised Infant-Toddler Environment Rating Scale (ITERS-R)
- The Sustained Shared Thinking and Emotional Wellbeing scale (SSTEWS)

For three- and four-year-old children three measures were used:

- The revised Early Childhood Environmental Rating Scale (ECERS-R)
- The curricular extension ECERS-E
- The Sustained Shared Thinking and Emotional Wellbeing scale (SSTEWS)

An overview of these scales is given in Table 1. More information can be found in Appendix A.

#### **Structural characteristics**

Structured questions covered the following topics: setting background; staff qualifications; staff / child ratios; and staff training / professional development activities. See Appendix B for the complete questionnaire.

**Table 1: Overview of the ITERS-R, ECERS-R, ECERS-E and SSTEW scales.**

The ITERS-R is essentially an overall measure of quality for the under-threes, and assesses centres across six domains:

- I. Space and Furnishings
- II. Personal Care Routines
- III. Listening and Talking
- IV. Activities
- V. Interaction
- VI. Program Structure

The ECERS-R is essentially an overall measure of quality for the over-threes, and was used in the SEED study to assess centres across five domains:

- I. Personal Care Routines
- II. Language Reasoning
- III. Activities
- IV. Interaction
- V. Programme Structure

The ECERS-E focuses on the educational aspects of experience for the over-threes, and was used in the SEED study to assess centres across three domains:

- I. Literacy
- II. Mathematics
- III. Diversity

The SSTEW focuses on the quality of interactions between staff and children, and was used in the SEED study to assess centres, both for under-threes and over-threes, across five domains:

- I. Building Trust, Confidence and Independence
- II. Supporting and Extending Language and Communication
- III. Supporting Emotional Well-being
- IV. Supporting Learning and Critical Thinking
- V. Assessing Learning and Language

## 2.2 Sample

Detail of the study sample and sampling strategy are available in the main report. More information on assessment procedures can be found in the main report and Appendix C of this technical report. A summary of different types of provision is available in the main report and in Appendix D of this technical report.

## 2.3 Analytical Strategy

### **A note on standardized model coefficients**

For binary covariates, the standardized model coefficient is the difference in the outcome between units with and without the binary characteristic (e.g., “settings with a training plan in place” vs. “settings with no training plan in place”), controlling for all other covariates.

For continuous covariates, the standardized model coefficient is the difference in the outcome associated with a change in the covariate of two standard deviations, controlling for all other covariates. The reason for giving the change corresponding to a change in the covariate of two standard deviations is that this makes the coefficients for binary and continuous covariates approximately comparable,<sup>2</sup> as recommended by Tymms, Merrell, & Henderson (1997).

## 2.4 A note on causation

As in any observational study, it cannot necessarily be assumed that the observed associations between the structural characteristics of settings and process quality are causal. Where associations are found, these could be explained by a number of different causal pathways; four possibilities are summarized in Figure 1.

1. Structural factors are causal of process quality.
2. Process quality is causal of structural factors.
3. Both structural factors and process quality are caused by unobserved factors.
4. Structural factors are causal of process quality via unobserved mediating factors.

These causal patterns are not mutually exclusive, and it is probable that the full causal picture includes elements of all four.

It is suggested that where there is an association between a structural factor, such as staff to child ratio, and settings’ process quality that the most probable explanation is that the association is, at least in part, causal (pathway 1), e.g., altering a setting’s staff to

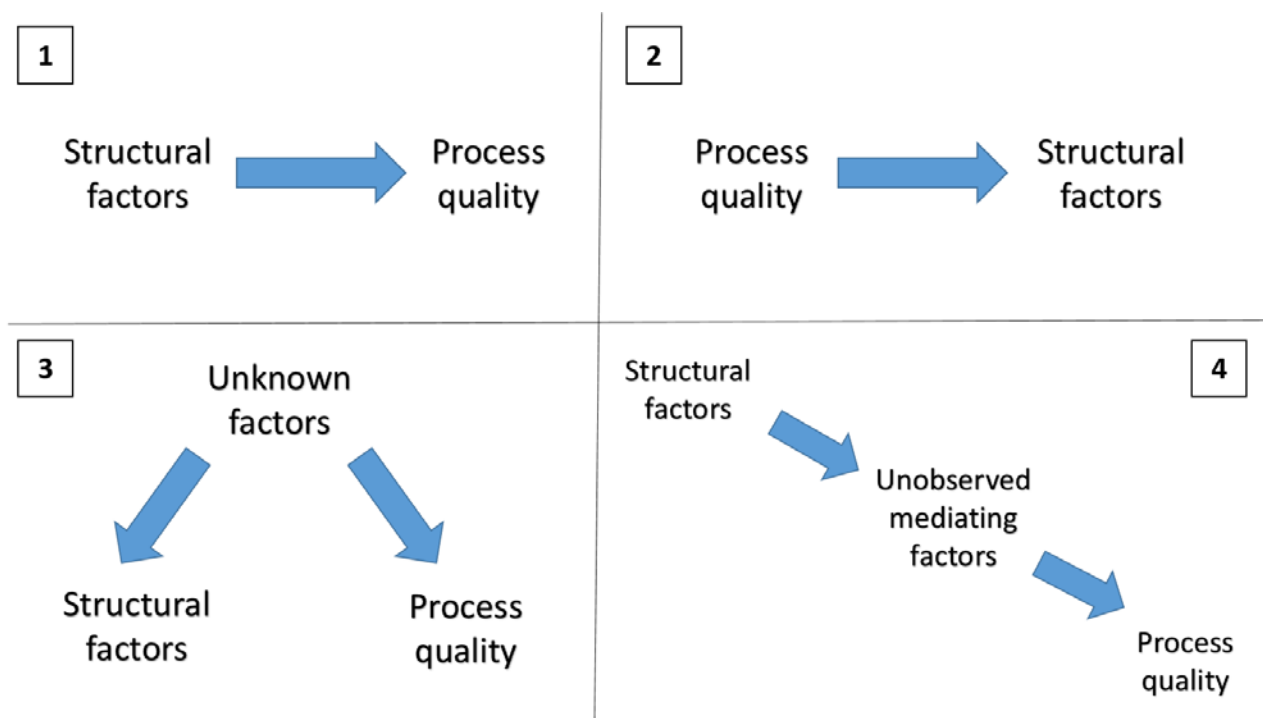
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<sup>2</sup> This is the case because a binary variable coded 0 / 1 has a standard deviation of 0.5 when the number of 0s and 1s observed are equal. The difference between those with and without the characteristic therefore corresponds to a change in the covariate of 2 standard deviations.

child ratio would, over time, tend to alter its process quality. In some cases, there may also be unobserved mediating factors (pathway 4), e.g., a higher staff to child ratio might improve staff morale (a factor not observed), which might in turn improve process quality.

In some cases, there may also be feedback from process quality to structural factors (pathway 2), e.g., if having more highly qualified staff is associated with improved process quality this may be, in part, because more highly qualified staff perform more effectively, thus raising a setting's quality, but it may also be the case that a higher quality setting finds it easier to recruit more highly qualified staff. However, whilst the presence of such reinforcing feedback is likely, it is suggested that it is unlikely that the primary causal pathway flows from process quality – which is the summation of many small differences – to structural factors – which are simpler and are generally under more direct control.

**Figure 1: Possible causal relationships between structural factors and process quality.**



It is possible that there are some external factors that influence both structural factors and process quality (pathway 3). However, there is little or no association between the Index of Multiple Deprivation and the quality of settings (see Chapter 5), making it unlikely that the observed associations are largely explained by a “neighbourhood effect”. It is therefore suggested that this too is unlikely to be the dominant causal pathway.

## 3 Chapter 3: Structural characteristics and process quality of settings for two-year-olds

### 3.1 Structural Characteristics of ECEC settings for two-year-olds

#### 3.1.1 Overview of Settings

##### Type of setting

A breakdown of the settings for two-year-olds by type is given in Table 2.

**Table 2: Breakdown of settings by type for two-year-olds.**

Type of setting	N	Percent
Private	256	63.7%
Voluntary	103	25.6%
Children's Centre	25	6.2%
Local Authority Nursery	7	1.7%
Nursery Class	5	1.2%
Nursery School	6	1.5%
<b>Total</b>	402	100.0%

Details of the structural characteristics of childcare settings for two-year-olds are given in Chapter 3 of the main report.

### 3.2 Process quality of ECEC settings for two-year-olds

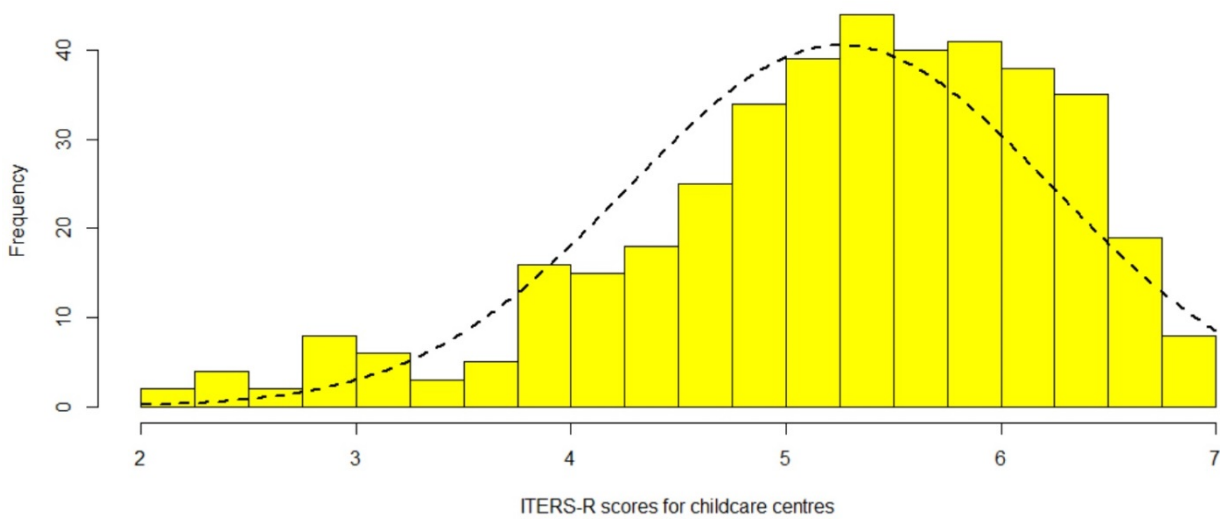
#### 3.2.1 Distribution of ITERS-R and SSTEW overall and sub-scale scores

##### ITERS-R scale

The quality of childcare was measured by observing what actually occurs in the settings using two multidimensional scales. Firstly, the findings for the ITERS-R were examined. The average for the ITERS-R total score was 5.25 (SD = 0.99). The distribution of the scores showed some negative skewness, see Figure 2.



**Figure 2: Histogram of ITERS-R average scores for settings.**



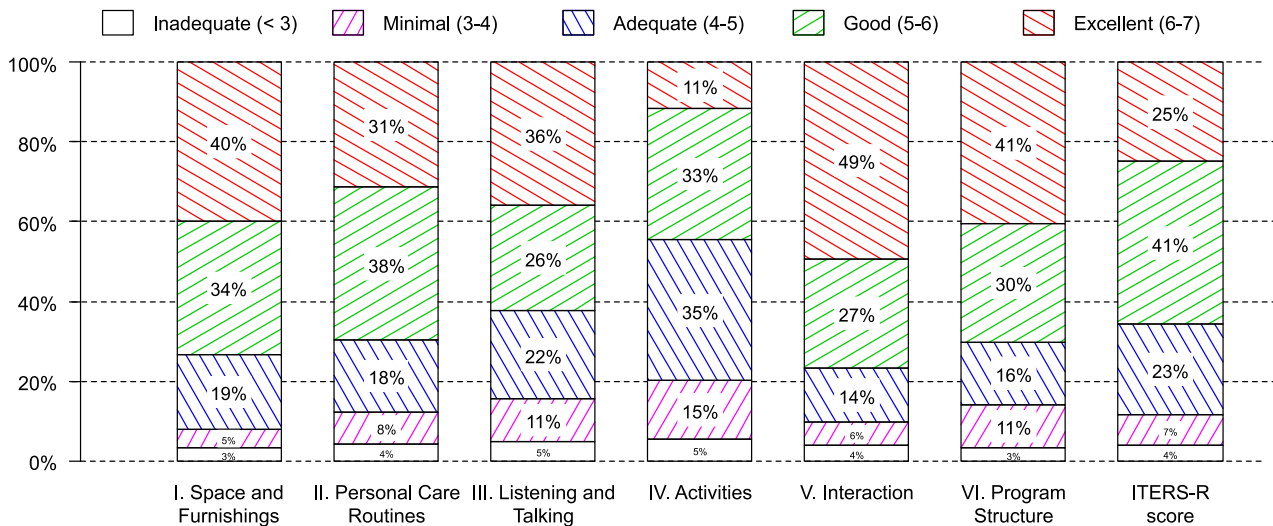
The means for the six ITERS-R sub-scales were similar, ranging from a low of 4.75 (Activities) to a high of 5.55 (Interaction).

**Table 3: Means and standard deviations for ITERS-R sub-scales.**

ITERS-R sub-scales	Mean	SD
I. Space and Furnishings	5.46	1.06
II. Personal Care Routines	5.26	1.15
III. Listening and Talking	5.13	1.25
IV. Activities	4.75	1.01
V. Interaction	5.55	1.14
VI. Program Structure	5.37	1.24

Figure 3 depicts the distribution of the ITERS-R scores classified into five levels of quality. These categories are: “inadequate ( $< 3$ )”, “minimal ( $\geq 3$  and  $< 4$ )”, “adequate ( $\geq 4$  and  $< 5$ )”, “good ( $\geq 5$  and  $< 6$ )” and “excellent ( $\geq 6$ )”.

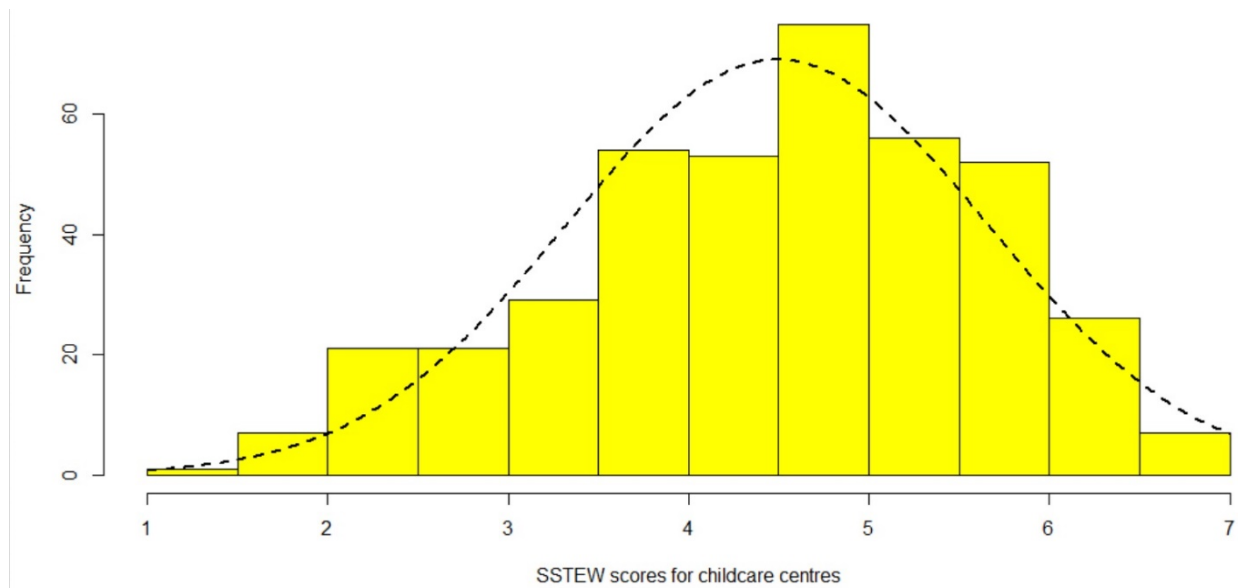
**Figure 3: ITERS-R sub-scales and overall average scores.**



### SSTEW scale

The second scale used to assess process quality was the Sustained Shared Thinking and Emotional Well-Being (SSTEW) scale. The average for the SSTEW total score was 4.49 (SD = 1.16). The distribution of the scores was close to Normal, see Figure 4.

**Figure 4: Histogram of SSTEW average scores for settings.**



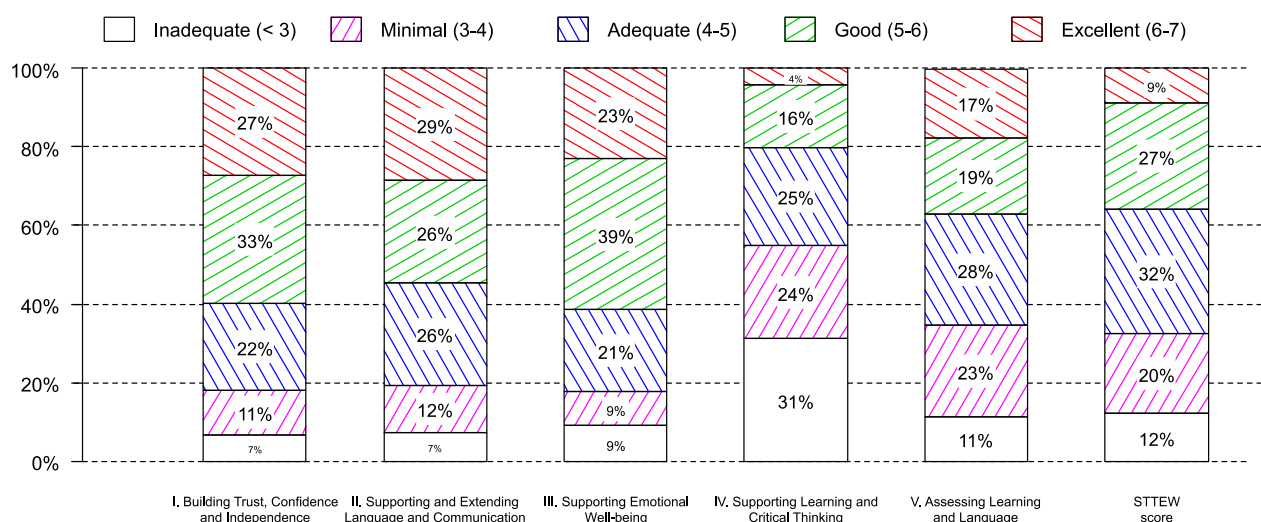
The means for the five SSTEW sub-scales were calculated. The lowest mean score was for the Supporting Learning and Critical Thinking sub-scale (mean = 3.65); the highest was for Supporting and Extending Language and Communication (mean = 4.95).

**Table 4: Means and standard deviations for SSTEW sub-scales.**

SSTEW sub-scales	Mean	SD
I. Building Trust, Confidence and Independence	4.94	1.27
II. Supporting and Extending Language and Communication	4.95	1.30
III. Supporting Emotional Well-being	4.62	1.29
IV. Supporting Learning and Critical Thinking	3.65	1.29
V. Assessing Learning and Language	4.30	1.34

Figure 5 depicts the distribution of the SSTEW scores classified into five levels of quality. These categories are: “inadequate (< 3)”, “minimal ( $\geq 3$  and < 4)”, “adequate ( $\geq 4$  and < 5)”, “good ( $\geq 5$  and < 6)” and “excellent ( $\geq 6$ )”.

**Figure 5: SSTEW sub-scales and overall average scores.**



The Supporting Learning and Critical Thinking sub-scale stands out, with a far higher percentage of settings having minimal or inadequate performance on this sub-scale.

### 3.3 Process and structural quality by provider type in two-year-old settings

A breakdown by type of the settings used by two-year-olds is given in Table 2.

For the purpose of this analysis, the Local Authority nurseries were a distinct type of setting that could not easily be combined with other settings, and were omitted, as the low numbers would make a separate analysis of these settings unreliable. Nursery classes and nursery schools have similarities in their staffing, regulations and relationship

to the education system, and hence were combined into a single “nursery class / school” category to give adequate numbers for analysis.

### 3.3.1 Comparing process quality by type of setting for two-year-old settings

For each quality outcome three models were fitted:

1. Model of scores treated as a continuous variable in a linear regression model.
2. Model of whether scores were “excellent” (6 and above) as outcome in a logistic regression model.
3. Model of whether scores were “good or better” (5 and above) as outcome in a logistic regression model.

Private settings, the largest group, were used as the reference category. Results are shown in Table 5 (ITERS-R) and Table 6 (SSTEWS).

**Table 5: Analysis of ITERS-R by settings type (two-year-olds).**

Coefficient	N	Predictors of ITERS-R			Predictors of excellent ITERS-R			Predictors of good or better ITERS-R		
		Mean	Difference	p	%	OR	p	%	OR	p
Private	256	5.15			21.5%			61.3%		
Voluntary	103	5.34	+0.187	0.104	22.3%	1.05	0.860	71.8%	1.61	0.061
Children's Centre	25	5.57	+0.419	0.043 *	44.0%	2.87	0.014 *	72.0%	1.62	0.297
Nursery Class / School	11	5.73	+0.582	0.056	63.6%	6.40	0.004 **	72.7%	1.68	0.451

N = 395

Mean ITERS-R scores by group are shown with differences from the private group (reference category). Percentages of settings with “excellent” and “good or better” scores are shown with odds ratio (= OR) comparisons with the reference group. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

**Table 6: Analysis of SSTEW by settings type (two-year-olds).**

Coefficient	N	Predictors of SSTEW			Predictors of excellent SSTEW			Predictors of good or better SSTEW		
		Mean	Difference	p	%	OR	p	%	OR	p
Private	256	4.41			6.6%			34.0%		
Voluntary	103	4.56	+0.156	0.251	9.7%	1.51	0.322	33.0%	0.96	0.860
Children's Centre	25	4.69	+0.281	0.249	24.0%	4.44	0.005**	48.0%	1.79	0.166
Nursery Class / School	11	4.90	+0.496	0.166	9.1%	1.41	0.752	63.6%	3.40	0.056

N = 395

Mean SSTEW scores by group are shown with differences from the private group (reference category). Percentages of settings with “excellent” and “good or better” scores are shown with odds ratio (= OR) comparisons with the reference group. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

ITERS-R scores were significantly higher at children’s centres than at private settings, and children’s centres and nursery classes / schools were significantly more likely to achieve excellent ITERS-R scores than the private settings reference group (Table 5).

Children’s centres were significantly more likely to achieve excellent SSTEW scores than the private settings reference group (Table 6).

The analysis was repeated controlling for the following structural characteristics of ECEC settings:

1. Whether setting is on single / multiple sites
2. Number of places at setting
3. Minimum age for children is two years
4. Maximum age for children
5. Staff to child ratio for two-year-olds
6. Overall staff to child ratio
7. Mean level of staff qualification
8. Whether there is SEN/D provision
9. Whether there is a training plan
10. Whether there is a training budget
11. Frequency of staff CPD
12. Frequency of staff supervision
13. Percentage of staff replaced in previous year

Results are shown in Table 7 (ITERS-R) and Table 8 (SSTEW).

**Table 7: Analysis of ITERS-R by settings type (two-year-olds) controlling for structural characteristics.**

Coefficient	N	Predictors of ITERS-R		Predictors of excellent ITERS-R		Predictors of good or better ITERS-R	
		Beta	p	OR	p	OR	p
Private	256	(reference level)		(reference level)		(reference level)	
Voluntary	103	+0.138	0.315	1.02	0.961	1.44	0.259
Children's Centre	25	+0.245	0.282	2.80	0.042 *	1.10	0.863
Nursery Class / School	11	+0.447	0.204	10.19	0.010 *	1.19	0.845

N = 395

Effects of setting type on ITERS-R scores are shown relative to the private group (reference level). Models control for structural characteristics of childcare settings. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

**Table 8: Analysis of SSTEWS by settings type (two-year-olds) controlling for structural characteristics.**

Coefficient	N	Predictors of SSTEWS		Predictors of excellent SSTEWS		Predictors of good or better SSTEWS	
		Beta	p	OR	p	OR	p
Private	256	(reference level)		(reference level)		(reference level)	
Voluntary	103	+0.060	0.709	1.22	0.707	0.88	0.679
Children's Centre	25	+0.157	0.557	2.90	0.118	1.90	0.196
Nursery Class / School	11	+0.434	0.293	0.52	0.600	5.25	0.064

N = 395

Effects of setting type on SSTEWS scores are shown relative to the private group (reference level). Models control for structural characteristics of childcare settings. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

In the controlled models, children's centres and nursery classes / schools are significantly more likely to achieve excellent ITERS-R scores than the private settings reference group (Table 7).

### 3.3.2 Comparing structural characteristics of settings by type of setting

Analyses investigated whether there were any systematic variations in the structural characteristics of ECEC settings by settings type. There were comparisons of the means of continuous structural characteristics of childcare settings by setting type using Wilcoxon rank sum tests. As the largest group, private settings were used as the reference category. The results are shown in Table 9.

**Table 9: Difference in structural characteristics by settings type: continuous variables (two-year-olds).**

Variable	Private	Voluntary		Nursery class / school		Children's Centre	
	Mean	Mean	p	Mean	p	Mean	p
Number of places	61.01	41.10	<0.001 ***	61.91	0.606	64.46	0.583
Minimum age of children	0.39	1.34	<0.001 ***	2.00	<0.001 ***	0.76	0.052
Maximum age of children	6.14	5.64	0.002 **	4.73	0.002 **	5.00	<0.001 ***
Ratio: children aged 2 per staff member	3.96	3.91	0.704	4.22	0.100	4.00	0.404
Overall ratio: children per staff member	4.27	4.36	0.899	9.60	0.016 *	4.79	0.208
Mean level of staff qualification	2.98	3.01	0.719	3.72	<0.001 ***	3.46	0.001 **
Manager's highest qualification	4.95	4.48	0.002 **	6.27	<0.001 ***	5.84	0.002 **
Frequency of CPD	4.78	4.22	0.419	4.36	0.834	6.88	0.067
Frequency of staff supervision	8.70	8.47	0.730	9.00	0.259	8.92	0.307
% staff replaced in last year	11.59	8.38	0.014 *	9.80	0.739	12.18	0.773
Group size	256	103		11		25	

N = 395

P-values are from non-parametric Wilcoxon tests for difference in means.

Significant p-values are marked: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Analyses compared the binary structural characteristics of childcare settings by settings type using chi-square tests for difference in proportions. "Private settings" was used as the comparison group. The results are given in Table 10.

**Table 10: Difference in structural characteristics by settings type: binary variables (two-year-olds).**

Variable	Private	Voluntary		Nursery class / school		Children's Centre	
	%	%	p	%	p	%	p
Centre on single site	56.6	89.2	<0.001 ***	100.0	0.011 *	72.0	0.203
Has SEN provision	60.5	65.3	0.465	54.5	0.937	68.0	0.602
Has training plan	89.0	82.5	0.140	90.9	1.000	92.0	0.899
Has training budget	39.2	48.5	0.133	81.8	0.012 *	72.0	0.003 **
Group size	256	103		11		25	

N = 395

P-values are from tests for differences in proportions.

Significant p-values are marked: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

### 3.3.2.1 Voluntary settings

Voluntary settings tend to be smaller than private settings and tend to accept a narrower age range of children. The managers at voluntary settings tend to be less highly qualified than those at private settings, and the rate of staff turnover tends to be lower. Voluntary settings are more likely than private settings to be on a single site.

### 3.3.2.2 Nursery classes / schools

Nursery classes / schools tend to have a narrow age range of children than private settings. They tend to have a lower staff to child ratio (i.e. more children per member of staff) and to have more highly qualified staff and managers. Nursery classes / schools are more likely to be on a single site than private settings; they are also more likely to have a training budget.

### 3.3.2.3 Children's centres

Children's centres tend to have a lower maximum age for children than private settings. Children's centres also tend to have more highly qualified managers and staff. Finally, children's centres are more likely to have a training budget than are private settings.

## 3.4 Relationship between process quality and structural characteristics for two-year-old settings

### 3.4.1 Univariate analysis of process quality by structural characteristics for two-year-old settings

The ITERS-R and SSTEWS process quality scores were analysed in terms of the following structural characteristics of settings:

1. Setting on single site / multiple sites
2. Number of places at setting
3. Minimum age of children is two years of age vs. below two years of age



4. Maximum age of children
5. Staff to child ratio for two-year-olds
6. Overall staff to child ratio
7. Mean level of staff qualification
8. Manager's highest qualification
9. SEN/D provision
10. Training plan in place
11. Training budget in place
12. Frequency of CPD
13. Frequency of staff supervision
14. Percentage of staff replaced in last year

For the binary variables, analyses compared the mean ITERS-R and SSTEW scores for those with and without a given characteristic; see Table 11. For the continuous variables analyses measured the associations with the ITERS-R and SSTEW process quality measures using Kendall's tau non-parametric correlation coefficient; see Table 12.

**Table 11: Comparison of ITERS-R and SSTEW scores by binary structural characteristics.**

Process quality measure	Structural characteristic	Mean 1		Mean 2		p
ITERS-R	Setting on single / multiple sites	Single	5.29	Multiple	5.14	0.101
	Minimum age of children	< 2	5.15	2	5.41	0.005 **
	SEN/D provision	No	5.23	Yes	5.25	0.794
	Training plan in place	No	4.94	Yes	5.28	0.027 *
	Training budget in place	No	5.17	Yes	5.32	0.107
SSTEW	Setting on single / multiple sites	Single	4.51	Multiple	4.41	0.356
	Minimum age of children	< 2	4.38	2	4.66	0.033 *
	SEN/D provision	No	4.47	Yes	4.49	0.821
	Training plan in place	No	4.21	Yes	4.52	0.080
	Training budget in place	No	4.44	Yes	4.52	0.565

N = 395

The p-values are from a non-parametric Wilcoxon test for difference in means.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

**Table 12: Association of ITERS-R and SSTEW scores with continuous structural characteristics.**

Process quality measure	Structural characteristic	Correlation (Kendall's tau)	p
ITERS-R	Number of places	-0.021	0.548
	Maximum age of children	-0.086	0.025 *
	Staff to child ratio for two-year-olds	+0.022	0.590
	Overall staff to child ratio	+0.076	0.026 *
	Mean staff qualification	+0.065	0.056
	Manager's highest qualification	+0.041	0.279
	Frequency of CPD	+0.071	0.068
	Frequency of staff supervision	-0.054	0.140
	Percentage of staff replaced in last year	-0.051	0.149
SSTEW	Number of places	-0.039	0.257
	Maximum age of children	-0.026	0.505
	Staff to child ratio for two-year-olds	+0.062	0.133
	Overall staff to child ratio	+0.096	0.005 **
	Mean staff qualification	+0.098	0.004 **
	Manager's highest qualification	+0.081	0.032 *
	Frequency of CPD	+0.044	0.261
	Frequency of staff supervision	-0.055	0.139
	Percentage of staff replaced in last year	-0.070	0.048 *

N = 395

The association between the ITERS-R and SSTEW process quality measures and the structural characteristics of settings is assessed using Kendal's tau, a non-parametric correlation coefficient. P-values are from a test of whether correlations are different from zero. The Kendall correlation coefficient is used rather than Pearson's because many of the structural characteristics are not distributed normally. Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

### **Minimum age of children**

Both ITERS-R and SSTEW scores were higher at settings where the minimum age of children was 2.

### **Training plan in place**

ITERS-R was higher at settings with a training plan in place. There was no significant effect on SSTEW scores.

### **Maximum age of children**

Settings with a lower maximum age for children tend to have higher ITERS-R quality scores, but there was no association with SSTEW scores.

### **Overall staff to child ratio**

Both ITERS-R and SSTEW scores were positively correlated with the overall staff to child ratio; i.e. scores tend to be higher where there are fewer children per member of staff.

### **Mean level of staff qualification**

SSTEWE scores were positively correlated with the mean level of staff qualification at settings, i.e. scores tend to be higher where staff are more highly qualified. There was no significant association with ITERS-R scores.

#### **Manager's highest qualification**

SSTEWE scores are positively correlated with the manager's level of qualification. There was no significant association with ITERS-R scores.

#### **Percentage of staff replaced in last year**

SSTEWE scores are negatively correlated with the percentage of staff replaced in the last year; i.e. a smaller percentage of staff replaced in the last year is associated with higher SSTEWE scores. There was no significant association with ITERS-R scores.

### **3.4.2 Multivariate analysis of process quality by structural characteristics for two-year-old settings**

#### **3.4.2.1 Introduction**

The ITERS-R and SSTEWE scores of settings were analysed in terms of the structural characteristics of settings using multivariate linear regression models. Separate models were fitted for:

1. Private settings
2. Voluntary settings
3. Children's centres

The analyses omitted "number of staff at setting" from the list of structural characteristics since including this as well as "number of places at setting" and "staff to child ratio" would have made model interpretation difficult. "Manager's highest qualification" was also omitted due to possible collinearity with "mean staff qualification level at setting", which would make interpretation of results difficult.

Three models were fitted for each outcome:

1. Scores treated as a continuous variable in a linear regression model
2. Whether scores were "excellent" (6 and above) or not in a logistic regression model and
3. Whether scores were "good or better" (5 and above) or not in a logistic regression model.

### 3.4.2.2 Private settings

Results are given in Table 13 (ITERS-R) and Table 14 (SSTEWS).

**Table 13: Analysis of ITERS-R by characteristics of settings (two-year-olds); private settings.**

Coefficient	Model 1: Predictors of ITERS-R		Model 2: Predictors of excellent ITERS-R		Model 3: Predictors of good or better ITERS-R	
	Beta	p	OR	p	OR	p
Centre on single site					2.00	0.029 *
Larger number of places	+0.399	0.007 **			2.08	0.029 *
Minimum age of children is 2	+0.482	0.016 *				
Maximum age of children	-0.267	0.042 *			0.48	0.016 *
Overall staff to child ratio	+0.567	0.001 **			2.63	0.024 *
Mean level of staff qualification			2.52	0.034 *		

N = 256

Model coefficients are shown if significantly different from zero. Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models are for private settings.

**Table 14: Analysis of SSTEWS by characteristics of settings (two-year-olds); private settings.**

Coefficient	Model 1: Predictors of SSTEWS		Model 2: Predictors of excellent SSTEWS		Model 3: Predictors of good or better SSTEWS	
	Beta	p	OR	p	OR	p
Larger number of places	+0.368	0.029 *	3.90	0.031 *		
Minimum age of children is 2	+0.633	0.006 **				
Overall staff to child ratio	+0.744	<0.001 ***			4.16	0.001 **
Mean level of staff qualification	+0.539	0.003 **			4.27	<0.001 ***

N = 256

Model coefficients are shown if significantly different from zero. Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models are for private settings.

#### Centre on single site

Childcare centres that were on a single site were more likely to achieve good or better ITERS-R scores than centres on multiple sites.

#### Larger number of places

Settings with a larger number of places tended to have higher scores on both the ITERS-R and SSTEWS scales. Larger settings were more likely to achieve good or better ITERS-R scores and also more likely to achieve excellent SSTEWS scores.

### Minimum age of children is 2

Settings with a minimum age of 2 for children tended to have higher scores on both the ITERS-R and SSTEW scales than settings that accepted children from 0 or 1.

### Maximum age of children

Centres with a higher maximum age for children tended to have lower ITERS-R scores and were less likely to achieve good or better scores on this scale.

### Overall staff to child ratio

Settings with a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting) tended to have higher scores on both the ITERS-R and SSTEW quality scales. They were also more likely to achieve good or better scores on these scales.

### Mean level of staff qualification

Settings with a higher mean level of staff qualification were more likely to achieve excellent ITERS-R scores. They also tended to have higher SSTEW scores and were more likely to achieve good or better SSTEW scores.

#### 3.4.2.3 Voluntary settings

Results are given in Table 15 (ITERS-R) and Table 16 (SSTEW).

**Table 15: Analysis of ITERS-R by characteristics of settings (two-year-olds); voluntary settings.**

Coefficient	Model 1: Predictors of ITERS-R		Model 2: Predictors of excellent ITERS-R		Model 3: Predictors of good or better ITERS-R	
	Beta	p	OR	p	OR	p
SEN/D provision	-0.600	0.002 **			0.07	0.002 **
Training plan in place	+0.607	0.015 *			8.38	0.015 *

N = 103

Model coefficients are shown if significantly different from zero. Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models are for voluntary settings.

**Table 16: Analysis of SSTEW by characteristics of settings (two-year-olds); voluntary settings.**

Coefficient	Model 1: Predictors of SSTEW		Model 2: Predictors of excellent SSTEW		Model 3: Predictors of good or better SSTEW	
	Beta	p	OR	p	OR	p
SEN/D provision	-0.738	0.003 **			0.34	0.049 *

N = 103

Model coefficients are shown if significantly different from zero. Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models are for voluntary settings.

### **SEN/D provision**

Voluntary settings with SEN/D provision tended to have lower ITERS-R and SSTEW scores than other voluntary settings. They were also less likely to achieve good or better scores on the ITERS-R and SSTEW scales.

### **Training plan in place**

Voluntary settings with a training plan in place tended to have higher ITERS-R scores. They were also more likely to achieve good or better ITERS-R scores.

#### **3.4.2.4 Children's centres**

In the models for Children's centres none of the structural characteristics of settings were significant predictors of settings quality. This absence of significant results is likely to be a consequence of the small sample size ( $N = 25$ ), and the relative homogeneity of this group.

## 4 Chapter 4: Structural characteristics and process quality of settings for three- and four-year-olds

### 4.1 Structural characteristics of ECEC settings for three- to four-year-olds

#### 4.1.1 Overview of Settings and Staff Characteristics

##### Type of setting

A breakdown of settings for three- and four-year-olds by type is given in Table 17.

Table 17: Breakdown of settings by type.

Type of setting	N	Percent
Private	302	50.5%
Voluntary	143	23.9%
Children's Centre	26	4.3%
Local Authority Nursery	4	0.7%
Nursery Class	110	18.4%
Nursery School	13	2.2%
<b>Total</b>	<b>598</b>	<b>100.0%</b>

Details of the structural characteristics of ECEC settings for three- to four- year olds are given in Chapter 4 of the main report.

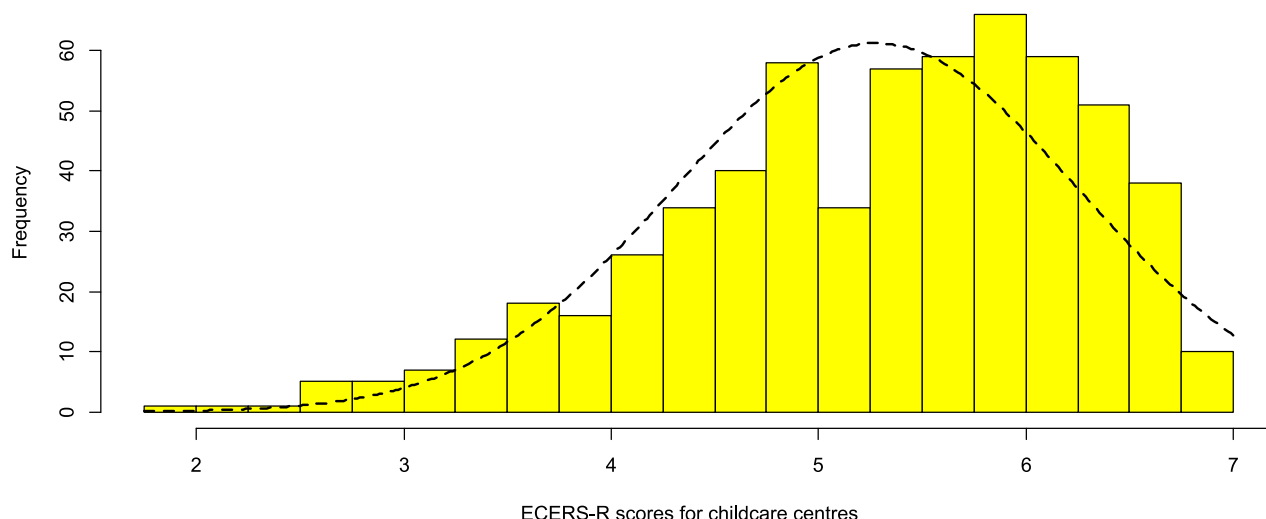
### 4.2 Process Quality of settings for three-to four-year-olds

#### 4.2.1 Distribution of ECERS-R, ECERS-E and SSTEW overall and sub-scale scores

##### **ECERS-R scale**

The average for the ECERS-R total score was 5.28 (SD = 0.99). The distribution of the scores was somewhat negatively skewed, see Figure 6.

**Figure 6: Histogram of ECERS-R average scores for settings.**



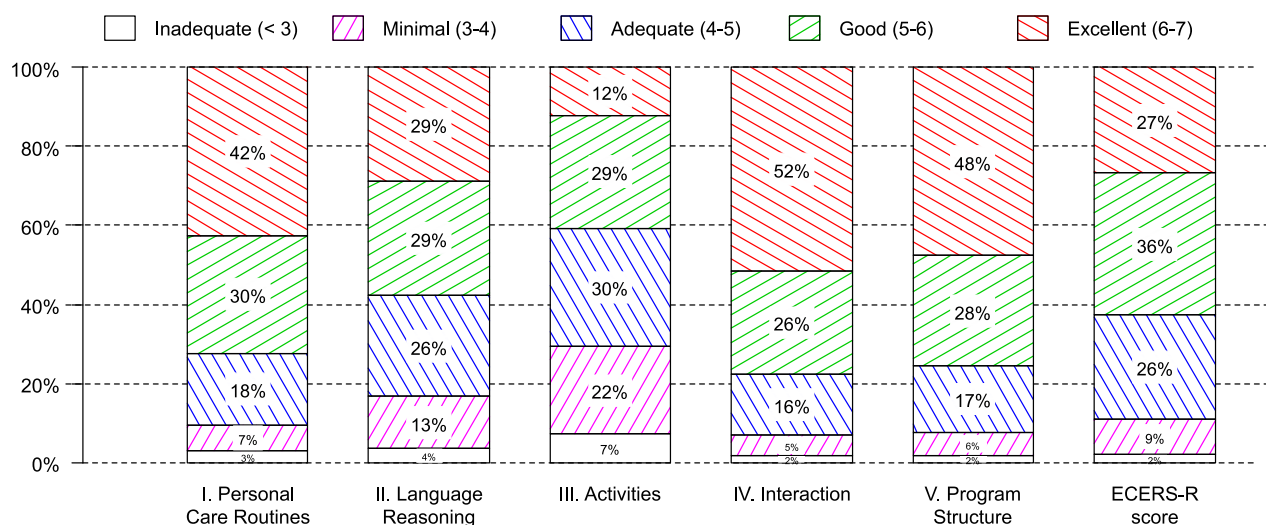
The means for the five ECERS-R sub-scales were calculated and found to be similar, ranging from a low of 4.60 (Activities) to the highest value of 5.67 (Interaction).

**Table 18: Means and standard deviations for ECERS-R sub-scales.**

ECERS-R sub-scales	Mean	SD
I. Personal Care Routines	5.45	1.15
II. Language Reasoning	5.07	1.16
III. Activities	4.60	1.09
IV. Interaction	5.67	1.08
V. Program Structure	5.59	1.13

Figure 7 depicts the distribution of the ECERS-R scores classified into five levels of quality. These categories are: “inadequate ( $< 3$ )”, “minimal ( $\geq 3$  and  $< 4$ )”, “adequate ( $\geq 4$  and  $< 5$ )”, “good ( $\geq 5$  and  $< 6$ )” and “excellent ( $\geq 6$ )”.

**Figure 7: ECERS-R sub-scales and overall average scores.**

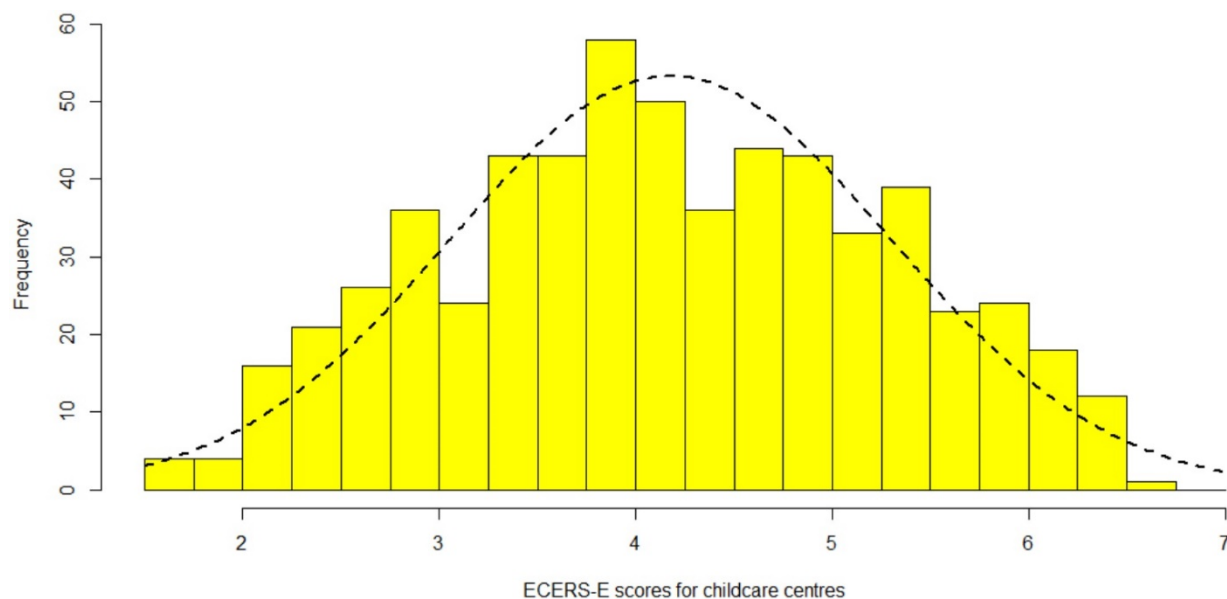




### **ECERS-E scale**

The average for the ECERS-E total score was 4.18 (SD = 1.13). The distribution of the scores was close to normal, see Figure 8.

**Figure 8: Histogram of ECERS-E average scores for settings.**



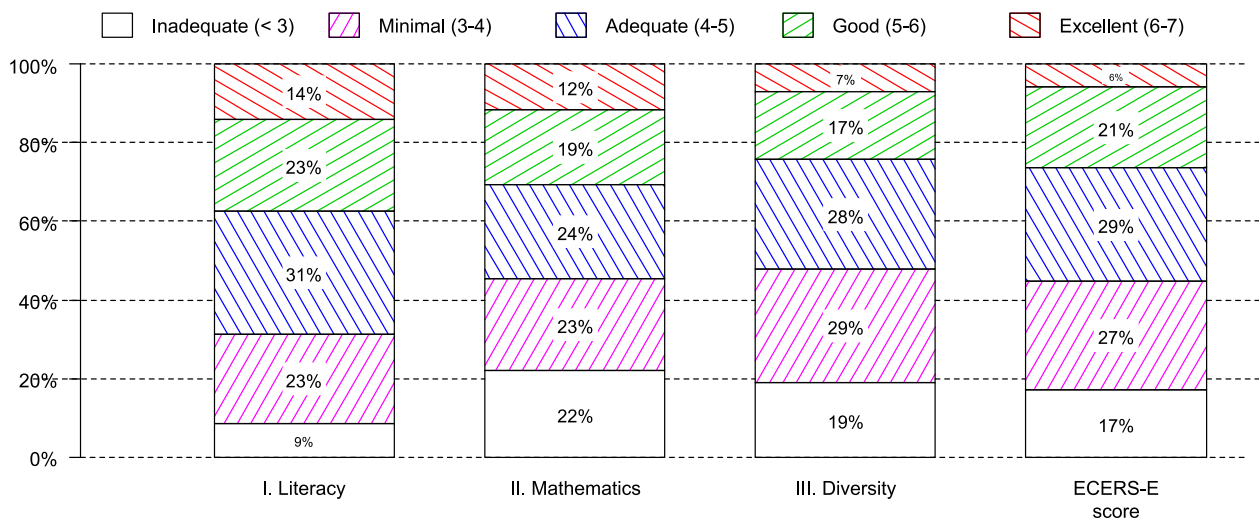
The means for the three ECERS-E sub-scales were similar, ranging from 3.96 (Diversity) to 4.54 (Literacy).

**Table 19: Means and standard deviations for ECERS-E sub-scales.**

ECERS-E sub-scales	Mean	SD
I. Literacy	4.54	1.14
II. Mathematics	4.03	1.38
III. Diversity	3.96	1.19

Figure 9 depicts the distribution of the ECERS-E scores classified into five levels of quality. These categories are: “inadequate ( $< 3$ )”, “minimal ( $\geq 3$  and  $< 4$ )”, “adequate ( $\geq 4$  and  $< 5$ )”, “good ( $\geq 5$  and  $< 6$ )” and “excellent ( $\geq 6$ )”.

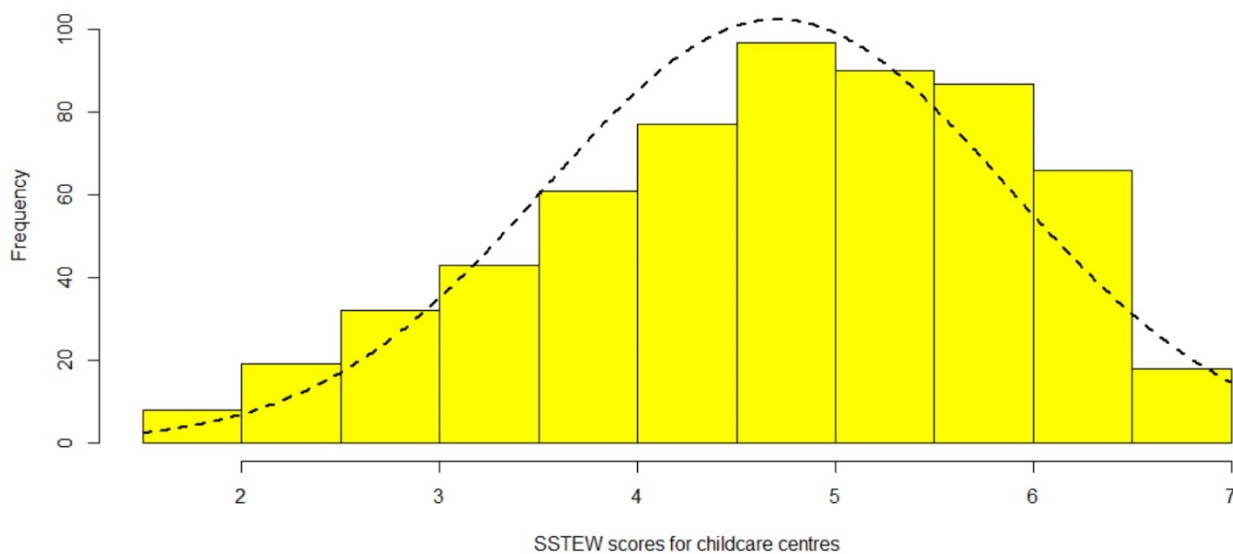
**Figure 9: ECERS-E sub-scales and overall average scores.**



### **SSTEW scale**

The final scale used to assess process quality was the Sustained Shared Thinking and Emotional Well-Being (SSTEW) scale. The average for the SSTEW total score was 4.71 (SD = 1.17). The distribution of the scores was close to normal, see Figure 10.

**Figure 10: Histogram of SSTEW average scores for settings.**



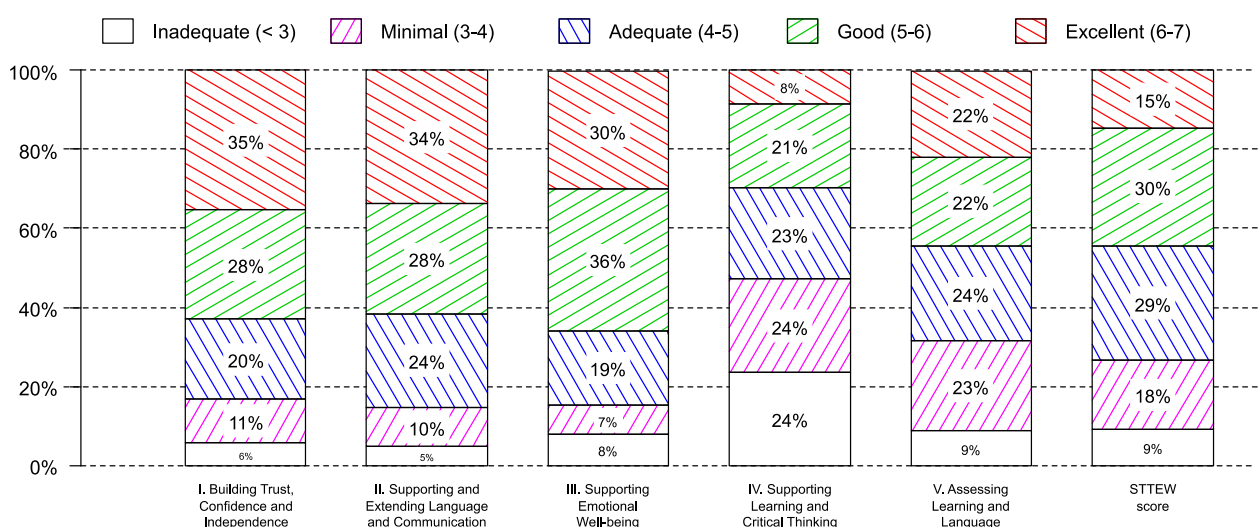
The means for the five SSTEW sub-scales were calculated. The lowest mean score was for the Supporting Learning and Critical Thinking sub-scale (mean = 3.98); the highest was for Supporting and Extending Language and Communication (mean = 5.16).

**Table 20: Means and standard deviations for SSTEW sub-scales.**

SSTEW sub-scales	Mean	SD
I. Building Trust, Confidence and Independence	5.12	1.28
II. Supporting and Extending Language and Communication	5.16	1.23
III. Supporting Emotional Well-being	4.79	1.31
IV. Supporting Learning and Critical Thinking	3.98	1.34
V. Assessing Learning and Language	4.47	1.35

Figure 11 depicts the distribution of the SSTEW scores classified into five levels of quality. These categories are: “inadequate ( $< 3$ )”, “minimal ( $\geq 3$  and  $< 4$ )”, “adequate ( $\geq 4$  and  $< 5$ )”, “good ( $\geq 5$  and  $< 6$ )” and “excellent ( $\geq 6$ )”.

**Figure 11: SSTEW sub-scales and overall average scores.**



The Supporting Learning and Critical Thinking sub-scale stands out, with a higher percentage of settings having minimal or inadequate performance on this sub-scale.

### 4.3 Process and structural quality by provider type in three-to four-year-old settings

A breakdown by type of the settings used by three- and four-year-olds is given in Table 17.

As with the two-year-old analyses, Local Authority Nurseries were omitted as the low numbers made analyses unreliable, and “Nursery Class” and “Nursery School” were merged into a single “Nursery class / school” category.

### 4.3.1 Comparing process quality and type of setting for three- to four-year-old settings

For each quality outcome three models were fitted:

1. Model of scores treated as a continuous variable in a linear regression model.
2. Model of whether scores were “excellent” (6 and above) as outcome in a logistic regression model.
3. Model of whether scores were “good or better” (5 and above) as outcome in a logistic regression model.

Private settings, the largest group, were used as the reference category. Results are shown in Table 21 (ECERS-R), Table 22 (ECERS-E) and Table 23 (SSTEWS).

**Table 21: Analysis of ECERS-R by setting type (three- and four-year-olds).**

Coefficient	N	Predictors of ECERS-R			Predictors of excellent ECERS-R			Predictors of good or better ECERS-R		
		Mean	Difference	p	%	OR	p	%	OR	p
Private	302	5.14			21.2%			57.0%		
Voluntary	143	5.12	-0.021	0.825	19.6%	0.91	0.695	55.2%	0.93	0.734
Children's Centre	26	5.72	+0.581	0.003 **	38.5%	2.32	0.048 *	84.6%	4.16	0.010 *
Nursery Class / School	123	5.68	+0.540	<0.001 ***	45.5%	3.11	<0.001 ***	80.5%	3.12	<0.001 ***

N = 594

Mean ECERS-R scores by group are shown with differences from the private group (reference category). Percentages of settings with “excellent” and “good or better” scores are shown with odds ratio (= OR) comparisons with the reference group. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

**Table 22: Analysis of ECERS-E by setting type (three- and four-year-olds).**

Coefficient	N	Predictors of ECERS-E			Predictors of excellent ECERS-E			Predictors of good or better ECERS-E		
		Mean	Difference	p	%	OR	p	%	OR	p
Private	302	4.03			3.3%			20.9%		
Voluntary	143	3.81	-0.220	0.040 *	2.8%	0.84	0.772	12.6%	0.55	0.037 *
Children's Centre	26	4.85	+0.821	<0.001 ***	15.4%	5.31	0.008 **	46.2%	3.25	0.005 **
Nursery Class / School	123	4.79	+0.759	<0.001 ***	12.2%	4.06	<0.001 ***	51.2%	3.98	<0.001 ***

N = 594

Mean ECERS-E scores by group are shown with differences from the private group (reference category). Percentages of settings with “excellent” and “good or better” scores are shown with odds ratio (= OR) comparisons with the reference group. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

**Table 23: Analysis of SSTEWS by setting type (three- and four-year-olds).**

Coefficient	N	Predictors of SSTEWS			Predictors of excellent SSTEWS			Predictors of good or better SSTEWS		
		Mean	Difference	p	%	OR	p	%	OR	p
Private	302	4.51			9.6%			37.4%		
Voluntary	143	4.51	+0.007	0.952	8.4%	0.86	0.680	35.7%	0.93	0.720
Children's Centre	26	5.34	+0.831	<0.001 ***	30.8%	4.18	0.002 **	69.2%	3.76	0.003 **
Nursery Class / School	123	5.26	+0.753	<0.001 ***	29.3%	3.90	<0.001 ***	65.0%	3.11	<0.001 ***

N = 594

Mean SSTEWS scores by group are shown with differences from the private group (reference category). Percentages of settings with “excellent” and “good or better” scores are shown with odds ratio (= OR) comparisons with the reference group. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Children’s centres and nursery classes / schools had significantly higher quality than the private settings (reference category) and were also more likely to achieve “excellent” and “good or better” scores.

Voluntary settings scored significantly lower than the private reference group on ECERS-E and were also less likely to achieve the “good or better” threshold on this scale.

The analysis was repeated controlling for the following structural characteristics of ECEC settings:

1. Whether setting is on single / multiple sites
2. Number of places at setting
3. Minimum age for children is two years
4. Maximum age for children
5. Staff to child ratio for two-year-olds
6. Overall staff to child ratio
7. Mean level of staff qualification
8. Whether there is SEN/D provision
9. Whether there is a training plan
10. Whether there is a training budget
11. Frequency of staff CPD
12. Frequency of staff supervision
13. Percentage of staff replaced in previous year

Results are in Table 24 (ECERS-R), Table 25 (ECERS-E) and Table 26 (SSTEWS).

**Table 24: Analysis of ECERS-R by setting type (three- and four-year-olds) controlling for structural characteristics.**

Coefficient	N	Predictors of ECERS-R		Predictors of excellent ECERS-R		Predictors of good or better ECERS-R	
		Beta	p	OR	p	OR	p
Private	302	(reference level)		(reference level)		(reference level)	
Voluntary	143	-0.050	0.645	0.77	0.392	0.91	0.720
Children's Centre	26	+0.460	0.020 *	1.88	0.190	3.27	0.043 *
Nursery Class / School	123	+0.467	<0.001 ***	2.31	0.020 *	3.30	0.002 **

N = 594

Effects of setting type on ECERS-R scores are shown relative to the private group (reference level). Models control for structural characteristics of childcare settings. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

**Table 25: Analysis of ECERS-E by setting type (three- and four-year-olds) controlling for structural characteristics.**

Coefficient	N	Predictors of ECERS-E		Predictors of excellent ECERS-E		Predictors of good or better ECERS-E	
		Beta	p	OR	p	OR	p
Private	302	(reference level)		(reference level)		(reference level)	
Voluntary	143	-0.261	0.034 *	1.18	0.802	0.60	0.128
Children's Centre	26	+0.559	0.013 *	4.55	0.041 *	2.45	0.056
Nursery Class / School	123	+0.632	<0.001 ***	3.85	0.050	4.55	<0.001 ***

N = 594

Effects of setting type on ECERS-E scores are shown relative to the private group (reference level). Models control for structural characteristics of childcare settings. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

**Table 26: Analysis of SSTEWS by setting type (three- and four-year-olds) controlling for structural characteristics.**

Coefficient	N	Predictors of SSTEWS		Predictors of excellent SSTEWS		Predictors of good or better SSTEWS	
		Beta	p	OR	p	OR	p
Private	302	(reference level)		(reference level)		(reference level)	
Voluntary	143	-0.093	0.464	0.79	0.568	0.90	0.667
Children's Centre	26	+0.611	0.009 **	2.92	0.047 *	3.11	0.018 *
Nursery Class / School	123	+0.539	0.001 **	2.79	0.018 *	2.80	0.002 **

N = 594

Effects of setting type on SSTEWS scores are shown relative to the private group (reference level). Models control for structural characteristics of childcare settings. The p-values are derived from regression models. Models are fitted to complete cases.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Comparison of Tables 21 to 23 with Tables 24 to 26 shows that the differences in quality between the different types of childcare settings are not wholly explained by differences in structural characteristics between settings types.

### 4.3.2 Comparing structural characteristics of settings by type of setting for three- to four-year-old settings

Analyses investigated whether there were any systematic variations in the structural characteristics of ECEC settings by settings type. There were comparisons of the means of continuous structural characteristics of ECEC settings by setting type using Wilcoxon rank sum tests. As the largest group, Private settings were used as the reference category. The results are shown in Table 27.

**Table 27: Difference in structural characteristics by settings type: continuous variables (three- and four-year-olds).**

Variable	Private	Voluntary		Nursery class / school		Children's Centre	
	Mean	Mean	p	Mean	p	Mean	p
Number of places	54.95	38.27	<0.001 ***	51.65	0.038 *	69.48	0.015 *
Minimum age of children	0.65	1.54	<0.001 ***	2.76	<0.001 ***	0.81	0.460
Maximum age of children	6.10	5.46	<0.001 ***	5.55	<0.001 ***	5.46	0.073
Ratio: children aged 3-4 per staff member	7.70	7.36	0.016 *	10.03	<0.001 ***	8.65	<0.001 ***
Overall ratio: children per staff member	4.33	4.34	0.760	10.08	<0.001 ***	4.89	0.589
Mean level of staff qualification	3.02	2.90	0.126	3.78	<0.001 ***	3.43	0.006 **
Manager's highest qualification	4.91	4.52	0.004 **	6.16	<0.001 ***	6.08	<0.001 ***
Frequency of CPD	4.39	3.63	0.011 *	6.10	<0.001 ***	8.50	<0.001 ***
Frequency of staff supervision	9.02	7.13	0.053	10.14	<0.001 ***	7.00	0.375
% staff replaced in last year	11.62	9.66	0.029 *	9.29	<0.001 ***	10.18	0.735
Group size	302	143		123		26	

N = 594

P-values are from non-parametric Wilcoxon tests for difference in means.

Significant p-values are marked: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Analyses compared the binary structural characteristics of childcare settings by settings type using chi-square tests for difference in proportions. "private settings" was used as the comparison group. The results are given in Table 28



**Table 28: Difference in structural characteristics by settings type: binary variables (three- and four-year-olds).**

Variable	Private	Voluntary		Nursery class / school		Children's Centre	
	%	%	p	%	p	%	p
Centre on single site	59.9	90.1	<0.001 ***	96.7	<0.001 ***	76.9	0.134
Has SEN provision	61.5	67.1	0.299	62.8	0.888	65.4	0.856
Has training plan	90.0	80.4	0.008 **	84.4	0.143	92.3	0.976
Has training budget	49.8	43.4	0.240	82.8	<0.001 ***	80.8	0.005 **
Group size	302	143		123		26	

N = 594

P-values are from tests for differences in proportions.

Significant p-values are marked: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

#### 4.3.2.1 Voluntary settings

Voluntary settings tend to be smaller than private settings and tend to accept a narrower age range of children. The managers at voluntary settings tend to be less highly qualified than those at private settings. The frequency of staff CPD and the rate of staff turnover tend to be lower at voluntary settings. Voluntary settings are more likely than private settings to be on a single site and they are less likely than private settings to have a training plan.

#### 4.3.2.2 Nursery classes / schools

Nursery classes / schools tend to be slightly smaller than private settings and they tend to have a narrow age range of children. They tend to have a lower staff to child ratio (i.e. more children per member of staff) and more highly qualified staff and managers. They tend to have higher frequencies of staff CPD and staff supervision and a lower rate of staff turnover. Nursery classes / schools are more likely to be on a single site than private settings; they are also more likely to have a training budget.

#### 4.3.2.3 Children's centres

Children's centres tend to be larger than private settings. They tend to have a lower staff to child ratio for three- and four-year-olds (i.e. more children per member of staff); but the overall staff to child ratio across the setting shows no difference from that at private settings. Children's centres tend to have more highly qualified managers and staff and to have a higher frequency of staff CPD. Finally, children's centres are more likely to have a training budget than are private settings.

## **4.4 Process quality and structural characteristics for three- to four-year-old settings**

### **4.4.1 Univariate analysis of process quality by structural characteristics for three- to four-year-old settings**

The scores on process quality from the ECERS-R, ECERS-E and SSTEW scales were analysed in terms of the following structural characteristics of settings:

1. Setting on single site / multiple sites
2. Number of places at setting
3. Minimum age of children
4. Maximum age of children
5. Staff to child ratio for three- and four-year-olds
6. Overall staff to child ratio
7. Mean level of staff qualification
8. Manager's highest qualification
9. SEN/D provision
10. Training plan in place
11. Training budget in place
12. Frequency of CPD
13. Frequency of staff supervision
14. Percentage of staff replaced in last year

For the binary variables, analyses compared the mean ECERS-R, ECERS-E and SSTEW scores for those with and without a given characteristic; see Table 29. For the continuous variables analyses measured the associations with the ECERS-R, ECERS-E and SSTEW process quality measures using Kendall's tau non-parametric correlation coefficient; see Table 30.

**Table 29: Comparison of ECERS-R, ECERS-E and SSTEW scores by binary structural characteristics.**

Process quality measure	Structural characteristic	Mean 1		Mean 2		p
ECERS-R	Setting on single / multiple sites	Single	5.29	Multiple	5.21	0.105
	SEN/D provision	No	5.22	Yes	5.31	0.317
	Training plan in place	No	5.01	Yes	5.31	0.004 **
	Training budget in place	No	5.12	Yes	5.39	<0.001 ***
ECERS-E	Setting on single / multiple sites	Single	4.20	Multiple	4.10	0.252
	SEN/D provision	No	4.05	Yes	4.26	0.035 *
	Training plan in place	No	3.84	Yes	4.22	0.007 **
	Training budget in place	No	3.98	Yes	4.32	<0.001 ***
SSTEW	Setting on single / multiple sites	Single	4.77	Multiple	4.50	0.009 **
	SEN/D provision	No	4.60	Yes	4.77	0.091
	Training plan in place	No	4.38	Yes	4.75	0.004 **
	Training budget in place	No	4.50	Yes	4.85	<0.001 ***

N = 594

The p-values are from a non-parametric Wilcoxon test for difference in means.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

**Table 30: Association of ECERS-R, ECERS-E and SSTEW scores with continuous structural characteristics.**

Process quality measure	Structural characteristic	Kendall's tau	p
ECERS-R	Number of places	+0.046	0.099
	Minimum age of children	+0.144	<0.001 ***
	Maximum age of children	-0.106	<0.001 ***
	Staff to child ratio for three- and four-year-olds	-0.053	0.092
	Overall staff to child ratio	-0.043	0.118
	Mean staff qualification	+0.163	<0.001 ***
	Manager's highest qualification	+0.164	<0.001 ***
	Frequency of CPD	+0.059	0.063
	Frequency of staff supervision	-0.061	0.040 *
	Percentage of staff replaced in last year	-0.064	0.030 *
ECERS-E	Number of places	+0.091	0.001 **
	Minimum age of children	+0.163	<0.001 ***
	Maximum age of children	-0.087	0.005 **
	Staff to child ratio for three- and four-year-olds	-0.105	<0.001 ***
	Overall staff to child ratio	-0.073	0.008 **
	Mean staff qualification	+0.160	<0.001 ***
	Manager's highest qualification	+0.177	<0.001 ***
	Frequency of CPD	+0.104	0.001 **
	Frequency of staff supervision	-0.054	0.071
	Percentage of staff replaced in last year	-0.055	0.064
SSTEW	Number of places	+0.031	0.266
	Minimum age of children	+0.180	<0.001 ***
	Maximum age of children	-0.088	0.005 **
	Staff to child ratio for three- and four-year-olds	-0.068	0.031 *
	Overall staff to child ratio	-0.064	0.021 *
	Mean staff qualification	+0.191	<0.001 ***
	Manager's highest qualification	+0.159	<0.001 ***
	Frequency of CPD	+0.069	0.030 *
	Frequency of staff supervision	-0.052	0.081
	Percentage of staff replaced in last year	-0.088	0.003 **

N = 594

Associations between the ECERS-R, ECERS-E and SSTEW process quality measures and the structural characteristics of settings are assessed using Kendal's tau, a non-parametric correlation coefficient. P-values indicate whether correlations are different from zero. The Kendall correlation coefficient is used rather than Pearson's because many structural characteristics are not distributed normally.

Significant p-values are marked \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

**Setting on single / multiple sites**

Settings on a single site had significantly higher SSTEWS scores than those on multiple sites.

**SEN/D provision**

Settings with SEN/D provision had significantly higher ECERS-E scores than those that did not.

**Training plan in place**

Settings with a staff training plan in place scored significantly higher on all three process quality scales than those that did not.

**Training budget in place**

Settings with a training budget also score significantly higher on all three process quality scales.

**Number of places**

There was a positive correlation between the number of places at settings and their ECERS-E scores.

**Minimum age of children**

The minimum age of children was positively correlated with scores on all three process quality scales (i.e. settings with a higher minimum age for children tended to score better than those with a lower minimum age for children).

**Maximum age of children**

The maximum age of children was negatively correlated with scores on all three process quality scales; i.e. settings with a lower maximum age for children tended to score better than those with a higher maximum age for children.

**Staff to child ratio**

The staff to child ratio for three- and four-year-olds and the overall staff to child ratio were negatively correlated with ECERS-E and SSTEWS scores; i.e. settings with a larger number of children per staff member tended to have higher process quality scores on these scales.

The analysis of quality by type of setting given in the previous section sheds some light on this unexpected finding. Nursery classes / schools tend to perform significantly better than private and voluntary settings on the process quality measures, but nursery classes / schools also tend to have significantly lower staff to child ratios than other settings. The negative correlations between the process quality measures and the staff to child ratios are therefore confounded by the effects of setting type.

**Mean level of staff qualification / manager's highest qualification**

The mean level of staff qualification and the manager's highest qualification were

positively correlated with all three process quality scales; i.e. settings with more highly qualified staff / managers tended to perform better.

#### **Frequency of CPD**

Frequency of CPD was positively correlated with ECERS-E and SSTEWS scores; i.e. settings with higher frequencies of CPD tended to perform better.

#### **Frequency of staff supervision**

Frequency of staff supervision was negatively correlated with ECERS-R scores; i.e. settings with higher frequencies of staff supervision tended to perform less well on this scale.

#### **Percentage of staff replaced in last year**

The percentage of staff replaced in the last year was negatively correlated with scores on the ECERS-R and SSTEWS scales; i.e. settings with a higher rate of staff turnover tended to perform less well on these scales.

### **4.4.2 Multivariate analysis of process quality by structural characteristics for three- to four-year-old settings**

#### **4.4.2.1 Introduction**

Multivariate analysis was carried out separately for:

1. Private settings
2. Voluntary settings
3. Nursery classes / schools
4. Children's centres

Multivariate analyses enable calculations of the effect of a variable allowing for the effects of all the other variables in the analysis. Models of process quality outcomes were fitted in terms of the following structural characteristics:

1. Setting on single site / multiple sites
2. Number of places
3. Minimum age of children is two years vs. younger
4. Maximum age of children
5. Staff to child ratio for three- and four-year-olds
6. Overall staff to child ratio
7. Mean level of staff qualification
8. SEN/D provision
9. Training plan in place
10. Training budget in place
11. Frequency of CPD
12. Frequency of staff supervision
13. Percentage of staff replaced in last year

Manager's highest qualification was omitted from the models because of the possibility that collinearity with mean level of staff qualification would make results difficult to interpret. Analyses were of ECERS-R, ECERS-E and SSTEWS scores. Three models were fitted for each outcome:

1. Scores treated as a continuous variable in a linear regression model,
2. Whether scores were "excellent" (6 and above) or not as the outcome in a logistic regression model and
3. Whether scores were "good or better" (5 and above) or not as the outcome in a logistic regression model.

For clarity, only statistically significant model coefficients are reported.

#### 4.4.2.2 Models for private settings

Results are given in Table 31 (ECERS-R), Table 32 (ECERS-E) and Table 33 (SSTEWS).

**Table 31: Analysis of ECERS-R by characteristics of settings, private settings (three- and four-year-olds).**

Coefficient	Model 1: Predictors of ECERS-R		Model 2: Predictors of excellent ECERS-R		Model 3: Predictors of good or better ECERS-R	
	Beta	p	OR	p	OR	p
Number of places	+0.335	0.017 *			1.91	0.041 *
Minimum age of children is 2 vs. 0-1	+0.296	0.043 *				
Overall staff to child ratio					2.03	0.034 *
Mean level of staff qualification	+0.635	<0.001 ***	3.78	0.003 **	3.00	0.002 **
Frequency of CPD			0.45	0.049 *		

N = 302

Model coefficients are shown if they were significantly different from zero at the  $p < 0.05$  level. Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models for private settings.

**Table 32: Analysis of ECERS-E by characteristics of settings, private settings (three- and four-year-olds).**

Coefficient	Model 1: Predictors of ECERS-E		Model 2: Predictors of excellent ECERS-E		Model 3: Predictors of good or better ECERS-E	
	Beta	p	OR	p	OR	p
Number of places	+0.613	<0.001 ***	5.93	0.042 *	3.64	<0.001 ***
Minimum age of children is 2 vs. 0-1	+0.476	0.003 **			2.79	0.010 *
Mean level of staff qualification	+0.630	<0.001 ***				
SEN/D provision	+0.338	0.011 *				

N = 302

Model coefficients are shown if they were significantly different from zero at the  $p < 0.05$  level. (Where no model coefficient reached the  $p < 0.05$  level of significance, coefficients are shown if they were significant at the 0.1 level.) Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models for private settings.

**Table 33: Analysis of SSTEWS by characteristics of settings, private settings (three- and four-year-olds).**

Coefficient	Model 1: Predictors of SSTEWS		Model 2: Predictors of excellent SSTEWS		Model 3: Predictors of good or better SSTEWS	
	Beta	p	OR	p	OR	p
Number of places	+0.400	0.014 *	2.92	0.047 *	2.09	0.023 *
Minimum age of children is 2 vs. 0-1	+0.460	0.007 **			2.01	0.034 *
Overall staff to child ratio			3.14	0.048 *		
Mean level of staff qualification	+0.723	<0.001 ***			3.15	0.002 **

N = 302

Model coefficients are shown if they were significantly different from zero at the  $p < 0.05$  level. Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models for private settings.

### Number of places

Larger private settings tended to have higher scores on the ECERS-R, ECERS-E and SSTEWS scales. They were also more likely to achieve good or better scores on these scales and more likely to achieve excellent ECERS-E and SSTEWS scores.

### Minimum age of children is 2 vs. 0-1

Private settings with a minimum age of 2 tended to have higher scores on the ECERS-R, ECERS-E and SSTEWS scales. Such settings were also more likely to achieve good or better scores on the ECERS-E and SSTEWS scales.



### Overall staff to child ratio

Where there was a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting) settings were more likely to achieve good or better ECERS-R scores and more likely to achieve excellent SSTEW scores.

### Mean level of staff qualification

Settings with a higher mean level of staff qualification tended to score more highly on the ECERS-R, ECERS-E and SSTEW scales. Such settings were more likely to achieve good or better and excellent ECERS-R scores and more likely to achieve good or better SSTEW scores.

### SEN/D provision

Settings with SEN/D provision tended to have higher ECERS-E scores.

### Frequency of CPD

Settings with a higher frequency of staff CPD were less likely to achieve excellent scores on the ECERS-R scale. This may be an instance of reverse causation, i.e. a higher frequency of staff CPD is not causing quality to fall; rather settings with relatively poor scores may have increased the frequency of staff CPD in an effort to improve quality.

#### 4.4.2.3 Voluntary settings

Results are given in Table 34 (ECERS-R), Table 35 (ECERS-E) and Table 36 (SSTEW).

**Table 34: Analysis of ECERS-R by characteristics of settings, voluntary settings (three- and four-year-olds).**

Coefficient	Model 1: Predictors of ECERS-R		Model 2: Predictors of excellent ECERS-R		Model 3: Predictors of good or better ECERS-R	
	Beta	p	OR	p	OR	p
Overall staff to child ratio	+0.452	0.049 *				
SEN/D provision			0.22	0.005 **		
Training plan in place	+0.537	0.018 *				

N = 143

Model coefficients are shown if they were significantly different from zero at the  $p < 0.05$  level. Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models for voluntary settings.

**Table 35: Analysis of ECERS-E by characteristics of settings, voluntary settings (three- and four-year-olds).**

Coefficient	Model 1: Predictors of ECERS-E		Model 2: Predictors of excellent ECERS-E		Model 3: Predictors of good or better ECERS-E	
	Beta	p	OR	p	OR	p
Minimum age of children is 2 vs. 0-1					0.12	0.020 *
Staff to child ratio for 3- to 4-year olds	+0.386	0.050 *			4.50	0.006 **

= 143

Model coefficients are shown if they were significantly different from zero at the  $p < 0.05$  level. (Where no model coefficient reached the  $p < 0.05$  level of significance, coefficients are shown if they were significant at the 0.1 level.) Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models for voluntary settings.

**Table 36: Analysis of SSTEWS by characteristics of settings, voluntary settings (three- and four-year-olds).**

Coefficient	Model 1: Predictors of SSTEWS		Model 2: Predictors of excellent SSTEWS		Model 3: Predictors of good or better SSTEWS	
	Beta	p	OR	p	OR	p
Training plan in place	+0.620	0.024 *			7.58	0.004 **

N = 143

Model coefficients are shown if they were significantly different from zero at the  $p < 0.05$  level. Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Models for voluntary settings.

### **Minimum age of children is two vs. zero to one**

Voluntary settings where the minimum age for children was two were less likely to achieve good or better ECERS-E scores than voluntary settings with a minimum age of zero or one.

### **Staff to child ratio for three- to four-year-olds**

A higher staff to child ratio for three- to four-year olds (i.e. fewer children aged three to four per member of staff supervising this age group) was associated with higher ECERS-E scores and an increased chance of achieving good or better ECERS-E scores.

### **Overall staff to child ratio**

A higher overall staff to child ratio (i.e. fewer children per member of staff across the

whole setting) was associated with settings achieving higher scores on the ECERS-R scale.

### **SEN/D provision**

Settings with SEN/D provision were less likely to achieve excellent ECERS-R scores than other settings.

### **Training plan in place**

Settings with a training plan in place tended to achieve higher scores on the ECERS-R and SSTEW scales and were also more likely to achieve good or better SSTEW scores.

#### **4.4.2.4 Models for nursery classes / schools**

The process quality outcomes were analysed separately for Nursery schools / classes. Because of the small sample size available for this group of settings, it was not possible to fit additional binary models for “excellent” and “good or better” scores. Results are given in Table 37.

**Table 37: Analyses of ECERS-R, ECERS-E and SSTEW scores by characteristics of nursery classes / schools (three- and four-year-olds).**

Structural characteristics	Predictors of ECERS-R		Predictors of ECERS-E		Predictors of SSTEW	
	Beta	p	Beta	p	Beta	p
Maximum age of children	-	0.015	-0.431	0.009		
Training budget in place			+0.573	0.046 *	+0.613	0.024
Percentage of staff replaced in last					-0.307	0.045

N = 123

Model coefficients are shown if they were significantly different from zero at the  $p < 0.05$  level. Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

Nursery classes / schools with a lower maximum age for children tended to achieve higher ECERS-R scores. A lower maximum age for children and having a training budget in place were predictive of higher ECERS-E scores. Having a training budget in place and a lower rate of staff turnover were predictive of higher SSTEW scores.

#### 4.4.2.5 Models for children's centres

Finally, regression models were fitted for the process quality measures for Children's Centres (Table 38).

**Table 38: Analyses of ECERS-R, ECERS-E and SSTEW by characteristics of children's centres (three- and four-year-olds).**

Structural characteristic	Predictors of ECERS-R		Predictors of ECERS-E		Predictors of SSTEW	
	Beta	p	Beta	p	Beta	p
Mean level of staff qualification	+0.892	0.026 *	+0.903	0.110	+1.122	0.061

N = 26

Models are fitted to complete cases.

Significance levels are indicated by stars: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

OR = odds ratio.

A higher mean level of staff qualification was the best predictor of better ECERS-R, ECERS-E and SSTEW scores, but was statistically significant for ECERS-R scores only.

## 4.5 Differences between quality of provision for two-year-olds and for three- and four-year-olds

Analyses investigated whether the quality of settings differed for settings used by two-year-olds and settings used by three- and four-year-olds using the SSTEW process quality measure, which is common to all settings in the study.

**Table 39: Comparisons of mean SSTEW, mean level of manager's qualification and mean level of staff qualification between settings for two-year-olds and settings for three- and four-year-olds.**

Variable	Age 2 settings	Age 3-4 settings	p-value from t-test for difference in means
SSTEW	4.49	4.70	0.0045 **
Manager's highest level qualification	4.93	5.11	0.039 *
Mean level of staff qualification	3.04	3.12	0.0046 **

Significant p-values are marked: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$

Mean SSTEW scores were slightly but significantly higher at the settings for three- and four-year-olds, see Table 39.

A possible explanation for this is the higher levels of staff and manager qualifications at the three- to four-year-old settings than at the settings for two-year-olds (Table 39).

In a model controlling for staff and manager's qualifications, the difference between two-year-old and three- to four-year-old settings was  $\beta = 0.16$ ,  $p = 0.030$ . We conclude that

the difference between SSTEW quality at the settings for the two age groups is not entirely explained by the difference in level of staff / manager qualifications.

## **5 Chapter 5: Comparing quality by region, setting type, area deprivation and era**

### **5.1 Introduction**

Analysis investigated whether the quality of settings varied according to:

- Government Office Region
- Index of Multiple Deprivation (IMD)
- Change over time (using data from the Effective Provision of Pre-School Education (EPPE) Project in 1998-1999).

### **5.2 Procedure for region, type and IMD comparisons**

The analyses used the official classification of Government Office Region as used by the Office of National Statistics as follows:

1. North East
2. North West
3. Yorkshire and the Humber
4. East Midlands
5. West Midlands
6. East of England
7. London
8. South East
9. South West

Settings were divided into the following types:

1. Private
2. Voluntary
3. Children's Centre
4. Local Authority Nursery
5. Nursery Class
6. Nursery School

The small number of Local Authority Nurseries were omitted and the Nursery classes and Nursery schools were merged into a single Nursery class / school category.

Based on the setting's postcode the Index of Multiple Deprivation (IMD) for the area was measured. The IMD is a measure of area deprivation that uses data on people's income, employment, health and disability, education, skills and training, barriers to housing and services, living environment, and crime, to produce a measure of overall deprivation for an area. The IMD was analysed by quintile.

The process quality measures were analysed by region, setting type and IMD in two ways:

1. Mean quality measures for each type of setting.
2. Analysis of quality measures by type of setting, controlling for structural characteristics of settings.

Analysis also examined settings type by region.

## 5.3 Region

### 5.3.1 Results

Setting quality varied by region.

For settings for two-year-old children, there were differences between regions on ITERS-R quality, a measure of overall quality specifically for under-threes (see Table 40). Scores were highest in the North West, South East and South West and lowest in the North East. There were no statistically significant regional differences in SSTEWS, a measure of quality of interactions between staff and children.

For settings for three- and four-year-old children, there were differences in quality on all three quality measures (see Table 41). In contrast to the results for settings for two-year-olds, the North East was here among the best performing regions, with the poorest quality scores found in the East of England and in Yorkshire and the Humber.

**Table 40: Analysis of ITERS-R and SSTEWS scores by region; settings for two-year-olds.**

Region	N	%	ITERS-R		SSTEWS	
			Mean score	Coefficients from controlled linear model	Mean score	Coefficients from controlled linear model
North East	25	6.8	4.55	(reference level)	4.29	(reference level)
North West	42	11.4	5.45	+0.759 **	4.82	+0.353
Yorkshire and the Humber	52	14.2	5.13	+0.381	4.52	+0.004
East Midlands	15	4.1	5.34	+0.679 *	4.75	+0.397
West Midlands	45	12.3	5.10	+0.288	4.22	-0.388
East of England	38	10.4	5.17	+0.424	4.23	-0.246
London	43	11.7	5.27	+0.553 *	4.41	-0.013
South East	75	20.4	5.44	+0.729 **	4.54	+0.103
South West	32	8.7	5.60	+0.865 **	4.90	+0.377
TOTAL	367	100.0	5.26		4.50	

Linear model coefficients which are significantly different from zero are marked with stars:

Significant p-values are marked: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Models are fitted to complete cases.

**Table 41: Analysis of ECERS-R, ECERS-E and SSTEW scores by region; settings for three- and four-year-olds.**

Region	N	%	ECERS-R		ECERS-E		SSTEW	
			Mean score	Coefficients from controlled linear model	Mean score	Coefficients from controlled linear model	Mean score	Coefficients from controlled linear model
North East	56	9.5	5.47	(reference level)	5.06	(reference level)	5.33	(reference level)
North West	55	9.3	5.27	-0.049	4.41	-0.450 *	4.80	-0.343
Yorkshire and the Humber	57	9.7	4.93	-0.412 *	3.97	-0.961 ***	4.42	-0.799 ***
East Midlands	14	2.4	5.33	-0.036	4.32	-0.576	4.84	-0.365
West Midlands	83	14.1	5.51	+0.181	4.27	-0.630 ***	4.95	-0.244
East of England	40	6.8	4.92	-0.450 *	3.45	-1.434 ***	4.08	-1.113 ***
London	106	18.0	5.17	-0.042	4.04	-0.785 ***	4.41	-0.615 **
South East	109	18.5	5.27	-0.060	3.99	-0.840 ***	4.64	-0.515 **
South West	70	11.9	5.49	+0.184	4.26	-0.576 **	4.96	-0.157
TOTAL	590	100.0	5.28		4.18		4.71	

Linear model coefficients which are significantly different from zero are marked with stars:

Significant p-values are marked: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Models are fitted to complete cases.

### 5.3.2 Association between region and type of setting

In chapters 3 and 4 analyses of process quality measures by type of setting are shown in Tables 5-8 (settings for two-year-olds) and Tables 21-26 (settings for three- and four-year-olds). These analyses show that all process quality measures tend to be higher in Nursery classes / schools and Children's Centres than in Private and Voluntary settings.

The distribution of types of setting varies considerably by region of the country; see Table 42 (settings for two-year-olds) and Table 43 (settings for three- and four-year-olds).

These variations between regions by type of setting offer some explanation for the North East having the poorest mean quality of settings for children at age two whilst being among the best performing regions for settings for children at age three and four years. For two-year-olds the North East has the highest proportion of Private settings of any region (84.0%). Private settings tend, on average, to perform less well on process quality



measures than other types of setting. However, for three- and four-year-olds the North East has the lowest proportion of Private settings of any region (41.1%) and the highest proportions of Children's Centres (8.9%) and settings in the Nursery class / school cluster (39.3%). These latter two types of childcare settings are among the best performing for quality measures.

**Table 42: Cross tabulation of setting type by region; settings for two-year-olds.**

Region	Private		Voluntary		Children's Centre		Nursery class / school	
	N	Row %	N	Row %	N	Row %	N	Row %
North East	21	87.5	2	8.3	1	4.2	0	0.0
North West	31	73.8	8	19.0	2	4.8	1	2.4
Yorkshire and the Humber	32	62.7	12	23.5	5	9.8	2	3.9
East Midlands	10	71.4	4	28.6	0	0.0	0	0.0
West Midlands	28	63.6	10	22.7	4	9.1	2	4.5
East of England	24	63.2	12	31.6	2	5.3	0	0.0
London	26	61.9	10	23.8	6	14.3	0	0.0
South East	45	61.6	25	34.2	2	2.7	1	1.4
South West	18	56.2	11	34.4	2	6.2	1	3.1
TOTAL	235	65.3	94	26.1	24	6.7	7	1.9

**Table 43: Cross tabulation of setting type by region; settings for three- and four-year-olds.**

Region	Private		Voluntary		Children's Centre		Nursery class / school	
	N	Row	N	Row	N	Row %	N	Row %
North East	23	41.8	6	10.9	5	9.1	21	38.2
North West	29	52.7	17	30.9	1	1.8	8	14.5
Yorkshire and the Humber	32	56.1	6	10.5	2	3.5	17	29.8
East Midlands	6	46.2	5	38.5	0	0.0	2	15.4
West Midlands	42	50.6	20	24.1	2	2.4	19	22.9
East of England	22	55.0	14	35.0	1	2.5	3	7.5
London	51	48.1	14	13.2	7	6.6	34	32.1
South East	56	52.3	34	31.8	2	1.9	15	14.0
South West	36	51.4	25	35.7	5	7.1	4	5.7
TOTAL	297	50.7	141	24.1	25	4.3	123	21.0

### 5.3.3 Models of quality in terms of region controlling for type and structural characteristics of settings

In order to test the hypothesis that regional differences were explained by differences in the proportion of types of setting between regions we fitted models of quality by region controlling for setting type and structural characteristics. Results are given in Tables 44 to 48.

**Table 44: Models of two-year-old ITERS-R in terms of region.**

Two-year-old ITERS-R							
Region	N	%	Mean	Uncontrolled model	Controlling for type	Controlling for covariates	Controlling for type and covariates
South East	75	20.4	5.44	(ref. level)	(ref. level)	(ref. level)	(ref. level)
Yorkshire and the Humber	52	14.2	5.13	-0.315	-0.338	-0.349	-0.357
West Midlands	45	12.3	5.10	-0.337	-0.375 *	-0.442 *	-0.453 *
London	43	11.7	5.27	-0.172	-0.223	-0.176	-0.211
North West	42	11.4	5.45	+0.009	+0.019	+0.029	+0.034
East of England	38	10.4	5.17	-0.268	-0.269	-0.306	-0.303
South West	32	8.7	5.60	+0.158	+0.144	+0.135	+0.129
North East	25	6.8	4.55	-0.891 ***	-0.951 ***	-0.729 **	-0.838 **
East Midlands	15	4.1	5.34	-0.100	-0.144	-0.050	-0.109
All regions	367	100.0	5.26				

**Table 45: Models of two-year-old SSTEW in terms of region.**

Two-year-old SSTEW							
Region	N	%	Mean	Uncontrolled model	Controlling for type	Controlling for covariates	Controlling for type and covariates
South East	75	20.4	4.54	(ref. level)	(ref. level)	(ref. level)	(ref. level)
Yorkshire and the Humber	52	14.2	4.52	-0.021	-0.047	-0.099	-0.124
West Midlands	45	12.3	4.22	-0.321	-0.366	-0.491 *	-0.529 *
London	43	11.7	4.41	-0.131	-0.192	-0.116	-0.194
North West	42	11.4	4.82	+0.280	+0.275	+0.251	+0.225
East of England	38	10.4	4.23	-0.308	-0.326	-0.349	-0.368
South West	32	8.7	4.90	+0.366	+0.343	+0.275	+0.252
North East	25	6.8	4.29	-0.250	-0.332	-0.103	-0.264
East Midlands	15	4.1	4.75	+0.208	+0.153	+0.294	+0.275
All regions	367	100.0	4.50				

**Table 46: Models of three- to four-year-old ECERS-R in terms of region.**

Three- to four-year-old ECERS-R							
Region	N	%	Mean	Uncontrolled model	Controlling for type	Controlling for covariates	Controlling for type and covariates
South East	109	18.5	5.27	(ref. level)	(ref. level)	(ref. level)	(ref. level)
Yorkshire and the Humber	57	9.7	4.93	-0.338 *	-0.447 **	-0.290	-0.368 *
West Midlands	83	14.1	5.51	+0.239	+0.187	+0.261	+0.249
London	106	18.0	5.17	-0.099	-0.237	+0.066	-0.018
North West	55	9.3	5.27	+0.004	+0.009	+0.063	+0.041
East of England	40	6.8	4.92	-0.351 *	-0.304	-0.375 *	-0.341 *
South West	70	11.9	5.49	+0.224	+0.254	+0.230	+0.263
North East	56	9.5	5.47	+0.198	-0.012	+0.163	+0.038
East Midlands	14	2.4	5.33	+0.058	+0.042	+0.058	-0.006
All regions	590	100.0	5.28				

**Table 47: Models of three- to four-year-old ECERS-E in terms of region.**

Three- to four-year-old ECERS-E							
Region	N	%	Mean	Uncontrolled model	Controlling for type	Controlling for covariates	Controlling for type and covariates
South East	109	18.5	3.99	(ref. level)	(ref. level)	(ref. level)	(ref. level)
Yorkshire and the Humber	57	9.7	3.97	-0.021	-0.187	-0.044	-0.166
West Midlands	83	14.1	4.27	+0.285	+0.210	+0.236	+0.213
London	106	18.0	4.04	+0.048	-0.151	+0.116	-0.010
North West	55	9.3	4.41	+0.422 *	+0.427 *	+0.457 **	+0.438 *
East of England	40	6.8	3.45	-0.538 **	-0.478 *	-0.574 **	-0.538 **
South West	70	11.9	4.26	+0.273	+0.314 *	+0.247	+0.289
North East	56	9.5	5.06	+1.075 ***	+0.787 ***	+0.969 ***	+0.805 ***
East Midlands	14	2.4	4.32	+0.333	+0.334	+0.307	+0.236
All regions	590	100.0	4.18				

**Table 48: Models of three- to four-year-old SSTEWS in terms of region.**

Three- to four-year-old SSTEWS							
Region	N	%	Mean	Uncontrolled model	Controlling for type	Controlling for covariates	Controlling for type and covariates
South East	109	18.5	4.64	(ref. level)	(ref. level)	(ref. level)	(ref. level)
Yorkshire and the Humber	57	9.7	4.42	-0.224	-0.362 *	-0.219	-0.316
West Midlands	83	14.1	4.95	+0.304	+0.234	+0.293	+0.274
London	106	18.0	4.41	-0.232	-0.411 **	-0.049	-0.155
North West	55	9.3	4.80	+0.154	+0.156	+0.228	+0.201
East of England	40	6.8	4.08	-0.558 **	-0.505 *	-0.582 **	-0.550 **
South West	70	11.9	4.96	+0.319	+0.350 *	+0.343 *	+0.371 *
North East	56	9.5	5.33	+0.691 ***	+0.423 *	+0.624 **	+0.477 *
East Midlands	14	2.4	4.84	+0.199	+0.165	+0.186	+0.131
All regions	590	100.0	4.71				

We see that regional differences remain even in the models controlling for type and for structural characteristics.

### 5.3.4 Further investigation of regional differences in quality

To investigate these differences further, we fitted models of quality in terms of region for each major type of settings.

At two years old:

- Private Settings
- Voluntary Settings

At three to four years old:

- Private Settings
- Voluntary Settings
- Nursery Classes / Schools

Two models were fitted in each case, one uncontrolled models and one controlling for structural covariates.

Results are given in Tables 49 to 61.

**Table 49: Models of two-year-old ITERS-R in terms of region; private settings.**

<b>ITERS-R ; Private</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	45	19.1	5.47	(reference level)	(reference level)
Yorkshire and the Humber	32	13.6	4.86	-0.609 **	-0.568 *
West Midlands	28	11.9	5.02	-0.442	-0.492
London	26	11.1	5.09	-0.381	-0.317
North West	31	13.2	5.51	+0.047	+0.033
East of England	24	10.2	5.02	-0.446	-0.480
South West	18	7.7	5.48	+0.015	+0.183
North East	21	8.9	4.55	-0.914 ***	-0.801 **
East Midlands	10	4.3	5.45	-0.021	+0.031
All regions	235	100.0%	5.17		

**Table 50: Models of two-year-old SSTEW in terms of region; private settings.**

<b>SSTEW ; Private</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	45	19.1	4.57	(reference level)	(reference level)
Yorkshire and the Humber	32	13.6	4.25	-0.313	-0.312
West Midlands	28	11.9	4.23	-0.341	-0.435
London	26	11.1	4.18	-0.390	-0.305
North West	31	13.2	4.95	+0.380	+0.277
East of England	24	10.2	4.10	-0.470	-0.518
South West	18	7.7	4.71	+0.140	+0.228
North East	21	8.9	4.28	-0.282	-0.181
East Midlands	10	4.3	5.03	+0.463	+0.751
All regions	235	100.0%	4.45		

**Table 51: Models of two-year-old ITERS-R in terms of region; voluntary settings.**

<b>ITERS-R ; Voluntary</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	25	26.6	5.44	(reference level)	(reference level)
Yorkshire and the Humber	12	12.8	5.58	+0.138	-0.023
West Midlands	10	10.6	5.41	-0.030	-0.107
London	10	10.6	5.63	+0.194	+0.360
North West	8	8.5	4.90	-0.539	-0.234
East of England	12	12.8	5.41	-0.026	+0.085
South West	11	11.7	5.47	+0.034	+0.183
North East	2	2.1	2.97	-2.469 ***	-2.515 **
East Midlands	4	4.3	4.85	-0.584	-0.616
All regions	94	100.0%	5.35		

**Table 52: Models of two-year-old SSTEW in terms of region; voluntary settings.**

<b>SSTEW ; Voluntary</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	25	26.6	4.61	(reference level)	(reference level)
Yorkshire and the Humber	12	12.8	5.00	+0.395	+0.221
West Midlands	10	10.6	4.47	-0.132	-0.275
London	10	10.6	5.04	+0.437	+0.586
North West	8	8.5	4.13	-0.480	-0.280
East of England	12	12.8	4.47	-0.134	+0.014
South West	11	11.7	4.72	+0.113	+0.376
North East	2	2.1	2.62	-1.982 **	-2.159 *
East Midlands	4	4.3	3.86	-0.748	-0.624
All regions	94	100.0%	4.57		

**Table 53: Models of three- to four-year-old ECERS-R in terms of region; private settings.**

<b>ECERS-R ; Private</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	56	18.9	5.25	(reference level)	(reference level)
Yorkshire and the Humber	32	10.8	4.58	-0.671 **	-0.730 ***
West Midlands	42	14.1	5.60	+0.349	+0.250
London	51	17.2	4.87	-0.383 *	-0.244
North West	29	9.8	5.20	-0.051	-0.157
East of England	22	7.4	4.72	-0.535 *	-0.557 *
South West	36	12.1	5.41	+0.154	+0.141
North East	23	7.7	5.26	+0.007	-0.111
East Midlands	6	2.0	5.32	+0.069	+0.027
All regions	297	100.0%	5.14		

**Table 54: Models of three- to four-year-old ECERS-E in terms of region; private settings.**

<b>ECERS-E ; Private</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	56	18.9	3.99	(reference level)	(reference level)
Yorkshire and the Humber	32	10.8	3.48	-0.510 *	-0.595 *
West Midlands	42	14.1	4.32	+0.327	+0.168
London	51	17.2	3.69	-0.299	-0.189
North West	29	9.8	4.46	+0.472 *	+0.337
East of England	22	7.4	3.38	-0.611 *	-0.640 *
South West	36	12.1	4.24	+0.251	+0.279
North East	23	7.7	4.75	+0.753 **	+0.625 *
East Midlands	6	2.0	4.58	+0.586	+0.461
All regions	297	100.0%	4.03		

**Table 55: Models of three- to four-year-old SSTEW in terms of region; private settings.**

<b>SSTEW ; Private</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	56	18.9	4.70	(reference level)	(reference level)
Yorkshire and the Humber	32	10.8	3.98	-0.722 **	-0.825 **
West Midlands	42	14.1	4.88	+0.174	+0.059
London	51	17.2	4.06	-0.639 **	-0.518 *
North West	29	9.8	4.67	-0.031	-0.117
East of England	22	7.4	3.86	-0.845 **	-0.919 **
South West	36	12.1	4.81	+0.102	+0.120
North East	23	7.7	4.97	+0.271	+0.177
East Midlands	6	2.0	4.67	-0.037	-0.048
All regions	297	100.0%	4.51		

**Table 56: Models of three- to four-year-old ECERS-R in terms of region; voluntary settings.**

<b>ECERS-R ; Voluntary</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	34	24.1	5.10	(reference level)	(reference level)
Yorkshire and the Humber	6	4.3	5.05	-0.057	+0.077
West Midlands	20	14.2	5.18	+0.078	+0.199
London	14	9.9	5.10	0.000	+0.122
North West	17	12.1	5.22	+0.115	+0.339
East of England	14	9.9	5.11	+0.007	-0.091
South West	25	17.7	5.34	+0.237	+0.363
North East	6	4.3	3.83	-1.273 **	-0.949 *
East Midlands	5	3.5	5.11	+0.005	+0.181
All regions	141	100.0%	5.12		

**Table 57: Models of three- to four-year-old ECERS-E in terms of region; voluntary settings.**

<b>ECERS-E ; Voluntary</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	34	24.1	3.66	(reference level)	(reference level)
Yorkshire and the Humber	6	4.3	4.35	+0.689	+0.664
West Midlands	20	14.2	3.85	+0.196	+0.354
London	14	9.9	3.82	+0.161	+0.147
North West	17	12.1	4.13	+0.476	+0.748 *
East of England	14	9.9	3.55	-0.112	-0.208
South West	25	17.7	3.91	+0.253	+0.337
North East	6	4.3	3.50	-0.158	+0.073
East Midlands	5	3.5	3.58	-0.080	+0.154
All regions	141	100.0%	3.81		

**Table 58: Models of three- to four-year-old SSTEWS in terms of region; voluntary settings.**

<b>SSTEWS ; Voluntary</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	34	24.1	4.32	(reference level)	(reference level)
Yorkshire and the Humber	6	4.3	4.72	+0.399	+0.502
West Midlands	20	14.2	4.55	+0.229	+0.317
London	14	9.9	4.37	+0.051	+0.219
North West	17	12.1	4.74	+0.413	+0.605
East of England	14	9.9	4.40	+0.077	+0.065
South West	25	17.7	4.83	+0.506	+0.681 *
North East	6	4.3	3.70	-0.626	-0.439
East Midlands	5	3.5	4.85	+0.527	+0.679
All regions	141	100.0%	4.52		

**Table 59: Models of three- to four-year-old ECERS-R in terms of region; nursery classes / schools.**

<b>ECERS-R ; Nursery Class / School</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	15	12.2	5.76	(reference level)	(reference level)
Yorkshire and the Humber	17	13.8	5.48	-0.279	-0.136
West Midlands	19	15.4	5.63	-0.128	+0.109
London	34	27.6	5.49	-0.272	+0.022
North West	8	6.5	5.72	-0.039	-0.001
East of England	3	2.4	5.71	-0.049	-0.175
South West	4	3.3	5.99	+0.225	+0.677
North East	21	17.1	6.05	+0.290	+0.474
East Midlands	2	1.6	5.68	-0.081	-0.793
All regions	123	100.0%	5.68		

**Table 60: Models of three- to four-year old ECERS-E in terms of region; nursery classes / schools.**

<b>ECERS-E ; Nursery Class / School</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	15	12.2	4.75	(reference level)	(reference level)
Yorkshire and the Humber	17	13.8	4.68	-0.067	-0.248
West Midlands	19	15.4	4.55	-0.196	-0.166
London	34	27.6	4.45	-0.297	-0.103
North West	8	6.5	4.89	+0.142	+0.187
East of England	3	2.4	3.76	-0.991	-1.249 *
South West	4	3.3	5.23	+0.479	+0.893
North East	21	17.1	5.66	+0.906 **	+0.892 **
East Midlands	2	1.6	5.22	+0.472	-0.341
All regions	123	100.0%	4.79		



**Table 61: Models of three- to four-year-old SSTEWS in terms of region; nursery classes / schools.**

<b>SSTEWS ; Nursery Class / School</b>					
<b>Region</b>	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>Uncontrolled model</b>	<b>Controlling for covariates</b>
South East	15	12.2	5.26	(reference level)	(reference level)
Yorkshire and the Humber	17	13.8	5.14	-0.126	-0.048
West Midlands	19	15.4	5.41	+0.151	+0.470
London	34	27.6	4.75	-0.508	-0.132
North West	8	6.5	5.47	+0.209	+0.326
East of England	3	2.4	4.61	-0.657	-1.040
South West	4	3.3	5.41	+0.150	+0.291
North East	21	17.1	6.03	+0.768 *	+0.849 **
East Midlands	2	1.6	5.04	-0.221	-0.886
All regions	123	100.0%	5.26		

### **Two-year-olds; private settings**

Private settings in Yorkshire and the Humber and in the North East have significantly lower ITERS-R scores than the reference group (Table 49); even once structural covariates have been controlled for. There were no significant regional differences in SSTEWS (Table 50).

### **Two-year-olds; voluntary settings**

Voluntary settings in the North East were of significantly lower quality than the reference group in both ITERS-R (Table 51) and SSTEWS (Table 52). Note that there were only 2 voluntary settings in the North East in the sample.

### **Three- to four-year-olds; private settings**

Private settings in the Yorkshire and the Humber and in the East of England were of poorer quality than those in the reference group (the South East) on all three measures of quality (Tables 53 to 55). Private settings in London were poorer on the SSTEWS measure (Table 55).

Private settings in the North East were of higher quality than the reference group on the ECERS-E scale (Table 54).

### **Three- to four-year-olds; voluntary settings**

Voluntary settings in the North East showed poorer quality on the ECERS-R scale than the reference group (Table 56). Note that there were only 6 voluntary settings in the North East in the sample.

Voluntary settings in the North West scored more highly on the ECERS-E scale than the reference group, once structural covariates were controlled for (Table 57).

Voluntary settings in the South West scored more highly on the SSTEWS scale than the reference group, once structural covariates were controlled for (Table 58).

### Three- to four-year-olds; nursery classes / schools

Nursery classes / schools in the East of England scored lower on the ECERS-E scale than the reference group, once structural covariates were controlled for (Table 60). Note that there were only 3 Nursery classes / schools in the North East in the sample.

Nursery classes / schools in the North East scored more highly than the reference group on the ECERS-E and SSTEWS measures (Tables 60 to 61).

## 5.4 Index of Multiple Deprivation (IMD)

There was little evidence of systematic variation in setting quality by quintile of IMD (see Table 62 and Table 63). There was one statistically significant result in the controlled models: For settings for two-year-old children, those in areas in the 4<sup>th</sup> quintile of IMD had significantly lower SSTEWS scores than those in the least deprived quintile (see Table 62).

**Table 62: Analysis of ITERS-R and SSTEWS scores by IMD quintile; settings for two-year-olds.**

IMD	N	%	ITERS-R		SSTEWS	
			Mean score	Coefficients from controlled linear model	Mean score	Coefficients from controlled linear model
1 least deprived	59	14.7	5.28	(reference level)	4.67	(reference level)
2	76	18.9	5.21	-0.156	4.47	-0.276
3	85	21.1	5.37	+0.012	4.50	-0.263
4	84	20.9	5.14	-0.234	4.29	-0.477 *
5 most deprived	98	24.4	5.27	-0.056	4.56	-0.160
TOTAL	402	100.0	5.25		4.49	

Linear model coefficients which are significantly different from zero are marked with stars:

Significant p-values are marked: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Models are fitted to complete cases.

**Table 63: Analysis of ECERS-R, ECERS-E and SSTEW scores by IMD quintile; settings for three- and four-year-olds.**

IMD	N	%	ECERS-R		ECERS-E		SSTEW	
			Mean score	Coefficients from controlled linear model	Mean score	Coefficients from controlled linear model	Mean score	Coefficients from controlled linear model
1 least deprived	121	20.2	5.29	(reference level)	4.24	(reference level)	4.79	(reference level)
2	118	19.7	5.24	-0.066	4.14	-0.104	4.77	-0.004
3	114	19.1	5.29	-0.036	4.05	-0.239	4.63	-0.156
4	117	19.6	5.34	-0.018	4.24	-0.082	4.67	-0.158
5 most deprived	128	21.4	5.23	-0.145	4.22	-0.125	4.66	-0.192
TOTAL	598	100.0	5.28		4.18		4.70	

Linear model coefficients which are significantly different from zero are marked with stars:

Significant p-values are marked: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ .

Models are fitted to complete cases.

## 5.5 Comparison between EPPE and SEED quality findings

This section compares findings from this report with the Effective Provision of Pre-School Education (EPPE) Project (data collected 1998-1999), which is the previous benchmark longitudinal study carried out in England to investigate the characteristics of early childhood care and education, including the quality of provision.<sup>3</sup> In considering this comparison it should be borne in mind that neither SEED nor EPPE samples were strictly representative of the early years sector at the time. However, there are no better data available, and the sample sizes and distribution in both studies suggest close approximation to representativeness, and hence the comparison may be instructive. Both EPPE (Sylva, K. et.al., 1999) and SEED provide quality data using the ECERS-R and ECERS-E measures applied to group settings for three- and four-year-olds.

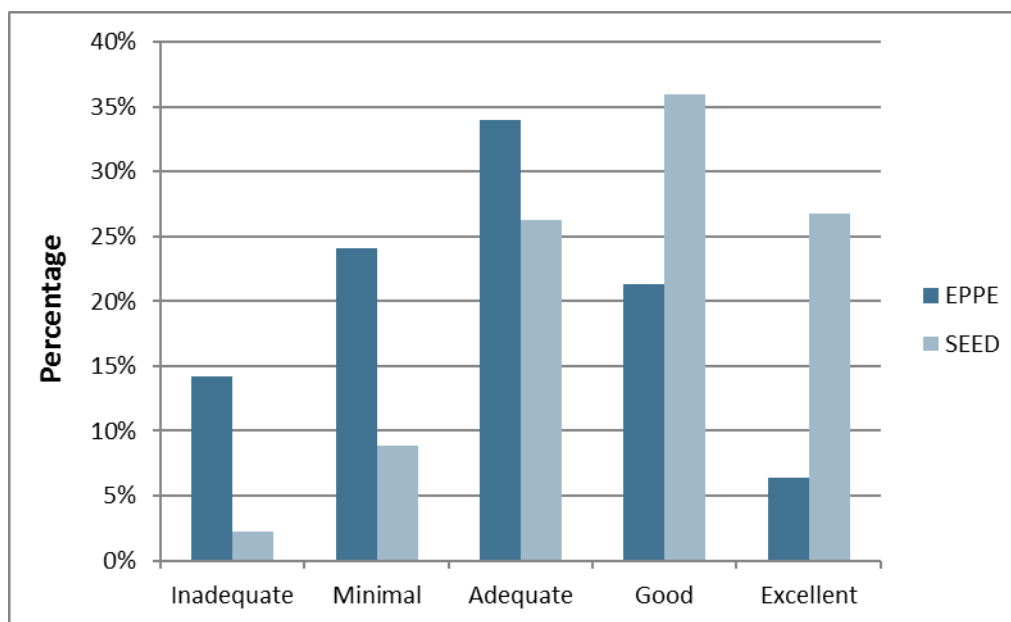
Using the ECERS-R (a measure of quality for the over-threes) and ECERS-E (a measure that focuses on the educational aspects of experience for the over-threes) subscales administered in both EPPE and SEED, find that these process quality measures showed higher average quality in settings quality in the SEED study than in the EPPE study.

Comparing EPPE with SEED, the average overall score for ECERS-R in EPPE was 4.29, a rating of 'adequate'. In SEED the average was 5.18, consolidating provision quality level in the 'good' range. The ECERS-E scores was 3.17 in EPPE and 4.12 in SEED.

<sup>3</sup> More information on the Effective Provision of Pre-School Education (EPPE) study is available at: <http://eppe.ioe.ac.uk/eppe/eppepdfs/RBTec1223sept0412.pdf>

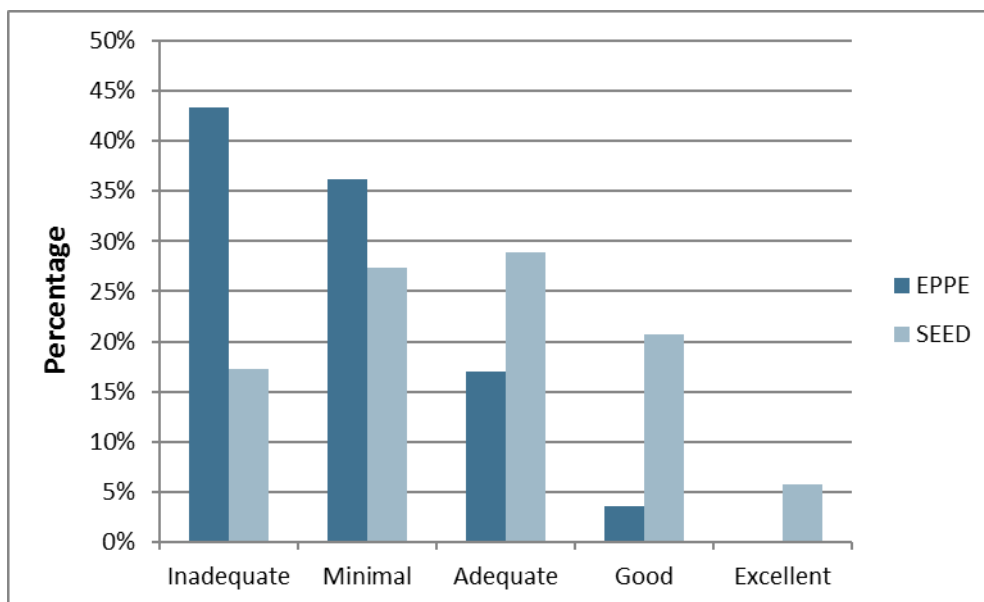
The differences between the ECERS-R and ECERS-E quality ratings for EPPE and SEED are shown in Figures 12 and 13.

**Figure 12: Percentage of ECERS-R scores in categories for EPPE and SEED.**



Showing the percentages of settings that score within these categories; “inadequate ( $< 3$ )”, “minimal ( $\geq 3$  and  $< 4$ )”, “adequate ( $\geq 4$  and  $< 5$ )”, “good ( $\geq 5$  and  $< 6$ )” and “excellent ( $\geq 6$ )”.

**Figure 13: Percentage of ECERS-E scores in categories for EPPE and SEED.**



Showing the percentages of settings that score within these categories; “inadequate ( $< 3$ )”, “minimal ( $\geq 3$  and  $< 4$ )”, “adequate ( $\geq 4$  and  $< 5$ )”, “good ( $\geq 5$  and  $< 6$ )” and “excellent ( $\geq 6$ )”.

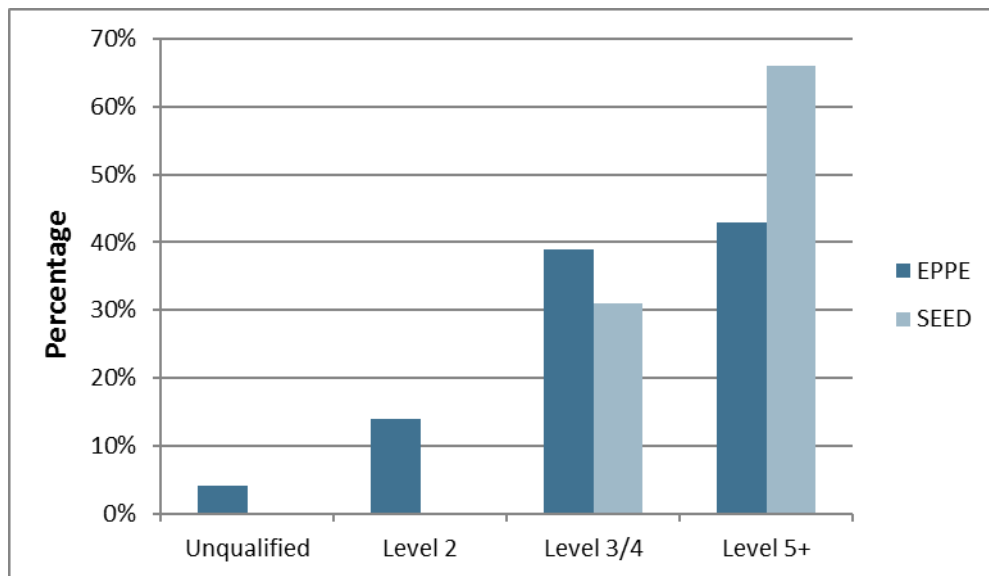
There are a greater proportion of poor quality settings (i.e. inadequate, minimal, and adequate) in the EPPE study than in the SEED study. This is the case for both ECERS-R (a measure of quality for the over-threes) and ECERS-E (a measure that focuses on

the educational aspects of experience for the over-threes) measures. This indicates that the overall quality in ECEC settings in England as assessed by these measures has improved from the time of EPPE to the time of SEED.

### Manager and staff qualifications for EPPE and SEED

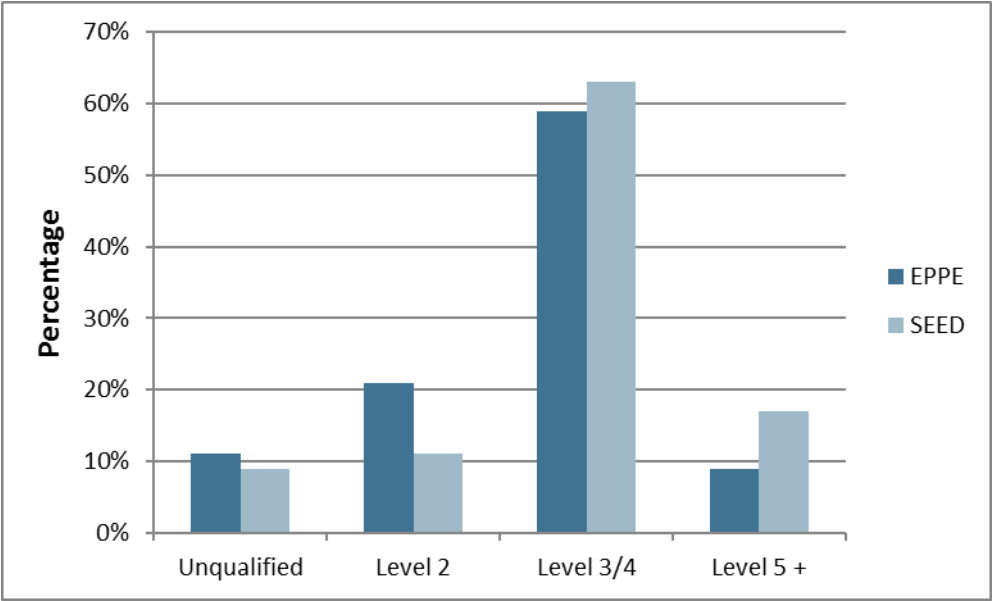
Increasing qualification levels for both managers and staff in settings was observed from when EPPE interviews occurred in 1997-1998 (Taggart et al., 2000). The percentage of managers with a degree (Level 5 or above) rose from 43% to 66%. See Figure 14.

**Figure 14: Manager qualifications relevant to working with children: EPPE and SEED.**



As seen in Figure 15, by far the most commonly held early years qualification level by staff was a Level 3 or 4 in both SEED and EPPE projects, registering an increase in the proportion of staff holding this qualification: from 59% to 63%. But the second most common category for the EPPE Project was a Level 2 whilst for the SEED data the second most common was a Level 5 or above. It is possible that the increase of the qualification level of managers and staff is related to the rise in quality levels.

Figure 15: Staff qualifications relevant to working with children for EPPE and SEED.



## **6 Chapter 6: Discussion and conclusion**

An overview of findings, and discussion of their implications in the context of wider research, is presented in the research report Chapter 6.

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## 8 Appendix A - Instruments

### Process quality

To assess the quality of provision for two year old and three-four year old children, information about process quality as well as structural characteristics was collected through observations lasting half a day. The observation measures employed were the revised versions of the Infant and Toddler Environment Rating Scale (ITERS-R) and the Early Childhood Environment Rating Scale (ECERS-R; Harms, Clifford & Cryer 2007) as well as an English developed extension to ECERS-R, called Early Childhood Environment Rating Scale – Extension (ECERS-E; Sylva, Siraj-Blatchford & Taggart 2011); and a newly developed scale: the Sustained Shared Thinking and Emotional Well-being scale (SSTEWS; Siraj, Kingston & Melhuish, 2015). A questionnaire for the manager, Early Years Foundation Stage Lead or head teacher, provided was used to gather information on structural characteristics.

The assessment instruments used to gather information on process quality were selected according to the age group. For the two-year-old children, the revised Infant-Toddler Environment Rating Scale (ITERS-R) and the Sustained Shared Thinking and Emotional Wellbeing scale (SSTEWS) were applied. For the three - four-year-old children, the revised Early Childhood Environmental Rating Scale (ECERS-R) and its curricular extension ECERS-E, and the aforementioned SSTEWS scale were administered. These methods have been proved to be relatively successful in predicting later child outcomes, and / or capturing key elements of quality.

The SSTEWS Scale was designed to observe early years' provision for children from two years up to five years old, in terms of the quality of interactions experienced by children. It contains 14 items comprising five sub-scales related to two developmental domains:

Domain A - Social and emotional wellbeing, with two sub-scales related to this domain:

1. Building trust, confidence and independence and
2. Social and emotional well-being;

Domain B - Cognitive development, with three subscales pertaining to this domain:

3. Supporting and extending language and communication,
4. Supporting learning and critical thinking and
5. Assessing learning and language.

The ITERS-R consists of 39 items, which assess seven aspects of centre-based childcare and education programmes for infants and toddlers up to 30 months of age.

These features are measured by the following sub-scales:

- Space and Furnishings (e.g. indoor space, furniture, room arrangement for play),
- Personal Care Routines (greeting / departing, meals / snacks, health and safety),
- Listening and Talking (e.g. books / encouraging children to use the language),
- Activities (e.g. art, blocks, sand and water play)
- Interaction (e.g. supervision of play and learning),

- Programme Structure (e.g. schedule, provisions for children with SEN/D),
- Parents and Staff (e.g. provisions for parents, staff interactions).

Items are averaged to produce both sub-scale and total scores.

The ECERS-R was designed to evaluate quality of provision for children aged two and a half to five years in centre-based settings. It consists of 43 items organized into seven sub-scales:

- Space and Furnishings,
- Personal Care Routines,
- Language-Reasoning,
- Activities,
- Interaction,
- Programme Structure,
- Parents and Staff.

The ECERS-E scale provides greater depth and 15 additional items on four educational aspects of provision:

- Literacy (e.g. opportunities for emergent writing, letters and sounds);
- Mathematics (e.g. number, reasoning);
- Science and Environment (e.g. supporting children's creative and critical thinking and understanding of the natural and physical world),
- Diversity (e.g. planning for children's individual learning needs, valuing and respecting other cultures, gender diversity).

Items are averaged to produce both sub-scale and total scores.

Based on previous research, some sub-scales were omitted as they had less value for predicting child outcomes. The ITTERS-R and the ECERS-R Parents and Staff sub-scale was excluded. However, some of this information (such as staff continuity and provisions for staff needs) was requested in the supplementary questionnaire for managers. The Space and Furnishings sub-scale (ECERS-R) and Science and Environment sub-scale (ECERS-E) were omitted, as they were not considered as relevant for the age groups in this particular study.

Detailed descriptions are provided for each item within the ITTERS-R, ECERS-R, ECERS-E and the SSTEWS. Items are scored on a 7-point scale, where 1 = inadequate, 3 = minimal, 5 = good and 7 = excellent. The score of the general scale and sub-scales represent the average of the items that compose them. The ratings are based on a minimum of a two-and-a-half-hour observation in a setting and a set number of interview questions to gather information on indicators that could not be observed.

It was decided to use these environment rating scales because they are the measures most commonly used both internationally and in England for quality assessments of childcare and early education settings and have high levels of inter-rater reliability, which indicates that different observers produce closely similar scores. For this study a test

conducted for assessing its dependability obtained a high level of internal consistency for all the scales total scores within the age two and age three to four observational data for this provisional sample<sup>4</sup>.

A significantly strong correlation was found between ITERS-R and SSTEWS total scores ( $r = 0.871$ ,  $p < 0.001$ ); ECERS-R and ECERS-E ( $r = 0.801$ ,  $p < 0.001$ ); ECERS-R and SSTEWS, ( $r = 0.881$ ,  $p < 0.001$ ); ECERS-E and SSTEWS ( $r = 0.824$ ,  $p < 0.001$ ). These correlations show that the scales are gathering information on highly related aspects of quality. For instance, while the ITERS-R and ECERS-R scales assess some interactional aspects and listening and talking indicators, SSTEWS was particularly designed to assess details of interactions that are likely to be related to child outcomes, such as sustained shared thinking processes as well as the behaviour fostering emotional wellbeing.

The structure of the four environmental scales is presented in Appendix A.1 and one example of an individual item from each scale is shown in the Appendix A.2.

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<sup>4</sup> This was the Cronbach's alpha test. ITERS-R = 0.932, ECERS-R = 0.919, ECERS-E = 0.884 and SSTEWS = 0.937.

## 8.1 Appendix A.1 Structure of the environmental scales

### Overview of the Subscales and Items of the Infant Toddler Environment Rating Scale (ITERS-R)

#### Space and furnishings

1. Indoor Space
2. Furniture for routine care and play
3. Provision for relaxation and comfort
4. Room arrangement
5. Display for children

#### Personal care practices

6. Greeting / departing
7. Meals / snacks
8. Nap
9. Diapering / toileting
10. Health practices
11. Safety practices

#### Listening and Talking

12. Helping children understand language
13. Helping children use language
14. Using books

#### Activities

15. Fine motor
16. Active physical play
17. Art
18. Music and movement
19. Blocks
20. Dramatic play
21. Sand and water play

22. Nature / science
23. Use of TV, video and / or computer
24. Promoting acceptance of diversity

#### Interaction

25. Supervision of play and learning
26. Peer interaction
27. Staff-child interaction
28. Discipline

#### Programme Structure

29. Schedule
30. Free play
31. Group play activities
32. Provisions for children with disabilities

#### Parents and Staff

33. Provisions for parents
34. Provisions for personal needs of staff
35. Provisions for professional needs of staff
36. Staff interaction and cooperation
37. Staff continuity
38. Supervision and evaluation of staff
39. Opportunities for professional growth

*(Harms, T., Clifford, M. & Cryer, D. 2006:9)*

## Overview of the Subscales and Items of the Early Childhood Environment Rating Scale (ECERS-R)

### Space and furnishings

1. Indoor space
2. Furniture for routine care, play and learning
3. Furnishings for relaxation and comfort
4. Room arrangement for play
5. Space for privacy
6. Child-related display
7. Space for gross motor play
8. Gross motor equipment

### Personal care practices

9. Greeting / departing
10. Meals / snacks
11. Nap / rest
12. Toileting / diapering
13. Health practices
14. Safety practice

### Language-Reasoning

15. Books and pictures
16. Encouraging children to communicate
17. Using language to develop reasoning skills
18. Informal use of language

### Activities

19. Fine motor
20. Art
21. Music / movement
22. Blocks

23. Sand / water
24. Dramatic play
25. Nature / science
26. Math / number
27. Use of TV, video, and / or computer
28. Promoting acceptance of diversity

### Interaction

29. Supervision of gross motor activities
30. General supervision of children (other than gross motor)
31. Discipline
32. Staff-child interactions
33. Interactions among children

### Programme Structure

34. Schedule
35. Free play
36. Group time
37. Provisions for children with disabilities

### Parents and Staff

38. Provisions for parents
39. Provisions for personal needs of staff
40. Provisions for professional needs of staff
41. Staff interaction and cooperation
42. Supervision and evaluation of staff
43. Opportunities for professional growth

*(Harms, Clifford & Cryer 2005:9)*

## Overview of the Four Curricular Sub-scales Extension (ECERS-E) to the Early Childhood Environment Rating Scale (ECERS-R)

### **Literacy: Items 1-6**

1. Print in the environment
2. Book and literacy areas
3. Adult reading with the children
4. Sounds in words
5. Emergent writing / mark making
6. Talking and listening

### **Mathematics: Items 7-9b**

7. Counting and the application of counting
8. Reading and representing simple numbers
- 9a. Mathematical activities: shape
- 9b. Mathematical activities: sorting, matching and comparing

### **Science and Environment: Items 10-12c**

10. Natural materials
11. Areas featuring science / science materials
- 12a. Science activities: non-living
- 12b. Science activities: living processes
- 12c. Science activities: food preparation

### **Diversity: Items 13-15**

13. Planning for individual learning needs
14. Gender equality and awareness
15. Race equality and awareness

*(Sylva, Siraj-Blatchford & Taggart 2001: iii)*

## **Overview of the Subscales and Items of the Sustained Shared Thinking and Emotional Wellbeing Scale (SSTEWS)**

### **Subscale 1. Building trust, confidence and independence**

1. Self-regulation and social development
2. Encouraging choices and independent play
3. Planning for small group and individual interactions / adult

### **Subscale 2. Social and emotional well-being**

4. Supporting socio-emotional wellbeing

### **Subscale 3. Supporting and extending language and communication**

5. Encouraging children to interact with others
6. Staff actively listen to children and encourage children to listen
7. Staff support children's language use
8. Sensitive responsiveness

### **Subscale 4. Supporting learning and critical thinking**

9. Supporting curiosity and problem solving
10. Encouraging sustained shared thinking through storytelling, sharing books, singing and rhymes
11. Encouraging sustained shared thinking in investigation and exploration
12. Supporting concept development and higher-order thinking

### **Subscale 5. Assessing learning and language**

13. Using assessment to support and extend learning and critical thinking
14. Assessing language development

(Siraj, Kingston & Melhuish 2015)



## 8.2 Appendix A.2 Examples of scale individual items

### 8.2.1 An example of an ITERS-R item

#### Item 20: Dramatic play

Item	Inadequate		Minimal		Good		Excellent
	1	2	3	4	5	6	7
	1.1 No materials accessible for dramatic play. *		3.1 Some age-appropriate materials accessible, including dolls and soft animals. *		5.1 Many and varied age-appropriate dramatic play materials accessible daily. *		7.1 Props provided to represent diversity (Ex. dolls representing different races / cultures; equipment used by people of different cultures or with disabilities). *
			3.2 Materials accessible for much of the day.		5.2 Props represent what children experience in everyday life (Ex. household routines, work, transportation).		7.2 Props provided for toddlers to use active dramatic play outdoors or in other large area. <b>NA permitted.</b>
					5.3 Materials are organized by type (Ex. play dishes in separate container; dolls stored together; dress-up hats and purses hung on pegs).		7.3 Staff pretend with children in play (Ex. talk to child on toy telephone; rock and talk to baby doll). *
					5.4 Some child-sized play furniture for toddlers (Ex. small sink or stove, baby stroller, shopping cart. <b>NA permitted.</b>		

N.B. scores 2, 4 and 6 are halfway between 1, 3, 5 and 7.

## 8.2.2 An example of a SSTEW scale item

### Item 9: Supporting curiosity and problem solving

Item	Inadequate		Minimal		Good		Excellent
	1	2	3	4	5	6	7
1.1 The learning environment is always set out in the same way and includes the same resources and activities.			3.1 There are a variety of resources available each session. Activities are chosen that the adults know the children will want to play with.		5.1 New resources, activities or challenges are set up regularly. They are linked to the current theme or time of year or children's interests or schemas.		7.1 Planning shows there have been regular visitors e.g. police, local shop keepers, taxi driver and / or staff dressed as characters in familiar stories playing a role.
1.2 Staff stand back and allow the children to play by themselves all of the time unless there is conflict.			3.2 Staff offer at least one adult supported activity during a session.		5.2 Staff model, support and extend children's learning in ALL areas of the setting, moving from one area to the next as appropriate.		7.2 Visits are made to places of interest and / or to extend children's knowledge and experiences.
			3.3 Staff ask children to help them solve problems for example while setting up areas: finding and helping them put out resources.		5.3 Staff challenge and support problem solving for example by posing small everyday problems or inviting children to solve problems as they arise.		7.3 Staff support curiosity by hiding unexpected objects and / or using treasure boxes to be discovered during play.
							7.4 Staff support children's metacognition by talking aloud to model their thinking and problem solving processes and support children to plan, do and review activities.

N.B. scores 2, 4 and 6 are halfway between 1, 3, 5 and 7.

## 9 Appendix B – Supplementary questions for childcare and early education settings

This questionnaire should be completed prior to the visit from your SEED consultant and handed back to the consultant when they visit.

### Background

1. Is your setting (please circle)

A single setting

A multi-site setting (e.g. a part of chain)

2. How many childcare / early years places are you registered with Ofsted to offer?

-----

3. What is minimum and maximum age range you are registered for?

Minimum child age.....

Maximum child age.....

4. Does your setting offer specialist provision for children with Special Educational Needs and / or Disabilities? (please circle)

Yes / No

### Staff qualifications / training

5. What is the level of the highest qualification, relevant to working with children or young people, held by the Manager of your setting?

Qualification level

Level 8

Level 7

Level 6 (Degree)

Level 5 (Foundation degree)

Level 4

Level 3

Level 2

Level 1

No relevant childcare / early education qualifications

Don't know

Other (please specify)

6. How many paid staff are currently employed to run all the childcare and early education sessions at your setting?

-----

7. In the table below please record the number of staff who hold qualifications, relevant to working with children or young people, at each level (based on the highest level of qualification they hold)

Qualification level	No. of staff
Level 8	
Level 7	
Level 6 (Degree)	
Level 5 (Foundation degree)	
Level 4	
Level 3	
Level 2	
Level 1	
No relevant childcare / early education qualifications	
Don't know	
Other (please specify)	
Total no. of staff (this should match the number given at Q6)	

8. How many staff have you replaced in the last 12 months (i.e. staff turnover)?

### Staff / child ratios

9. What child to staff ratio do you currently operate on a typical day for children aged under two years-old?

----- or N / A

10. What child to staff ratio do you currently operate on a typical day for children aged two year-olds?

----- or N / A

11. What child to staff ratio do you currently operate on a typical day for children aged 3 and 4 year olds?

-----

### Training / Development

12. Does your setting have a training plan? (please circle)  
Yes / No

13. Does your setting have a specific training budget? (please circle)  
Yes / No

14. How frequently do staff typically attend CPD workshops or other activities to promote CPD? (please circle)
- At least once per month
  - At least once per quarter or term
  - At least twice per year
  - Less than twice per year
15. How frequently is staff supervision carried out for non-managerial staff? (please circle)
- Weekly / Monthly / Quarterly / Annually / Other – please specify: \_\_\_\_\_

## **10 Appendix C – Assessment procedures**

### **10.1 Data collectors' background**

A group of experienced consultants conducted these observational assessments of childcare and education providers. They had to be qualified teachers and / or had to have a high level qualification relevant to working with children, as well as being trained in the implementation of the ITTERS-R, ECERS-R and ECERS-E.

### **Reliability of observations**

To ensure consistency of judgements across the quality visits the following systems and structures were adhered to:

1. A small, highly qualified team well-versed in quality improvement and using the ECERS-R and ITTERS-R scales was recruited to work under the guidance of two SEED principal investigators.
2. The SEED Advisory Board approved the members of the team based on their credibility across the early years sector.
3. To upskill this team in the new scale used (SSTEWS) and ensure consistent understanding of this scale (SSTEWS), training was carried out in group sessions with intervening practice. Sessions were led by one of the authors. These provided an opportunity to answer queries and address any issues concerning content and implementation.
4. Quality assurance visits were carried out between SEED core team members and the consultants.
5. As part of each of the 2 consultant team days there were sessions on the moderation of judgements.
6. The very few instances of anomalies or queries were referred to Professor Melhuish for a final judgement.

### **10.2 Participation of sampled settings**

A letter was sent to all selected settings announcing the purpose of the study and inviting them to participate. A week later, a consultant called selected settings to follow up and address any queries or concerns that the manager / EYFS Lead / head teacher might have regarding the study. If the person consented to participate in the study, the consultant scheduled a visit. If the initial letter was not received by the setting it was followed up with an email version of the letter and a further phone call.

Most settings had one room for each of the age groups. When a setting had more than one room or session for that particular age group, the observation was conducted in just one room or session at a mutually convenient date.

For those settings that had two-year-old and three-four-year-old children participating in the study, the observation was carried out in two rooms when there were separate rooms for these age groups.

All observations to ECEC group settings for two-year-old and 3-year-old children discussed in this report took place between May 2014 and April 2016.

### **10.3 Incentives**

Providers wanted to participate in this study as they felt it was in the interest of the setting or school to be part of a research project that could positively influence future policy and practice for children. No other incentives were needed to enable participation.

## 11 Appendix D – Summary of the different types of provision

Early childhood education and care (ECEC) settings can be divided into seven types, which are distinguishable by funding source, operational characteristics and accessibility.

**Nursery class** – A maintained early years class within a primary school with a qualified teacher present. Children usually attend either a 3-hour morning or afternoon session and some schools offer the option to stay for lunch and attend both sessions.

**Nursery school** – A maintained school specifically for children in their early years with a qualified teacher present. Children usually attend either a 3-hour morning or afternoon session and some schools offer the option to stay for lunch and attend both sessions.

**Private nursery and / or pre-school** – Privately owned provision that includes both full day care and sessional care. It could be privately owned by an individual or by a larger organisation / chain. These settings will be incorporated and registered with Companies House. Some private provision is run on a school site, some from separate premises.

**Voluntary nursery and / or pre-schools** – These settings are run by a charity or voluntary management committee on a not-for-profit basis. They include both full day care and sessional care. If the organisation is incorporated it will be registered with the Charity Commission. Some smaller provision could be unincorporated and be run by a local committee. Some voluntary provision is run on a school site, some from separate premises (these have been sub classified for the SEED study).

**Independent nursery and / or nursery class** – This includes early years provision run by an Independent School and delivered on site. It can be full day care or sessional, depending on the arrangement of the individual school.

**Children's Centre** - Children's Centres are governed in various different ways: by the Local Authority, by the School Governing Body (if on a school site), by a charity, by a private provider. They offer all families with children under five a range of services, information and support in their local community. Some offer full day care and some offer sessional provision. Children's Centres in the SEED study have childcare provision on site that is run by the Children's Centre. (Note: early years provision run on Children's Centre sites by external providers was classified as either private or voluntary.)

**Local Authority Nursery** – Full day care or sessional provision delivered by the Local Authority with staff members employed by the Local Authority.

All the provision within the SEED study operates under the Statutory Framework for the Early Years Foundation Stage (Department for Education, 2014). Therefore, the minimum staff: child ratios for settings in the study are as described in the EYFS statutory framework. This is presented below.



## 11.1 Staff: child ratios under the EYFS statutory framework

The staff: child ratios for early years providers (other than childminders) are as follows (Department for Education 2014:22-23):

***For children aged two:***

*At least one member of staff for every four children, with at least one staff member holding a full and relevant level 3 qualification and at least half of all other staff holding a full and relevant level two qualification.*

***For children aged three and over in registered early years provision where a person with Qualified Teacher Status (QTS), Early Years Professional Status (EYPS), Early Years Teacher Status (EYT) or another suitable level 6 qualification is working directly with the children:***

*At least one member of staff for every 13 children and at least one other member of staff must hold a full and relevant level 3 qualification.*

***For children aged three and over in registered early years provision where there is no person with QTS, EYPS, EYT or another suitable level 6 qualification working directly with the children:***

*At least one member of staff for every eight children, at least one member of staff must hold a full and relevant level 3 qualification and at least half of all other staff must hold a full and relevant level 2 qualification.*

***For children aged three and over in independent schools, where a person with Qualified Teacher Status, Early Years Professional Status, Early Years Teacher Status or another suitable level 6 qualification, an instructor, or another suitably qualified overseas trained teacher, is working directly with the children:***

*For classes where the majority of children will reach the age of five or older within the school year, there must be at least one member of staff for every 30 children; for all other classes there must be at least one member of staff for every 13 children; and at least one other member of staff must hold a full and relevant level 3 qualification.*

***For children aged three and over in independent schools, where there is no person with Qualified Teacher Status, Early Years Professional Status, Early Years Teacher Status or another suitable level 6 qualification, no instructor, and no suitably qualified overseas trained teacher, working directly with the children:***

*At least one member of staff for every eight children; at least one member of staff must hold a full and relevant level 3 qualification; and at least half of all other staff must hold a full and relevant level 2 qualification.*

***For children aged three and over in maintained nursery schools and nursery classes in maintained schools:***

*At least one member of staff for every 13 children; at least one member of staff must be a school teacher as defined by section 122 of the Education Act 2002; and at least one other member of staff must hold a full and relevant level 3 qualification.*

## 11.2 A description of Levels of Qualification 1 to 8.

The levels of qualification 1 to 8 are described on this website:

<https://www.gov.uk/what-different-qualification-levels-mean/list-of-qualification-levels>

Level 1 qualifications are:

- first certificate
- GCSE - grade D, E, F or G
- level 1 award
- level 1 certificate
- level 1 diploma
- level 1 ESOL
- level 1 essential skills
- level 1 functional skills
- level 1 national vocational qualification (NVQ)
- music grades 1, 2 and 3

Level 2 qualifications are:

- CSE - grade 1
- GCSE - grade A\*, A, B or C
- intermediate apprenticeship
- level 2 award
- level 2 certificate
- level 2 diploma
- level 2 ESOL
- level 2 essential skills
- level 2 functional skills
- level 2 national certificate
- level 2 national diploma
- level 2 NVQ
- music grades 4 and 5
- O level - grade A, B or C

Level 3 qualifications are:

- A level - grade A, B, C, D or E
- access to higher education diploma
- advanced apprenticeship
- applied general
- AS level
- international Baccalaureate diploma
- level 3 award
- level 3 certificate
- level 3 diploma
- level 3 ESOL
- level 3 national certificate

- level 3 national diploma
- level 3 NVQ
- music grades 6, 7 and 8
- tech level

Level 4 qualifications are:

- certificate of higher education (CertHE)
- higher apprenticeship
- higher national certificate (HNC)
- level 4 award
- level 4 certificate
- level 4 diploma
- level 4 NVQ

Level 5 qualifications are:

- diploma of higher education (DipHE)
- foundation degree
- higher national diploma (HND)
- level 5 award
- level 5 certificate
- level 5 diploma
- level 5 NVQ

Level 6 qualifications are:

- degree apprenticeship
- degree with honours – e.g., BA honours, BSc honours
- graduate certificate
- graduate diploma
- level 6 award
- level 6 certificate
- level 6 diploma
- level 6 NVQ
- ordinary degree without honours

Level 7 qualifications are:

- integrated master's degree, for example master of engineering (MEng)
- level 7 award
- level 7 certificate
- level 7 diploma
- level 7 NVQ
- master's degree, for example master of arts (MA), master of science (MSc)
- postgraduate certificate
- postgraduate certificate in education (PGCE)
- postgraduate diploma

Level 8 qualifications are:

- doctorate, for example doctor of philosophy (PhD or DPhil)
- level 8 award
- level 8 certificate
- level 8 diploma



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