



Improving Writing Quality

Evaluation Report and Executive Summary

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Independent evaluators:

THE UNIVERSITY *of York*



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- Evaluating these innovations to extend and secure the evidence on what works and can be made to work at scale;
- Encouraging schools, government, charities, and others to apply evidence and adopt innovations found to be effective.

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Literacy Catch-up Round

This study was funded by the Education Endowment Foundation as one of 23 projects funded through a themed funding round on literacy catch-up at the primary-secondary transition. Projects funded within this round aimed to identify effective ways to support pupils who do not achieve Level 4 in English by the end of Key Stage 2. The project was one of three funded with a particular focus on writing.

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Contents

Executive summary	2
Introduction.....	4
Methodology	6
Impact evaluation	14
Process evaluation	26
Conclusion	28
References	30

Executive summary

The project

The project aimed to use memorable experiences and an approach called ‘Self-Regulated Strategy Development’ (SRSD) to help struggling writers in Years 6 and 7. SRSD provides a clear structure to help pupils plan, monitor and evaluate their writing. It aims to encourage pupils to take ownership of their work and can be used to teach most genres of writing, including narrative writing. Memorable experiences, such as trips to local landmarks or visits from World War II veterans, were used as a focus for writing lessons.

In this evaluation 23 primary schools and their Year 6 teachers in the Calderdale area of West Yorkshire were randomly allocated to receive training, from an external consultant, in the SRSD approach. Twelve schools were allocated to the comparison group and 11 schools to the intervention group. Children in the intervention schools were taught following the SRSD approach in the last six weeks of the summer term in Year 6 and in the first term of Year 7 at secondary school. The project was organised by the Calderdale Excellence Partnership.

The study was funded by the Education Endowment Foundation as one of 23 projects focused on literacy catch-up at the primary-secondary transition. It was one of three programmes with a particular focus on writing.

What impact did it have?

Overall, the project appeared to have a large positive impact on writing outcomes. The overall effect size for writing, comparing the progress of pupils in the project to similar pupils who did not participate was +0.74. This effect size was statistically significant, meaning that it is unlikely to have occurred by chance, and can be envisaged as saying that participating pupils made approximately nine months’ additional progress compared to similar pupils who did not participate in the intervention.

The approach was also effective for pupils eligible for free school meals (FSM). Whilst there appears to be a larger effect for FSM pupils, the difference in the interaction test is not statistically significant, so chance is a possible explanation for the difference observed.

The approach had no statistically significant effect on the secondary outcomes relating to reading, spelling or grammar (i.e. the small differences between the groups could have occurred by chance). These outcomes were not the main focus of the study, but were measured as part of the same test.

Teachers were trained in the SRSD approach by the North American developers, but, with support from the Calderdale Excellence Partnership team, also adapted it in some ways for an English context. For example, a component of the approach which focused on developing positive ‘self-talk’ was Anglicised.

Group	N	Effect size	Estimated months’ progress	95% confidence interval (CI)	Evidence strength*
Intervention vs. control	23 primary schools 3 secondary schools 261 pupils	+0.74	+9	+0.26 to +1.22	
Free School Meal pupils	86 pupils	+1.60	+18	+0.21 to +2.98	

*Evidence ratings are not provided for sub-group analyses, which will always be less secure than overall findings. For more information about evidence ratings, see Appendix R.

How secure is this finding?

The overall finding of the study is assessed as moderately secure. This assessment is based on the study’s design, its size and other factors such as the level of drop-out of participating pupils.

The evaluation was set up as an efficacy trial to test the impact of using SRSD in conjunction with memorable experiences at the transition from primary to secondary school. Efficacy trials seek to test evaluations in the best possible conditions, but they do not seek to demonstrate that the findings hold at scale in all types of schools.

Calderdale Excellence Partnership (CEP) recruited 23 primary schools and three secondary schools that were served by the recruited primary schools and a SRSD developer came from North America to deliver training. The 23 primary schools were randomly assigned by a statistician at the York Trials Unit so that Year 6 teachers in the 11 intervention schools¹ received training to deliver the intervention to their Year 6 pupils. Three secondary schools agreed to honour the randomisation by allocating intervention and comparison school pupils into separate Year 7 classes, and SRSD continued to be delivered, by secondary school English teachers, to the intervention children in the first term of their Year 7. All children (from both the intervention and comparison groups) were tested under exam conditions using the Progress in English 11 (Long Form) Test developed by GL Assessment as a measure of general writing ability. Primary schools allocated to the comparison group were offered the training in the SRSD approach at the end of the trial (known as a 'wait-list').

The study was well conducted with independent randomisation and a moderate sample size. Intention-to-treat analysis was used (i.e. pupils were compared in the groups to which they were originally randomly assigned), blind marking of the test papers was undertaken, and the analysis was adjusted for school randomisation. Attrition was 8.5% for comparison pupils and 8.0% for intervention of those who were eligible because they attended both the primary and participating secondary school, which should have resulted in relatively little bias.

A systematic review of all previous randomised controlled trials of SRSD, largely from North America, has shown that this approach to teaching writing is, on average, very effective, with large effect sizes reported. This trial suggests that the approach can also be effective in English schools.

To increase the security of the finding and to assess its applicability in other schools, a larger evaluation could be commissioned in the future. In addition, further work could be done to try and disentangle the role and importance of the individual components of the intervention (e.g. the training or memorable experiences), as this was not possible within this evaluation.

How much does it cost?

The cost of the approach is estimated at £52 per pupil. This estimate includes training and materials (£60 per teacher or £2 per pupil), and the cost of memorable experiences (£50 per pupil). Estimates are based on a class of 30 pupils, and on training being delivered to a group of 30 teachers.

Key conclusions

1. The approach had a strong positive effect on the writing outcomes of low attaining pupils at the transition from primary to secondary school among a sample of pupils in State schools in the West Yorkshire area.
2. The approach had beneficial effects for both FSM and non-FSM pupils.
3. These findings, in combination with existing evidence from the United States and elsewhere, suggest that the Self-Regulated Strategy Development approach has substantial promise as a literacy catch-up.
4. A larger effectiveness trial could be commissioned to test the approach on a larger scale and with other age groups.
5. Teachers were trained in the SRSD approach by the North American developers, but adapted it in some ways for an English context.

¹ **Correction issued: 17th June 2014.** A previous version of this report stated that there were 12 intervention schools.

Introduction

In 2013 approximately 85,000 pupils left primary school without having attained Level 4 or above in writing (Department for Education, 2013a). This study assessed the impact of a project which aimed to improve writing outcomes for pupils who had not achieved a 'secure Level 4' (defined as having achieved a Level 4b or above) prior to moving from the final year of primary school (Year 6) to the first year of secondary school (Year 7). The project involved memorable experiences and the use of Self-Regulated Strategy Development (SRSD) over the transition period.

A substantial minority of pupils who do not reach Level 4 in English at the end of Key Stage 2 (incorporating reading and writing) do not make the expected level of progress in secondary school (Department for Education, 2014). In addition, a literature review of the research into the transfer of pupils from primary to secondary school has identified the potential for personal, social and academic outcomes to 'dip' after the end of Key Stage 2 (KS2) leading to a large minority of pupils failing to make expected progress in the first year of secondary school (Galton, Gray and Ruddock, 1999).

The study was funded by the Education Endowment Foundation, as one of 23 projects focused on literacy catch-up at the primary-secondary transition. It was one of four programmes with a particular focus on writing.

Background and existing literature on Self-Regulated Strategy Development

SRSD is a writing process model in which students are encouraged to plan, draft, edit and revise their writing. SRSD is a strategy (originating in North America), which provides a clear structure to assist writers and can be used for most genres of writing, including narrative writing. There are six basic stages of instruction and four strategies for self-regulation, which include self-monitoring and goal setting, thus providing pupils with ownership for improving their own writing. SRSD uses 'heuristics' which provide scaffolding of structures and devices that aid the composition of argumentative writing – in particular planning – which can include examining a question, brainstorming, organising and sequencing ideas and evaluating.

The approach was created in the United States in the 1990s. It has been designed, and is suitable, for children who are aged between 8 and 14 (Andrews et al., 2006) so it is appropriate for children passing through the transition from primary to secondary school. A systematic review by Andrews et al. (2006) found that a combination of contextual factors and specific interventions based on the SRSD programme were necessary for successful practice in teaching and learning writing for 7-14 year olds. The effect sizes of individual studies, largely undertaken in North America, were very large with estimates in some instances exceeding 1 standard deviation between the intervention and control groups. For example, in a study by De La Paz and Graham (2002) of secondary school children of mixed attainment (aged between 12-14) the overall quality of their writing was 1.7 standard deviations better than the quality of writing of children in the control group 6 weeks after the intervention. Nevertheless, despite these promising results in a North American context it was important to establish whether or not such an intervention would be effective in a British setting. For this reason the intervention was appropriate for an efficacy trial in English schools.

In 2012 the Education Endowment Foundation funded the University of York and Durham University to independently evaluate the Improving Writing Quality intervention being delivered and supported by the Calderdale Excellence Partnership (CEP) in 2013 and 2014. The Improving Writing Quality intervention provided memorable experiences for pupils in Year 6 before the transition to Year 7 and also used an SRSD programme to embed these experiences into children's writing. The intervention included professional development for primary and secondary school teachers in key elements of the

writing intervention SRSD, including discussion, modelling and planning. Pupils continued to receive the intervention, including memorable experiences, when they moved into Year 7.

Evaluation objectives

What is the effectiveness of the *Improving Writing Quality* intervention compared with 'business as usual' on the writing skills of participating children?

Project team

The evaluation team, jointly comprised of staff from Durham University and the University of York, was responsible for the design, conduct, analysis and reporting of the independent evaluation.

Implementation team

Calderdale Excellence Partnership, a partnership of 23 schools in West Yorkshire, was responsible for school recruitment and ongoing relationship with schools, informing parents and pupils, intervention development (including writing a detailed description of the intervention to allow others, if necessary, to be able to replicate the intervention in other areas), intervention training and delivery, baseline data collection, overseeing outcome testing and data collection.

Ethical review

Ethics Committees:

- Durham University School of Education Ethics Committee;
- York Health Sciences Research Governance Committee (by Chair's Action).

All parents were sent a letter outlining the purpose of the study and stating that if they did not wish their child's data to be sent to Durham University for analysis or to the EEF data archive then they were to return a form to the school to remove their child's data from the study database. Two weeks were allowed to elapse after which consent was assumed.

Methodology

Trial design

The trial was designed as a pragmatic randomised controlled trial. Participating primary schools (feeding into participating secondary schools) were independently randomly allocated on a 1:1 ratio to either receive training and deliver the intervention in 2013 (the schools are labelled hereafter as being in the 'intervention group') or to continue with 'business as usual' in 2013 ('control' or 'comparison' group). Primary schools allocated to the control group were offered the intervention training at the end of the trial (2014). This is known as a wait-list design and is employed to increase school recruitment and reduce school attrition and resentful demoralisation, i.e. when participants behave in a way that introduces bias in response to being allocated to a control group (Torgerson & Torgerson, 2008). Whole school, rather than class, randomisation was used because of concerns about contamination between classes within schools and also to accommodate smaller schools into the study that had a single Year 6 class. Contamination would have occurred if schools in the control group began to follow the approach while the trial was still in progress, and this would have made it more difficult to assess the intervention's true impact.

In primary schools allocated to the intervention group the intervention was delivered to all pupils in Year 6 including those predicted to achieve below Level 4 in English at Key Stage 2. Participating secondary schools placed all eligible pupils (defined below) from primary intervention schools into one half or band of Year 7 and all eligible pupils from primary control schools into the other half or band in Year 7, which enabled the intervention to be delivered in Year 7 to eligible pupils from intervention primary schools only, minimising contamination.

The trial was designed, conducted and reported following the CONSORT standards (Altman et al., 2011) in order to minimise all potential threats to internal validity, such as selection bias and a range of post-randomisation biases (Cook and Campbell, 1969; Shadish, Cook and Campbell, 2002; Torgerson and Torgerson, 2008).

Eligibility

School recruitment and consent

The evaluation team and Calderdale Excellence Partnership (CEP) jointly provided information documentation on the trial for schools (Appendix C). CEP recruited schools from West Yorkshire using its existing and long-standing relationship with schools in the area. School recruitment took place between February and March 2013. An information event for schools, run jointly by CEP and the evaluation team, was held on 26 February 2013. This provided an opportunity to explain both the intervention and the importance of the independent evaluation and what would be required of schools which decided to take part. Schools that wanted to take part were asked to sign an 'agreement to participate form' (Appendix D) to ensure they agreed to all trial-related procedures.

Schools

Primary schools were eligible to take part in the trial if (a) they were currently working with Calderdale Excellence Partnership and (b) they agreed to all trial procedures, including informing parents, provision of pupil data, randomisation and implementation of the intervention as allocated.

Secondary schools were eligible to take part in the trial if (a) they were currently working with the Calderdale Excellence Partnership and (b) they agreed to all trial procedures, including informing parents, provision of pupil data, continued provision of the intervention to eligible intervention pupils only and outcome testing.

Pupil recruitment and consent

Participating primary schools informed parents of all pupils in Year 6 about the study using material provided by the evaluation team and CEP (Appendix F). Parents had the opportunity to withdraw their child's data from the analyses. Participating primary schools then shared pupil data with the evaluation team which included pupil name, unique pupil number (UPN), date of birth (DOB), free school meals (FSM), and Key Stage 2 (KS2) English teacher assessment from December 2012. Eligible pupils for continuation with the intervention in Year 7 were identified from this information. Pupils were eligible for continuation in Year 7 if they were predicted to achieve national curriculum Level 3 or insecure Level 4 (based on Year 6 teacher assessments).

Participating secondary schools informed parents of all pupils in Year 7 about the study using material provided by the evaluation team and CEP (Appendix G). Parents had the opportunity to withdraw their child's data from the analyses (opt out). Participating secondary schools then shared pupil data with the evaluation team.

Pupils

Data on all Year 6 and Year 7 pupils at participating primary schools were collected for trial purposes unless a parent/carer withdrew their child. Data on all year 7 pupils at participating secondary schools were collected for trial purposes unless a parent/carer withdrew their child. All children in Year 6 at primary schools allocated to the intervention group were eligible to receive the intervention.

All pupils predicted to achieve Level 3 or an 'insecure' Level 4 (defined as below Level 4b) in English by the end of Key Stage 2 from primary schools allocated to the intervention were eligible to continue receiving the intervention in Year 7. (Writing assessments were based on teacher assessments conducted at the end of autumn term 2012.) Pupils not going to one of the three secondary schools who had agreed to allocate intervention and control children to different classes were not included in the main analysis of the programme's impact, but were still recorded.

Intervention

The Improving Writing Quality intervention (delivered and supported by CEP) encouraged and funded primary schools to provide memorable experiences (such as a school trip to local caves and a castle) for all pupils in Year 6 before the transition to Year 7. Pupils who were predicted to achieve national curriculum Level 3 or insecure Level 4 (based on Year 6 teacher assessments) continued to receive the intervention when they moved into Year 7. The intervention included professional development for primary and secondary school teachers in key elements of the writing intervention Self-Regulated Strategy Development (SRSD), including discussion, modelling and planning. Initial training days were conducted on 18-19 March 2013 by Pooja Patel from Hill for Literacy Inc. Further training was conducted on 5 September for new secondary teachers who had not attended the March training.

Following the initial training, a working group of participating teachers was established to decide how the strategy should be delivered in the context of the English curriculum. Guidelines were then prepared for all schools involved in the project.

General Information

- All schools received funding to help with the provision of memorable experiences.
- The memorable experiences were used as the focus for pupils' writing.
- All schools in the intervention group were required to use the main elements of the SRSD writing programme (listed below) in the teaching of writing.
- Secondary schools received details of all the pupils involved in the programme at primary level and these pupils were then part of the programme at secondary level.
- All pupils at secondary schools could take part in any funded memorable experiences but only those pupils in English sets which contained pupils who were part of the project received tuition in the SRSD method for developing writing.
- The SRSD method of developing writing was used throughout the autumn term with the intervention groups in Year 7 in each of the participating secondary schools.
- All pupils working at NC Level 3 and above in Year 7 took the GL Writing test in December 2013.
- Arrangements were made for visits to schools to monitor and support the implementation of the programme at both primary and secondary level.

Timescales – dates and times for implementation

- Primary teachers were able to use elements of SRSD immediately after the training or could delay using the strategy until after SATs; most chose the latter.
- SRSD had to be taught explicitly as part of Literacy lessons and further developed through topic work.
- Secondary teachers used the SRSD approach with English sets which contained pupils in the intervention group for the teaching of writing in the autumn term.

Delivering the programme

Teachers delivered SRSD in the order outlined in the manual but were allowed to combine lessons rather than stick rigidly to the prescribed model.

When teaching a specific genre all teachers were asked to include the following elements:

- discussion about the genre
- pre assessment – carried out by class teachers before starting the SRSD programme on any genre
- mnemonics – the mnemonic recommended for use was IPEELL: I= Introductory paragraph; P= Points; E = Examples/elaboration; E=End; L=Links (connectives, openers); L = Language (wow words, genre specific vocabulary, punctuation)
- graphic organisers – all schools were asked to use the same graphic organiser (planning scaffold)
- self-scoring and graphing – self-scoring systems were required to be used based on examples in the manual, with the results always graphed

- ‘self-talk’ – to be used at all stages (the American practice of ‘self-talk’ was Anglicised using the terms ‘positive talk’ and ‘motivational messages’)
- peer scoring
- final assessment.

Monitoring and support

- Monitoring visits took place in June and July in primary schools.
- Monitoring visits took place in October and November in secondary schools.
- Support was available from April 2013 for all schools.

Liaison with secondary colleagues

- Some secondary colleagues took the opportunity to visit primary schools to see SRSD in action and to discuss what had been covered so that teachers could build on existing experiences in the autumn term.

Development of toolkit

- After the project is completed, teachers involved will meet to discuss the implementation of the programme and to put forward ideas for materials that could be included in a toolkit that will help any other schools that wish to use the strategy.

Outcomes

The Progress in English (PiE) 11: Second Edition Long Form (LF) Test, GL Assessment, was the main literacy outcome measure. The test includes both narrative and non-narrative exercises and assesses both reading and writing skills including areas such as spelling, grammar and comprehension. The Progress in English Test was the only test available to the evaluation team (in order to comply with EEF testing policy) which included a writing component.

All Year 7 pupils in participating secondary schools undertook the test in December 2013 with the exception of pupils identified as below Level 3 (for whom the test is not suitable). Schools were instructed to deliver the tests under ‘exam’ conditions. The whole class sat the test at the same time. Tests were marked by GL Assessment ‘blind to allocation’ (i.e. markers did not know whether test papers were from intervention or control pupils).

Primary outcome

The primary outcome was extended writing score which refers to the combined raw score on the two extended writing tasks (Exercises 5 and 6) from the PiE test. Exercise 5 has a maximum of 20 marks and involves writing a persuasive letter. Exercise 6 has a maximum of 12 marks and assesses

informative writing. Overall, the extended writing task score can be in the range 0 to 32, with a higher score representing higher attainment.

Secondary outcome

Reading score, the combined raw score on the reading tasks (Exercises 3, 4, 3x and 4x), was used as the secondary outcome. Exercise 3 (comprising Exercises 3 and 3x) has a maximum total of 19 marks and assesses reading comprehension of a narrative. Exercise 4 (comprising exercises 4 and 4x) has a maximum of 13 marks and assesses non-narrative reading comprehension. Overall, reading score can range between 0 and 32, with a higher score representing higher attainment.

Spelling and grammar score, the combined raw score on the spelling and grammar tasks (Exercises 1 and 2) was chosen as a further secondary outcome. Exercise 1 has a maximum of 10 marks and assesses spelling. Exercise 2 also has a maximum of 10 and assesses grammar. This means the spelling and grammar score combined can range from 0 to 20, with a higher score representing higher attainment.

Sample size

The focus of this evaluation was on children who were performing at either national curriculum Level 3 or insecure Level 4 in English and hence the sample size calculation was based upon this population of children.

Prior to recruitment it was anticipated that approximately 24 primary schools would be involved in this study. The average Year 6 cohort in Calderdale was estimated at 45 pupils and it was predicted that between a quarter and a third of pupils would meet the eligibility criteria. This meant that, on average, there would be between 11 and 15 eligible pupils per primary school. Assuming, conservatively, 12 pupils per school meant that around 288 pupils would be eligible for the trial (144 per group). Assuming an intra-cluster correlation coefficient of 0.19 (from ECC randomised trial, Torgerson et al., 2011) would give a design effect of 3.09. Dividing the number of pupils in the trial (288) by this design effect gives an 'effective sample size' of approximately 94 pupils. However, we also assumed a pre- and post-test correlation of 0.70 which inflates the effective sample size to 192 pupils. After allowing for an estimated attrition rate of 10% this leads to an effective sample size of 172 pupils. This would give 80% power to show a difference of 0.43 standard deviations in writing score between the two groups providing a difference of this magnitude exists.

Randomisation

Primary schools were allocated to either intervention or control on a 1:1 ratio using deterministic minimisation. Minimisation is a technique that ensures balance between the groups by using an arithmetical algorithm. This process was conducted by the independent evaluation statistician using minimPy (<http://sourceforge.net/projects/minimpy/>). The number of pupils on roll, percentage of pupils in minority ethnic groups and percentage of pupils eligible for free school meals (FSM) were used as minimisation factors. The first two of these factors used three levels while FSM used two levels. The algorithm calculates the balance on specified variables after each individual has been allocated such that the next allocated individual minimises any chance imbalance between the groups (Torgerson & Torgerson, 2008).

The evaluation team provided allocation information to the implementation team for them to disseminate this to the schools. Due to an administrative error within the evaluation team, there was a discrepancy between the minimisation output and the allocation information which was provided to CEP in relation to two schools. This meant that one school was informed that they had been allocated to the control group when in fact the minimisation had assigned them to receive the intervention and that another was informed they had been allocated to the intervention arm when in fact the minimisation had assigned them to the control arm. As this administrative error occurred before the delivery partners or schools were informed of allocations, and therefore was an independent error, no bias should be introduced. The schools, therefore, were analysed according to the allocations received by the schools.

Analysis

Analysis was conducted in Stata® version 13 (Stata Corporation, College Station, Texas, USA) using the principles of 'intention-to-treat', meaning that all schools and pupils were analysed in the group they were randomised to irrespective of whether or not they actually received the intervention.

Statistical significance was assessed at the 5% level unless otherwise stated. Regression based methods of analysis were used and 95% confidence intervals are provided as appropriate.

Effect sizes were calculated and are presented alongside 95% confidence intervals. Effect size is defined as:

$$\Delta = \frac{\beta_{\text{intervention}}}{\sigma_{\varepsilon}}$$

where $\beta_{\text{intervention}}$ is the difference in mean score between the intervention and control groups and σ_{ε} is the residual standard deviation. The residual standard deviation was used rather than the more usual pre-test standard deviation as there was no equivalent pre-test value. Numerical values used to calculate the effect sizes for each analysis can be found in Appendix Q.

The test and outcomes were examined for ceiling or floor effects using summary statistics and graphical representations.

Estimates of the intra-cluster correlation coefficients (ICCs) for secondary school class and primary school in terms of both primary outcome and raw score are provided. No estimates are presented for secondary schools due to the small number of schools involved. The correlation between predicted KS2 Level and both raw score and primary outcome is also explored.

Primary analysis

The primary objective of this study was to investigate the effectiveness of the intervention on the writing skills of children meeting the inclusion criteria described previously: Year 6 at the beginning of the study and predicted to achieve Level 3 or an insecure Level 4 in English by the end of Key Stage 2. The difference in extended writing scores between pupils in the intervention and control groups was compared using a cross-classified multilevel model to account for potential clustering. Such a model is required as the data are not strictly hierarchical. Adjustment was made for predicted KS2 score, gender, EAL status, FSM status and month of birth. Secondary school class and primary school were included in the model as random effects with an artificial super cluster created at the secondary school

class level. Due to the small number of secondary schools involved in this trial, secondary school was not included as a random effect in the primary analysis.

Secondary analyses

An analogous approach to the primary analysis was used to examine differences between the intervention and control groups in terms of the secondary outcomes of reading, spelling and grammar for pupils meeting the inclusion criteria.

To assess the impact on pupils who were not eligible to receive the intervention and thus only receiving the intervention in Year 6, a similar analytical approach to that used in the primary analysis was applied three times including pupils predicted to achieve a Level 4a or above. Each repetition of this analysis looked at differences in extended writing score, reading score, and spelling, and grammar score respectively.

A similar analytical approach was used to assess the effectiveness of the intervention on writing skills for all children at Level 3 and above who received the intervention in either just Year 6 (those ineligible), or Years 6 and Year 7 (those eligible).

Regression models were also used to compare differences between the intervention and control groups with respect to the secondary outcomes of reading, spelling and grammar for all children at Level 3 and above.

Sub-group analysis

The effect of the intervention in terms of extended writing score was also analysed for the sub-group of pupils eligible for free school meals (FSM) through the inclusion of an interaction between FSM status and allocation in a further repetition of the primary analysis. This sub-group was chosen by the funder *a priori* before the study started and is a subgroup of interest for all EEF projects. Statistical significance was set at the 10% level as this trial was not powered to detect interactions.

As required by the funding body, an analogous regression to that used in the primary analysis was used to examine the effect of the intervention on pupils eligible for FSM, excluding all those not eligible for FSM.

Sensitivity analyses

The primary analysis was repeated including secondary school as a random effect.

Process evaluation methodology

A 'light touch' process evaluation was conducted, primarily to assess fidelity and potential contamination. During CEP's observations of primary schools allocated to the intervention group a score of 'fidelity to intervention' was recorded based on two questions: (1) Are the teachers delivering

SRSD intervention in line with the training received? (fully, partially, not at all) and (2) Do participating pupils have the opportunity to practise SRSD techniques? (fully, partially, not at all).

CEP also conducted a brief survey of all participating primary schools (both intervention and control) to collect information on the memorable experiences conducted by schools, and (from intervention schools only) to obtain views on the impact of the SRSD intervention.

In addition: the evaluation team had on-going discussions and communication with the delivery partner CEP throughout the trial period, a primary school classroom observation, and an informal interview with a primary school teacher who had delivered the intervention was conducted.

Impact evaluation

Participants

School recruitment

CEP approached 24 primary schools to consider taking part in the trial (Table 1). All schools were members of CEP and were positive about taking part; however one school was excluded because it felt unable to deliver the intervention in 2013 if allocated to the intervention group due to being in special measures.

CEP approached three secondary schools, all of whom were willing to implement all necessary trial procedures.

Table 1. School recruitment

	Number of schools approached	Number of schools recruited	Recruitment rate
Primary	24	23	96%
Secondary	3	3	100%

Pupil recruitment

All 23 primary schools sent opt-out letters to parents of all children in Year 6. In total 865 letters were sent and 23 (2.7%) opt-out forms were returned.

All three secondary schools sent opt-out letters to parents of all children in Year 7. In total nine opt-out forms were returned: two of these pupils had also opted-out at Year 6 and there were seven new opt-outs.

Participant flow

Figure 1 shows the flow of participants who were involved in Year 6 through the study. There were 842 pupils involved in the study at the point of randomisation: 787 of these were predicted to achieve Level 3 or above in KS2 English and hence were eligible for testing. There were 432 pupils (51.3% of

842) who were predicted to achieve a Level 3 or insecure Level 4 in KS2 English and hence were eligible for inclusion in the primary analysis.

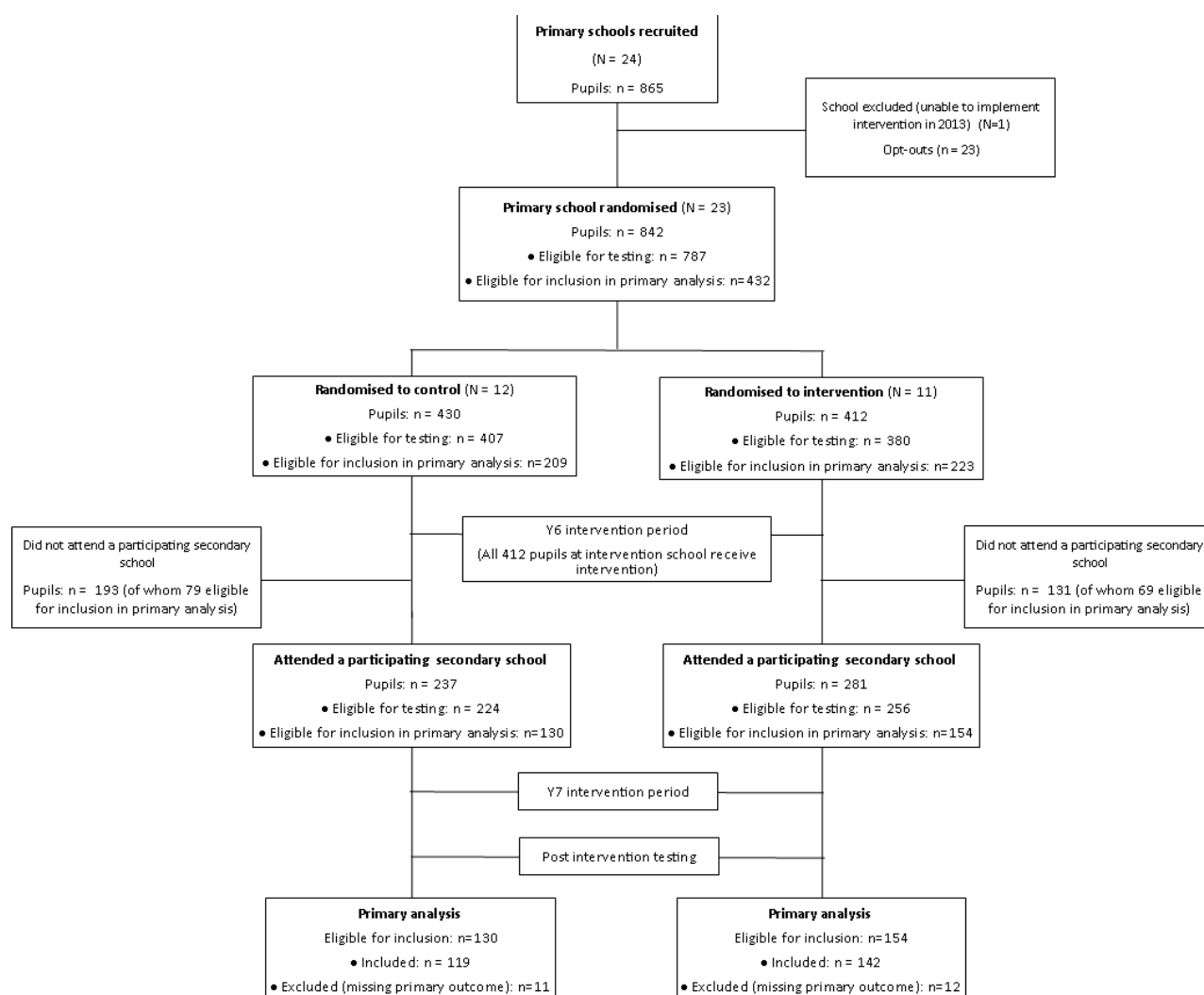
Twelve schools (containing 430 participating pupils) were randomised to the control condition and 11 schools (containing 412 participating pupils) were randomised to receive the intervention in 2013. There were 209 pupils in control schools and 223 pupils in intervention schools who were eligible for inclusion in the primary analysis.

When the pupils made the transition to secondary school, 193 of the 430 pupils at control schools did not attend participating secondary school; 79 of these 193 pupils would have been eligible for inclusion in the primary analysis, had they attended one of the three secondary schools. These 79 pupils did not attend the three designated secondary schools for a variety of reasons such as parental choice or moving out of the area. This left 237 pupils from control primary schools participating in the trial in Year 7, of whom 130 were eligible for inclusion in the primary analysis. There were 131 pupils from intervention primary schools who did not attend a participating secondary school; 69 of these pupils would have been eligible for inclusion in the primary analysis. This left 281 pupils from intervention primary schools participating in the trial in Year 7, of whom 154 were eligible for inclusion in the primary analysis.

After the exclusion of pupils without the primary outcome of extended writing score, the primary analysis was conducted on 142 intervention pupils and 119 control pupils.

There were 518 pupils who attended both a participating primary and secondary school; of these 480 were eligible for testing. Only 7.7% (37 out of 480) of these pupils did not complete all the writing exercises on the test and hence did not have a primary outcome. Slightly more males than females did not complete all the writing components (23 compared to 14) and more pupils who were not eligible for FSM had a missing value than those who were eligible for FSM. Just under half of the 37 pupils with no primary outcome had English as an additional language, and these had predicted levels ranging from Level 3c to Level 5b. Nearly half of these pupils (18 of 37) were missing secondary outcome measures of reading and spelling in addition to the primary outcome.

Figure 1. CONSORT diagram



School characteristics

Table 2 shows summary statistics of school-level characteristics of the 23 primary schools which were involved in the trial. The mean school size was just over 300 pupils with a range between 82 and 581. Just over one third of pupils on roll had been eligible to receive free school meals at some point in the previous 6 years and just under one third of pupils were from minority ethnic groups: this is slightly higher than the national average in January 2013 which was 28.5% (Department for Education, 2013). The proportion of FSM pupils was similar to the national average which is 19.2% for all maintained nursery and primary schools. All characteristics were fairly similar between the trial arms with the possible exception of minority ethnic groups where the control schools tended to have a higher proportion of such pupils than the intervention schools.

Table 2. School level characteristics

	As randomised Frequency (%)		Frequency (%)
	Intervention	Control	Overall
	n = 11	n = 12	n = 23
Number of pupils on roll			
Mean (SD)	312 (165.6)	308.2 (146.7)	310 (152.4)
Median (min, max)	231 (82, 581)	283.5 (127, 531)	283 (82, 581)
% eligible for FSM Ever 6			
Mean (SD)	39.4 (18.5)	33.5 (15.0)	36.3 (16.7)
Median (min, max)	40 (6.1, 68.1)	34.5 (8.9, 61)	37.2 (6.1, 68.1)
% pupils from minority ethnic groups			
Mean (SD)	22.5 (33.5)	39.0 (40.0)	31.1 (37.2)
Median (min, max)	7.5 (1, 96)	25.1 (2.4, 99.2)	10.2 (1, 99.2)
% pupils supported by school action			
Mean (SD)	13.2 (5.0)	13.5 (4.9)	13.4 (4.8)
Median (min, max)	12.6 (5.7, 20)	12.2 (6.7, 21.5)	12.6 (5.7, 21.5)
% stability			
Mean (SD)	81.1 (6.0)	83.6 (8.5)	82.4 (7.4)
Median (min, max)	80.9 (73.5, 91)	85.3 (61, 95.2)	83.7 (61, 95.2)

Pupil characteristics

Baseline characteristics for all those involved in the trial in Year 6 are presented in Table 3. At the point of baseline data collection and randomisation there were 842 pupils attending participating primary schools. Data collected in Year 7 suggested a further nine pupils attended participating primary schools, however no match within the Year 6 was available for any of these individuals. It is

possible that this discrepancy could be due to a misreported primary school in the Year 7 data or due to the fact that the pupils did not attend a participating primary school at the time of baseline data collection in December 2013. These pupils are therefore excluded from analyses and are not included in Year 6 figures. Proportions of pupils at each predicted level were fairly similar between trial arms; however the proportion of FSM pupils was slightly higher in the intervention group at 32.5% compared to 23.7% of the control group.

Table 3. Pupil level characteristics for all pupils

	As randomised (All pupils involved in Y6) Frequency (%)	
	Intervention	Control
	n = 412	n = 430
FSM		
Eligible	134 (32.5)	102 (23.7)
Not eligible	278 (67.5)	328 (76.3)
Missing	0 (0.0)	0 (0.0)
Predicted KS2 writing level		
Level 2 or below	32 (7.8)	23 (5.4)
Level 3c	14 (3.4)	17 (4.0)
Level 3b	29 (7.0)	29 (6.8)
Level 3a	27 (6.6)	19 (4.4)
Level 4c	77 (18.7)	69 (16.1)
Level 4b	76 (18.4)	75 (17.5)
Level 4a	56 (13.6)	62 (14.5)
Level 5 or above	100 (24.3)	135 (31.4)
Missing	1 (0.2)	1 (0.2)

At baseline there were 432 pupils eligible to receive the intervention in both Year 6 and Year 7 – 209 control pupils and 223 intervention pupils. Of these 432 pupils, 148 (34.3%) did not attend a participating secondary school. Baseline characteristics for the 284 pupils predicted to achieve between a Level 3c and a Level 4b who also attended a participating secondary school are presented in Table 4 both as randomised and as analysed. The KS2 predicted level, which is the strongest predictor of the primary outcome, is closely balanced in the analysed groups (i.e. 0.66 standard deviations difference).

Table 4. Pupil-level characteristics for pupils predicted a Level 3 or insecure Level 4 and attending a participating secondary school

	As randomised Frequency (%)		As analysed Frequency (%)	
	Intervention	Control	Intervention	Control
Number of eligible pupils in Year 7	n = 154	n = 130	n = 142	n = 119
Gender [†]				
Male	84 (54.6)	78 (60.0)	77 (54.2)	70 (58.8)
Female	70 (45.5)	52 (40.0)	65 (45.8)	49 (41.2)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
FSM				
Eligible	57 (37.0)	38 (29.2)	50 (35.2)	36 (30.3)
Not eligible	97 (63.0)	92 (70.8)	92 (64.8)	83 (69.8)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
English as an additional language[†]				
EAL	64 (41.6)	77 (59.2)	60 (42.3)	69 (58.0)
Non-EAL	90 (58.4)	53 (40.8)	82 (57.8)	50 (42.0)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Predicted KS2 writing level				
Level 3c	9 (5.8)	6 (4.6)	8 (5.6)	4 (3.4)
Level 3b	23 (13.9)	25 (19.2)	20 (14.1)	20 (16.8)
Level 3a	18 (11.7)	9 (6.9)	15 (10.6)	8 (6.7)
Level 4c	49 (31.8)	43 (33.1)	47 (33.1)	40 (33.6)
Level 4b	55 (35.7)	47 (36.2)	52 (36.6)	47 (39.5)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

	As randomised Frequency (%)		As analysed Frequency (%)	
Mean predicted KS2 writing levels			n =142 3.81 (1.23)	n = 119 3.89 (1.20)
Month of birth [†]				
Sept – Nov	38 (24.7)	27 (20.8)	35 (24.6)	24 (20.2)
Dec – Feb	41 (26.6)	30 (23.1)	37 (26.1)	29 (24.4)
Mar – May	40 (26.0)	34 (26.2)	38 (26.8)	31 (26.1)
Jun – Aug	35 (22.7)	39 (30.0)	32 (22.5)	35 (29.4)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

[†] Only collected in Year 7, however these are time constant variables and as such are still presented.

Outcomes and analysis

Of the 23 primary schools, eight sent pupils to only one secondary school, seven sent pupils to two different secondary schools and another seven sent pupils to all of the secondary schools involved in the trial. One school did not send any pupils to a participating secondary school.

Of the three secondary schools, one was fed into by 10 participating primary schools, another had 14 feeder primaries and the last received pupils from 19 of the participating schools.

There were 28 Year 7 classes spread across the three secondary schools. One secondary school class had no individuals from a participating primary school, the other 27 classes contained pupils from between two and 23 participating primary schools.

The post-test and outcomes were assessed for ceiling or floor effects using histograms and summary statistics. Ceiling effects occur if a test is too easy (e.g. lots of pupils achieve a perfect score), while floor effects occur if a test too hard (e.g. lots of pupils score zero). Both types of effect can unfairly reduce the apparent impact of the intervention. No evidence of either effect was found (details in Appendix O).

Intra-cluster correlation coefficients (ICCs) were estimated (Table 5). The secondary class ICC based on the primary analysis (0.10) is slightly smaller than the one that was used for the sample size calculation estimate (0.19) which was derived from a maths study. All primary school ICCs were fairly small. However, as post test data were not available for pupils who did not attend a participating secondary school, this is based on a sub-group of those who were involved in the trial in Year 6.

The correlation between primary outcome (the extended writing score) and the predicted KS2 level for those eligible for inclusion in the primary analysis was also lower than expected (Spearman's Rho 0.35). The correlation between overall test raw score and predicted KS2 level based on all participants was 0.64.

Table 5. Estimated intra-cluster correlation coefficients (ICCs).

	n	Secondary school class ICC	Primary school ICC
Total raw score	360	0.51	0.03
Primary outcome (extended writing score)	499	0.40	0.04
Primary outcome based on primary analysis	261	0.10	0.08

Raw, unadjusted mean post-test scores are presented in Table 6 by trial arm for those eligible for inclusion in the primary analysis (i.e. attended both a participating primary school and a participating secondary school and predicted Level 3 or insecure Level 4 in Year 6). In terms of the primary outcome of extended writing, the mean score was higher in the intervention group than in the control groups at 21.9 out of 32 marks (SD 4.39) in the intervention group compared to 19.4 marks (SD 5.32) in the control group. The proportion of those completing the extended writing questions was slightly higher in the intervention arm than in the control arm at 63.7% compared to 56.9% of the control arm. In general the completion rate of the primary outcome was high at 91.9% of those eligible for inclusion in analysis who attended a participating secondary school (261 out of 284). The majority of those completely missing answers to all the extended writing questions (148 of 163, 90.8%) did not attend a participating secondary school and hence were not tested. Mean reading score and mean spelling and grammar score were similar between the arms. The proportion of pupils completing the reading outcome was slightly lower in the intervention group than in the control group. The opposite was true for the spelling outcome, where a slightly higher proportion of intervention pupils completed than control pupils. For both secondary outcomes, the majority of pupils completely missing outcome scores did not attend a participating primary school.

Table 6. Unadjusted average scores for the intervention and control groups for those eligible for inclusion in the primary analysis

	Intervention	Control	Overall
Eligible for inclusion in primary analysis in Year 6	n = 223	n = 209	n = 432
Eligible for inclusion in primary analysis and attended a participating secondary school	n = 154	n = 130	n = 284
<u>Primary outcome</u>			
<i>Extended writing score</i>	n = 142	n = 119	n = 261
Mean (SD)	21.9 (4.39)	19.4 (5.32)	20.8 (4.97)
Med (Min, Max)	22 (8, 31)	19 (8, 32)	21 (8, 32)
Completely missing & not attending participating secondary school (%)	69 (30.9)	79 (37.8)	148 (34.3)
Completely missing & attending participating secondary school (%)	10 (12.7)	5 (6.0)	15 (3.5)
Partially missing (%)	2 (0.9)	6 (2.9)	8 (1.9)
Complete (%)	142 (63.7)	119 (56.9)	261 (60.4)
<u>Secondary outcomes</u>			
<i>Reading score</i>	n = 108	n = 88	n = 196
Mean (SD)	14.5 (4.38)	14.3 (4.79)	14.4 (4.56)
Med (Min, Max)	14 (5, 26)	14 (3, 26)	14 (3, 26)
Completely missing & not attending participating secondary school (%)	69 (30.9)	79 (37.8)	148 (34.3)
Completely missing & attending participating secondary school (%)	9 (4.0)	6 (2.9)	15 (3.5)
Partially missing (%)	37 (16.6)	36 (17.2)	73 (16.9)
Complete (%)	108 (48.4)	88 (42.1)	196 (45.4)
<i>Spelling and grammar score</i>	n = 142	n = 112	n = 254
Mean (SD)	8.1 (4.17)	8.8 (4.80)	8.4 (4.46)
Med (Min, Max)	8 (0, 17)	9 (0, 20)	8 (0, 20)
Completely missing & not attending participating	69 (30.9)	79 (37.8)	148 (34.3)

	Intervention	Control	Overall
secondary school (%)			
Completely missing & attending participating secondary school (%)	8 (3.6)	8 (3.8)	16 (3.7)
Partially missing (%)	4 (1.8)	10 (4.8)	14 (3.2)
Complete (%)	142 (63.7)	112 (53.6)	254 (58.8)

Primary analysis – impact of approach on extended writing of pupils between Level 3c and 4b

The primary analysis was adjusted for baseline-predicted KS2 writing level, gender, FSM status, EAL status and month of birth. After exclusion for missing data relating to any of these variables or the response, analysis was conducted on 261 pupils: 142 from the intervention group and 119 from the control group. There was evidence of a difference in extended writing score between the allocated groups, with a significant increase of 2.53 marks for those in the intervention group when compared with those in the control group ($p=0.002$, 95% CI: 0.90 to 4.16). This relates to an effect size of 0.74 (95% CI: 0.26 to 1.22). Full details of coefficients for all covariates can be found in Appendix P.

Secondary analyses

The primary analysis was repeated using reading score as the response. After exclusion for missing data relating to any covariates or the response, analysis was conducted on 196 pupils: 108 from the intervention group and 88 from the control group. There was no evidence of a difference in reading scores between the allocated groups, with a non-significant decrease of 0.31 marks for those in the intervention group when compared with those in the control group ($p=0.72$, 95% CI: -2.02 to 1.41). This relates to an effect size of -0.09 (95% CI: -0.59 to 0.41).

The primary analysis was also repeated using spelling and grammar score as the response. After exclusion for missing data relating to any covariates or the response, analysis was conducted on 254 pupils: 142 from the intervention group and 112 from the control group. There was no evidence of a difference in spelling and grammar score between the allocated groups, with a non-significant decrease of 0.44 marks for those in the intervention group when compared with those in the control group ($p=0.50$, 95% CI: -1.72 to 0.84). This relates to an effect size of -0.13 (95% CI: -0.51 to 0.25).

Pupils at Level 4a and above

To assess the impact on the writing skills of pupils who were not eligible to receive the intervention and thus only received the intervention in Year 6, the primary analysis was repeated using only pupils at Level 4a and above. After exclusion for missing data relating to any of covariates or the response, analysis was conducted on 181 pupils; 94 from the intervention group and 87 from the control group. There was no evidence of a difference in extended writing score between the allocated groups, with a non-significant increase of less than 0.01 marks for those in the intervention group when compared with those in the control group ($p=1.00$, 95% CI: -1.38 to 1.38). This relates to an effect size of approximately 0.00 (95% CI: -0.45 to 0.45). This could be due to a number of factors, for example the fact that these pupils did not receive the full intervention.

This analysis was repeated using the same individuals (those at Level 4a or above) but with reading score as the response variable. After exclusion for missing data relating to any of the covariates or the response, analysis was conducted on 148 pupils; 81 from the intervention group and 67 from the control group. There was no evidence of a difference in reading score between the allocated groups, with a non-significant decrease of 0.39 marks for those in the intervention group when compared with those in the control group ($p=0.59$, 95% CI: -1.80 to 1.02). This relates to an effect size of -0.12 (95% CI: -0.58 to 0.33).

This analysis was repeated on the same individuals again (those at Level 4a or above) but with spelling and grammar score as the response variable. After exclusion for missing data relating to any of the covariates or the response, analysis was conducted on 182 pupils: 95 from the intervention group and 87 from the control group. There was no evidence of a statistically significant difference in spelling and grammar score between the allocated groups, with a non-significant increase of 0.10

marks for those in the intervention group when compared with those in the control group ($p=0.89$, 95% CI: -1.43 to 1.64). This relates to an effect size of 0.04 (95% CI: -0.49 to 0.56).

Sub-group analysis

A pre-specified subgroup analysis was conducted. The effect of the intervention on pupils eligible for FSM was assessed through the inclusion of an interaction term in a repetition of the primary analysis. Statistical significance was assessed at the 10% level. There was no evidence of a statistically significant interaction between allocated group and FSM status ($p=0.69$) suggesting the intervention did not have a differential effect dependent on FSM status.

As required by the funding body, the primary analysis was repeated in the subgroup of pupils eligible for FSM. After exclusion for missing data relating to any of these variables or the response and for pupils not eligible to receive FSM, analysis was conducted on 86 pupils; 50 from the intervention group and 36 from the control group. There was evidence of a difference, which reflects the main analysis, in extended writing score between the allocated groups, with a significant increase of 3.34 marks for those in the intervention group when compared with those in the control group ($p=0.02$, 95% CI: 0.55 to 6.13). This relates to an effect size of 1.60 (95% CI: 0.21 to 2.98). Note, however, that although the effect size for this subgroup appears to be much larger than the overall effect size, the test for interaction, described above, showed no evidence that this apparent difference was caused by anything other than chance.

Sensitivity analysis

When the primary analysis was repeated also accounting for clustering at the secondary school level, results were consistent with those obtained in the primary analysis.

Cost

The costs to schools of repeating the programme is estimated at:

- one day's training – venue, equipment, refreshments and training materials (£900)
- SRSD trainers, with one day's preparation (£900 per trainer)
- memorable experiences per class (£1,500).

The following assumptions are built into the calculations for implementation by other schools:

- SRSD training delivered to 30 teachers
- SRSD delivered to a class of 30 pupils.

Basic costs would then be: £60 per teacher for the initial training and £50 per pupil for memorable experiences i.e. £1,560 per class.

These costs could be reduced significantly depending on the cost of the memorable experiences chosen; they would be increased if supply cover for the teacher training was required.

Additional resources required would be minimal as the strategies can be delivered as an integral part of literacy/English teaching. The project team is developing a toolkit by 2015 (teacher manual, DVDs

etc.) which, if reproduced commercially, is estimated will cost in the region of £50 to £100. A school would only need to buy one toolkit.

Costs in future years would relate to the cost of the chosen memorable experiences and any further training required for teachers new to the school.

Process evaluation

Only two of the intervention schools opted to implement the intervention before the Standard Assessment Tests (SATs) in May (as they did not wish to disrupt children's progress towards the SATs). The implication of this is that in most primary schools the intervention was only delivered over approximately a six-week period. Generally the feeling, reported by CEP, was that most schools would have preferred to have started using the intervention earlier, with many teachers commenting on the positive impact it had had on children within their class. Most of the intervention primary schools also reported to CEP that they intended to use the intervention from September with the following year's Year 6 and Year 7 children and to introduce it into other year groups.

Classroom observation

One classroom observation in total was conducted, and therefore any findings and conclusions should be interpreted with extreme caution. This session was delivered especially for the evaluation team (at the end of summer term). The session clearly demonstrated many of the essential elements of the SRSD intervention that had been outlined to schools by CEP related to planning to write. It was clear that the session was the first of two, and it covered all the elements related to planning and preparing to write. The session did not involve the children actually writing, or conducting any self-scoring or graphing: this was due to be covered in a second session.

Informal teacher interview

An informal discussion was held with one teacher who had been delivering the intervention, along with a member of CEP. In her view, the training received was too 'American' and 'not the way things would be done here', especially the 'self-talk' and motivational elements. She suggested that the training could have been condensed into one day rather than two. She had not accessed any of the additional resources suggested and also noted that she had not made use of the manual provided at the training day, except when, as a school, they designed their own scaffold. She noted that CEP had given them flexibility and that they had gone on to adapt and use the intervention as they felt suited their school. Overall the teacher was extremely positive about the intervention (although noted this was as adapted and used by CEP rather than the way they were trained). She felt the intervention had been very beneficial and intended to continue using it the following year. She also felt that the children had internalised the techniques and that this was demonstrated in the 'cold writing tasks' where children were given no guidance but used the techniques taught of their own accord.

The teacher noted that at the beginning some children were spending more time on the mathematical elements (graphs), and as a school they knew they needed to alter this as it clearly wasn't the purpose of the intervention.

The teacher reported that children enjoyed the scoring (this school used self-scoring, peer-scoring and teacher scoring) and the graphing element of the intervention as it allowed them to see how they could make progress, and increased their confidence.

This school did not start using the intervention until after SATs and reported that there had been too little time after SATs, but that they intended to use the intervention from the following September with the new Year 6.

The teacher also reported that she did not feel that the children's writing skills improved solely due to writing about a memorable experience, as at the beginning of the intervention period they had conducted a 'cold writing task' based on a memorable experience, because they were interested to know for themselves if the SRSD intervention would make a difference above and beyond writing about a memorable experience. The teacher reported that, in her view, that the SRSD intervention was the element that made the difference not just writing about memorable experiences.

This school conducted their own process evaluation of the intervention by asking participating children their views on the intervention. A large majority of the children noted that they had found the self-scoring and graphing very important and helpful as it allowed them to see what elements of their writing they needed to improve. It also increased their confidence when they could visually see they were making progress.

Discussions with Calderdale Excellence Partnership

From ongoing discussions with CEP throughout the trial period, it was clear that a process of 'intervention development' occurred over the trial period and is ongoing. CEP gave the primary schools flexibility to develop and implement some components of the intervention as each saw fit following the training received in March 2013. CEP also noted the 'American-ness' of the intervention and felt it needed to be Anglicised for the English classroom context. This was especially true of the 'self-talk' element which CEP reported many of the primary schools had reframed into a more British approach.

CEP delivered their own refresher training to secondary schools in September, and incorporated 'lessons learnt' and adaptations following the intervention period in primary schools. CEP have set up a working group to discuss how the intervention should be modified and adapted for implementation next year.

Implementation

One teacher at one secondary school received training but taught a control class; at another secondary school, two teachers taught intervention classes without having had the initial SRSD training.

Conclusion

The results of this large cluster randomised controlled trial are in line with a systematic review of previous, largely American, trials showing SRSD is an effective strategy for teaching writing skills. Though the finding is consistent with existing research, the positive effect size for the primary outcome (in excess of 0.70 standard deviations) was nonetheless remarkably large. Although there appeared to be an even larger difference within the FSM subgroup, this difference between FSM and non-FSM pupils was not close to being statistically significant. Consequently, there is a high likelihood that the difference is simply due to chance.

Strengths of the evaluation

In the design and conduct of our study we used best practice as defined by the CONSORT guidelines for randomised controlled trials (Altman et al., 2011). Importantly, we used independent concealed allocation to ensure that the clusters were allocated without the possibility of bias. We used the principles of intention-to-treat by including all consenting eligible classes, teachers and children in the final analysis. We pre-specified our main outcome and wrote a statistical analysis plan before we observed the data. We also used an independent company to mark the test papers, blind to the allocated group.

Limitations of the evaluation

The trial was only undertaken within a narrow geographical area of the UK, however about 30% of pupils were eligible for FSM and 30% were from ethnic minorities, suggesting that the results are applicable across different sub-groups within the population. From the process evaluation there is evidence that teachers adapted the SRSD intervention into an English context as they felt that it was too 'American'; therefore the description of the intervention may not be actually what was implemented within the typical classroom. In addition, we cannot disentangle the effectiveness of the individual components of the intervention (e.g. the training or the implementation of the intervention with pupils in primary or secondary schools).

Interpretation

This intervention appears to be highly effective at improving children's writing skills despite imperfect implementation (one teacher at one secondary school received training but taught a control class; at another secondary school, two teachers taught intervention classes without having had the initial SRSD training) and despite being used for a relatively short period of time (less than a single academic year in total).

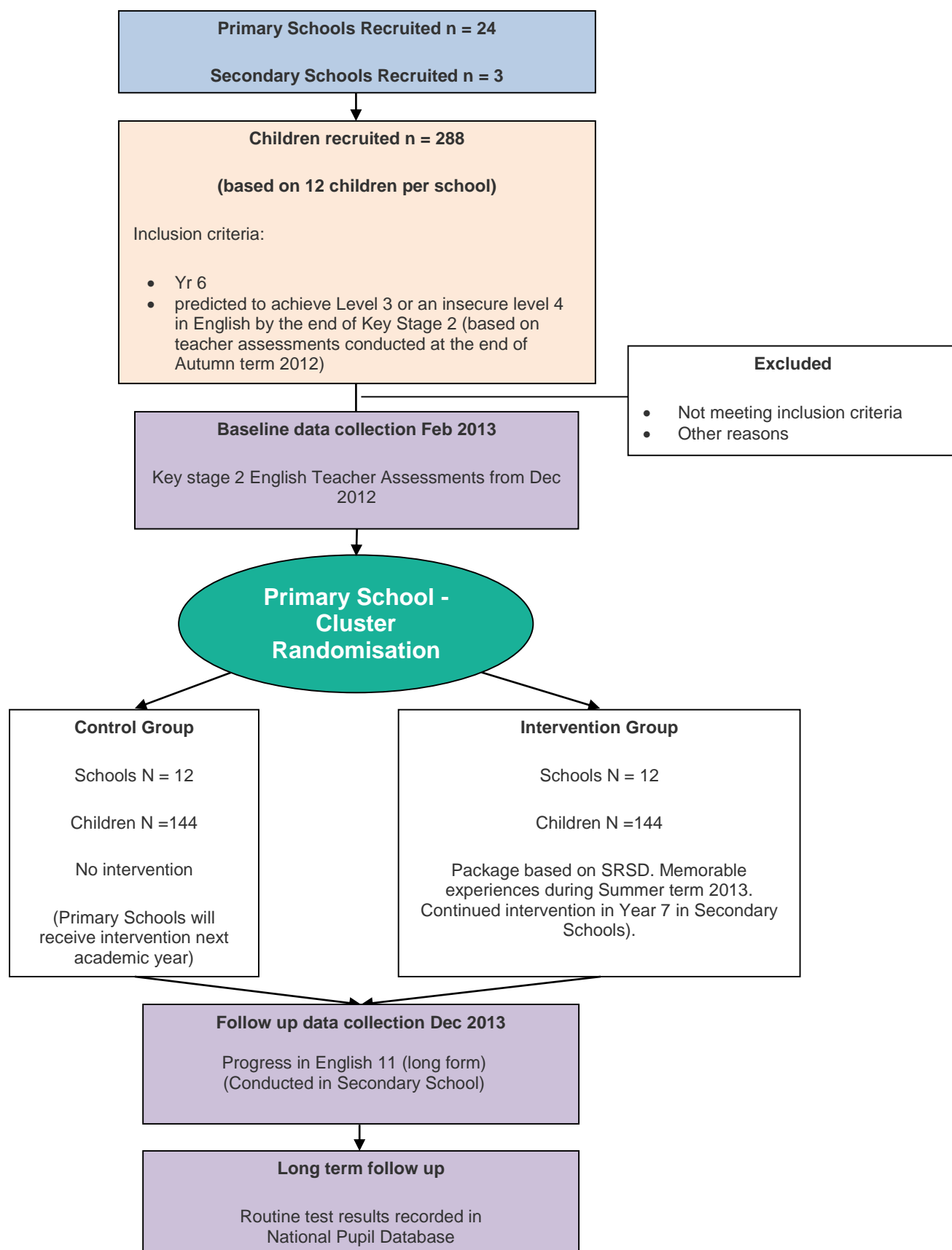
Future research and publications

Given the large effect size and positive feedback from teachers, we would recommend a much larger-scale effectiveness RCT of the intervention in undertaken to confirm the findings of this trial. The rationale behind this is as follows. First, the trial was geographically confined and focused on ‘transfer’ or ‘transition’ pupils. Second, Calderdale teachers adapted the intervention to suit their context and a formal evaluation of training teachers in an ‘Anglicised’ version would be appropriate. We consider that a trial of an Anglicised version of SRSD aimed at all primary school pupils with KS2 English assessments as the main outcome would be useful. Additionally, a trial of teaching the technique to secondary school teachers and using GCSE English scores as the main outcome would also be a valuable study. These two trials could be run in parallel.

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Appendix A: Trial Diagram



Appendix B: Trial Timelines

Calderdale Timeline																	
	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14
Apply for University Ethics																	
Intervention Development																	
Recruitment of Schools																	
Baseline Data Collection																	
Randomisation																	
Delivery of Intervention																	
Post Intervention Testing																	
Analysis & Report Writing																	

Appendix C:

Expression of Interest Document for Schools

THE UNIVERSITY *of York*



Evaluation of Calderdale Excellence Partnership Improving Writing Quality intervention

The Education Endowment Foundation has asked researchers at the University of York and Durham University to evaluate the *Improving Writing Quality* intervention being delivered and supported by the Calderdale Excellence Partnership in 2013 and 2014. In addition to providing memorable experiences for the pupils the intervention will include professional development for teachers in key elements of the writing intervention Self-Regulated Strategy Development (SRSD), including discussion, modelling and planning. The evaluation aims to find out if the intervention helps to improve pupils' writing skills during the transition from Year 6 to Year 7, especially the writing skills of pupils who are currently working at KS2 Level 3 or a fragile KS2 Level 4.

All primary schools who decide to take part in the intervention and its evaluation will be asked to provide information to Durham University about all pupils currently in Year 6 at their school. The information will include each Year 6 pupil's UPN and their KS2 teacher assessment (from the end of the autumn term 2012) plus some basic demographic information about the school.

Primary schools will then be randomly allocated in March 2013 by an independent researcher at the University of York to either implement the intervention in summer term 2013 with their Year 6 pupils or wait to implement the intervention in summer term 2014 with Year 6 pupils. Notice will be taken of the demographic information to ensure that the two groups are balanced. Schools delivering the programme in 2013 will receive training in March 2013. The intervention will be delivered to all Year 6 pupils in the experimental group.

Pupils taking part in the intervention will continue to receive the intervention when they move into Year 7. All secondary schools who decide to take part will be asked to place all pupils from primary schools who have been running the programme into one half of Year 7 (who will continue to take

part in the activities in the autumn term 2013), and all pupils from primary schools who have not been running the programme in 2013 into the other half of Year 7 (who will receive the usual teaching in autumn term 2013). The intervention will be delivered to those classes/sets in which there are pupils from the intervention schools.

At the end of autumn term 2013 all Year 7 pupils (with some exceptions where needed) in participating secondary schools will complete the GL Assessment Progress in English (PiE) 11 (Long Form). Secondary schools will send the pupils' results to Durham University.

The PiE results of all pupils taking part in the intervention will then be compared with the results of all children receiving the usual teaching, in order to estimate the effect the intervention has had on pupils' writing skills.

What commitment would this project require from schools?

- Enthusiasm for the project and for your own professional learning
- Provision of baseline data about pupils in Year 6 (primary schools)
- Willingness to allow random allocation to the 'Memorable Experiences' intervention in 2013 or 2014 (primary schools)
- Willingness to place all pupils from primary schools implementing the intervention in 2013 in one half of Yr 7 and all pupils from primary schools waiting to implement the intervention in 2014 in the other half of Yr 7 (secondary schools)
- Attendance at professional development days
- Willingness to implement the intervention
- Willingness to administer a writing test to all Year 7 pupils in December 2013 (secondary schools) and to provide the results to Durham University (the test will be marked independently by external markers)

When will this project take place?

We hope to randomise participating schools in early March 2013. The first CPD days will be in March 2013. For primary schools allocated to implement the intervention in 2013, the activities will begin after the Easter holidays.

Is there funding to support my involvement?

Yes – funding for memorable experiences, training and development.

Please come to the information meeting to find out more

On **Tuesday 26th February 2013** the Calderdale Excellence Partnership and the Evaluation team will jointly hold an information meeting for schools to find out more about the intervention and its evaluation. We very much hope to see you at this event – 1.15pm for a 1.30pm start and a 3.00pm finish at the Cedar Court Hotel, Lindley Moor Road, Ainley Top, Huddersfield, West Yorkshire HD3 3RH. To book a place, please contact the Partnership office. Email: hxec.co.uk Tel: 01422 255006

Appendix D: Primary School Agreement to participate form

THE UNIVERSITY *of York*



Calderdale Excellence Partnership



Evaluation of Calderdale Excellence Partnership *Improving Writing Quality* intervention

Primary School Agreement to Participate

☐ I confirm that I have read and understood the information sheet for the above evaluation and have had the opportunity to ask questions;

☐ I understand that all children's results will be kept confidential and that no material which could identify individual children or the school will be used in any reports of this evaluation;

☐ I agree to send an information letter out to all parents/carers of children in Year 6 and collect in any returned opt out forms;

☐ I agree to provide baseline data about pupils in Year 6 to the evaluation team, Calderdale Excellence Partnership and EEF(excluding any pupils for whom opt out forms have been returned)

☐ I understand that named baseline data will be matched with the National Pupil Database and shared between the evaluation team, Calderdale Excellence Partnership and EEF.

☐ I agree to random allocation to implement the 'Improving Writing Quality' intervention in 2013 or 2014

☐ I agree to staff attending professional development days

☐ **I consent to the school taking part in the above study.**

Name of headteacher

.....

Name of School

.....

School Tel no

.....
....

Headteacher Email address

.....

Name of School Contact (if not
headteacher).....

School Contact email
address.....

**Signature of
headteacher**.....

Date.....

Thank you for agreeing to take part in this research. Please return this consent form at the information meeting or afterwards by post to:

Calderdale Excellence Partnership office Room 121, E Mill, Dean Clough, Halifax, HX3 5AX

Appendix E: Secondary School Agreement to participate form



Evaluation of Calderdale Excellence Partnership *Improving Writing Quality* intervention

Secondary School Agreement to Participate

☐ I confirm that I have read and understood the information sheet for the above evaluation and have had the opportunity to ask questions;

☐ I understand that all children's results will be kept confidential and that no material which could identify individual children or the school will be used in any reports of this evaluation;

☐ I agree to place all pupils from primary schools implementing the intervention in 2013 in one half of Yr 7 and all pupils from primary schools waiting to implement the intervention in 2014 in the other half of Yr 7;

☐ I agree to implement the 'Improving Writing Quality' intervention with children in Year 7 from primary schools implementing the intervention in 2013;

☐ I agree to staff attending professional development days

☐ I agree to send an information letter out to all parents/carers of children in Year 7 and collect in any returned opt out forms;

☐ I agree to administer a writing test to all Year 7 pupils in December 2013;

☐ I understand that pupils' test responses, date of birth and gender will be collected by GL Assessment and accessed by the evaluation team. Named data will be matched with the National Pupil Database and shared between the evaluation team, Calderdale Excellence Partnership and EEF (Excluding data on any pupils for whom opt out forms have been returned).

☐ **I consent to the school taking part in the above study.**

Name of headteacher

.....
.....

Name of School

.....
.....

School Tel no

.....
.....

Headteacher Email address

.....
.....

Name of School Contact (if not
headteacher).....

School Contact email
address.....

.....

**Signature of
headteacher**.....

Date.....

.....

Thank you for agreeing to take part in this research. Please return this consent form at the information meeting or afterwards by post to:

Calderdale Excellence Partnership Office Room 121, E Mill, Dean Clough, Halifax, HX3 5AX

Appendix F: Parent and Pupil Information Letter Year 6



[INSERT DATE]

[INSERT SCHOOL NAME]

Dear Parent / Carer

Your child's school is taking part in the *Improving Writing Quality* programme evaluation. Durham University and the University of York have been asked by the Education Endowment Foundation (an organisation funding research into education) to independently evaluate the *Improving Writing Quality* programme.

The *Improving Writing Quality* programme is being led by the Calderdale Excellence Partnership (an organisation which helps schools in the Calderdale area). It is designed to improve children's writing skills during the transition from Year 6 to Year 7. Good writing skills are important for all children.

To find out how well the *Improving Writing Quality* programme works some schools will use the Improving Writing Quality programme this year and some schools will not. This is decided randomly by a computer. (However all schools will continue to teach children writing skills.) Researchers will then compare results from schools that have used the programme with schools that have not. In order to do this we would like to collect information about your child from your child's primary school and later from your child's secondary school.

Your child's school will provide information including your child's name, date of birth, gender, unique pupil number, details on your child's current National Curriculum writing level and free school meal status.

Your child's information will be treated with the strictest confidence. Named data will be matched with the National Pupil Database and shared between the evaluation team, Calderdale Excellence Partnership and EEF. We will not use your child's name or the name of the school in any report arising from the research. Your child's information will be kept confidential at all times.

If you are happy for your child's information to be used you do not need to do anything. Thank you for your help with this project.

If you would rather your child's school did not share your child's information for this project please complete the enclosed opt out form and return it to your child's school by [INSERT DATE].

If you would like further information about the Improving Writing Quality evaluation please contact Hannah Ainsworth the Evaluation Coordinator: hannah.ainsworth@york.ac.uk; 01904 328158

Yours faithfully

Professor David Torgerson (University of York)

Professor Carole Torgerson (Durham University)

Calderdale Excellence Partnership

Education Endowment Foundation



Improving Writing Quality Evaluation: Opt Out Form

If you **DO NOT** want your child's data to be shared for use in the Improving Writing Quality evaluation, please return this form to your child's school asap.

I **DO NOT** want my child's data to be shared for use in the Improving Writing Quality evaluation

☐

Parent/Carer Signature.....
Date.....

Child's Name.....
.....

Child's School.....
.....

Appendix G: Parent and Pupil Information Letter Year 7



[INSERT DATE]

[INSERT SCHOOL NAME]

Dear Parent / Carer

Your child's school is taking part in the *Improving Writing Quality* programme evaluation. Durham University and the University of York have been asked by the Education Endowment Foundation (an organisation funding research into education) to independently evaluate the *Improving Writing Quality* programme.

The *Improving Writing Quality* programme is being led by the Calderdale Excellence Partnership (an organisation which helps schools in the Calderdale area). It is designed to improve children's writing skills during the transition from Year 6 to Year 7. Good writing skills are important for all children.

To find out how well the *Improving Writing Quality* programme has worked we would like to use English test results. Your child will do a test at school designed by GL assessment. When the test is completed the test will be sent to GL assessment who will mark the test and send the test results to the evaluation team who will analyse the results of the test as part of the research. Your child's gender and date of birth will also be collected.

Your child's information will be treated with the strictest confidence. Named data will be matched with the National Pupil Database and shared between the evaluation team, Calderdale Excellence Partnership and EEF. We will not use your child's name or the name of the school in any report arising from the research. Your child's information will be kept confidential at all times.

If you are happy for your child's information to be used you do not need to do anything. Thank you for your help with this project.

If you would rather your child's school did not share your child's information for this project please complete the enclosed opt out form and return it to your child's school by [INSERT DATE].

If you would like further information about the *Improving Writing Quality* evaluation please contact Hannah Ainsworth the Evaluation Coordinator: hannah.ainsworth@york.ac.uk; 01904 328158

Yours faithfully

Professor David Torgerson (University of York)

Professor Carole Torgerson (Durham University)

Calderdale Excellence Partnership

Education Endowment Foundation

THE UNIVERSITY *of York*

Calderdale Excellence Partnership



Improving Writing Quality Evaluation: Opt Out Form

If you **do not** want your child's data to be shared for use in the Improving Writing Quality evaluation, please return this form to your child's school asap.

☐

ot want my child's data to be shared for use in the Improving Writing Quality evaluation

Parent/Carer Signature.....
Date.....

Child's
Name.....
.....

Child's
School.....
.....

Appendix H: Variable Collection Table

DP = Delivery Partner (Calderdale)

GL = GL Assessment

EVY = Evaluators (York)

EEF = Education Endowment Fund

EV = Evaluators (York and Durham)

EVD = Evaluators (Durham)

	Variable	Required By	Comments
School Information: (For both primary and secondary schools unless otherwise stated)	School Name	All	
	Secondary School DCSF code	GL	Currently missing (DP to collect)
	Secondary School Address + Postcode	GL	Currently missing (DP to collect)
	Secondary School Telephone Number	GL	Currently missing (DP to collect)
	Secondary School Assessment Lead Name	GL	Currently missing (DP to collect)
	Secondary School Assessment Lead Email and Role	GL	Currently missing (DP to collect)
	Number of tests required per secondary school	GL	Currently missing (DP to collect)
	Number of Pupils on Roll	EV	Currently missing for secondary schools
	% pupils FSM (Ever 6)	EV	Currently missing for secondary schools
	% pupils from minority ethnic groups	EV	Currently missing for secondary schools
Pupil Information:	% pupils supported at school action plus without SEN statement	EV	Currently missing for secondary schools
	Special measures (binary variable)	EV	Currently missing for secondary schools
	Pupil Name	EEF, EVD, GL	
	UPN	EEF, EVD, GL	
	DoB	EEF, EV, GL	Currently missing (Retrieve from NPD)
	Gender (M/F)	EEF, EV, GL	Currently missing (Retrieve from NPD)
	Predicted KS2 English Level (end of Autumn Term 2012)	EEF, EV	
	Actual KS2 English Level	EEF, EV	Retrieving from NPD
	FSM current	EEF, EV	
	FSM not ever 6	EEF, EV	
	PP	EEF, EV	Currently missing (Retrieve from NPD)
	EAL	EEF, EV	Currently missing (Retrieve from NPD)
Post Intervention:	Secondary School Class/Registration Group	EV, GL	Currently missing (DP to collect)
	Pupil post test results	EEF, EV	Provided by GL to EVD
	Fidelity Measure?	EV	In development

Appendix I: Classroom Observation Information Sheet and Consent Form



Improving Writing Quality Evaluation: Classroom Observation Information Sheet

The Education Endowment Foundation has asked researchers at the University of York and Durham University to evaluate the *Improving Writing Quality* intervention being delivered and supported by the Calderdale Excellence Partnership in 2013 and 2014.

As your school is taking part in the *Improving Writing Quality* intervention we would like to observe you delivering a session of the *Improving Writing Quality* intervention to a class of pupils.

We will use the observation to help us better understand the *Improving Writing Quality* intervention and evaluate its use in schools. Neither yourself, your school, or any pupils will be identified in any reports resulting from the evaluation.

It would be helpful to us if we could observe you delivering the *Improving Writing Quality* intervention to a class of pupils but you do not have to agree to be observed. If you decide you do want to take part then change your mind, you are free to withdraw at any time, without giving a reason. This will not affect your school taking part in the project generally.

If you decide you would like to take part, please sign and return the consent form to the researcher.

If you would like any more information please contact Hannah Ainsworth.

Tel: 01904 328158

Email: hannah.ainsworth@york.ac.uk

Thank you for considering taking part



Improving Writing Quality Evaluation: Classroom Observation Consent Form

- | | Please
initial
each box |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. I confirm that I have read and understood the Improving Writing Quality Evaluation: Classroom Observation Information Sheet. I have had the opportunity to consider the information and ask questions. | <input type="checkbox"/> |
| 2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. | <input type="checkbox"/> |
| 3. I understand that my details will be provided to researchers working on the evaluation and will be stored securely. I understand that neither I, nor my school, nor any pupils will be identified in any reports resulting from the evaluation. | <input type="checkbox"/> |
| 4. I agree to be observed delivering a session of the <i>Improving Writing Quality</i> intervention to a class of pupils. | <input type="checkbox"/> |

School Name (please print).....

Teacher Name (please print).....

Teacher Signature.....

Date.....

Thank you for taking part

Appendix J: Classroom Observation Schedule

Improving Writing Quality Evaluation

Observation Schedule

Introduction

Introduce yourself

Talk through Information Sheet for observation

Provide opportunity for questions about the observation

Confirm consent to take part.

Observation

School:..... **Teacher's Name:**.....

Date:/...../.....

Scoring System:

1 – No/None

2 – Poor explanation/Partly/To some degree/A few

3 – Satisfactory explanation /Most

4 – Yes/Good explanation/All

Observation	Score	Notes
Was there a discussion about the writing genre being covered in the session?		
Did the teacher remind children to use the mnemonic IPEELL?		
Did children use the mnemonic IPEELL?		
Did the teacher remind children to use graphic organiser or planning sheet?		
Did the children use graphic organiser or planning sheet?		
Was a form of self-scoring used?		
Did the teacher model positive self-talk?		
Did the teacher encourage children to stay motivated by talking themselves through it?		
Did peer-scoring occur?		

Other Notes

Thank teacher for allowing session to be observed

Appendix L: Teacher Interview Information Sheet and Consent Form



Improving Writing Quality Evaluation: Teacher Interview Information Sheet

The Education Endowment Foundation has asked researchers at the University of York and Durham University to evaluate the *Improving Writing Quality* intervention being delivered and supported by the Calderdale Excellence Partnership in 2013 and 2014.

As your school is taking part in the *Improving Writing Quality* intervention we would like to hear about your experiences of delivering and using the intervention with your pupils.

We would like to conduct an interview with you, which will take approximately 30 minutes to complete. We would ask for your permission to record the interview and for the recording of the conversation to be typed into a transcript by an approved transcriptionist.

We will use the information you provide to help us evaluate the *Improving Writing Quality* intervention. You will not be identified in any reports resulting from the evaluation.

As your school is taking part in the *Improving Writing Quality* intervention it would be helpful to us if we could get feedback from you but you do not have to take part in an interview. If you decide you do want to take part then change your mind, you are free to withdraw at any time, without giving a reason. This will not affect your school taking part in the project generally.

If you decide you would like to take part, please sign and return the consent form to the researcher.

If you would like any more information please contact Hannah Ainsworth.

Tel: 01904 328158

Email: hannah.ainsworth@york.ac.uk

Thank you for considering taking part



Improving Writing Quality Evaluation: Teacher Interview Consent Form

- | | Please
initial
each box |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. I confirm that I have read and understood the Improving Writing Quality Evaluation: Teacher Interview Information Sheet. I have had the opportunity to consider the information and ask questions. | <input type="checkbox"/> |
| 2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. | <input type="checkbox"/> |
| 3. I understand that my details will be provided to researchers working on the evaluation and will be stored securely. I understand that my personal details will be removed from any reports resulting from the evaluation. | <input type="checkbox"/> |
| 4. I agree that I will take part in the Improving Writing Quality Evaluation interview. I give permission for the interview to be audio recorded and transcribed. | <input type="checkbox"/> |
| 5. I understand that direct quotations may be used in publications but no information will be released or printed that would identify me | <input type="checkbox"/> |

School Name (please print).....

Teacher Name (please print).....

Teacher Signature.....

Date.....

Thank you for taking part

Appendix M: Teacher Interview Topic Guide

Improving Writing Quality Evaluation

Topic guide for interviews with teachers

Introduction

Introduce yourself

Talk through Information Sheet for the interview

Provide opportunity for questions about the interview

Confirm consent to take part.

Experience of the Improving Writing Quality intervention (other names: SRSD Writing Project, Passing the Baton)

Training

What training did you receive?

How did you find the training?

Did you use any other resources?

- CASL website
- Any of the books recommended

Support

Thoughts on support offered by CEP during intervention phase.

Any other support required or would be helpful

Classroom delivery

Experiences of using the intervention in the classroom

What worked well

What worked less well

Memorable Experiences

Please can you tell me about any memorable experiences the pupils took part in?

Did these help pupils? How and Why?

Impact

Thoughts on the impact of the intervention on pupils writing skills

Quality of Writing

Knowledge of Writing

Approach to writing

Self-efficacy

End interview

Is there anything else you want to tell us about the *Improving Writing Quality* intervention or taking part in the independent evaluation?

Do you have any questions?

Thank participant

Appendix N: Essential Elements of Intervention (provided by CEP)

Self-Regulated Strategy Development

Primary schools - Essential elements:

NB It is important to deliver SRSD in the **order** outlined in the manual but it is acceptable to combine lessons rather than stick rigidly to the prescribed model.

- Discussion about genre
 - Non – narrative genres only in primary schools:
 - Persuasive writing
 - Recount
 - Balanced argument
 - Explanation
 - Instructional writing
- Pre assessment – all children should do a piece of writing in each genre before starting teaching using SRSD.
 - To be carried out by class teachers before starting the SRSD programme.
 - There is no need for these assessments to be sent to the CEP office although it would be helpful to keep copies so that they can be used in future training.
- Mnemonics
 - Mnemonics should be used to help pupils structure their writing.
 - At primary level the mnemonic to use is IPEELL.

I = Introductory paragraph;

P= Points;

E = Examples/elaboration;

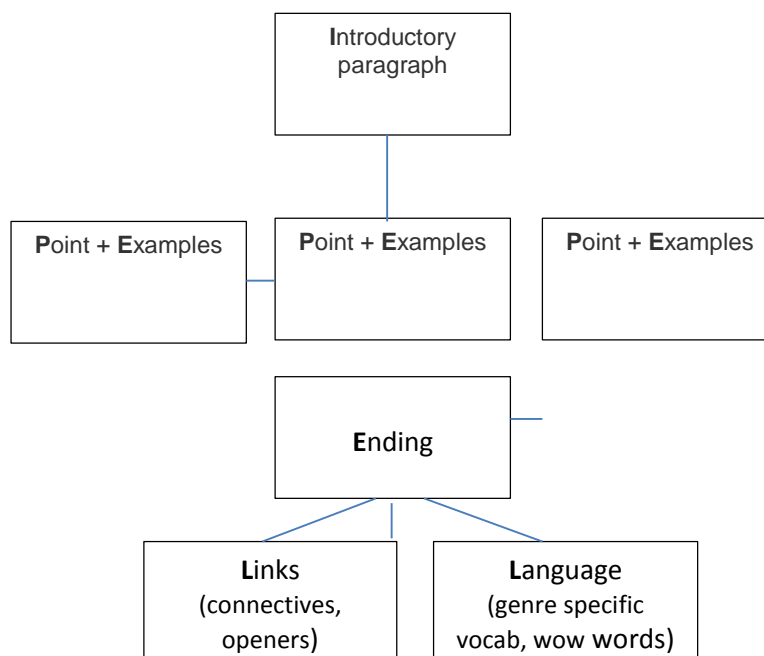
E = End;

L = Links (connectives, openers);

L = Language (wow words, genre specific vocabulary, punctuation)

Graphic organisers

- Children should use a graphic organiser or planning sheet to help structure their writing:



- Self-scoring and graphing
 - Devise your own self scoring system for pupils to use based on any of the examples in the manual. (Please see the example)
 - Children should practise scoring their own work against an agreed scoring schedule.
 - They should be encouraged to mark using “two stars and a wish” (2 good points and something to improve on the next piece of work).
 - Always graph results.
- Self-talk: Teachers should model positive self-talk and encourage children to stay motivated throughout the writing task by talking themselves through it.
 - Use terminology you are comfortable with: “Motivational messages”, “Positive talk”
 - Use self-talk at all stages
- Peer scoring
 - Children should work in pairs to check each other’s work using the marking schedule.
 - Pupils should explain their judgements.
- Final Assessment
 - A cold task to be carried out one/two weeks after the end of the unit.

Appendix O: Ceiling/Floor Effect Examination

The test and outcomes were assessed for ceiling or floor effects using histograms and summary statistics.

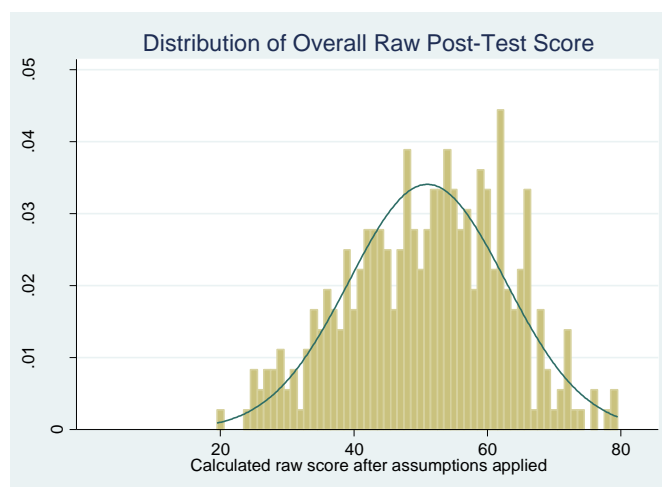
- Ceiling effects occur if a test is too easy - i.e. lots of pupils achieve a perfect score.
- Floor effects occur if a test too hard – i.e. lots of pupils score zero.

There does not appear to be a strong floor or ceiling effect in overall raw score, extended writing, reading or spelling or grammar scores.

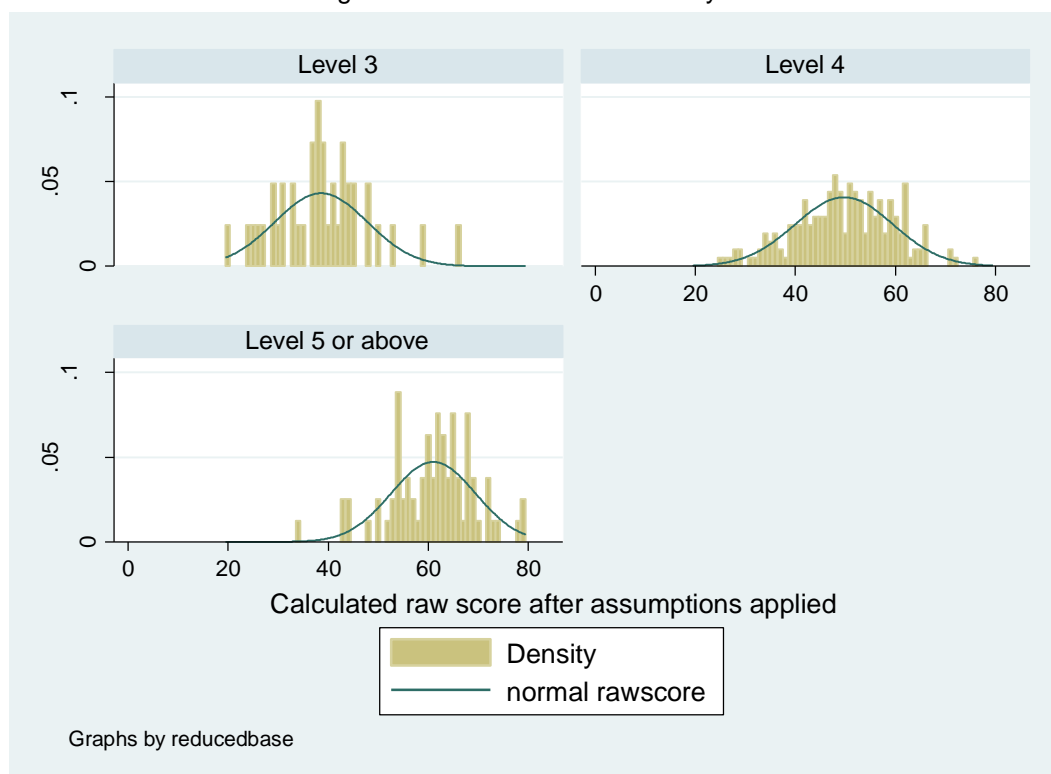
Overall raw score

Overall raw score can range between 0 and 84 marks. The histogram below shows the distribution of post test scores achieved and summary statistics are presented in the Table below. The mean score was slightly lower than the median score suggesting a slight skew to the data which can be seen in the histogram. The minimum score observed was 20 out of 84, no pupil achieved full marks. The mode score was 62 marks. As seen in the histogram, there was not a large proportion of pupils achieving particularly high or low score implying no ceiling or floor effect.

Overall Raw Score	Min	1 st Q	Med	3 rd Q	Max	Mean	SD
	20	43	52	60	79	51.0	11.71



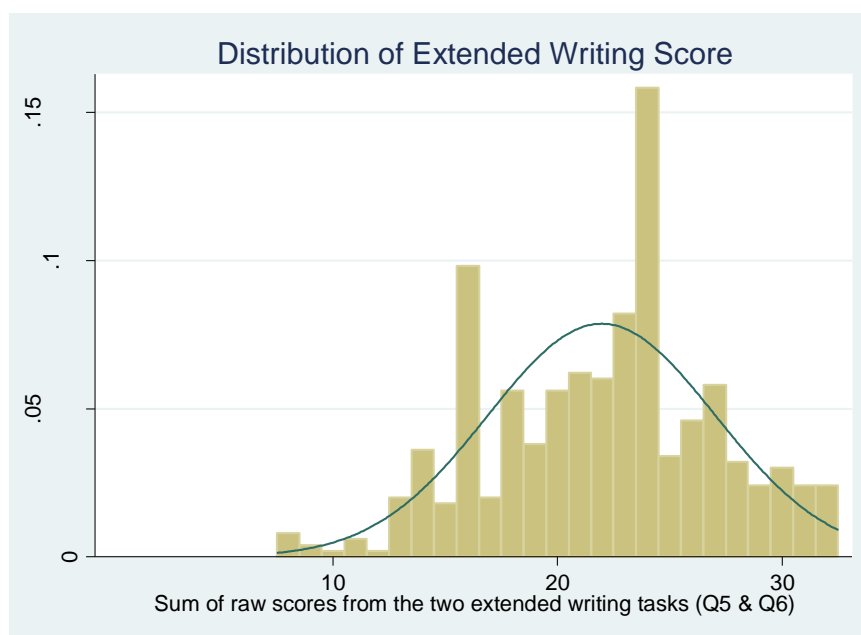
Histograms of overall raw score by predicted level (below) were produced and it appears that the test distinguished between different ability levels.



Primary outcome (extended writing)

The primary outcome of extended writing score can range between 0 and 32 marks. The histogram below shows the distribution of post-test extended writing scores achieved and summary statistics are presented in the Table below. The median and mean scores were similar at around 23 marks suggesting non-skewed data. The minimum score observed was 8 out of 32; the maximum score was 32 marks. The mode score was 24 marks. As seen in the histogram, there was not a large proportion of pupils achieving particularly low score and only 12 pupils achieved full marks implying no ceiling or floor effect.

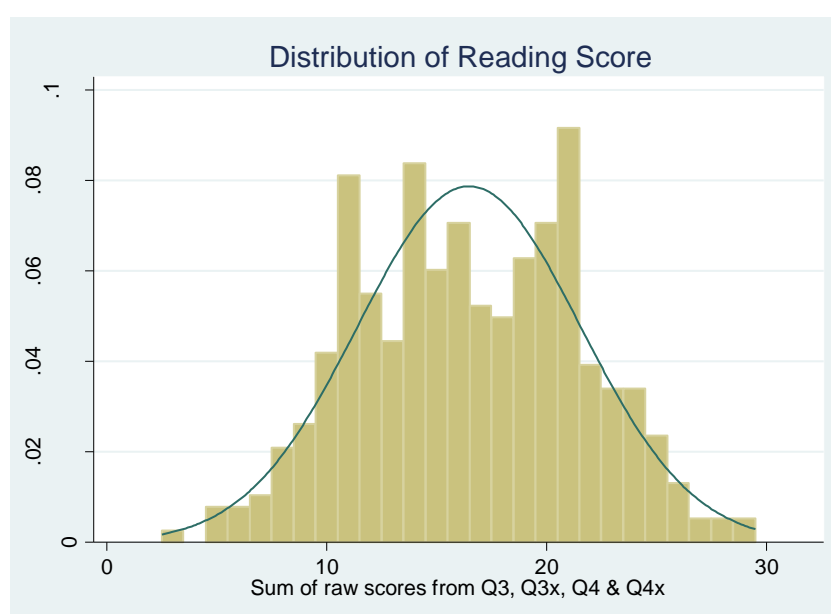
Extended Writing Score	Min	1 st Q	Med	3 rd Q	Max	Mean	SD
	8	18	23	25	32	22.0	5.07



Secondary outcome – Reading

The secondary outcome of reading score can range between 0 and 32 marks. The histogram below shows the distribution of post-test reading scores achieved and summary statistics are presented in the Table below. The median and mean scores were similar at around 16 marks implying no skew. The minimum score observed was 3 out of 32; the maximum score was 29 marks. The mode score was 21 marks. As seen in the histogram, there was not a large proportion of pupils achieving particularly high or low score implying no ceiling or floor effect.

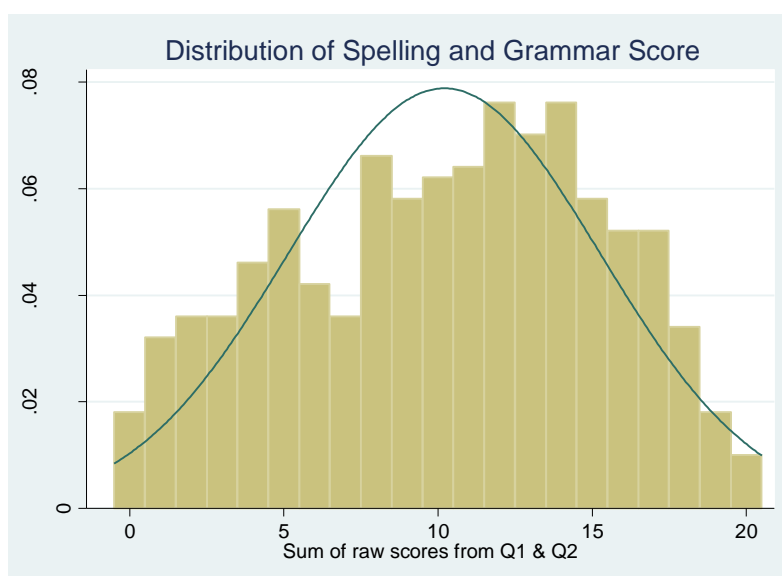
Reading Score	Min	1 st Q	Med	3 rd Q	Max	Mean	SD
	3	12	16	21	29	16.5	5.07



Secondary outcome – Spelling and Grammar

The secondary outcome of spelling and grammar score can range between 0 and 20 marks. The histogram below shows the distribution of post-test spelling and grammar scores achieved and summary statistics are presented in the Table below. The median and mean scores were similar at around 11 marks suggesting there is not a great concern over scores following a highly skewed distribution. The minimum score observed was 0 out of 20; the maximum score was 20 marks. The distribution was bi-modal with modes at 12 and 14 marks. As seen in the histogram, there was not a large proportion of pupils achieving particularly high or low score implying no ceiling or floor effect.

Spelling and Grammar Score	Min	1 st Q	Med	3 rd Q	Max	Mean	SD
	0	6	11	14	20	10.2	5.06



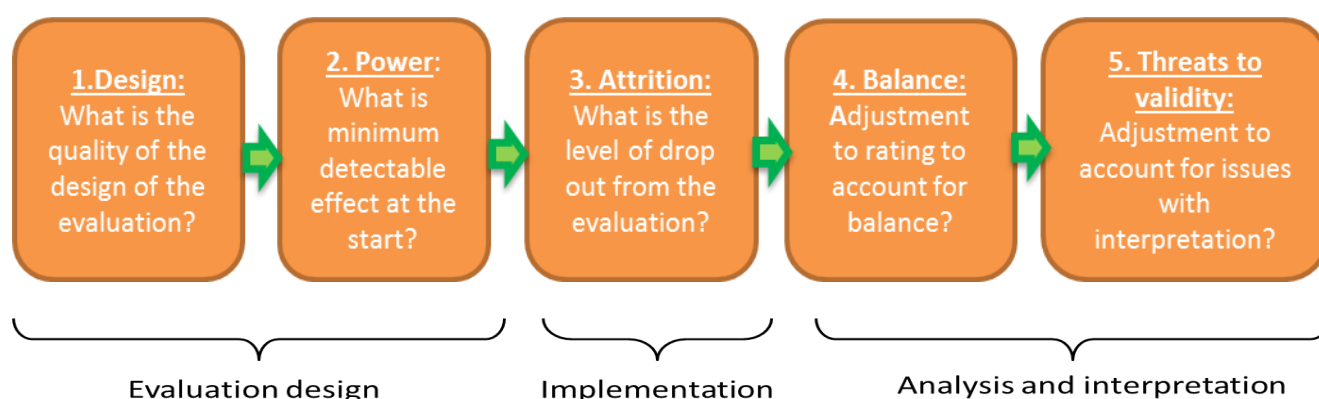
Appendix P: Coefficients and standard errors for effect sizes

	Coefficient (relating intervention)	to	SE Coefficient	of	Residual SD (Random Effect)	SE of Residual SD
L3c – L4b						
Primary analysis	2.5299438		0.83200796		3.4226462	0.1648204
Secondary (reading)	-0.30961708		0.8751381		3.4454817	0.1931986
Secondary (spelling)	-0.44108015		0.65325476		3.3753853	0.1701447
L4a+						
Primary outcome	0.00017931		0.70502193		3.0987022	0.1859449
Secondary (reading)	-0.38720413		0.71993268		3.1076949	0.1946564
Secondary (spelling)	0.10404381		0.78438441		2.9343483	0.1733643
L3c+						
Primary outcome	0.50696715		0.68195886		3.392538	0.1213736
Secondary (reading)	-0.3435145		0.55783096		3.3802348	0.13374
Secondary (spelling)	-0.13289695		0.65894462		3.1632813	0.1134944

Appendix Q: Coefficients relating to the primary analysis

Variable	Coefficient (95% CI)	p-value
<i>Allocation</i>		
Control	Reference group	-
Intervention	2.53 (0.90 to 4.16)	0.002
<i>Eligible for FSM</i>		
No	Reference group	-
Yes	-0.24 (-1.21 to 0.73)	0.628
<i>English as additional language</i>		
No	Reference group	-
Yes	2.05 (0.71 to 3.40)	0.003
<i>Gender</i>		
Female	Reference group	-
Male	-2.47 (-3.40 to -1.54)	<0.001
<i>Month of Birth</i>		
Jan	Reference group	-
Feb	1.44 (-0.59 to 3.47)	0.164
Mar	1.91 (-0.20 to 4.02)	0.076
Apr	1.56 (-0.59 to 3.70)	0.155
May	2.65 (0.58 to 4.71)	0.012
Jun	1.28 (-0.67 to 3.23)	0.198
Jul	0.58 (-1.62 to 2.78)	0.608
Aug	1.53 (-0.65 to 3.71)	0.168
Sep	2.21 (-0.06 to 4.48)	0.056
Oct	0.19 (-1.88 to 2.26)	0.858
Nov	0.88 (-1.37 to 3.14)	0.443
Dec	2.34 (0.11 to 4.57)	0.04
<i>Predicted KS2 level</i>		
Level 3c	Reference group	-
Level 3b	0.11 (-2.21 to 2.43)	0.928
Level 3a	3.15 (0.62 to 5.67)	0.014
Level 4c	4.15 (1.91 to 6.39)	<0.001
Level 4b	5.31 (3.04 to 7.59)	<0.001
<i>Constant</i>	14.72 (11.82 to 17.62)	<0.001

Appendix R. Security rating summary



Rating	1. Design	2. Power (MDES)	3. Attrition	4. Balance	5. Threats to validity
🔒🔒🔒🔒🔒	Fair and clear experimental design (RCT)	< 0.2	< 10%	Well-balanced on observables	No threats to validity
🔒🔒🔒🔒🔒	Fair and clear experimental design (RCT, RDD)	< 0.3	< 20%		
🔒🔒🔒🔒🔒	Well-matched comparison (quasi-experiment)	< 0.4	< 30%	0.06 imbalance on attainment, but regression used	Some threats
🔒🔒🔒🔒🔒	Matched comparison (quasi-experiment)	< 0.5	< 40%		
🔒🔒🔒🔒🔒	Comparison group with poor or no matching	< 0.6	< 50%	↓	↓
🔒🔒🔒🔒🔒	No comparator	> 0.6	> 50%	Imbalanced on observables	Significant threats

The final security rating for this trial is 2🔒. This means the findings are of moderate security. The trial was designed as a small-scale, independently-run, efficacy trial that could have achieved a maximum of 2🔒. This was achieved. It was run over a relatively short time period in 23 primary schools and three secondary schools, which reduces the generalisability of the findings.

Attrition was low at below 10%. There is some threat to the validity of the results as tests were delivered by schools, rather than blind by evaluators. However, there is no evidence to suggest they were not administered under exam conditions as required. There is also some threat from contamination caused by teachers sharing practice, because both treatment and control children attended the same secondary schools.

However, the main concern is that the precision of the estimate is weak due to the low power. To increase the security and generalisability of the findings, a further trial at a larger scale could be undertaken.

Additional detail about the EEF's security rating system can be found at:

www.educationendowmentfoundation.org.uk/evaluation.

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