Education
Endowment
Foundation

Rapid Phonics

Evaluation Report and Executive Summary

February 2015

Independent evaluators:

Bernardine King
Adetayo Kasim

CEM
Centre for Evaluation & Monitoring

Durham
University

The Education Endowment Foundation (EEF)

The Education Endowment Foundation (EEF) is an independent grant-making charity dedicated to breaking the link between family income and educational achievement, ensuring that children from all backgrounds can fulfil their potential and make the most of their talents.

The EEF aims to raise the attainment of children facing disadvantage by:

- Identifying promising educational innovations that address the needs of disadvantaged children in primary and secondary schools in England;
- 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.

The EEF was established in 2011 by the Sutton Trust, as lead charity in partnership with Impetus Trust (now part of Impetus-The Private Equity Foundation) and received a founding £125m grant from the Department for Education.

Together, the EEF and Sutton Trust are the government-designated What Works Centre for improving education outcomes for school-aged children.

For more information about the EEF or this report please contact:

Jonathan Sharples
Senior Researcher
Education Endowment Foundation
9th Floor, Millbank Tower
21-24 Millbank
SW1P 4QP

p: 02078021921
e: jonathan.sharples@eefoundation.org.uk
w: www.educationendowmentfoundation.org.uk

About the evaluator

The project was independently evaluated by a team from the Centre for Evaluation and Monitoring and the Wolfson Research Institute for Health and Wellbeing at Durham University.

The lead evaluator is Dr Bernardine King.

Contact details:

Centre for Evaluation and Monitoring
Rowan House
Mountjoy
Durham University
Stockton Road
Durham
DH1 3UZ

p: 0191 3344245
e: Bernardine.King@cem.dur.ac.uk

Acknowledgements

The authors would like to acknowledge the contributions of the following reviewers of this report: two anonymous peer reviewers, Dr Jonathan Sharples, Dr Christine Merrell, Camilla Neville, Elena Rosa-Brown and Sarah Tang.

Contents

Executive summary

The project

Rapid Phonics is a synthetic phonics intervention intended to improve decoding skills and reading fluency. It teaches the relationship of word sounds to their corresponding letter groups in a structured way. In this evaluation, the intervention was delivered across the transition between primary and secondary school to Year 6/7 pupils who had not reached Level 4b in English at the end of Key Stage 2.

Rapid Phonics pupils received one-and-a-half hours of tuition per week, in groups of four or fewer, by specialist teachers from Norfolk County Council. The intervention was delivered over six weeks in the summer term of 2013 (end of primary school) and six weeks in the autumn term of 2013 (start of secondary school) to 201 pupils from 22 primary schools and then in 13 secondary schools across Norfolk. Pupils were individually randomised to receive the intervention or to a waitlist control group, who received the intervention at the end of the trial.

The project was funded as part of a round of projects dedicated to literacy catch-up for pupils at the primary-secondary transition who do not achieve Level 4 in English by the end of Key Stage 2.

Key conclusions	
1.	Rapid Phonics was not found to have a noticeable impact on the primary outcome measure of reading comprehension at the end of the intervention.
2.	There was a small improvement in the secondary outcome of decoding, but this did not reach statistical significance.
3.	Conducting the intervention during the last term of Year 6 and the first term of Year 7 was not the most settled period as there were many disruptions in the school environment and conditions may not have been best suited for the children to respond optimally to tutoring.
4.	Continuing the intervention from primary to secondary schools can be logistically problematic, with a number of children transferring to schools outside the project or changing secondary school soon after arrival.
5.	An area of further research would be to employ the intervention in one continuous period at an earlier point in primary school, using a larger sample size and with more focus on children receiving free school meals and upon SEN.

What impact did it have?

No positive effect size was found for the primary outcome of reading comprehension. A small positive effect size was found for the other secondary outcome of non-word reading, but not for the secondary outcome of single word reading. None of the measures were found to be statistically significant, suggesting that we do not have sufficient evidence to confidently conclude that the observed effect was caused by the programme rather than occurring by chance.

As a result, it is not clear that Rapid Phonics is an effective intervention for improving reading comprehension for pupils who have not achieved the expected level of attainment in literacy at the end of primary school, when delivered across the primary/secondary transition.

How secure is this finding?

The existing evidence based on phonics training suggests that it is beneficial for young beginner readers but may be less so for older readers. Evaluations of a precursor of the Rapid Phonics intervention, Sound Discovery, suggest it is an effective intervention for beginner readers when used for catch-up in the early stages of formal reading instruction, however these evaluations did not include a control group. This is the first independent evaluation of the programme, and the first to use a randomised controlled trial methodology.

The evaluation was set up as an efficacy trial, randomly allocating 201 pupils in 22 primary schools to an intervention group or a waitlist control group. The developer led the recruitment and retention of the schools, was responsible for the training, and oversaw the provision of the intervention. Efficacy trials seek to test interventions in the best possible conditions to see if they hold promise. The minimal detectable effect size was relatively large (0.32) which impacts on the overall security of the trial.

Intention to treat analysis was used (i.e. pupils were compared in the groups to which they were originally randomly assigned); blinded invigilation and marking of test papers was undertaken; and appropriate analysis (multi-level modelling) was used to enable school effects to be taken into account.

Bias may have been introduced by two secondary schools declining to take part in the intervention. The overall attrition rate from the primary outcome was low (11%) and was similar between intervention and control groups. The process evaluation suggested that the intervention had been delivered with a high level of fidelity to the programme as designed by the developer.

Overall, this suggests the findings are of moderate security.

How much does it cost?

Based on teaching five groups per school, each containing four pupils, the estimated cost of the intervention per child is approximately £205, including starter packs for both primary and secondary schools and teacher time to deliver the intervention. This per-pupil cost will vary according to the number of classes and pupils who require the intervention, and future costs will be less given the upfront investment in materials.

Group	No. of pupils	Effect size (95% confidence intervals)	Estimated months' progress	Evidence strength*	Cost**
Intervention vs control (all pupils)	178	-0.05 (-0.34, 0.25)	-1 month	🔒🔒🔒	**£££**
Intervention vs control (FSM only)	93	-0.07 (-0.36, 0.23)	-1 month		**£££**

**For more information about evidence ratings, see Appendix C in the main evaluation report. Evidence ratings are not provided for sub-group analyses, which will always be less secure than overall findings.*
***For more information about cost ratings, see Appendix D in the main evaluation report.*

Introduction

Intervention

Rapid Phonics teaches the relationship of word sounds to their corresponding letter groups in a structured way. Its author is Marlynne Grant (e.g. Grant, 2011). The lessons are interactive and lively, incorporating various exercises and word games, and are accompanied by bespoke support materials which include books (some in e-book format), posters and worksheets. Although the methodology used by Rapid Phonics can be employed in teaching typical beginner readers, in this study Rapid Phonics was a catch-up programme tailored to small groups of struggling readers who were aged between 10 and 11 at the start of the trial.

Rapid Phonics is flexible: it can be used as an intervention meeting the needs of older struggling readers, including those in Years 6 and 7 (as it is used in this study), but it also conforms to the requirements of the Year 1 Phonics Screening Check, and so can be used much earlier in primary school. It can be used with groups of up to six children, or for one-to-one teaching when appropriate.

Background evidence

Sound Discovery, from which Rapid Phonics is a recent development, was featured as one of the leading reading programmes used for struggling readers by Greg Brooks in his publication 'What Works' (2013).

There is an existing body of research evidence about the effectiveness of Sound Discovery as a reading course for beginner readers and as a catch-up in the early stages of formal reading instruction, particularly in connection with following up readers who have fallen behind after Year 1. The success of Sound Discovery for beginner readers has been documented by a piece of longitudinal action research lasting eight years (Grant, 2011) in which statistical analyses made by the local authority compared the progress of the participants vis-à-vis the national picture. It found that Sound Discovery teaching received by 700 children (including those from disadvantaged groups) in Key Stage 1 led to Key Stage 2 results which were significantly above the national average: for example, 65% of pupils gained Level 5 in Key Stage 2 English compared to the national figure of 27%. No control group was employed in this research.

Research into Sound Discovery instruction delivered over the same 12-week duration as in the current trial was carried out in Norfolk (Worsley, 2005) but without a control group. This was action research conducted by the county council which used the Salford sentence reading test (reading accuracy) as an outcome measure, and the participating schools were selected by opportunity sampling. Forty-seven children took part. The Sound Discovery instruction resulted in an equivalent reading progress of 5.4 to 15.9 months in eleven of the twelve participant schools.

There was a wide age range of participants, from Year 2 to Year 8, but only two children were in the same year groups as studied in the present trial.

A group of twenty Year 7 students had previously been studied as a piece of action research at a secondary school in Gloucestershire: here, the school Special Educational Needs Coordinator (SENCo) reported marked advances in their reading ability when Sound Discovery was taught. It was, however, a small study, and the course of instruction was substantially longer than that of the present intervention as it was taught three times a week for 28 weeks. The participants in the Gloucestershire research comprised only the twenty lowest-achieving readers in Year 7; they progressed from reading

scores which were below the lowest measurable level to registering reading ages of between 8:05 and 10:05.[1]

Rapid Phonics shares its methodology with Sound Discovery, but has additional aspects which are particularly attractive for older children. Elements from Sound Discovery which are well suited to a reading catch-up scheme have been included in the present intervention—such as lessons dealing with advanced code and lessons for harder, polysyllabic words. Sound Discovery materials have thus complemented new ones developed for Rapid Phonics in this study.

Evaluation objectives

The present randomised controlled trial is an efficacy trial of Rapid Phonics. EEF efficacy trials seek to test evaluations in the best possible conditions to see if they hold promise, but do not seek to demonstrate that the findings hold at scale in all settings. The project was funded as a series of projects dedicated to literacy catch-up for pupils at the primary–secondary transition who do not achieve Level 4b in English by the end of Key Stage 2.

The main question that the trial sought to answer was: Does Rapid Phonics have a noticeable impact on the reading comprehension scores of struggling readers in Year 6, as they make the transition to Year 7, compared with a randomly selected control group?

It is the first evaluation of the approach to have a robust control group using a randomised design.

The process evaluation focused on the fidelity of implementation, so the primary aim here was to monitor whether the intervention was being delivered in accordance with the training received by the delivery team. It was not the intention of the evaluation to identify areas of improvement in delivery, but the interviews and questionnaires with the staff delivering the intervention may include such points. Other than these two forms of feedback, lesson observations were the method by which the implementation was assessed.

Project team

The project manager was Joan McLauchlan (joan.mclauchlan@norfolk.gov.uk). She was responsible for recruiting the schools, organising the team's training in Rapid Phonics, negotiating facilities with participating secondary schools, organising specialist teachers' timetables, purchasing and allocating resources, liaising with EEF and the evaluator, arranging for the provision of independent invigilators and markers of the tests (who were blinded as to which treatment group the children were part of), sending the test results to the evaluator, and conducting the day-to-day administration of the project.

The project leader was James Thatcher, a Senior Educational Psychologist at Norfolk who was also responsible for the grant application (james.thatcher@norfolk.gov.uk).

The project team comprised a group of specialist teachers from Norfolk County Council. Twelve teachers delivered the Year 6 intervention and eight teachers instructed the children in the Year 7 phase. They were experienced teachers with specialisms in teaching pupils with literacy difficulties and advising schools about suitable interventions. They were already well trained and experienced in delivering the methodology of the 'Snappy Lesson' in Sound Discovery—the lesson format which is also featured in Rapid Phonics. A training course for Rapid Phonics attended by these staff, and observed by the evaluator, showed that they were well-informed about both phonics and the application of that knowledge to the teaching of struggling older readers. The delivery of the course was well planned and professional. Discussions revealed that the practitioners were reflective. Ideas

[1] www.syntheticphonics.net summarises results of this and other *Sound Discovery* research.

were exchanged and suggestions were made as to the best way to deliver the intervention in a way that would be faithful to the programme and to the instructions from the author.

The independent evaluators were from Durham University. Dr Adetayo Kasim was the statistician who carried out the analysis of the results and the initial randomisation of the children into the treatment groups. The light touch evaluation was conducted by Dr Bernardine King, who liaised with the project on matters such as the importance of independent invigilation and marking, the EEF regulations about these issues, and the absolute requirement for the testing to be carried out by persons blinded to treatment or control allocation. She also ordered the standardised tests, collated the results and wrote the final report according to EEF guidance. The report was subject to thorough peer review.

Ethical review

The Durham University School of Education Ethics Committee gave ethical approval for this study in December 2012.

EEF guidelines for parental consent were followed and parents were given the opportunity, before the start of the trial, to opt their children out from the trial. They were informed that the data would be stored by EEF for longitudinal research purposes. The right of the children to withdraw at any time, and the preservation of anonymity in reports, were among the points covered in the letters and information about the trial that were also shared with parents. Please see the Appendix for the parental consent letter.

Methodology

Trial Design

This was a pragmatic individually randomised trial with two arms, in which the treatment group received the intervention and the control group continued their schooling as usual. No control task was involved. The intervention group comprised 100 children and the control group consisted of 101 children. These were drawn from 22 participant primary schools. They went on to attend 19 secondary schools during the research. The school effect was accounted for in the multi-level modelling analysis of results. The trial's design was chosen to conform to CONSORT standards (Altman et al., 2011).

Randomisation into treatment and control groups meant that the intervention classes did not contain the same mixture of children that would have occurred within teaching groups for Rapid Phonics had the tuition not been part of a randomised controlled trial. In order to attain a balanced representation of reading ability between treatment and control groups, performances in three baseline measures—the GL New Group Reading Test (NGRT), the GL Single Word Reading Test (SWRT) and the GL Phonological Assessment Battery (PhAB) (in that order)—were included as stratification factors in the multi-level modelling. As a consequence, there was less freedom for the project to group together children of similar needs than would usually be the case when delivering the intervention.

Transition studies, when an intervention continues from primary to secondary school, are rare (Brooks, 2013). The timing of the trial involved a six-week intervention at the end of primary school followed by a six-week summer break and a second six-week intervention at the start of secondary school. Individual randomisation was preferred to that of cluster randomisation using schools as the unit of randomisation.

The waiting list condition comprised a 'business as usual' group who continued their school activities as normal whilst the treatment group received the intervention. Their reading was assessed at the same time as their counterparts in the intervention group. At the end of the intervention, these comparison children were given the opportunity to receive the intervention by the teachers at their schools who had been trained by the Rapid Phonics project team.

Eligibility

School inclusion criteria

Pupil Premium numbers were used by the project manager to determine which schools should be approached to take part in the trial. Schools were chosen where the Pupil Premium numbers were highest in Norfolk. They were in three areas of the county.

Pupil inclusion and exclusion criteria

Children were chosen from the participant schools if they were predicted to achieve a Level 4c or below at Key Stage 2 English and if they had a standardised score on the SWRT of less than 100. The reason for the latter was that the intervention was intended to improve decoding up to an age-appropriate level: those children with standardised scores of 100 or more in the SWRT before the start of the study were unlikely to benefit sufficiently to justify missing their usual lessons to attend the intervention.

Decisions about the participation of eligible children with special educational needs were made by the schools and the parents before randomisation on the basis of what was appropriate for the individual child.

Consent from parents was sought before any testing was conducted in each primary school. The randomisation was conducted after the pre-tests.

Intervention

Table 2: Structure of the intervention instruction

	Stage of Intervention	Focus of Training
Rapid Phonics	Step 1	Alphabet sounds
Rapid Phonics	Step 2	Digraph sounds
Rapid Phonics	Step 3	Alternative spellings
Sound Discovery	Step 4	Root words, prefixes & suffixes
Sound Discovery	Steps 5–7	Syllables and special endings

Table 2 shows the overall structure of the intervention. The earlier stages are especially adapted to the Rapid Phonics programme of catch-up tuition whilst the later steps in the intervention are supplemented with more advanced materials from Sound Discovery which allow exposure to more challenging texts.

Every week during the six-week treatment periods in both primary and secondary school, the children received three half-hour lessons of Rapid Phonics, usually in groups of four or fewer, although with occasional one-to-one teaching. All primary schools were offered three lessons of 30 minutes (1.5 hours) per week: 85% of these schools received these lessons, but due to timetable constraints the remaining 15% received two sessions of 45 minutes each week. In secondary school, lesson durations were as follows:

- 70% of schools received three 30-minute lessons a week;
- 10% of schools received two 60-minute lessons;
- 10% of schools had two 45-minute lessons;
- 5% of schools received one 30-minute and one hour-long lesson each week (so 90 minutes total);
- 5% of schools had one 60-minute lesson because it was 1:1 teaching.

Thus the vast majority of schools received at least the intended 90 minutes of teaching per week.

The children were taken out of a range of different lessons depending on the decisions made by the particular school. The steps at which the children began the intervention were decided by an in-house placement test which formed an integral part of the planning the intervention.

Children were taught by specialist teachers whom they did not know prior to the intervention. Usually the children were taught by the same teacher in the secondary school as in primary school, although not always.

During a typical lesson observed by the evaluator, the teacher would recap where they had left off in the last lesson and introduce the major teaching point for the lesson—for example letter combinations that made the sound of a long ‘u’, such as in ‘blue’, ‘flew’ and so on. Good use was made of the colourful supporting materials, especially the posters which allowed the children to see the progress they were making. The ‘Snappy Lesson’ format engaged the children, keeping them occupied and

interested as they actively participated in exercises and games intended to explain and consolidate the learning points. Phoneme synthesis, and spelling rules such as the split digraph, were explicated and practised. Each lesson finished with the teacher reminding the children of a few main points and previewing the following lesson.

A range of exercises make up the 'Snappy Lesson' but every lesson varied this content so that the children experienced all the exercises or games during the course of the week. This ensured variety. Reading fluency was emphasised and reading sentences and short passages aloud was an essential part of the lessons. Colourfully illustrated short books of contemporary design were read by the children.

Writing was also part of the lessons. The correct way to form letters and write letter combinations was modelled. The children wrote in exercise books and on work sheets when appropriate. A key resource used was that of individual magnetic boards with magnetic letters which the children moved around, for example to spell out different words containing the same sounds. Through these, they were able to show their understanding of spelling patterns, split digraphs and so on..

Rapid Phonics is published by Pearson's and can be purchased by interested parties such as teachers, schools or parents.

The control children carried on with their school lessons as usual but were on a waiting list, receiving the intervention at the end of the treatment phase, delivered this time by members of the school staff who had received training from the intervention team.

Outcomes

Table 3 summarises the three reading outcomes used.

Table 3: Reading outcome measures

Outcome Assessment	Aspect of Reading Tested by Measure	Primary or Secondary Outcome
NGRT **New Group Reading Test**	Comprehension—understanding the meaning of written sentences and texts.	Primary
PhAB **Phonological Assessment Battery**	Letters–sounds (grapheme–phoneme) correspondences, phoneme blending, mainly regular spellings.	Secondary
SWRT **Single Word Reading Test**	Regular and irregular word reading without a context.	Secondary

The choice of reading comprehension as the primary outcome was made by EEF as an assessment of how well the children would be able to engage with the textual component of the Year 7 curriculum. The NGRT reading comprehension test does not assess the skill closest to the expected outcome from a phonics intervention, i.e. improved word decoding. Owing to the particular nature of the relationship between reading comprehension and decoding, two subsidiary questions were included which were tested by two further outcome measures which were if the intervention made a noticeable difference to the treatment group compared to controls in terms of: (i) their ability to read single real words—both with regular relationships between letters and sounds (graphemes and phonemes) and irregular grapheme–phoneme correspondences—and (ii) reading 'non-words' (made-up words), which was intended to assess reading via the sub-lexical phonological route of grapheme–phoneme conversion and phoneme blending (Coltheart,1978; Coltheart et al., 2001).

Primary outcome measure

The primary outcome measure was the standardised score on the New Group Reading Test (NGRT, Burge et al., 2010). As a test of reading comprehension, it was chosen by EEF as the externally valid measure reflecting the children's ability to access the Year 7 curriculum. The paper version of the test was chosen for this project because there were concerns around the availability of suitable computer facilities in all the 22 primary schools. Additionally, the paper NGRT concentrates more on the intended primary outcome of comprehension than does the computerised version which diverts low scoring children to phonological tasks after the initial sentence-level comprehension and passage-level comprehension is omitted for such children. The paper NGRT is an age-standardised test of sentence-level comprehension followed by passage comprehension. It is a parallel form test: 3A was used as the pre-test and 3B as the post-test. Raw scores were converted to age-standardised scores prior to statistical analysis.

Secondary outcome measures

The two secondary measures chosen were selected to assess the attainment of skills normally considered as stepping-stones towards improvements in reading comprehension. These skills might result from better decoding acquired through phonics training. The test chosen to measure the children's progress in reading at the individual word level was the Single Word Reading Test (SWRT6-16, Foster, 2007). The children read the list of single real words out loud to the independent tester. There are 60 words in total, ranging from high frequency monosyllabic words such as 'play' to low frequency words such as 'colloquial'. The raw test scores were converted to standardised age scores for analysis. SWRT has two parallel forms: SWRT1 was administered at pre-test and SWRT2 at the post-test. So as to monitor any fall-back in scores over the summer holiday, SWRTs were administered before and after the summer break to all the children. In summary, all the children, both treatment and control groups, were administered the following: SWRT1 in April 2013 (pre-test), SWRT2 in July 2013, SWRT1 in September 2013, and SWRT2 in December 2013 (post-test).

Non-word reading is regarded as a measure of reading via the phonological route (e.g. Colheart et al., 2001) whereby pseudo-words are read via letter–sound (grapheme–phoneme) conversion, and these sounds are then combined (phoneme blending) to form the spoken word. A test of non-word reading was taken from the Phonological Assessment Battery (PhAB, Frederickson, Frith & Reason, 1997). This test ranges from single-syllable non-words such as 'pim' to two-syllable non-words like 'plutskirl'. The child reads the list aloud to the independent tester. The raw test scores were converted to standardised scores prior to analysis.

The invigilators for the primary and secondary measures were unknown to the children, and post-test invigilators had no knowledge of which treatment group the children belonged to. They were part of the Norfolk specialist teachers' team. The group testing of the NGRT was carried out under examination conditions.

A random selection of test papers was checked by the evaluator to make sure that they had been correctly marked. No mistakes in marking in this selection of papers were noticed by the evaluator.

Sample size

The minimum number of participants in the experimental group had been calculated by the evaluators as 100, with a further 100 in the control group. These calculations were based on the assumptions that (a) the minimum effect size is 0.28, (b) the minimum power value is 0.8, (c) $p < 0.05$, (d) there is a 0.7 correlation with covariates, and (e) that half the sample is in the control group. There were no readily available data to inform the sample size calculation. The assumed effect size of 0.28 was a compromise between resources, recruitment feasibility and the expected impact of the intervention, based on existing research (see Background section).

The target sample size proposed by the project team was 300, however only 201 children in the participating schools were identified by the project as eligible for the study.

Randomisation

The goal of randomisation is to ensure that intervention and comparison groups are comparable with respect to baseline characteristics. Using a permuted block randomisation scheme, with mixed block sizes of three, four, or five,, 101 and 100 children were randomised to the control and intervention groups respectively. The randomisation schemes accounted for the baseline scores for NGRT standardised scores, PhAB standardised scores, SWRT standardised scores and gender as stratification factors. Note that children were randomised across schools. Randomisation within schools was not considered because some schools had as little as three pupils in the study. Permuted block randomisation with schools and baselines scores as stratification may increase accidental imbalance between the intervention groups due to many empty cells.

The random numbers were generated and the allocation to the treatment and control groups was carried out by the independent statistician from Durham University. The randomisation was done using *Blockrand* package in R. The randomisation procedure followed the following steps:

1. Children were stratified by gender where applicable.
2. Pupils were further grouped into three performance levels according to NGRT scores; least performing pupils, average performing pupils and the high performing pupils.
3. Within each performance group, pupils were further grouped into block of size three, four or five based on a composite score defined per pupil as the best rank from PHAB and SWRT. For some pupils the ranking based on the composite score was the same as individual ranking by PHAB or SWRT, which may be explained by the correlation between the scores.
4. Each block of pupils were randomly assigned to either the control or experimental groups using a permuted block randomisation scheme.

The schools which supplied participants for consideration as being eligible for the trial were recruited by the project team in Norfolk. The project manager was in charge of informing the schools of the children's allocated groups. The Minimal Detectable Effect Size (MDES) at randomisation for NGRT at 80% power was estimated as 0.32 based on N = 201 (samples used for analysis) and $R^2 = 0.35$. The reported MDES was underestimated because it ignored intra-cluster correlation.

Analysis

The intervention effect was calculated on the basis of 'intention to treat': the data were analysed strictly in accordance with the treatment groups to which the children were originally randomly allocated. It did not take into account whether the children actually received the intervention, therefore in cases where children were swapped from treatment to control or vice versa, their actual treatment (or lack of it) would not be taken into account by the intention to treat analysis. Further sensitivity analysis was used in situations where children had swapped treatment group.

The data were analysed using multilevel modelling to account for the clustering of children within schools. Although the study was such that randomisation was conducted at the level of the individual participant, it is important to account for school effects. If the school effect is removed, then the influence of the treatment can be more accurately calculated (in this way, the precise standard error for the intervention effects can be derived). Each of the outcomes was analysed separately and the results are presented in Table 8 in the Outcomes and Analysis section below. The effect sizes were calculated as recommended by Hedges (2007) for clustered data.

A sub-group of children in receipt of free school meals formed part of the analysis. Appropriate statistical analysis of the quantitative outcome measures taking into account pre-test levels was

conducted by the statistician at Durham University in order to establish the efficacy of the whole intervention. Decoding data from the SWRT was analysed in terms of progress in Year 6, immediately before and after the summer holiday, and in Year 7.

Process evaluation methodology

Observations of six lessons, at both primary and secondary schools, were carried out. The schools to be visited were chosen by the evaluator based on having the opportunity to see a range of schools in a variety of neighbourhoods. During these visits, informal interviews took place with delivery staff as to their impressions of how the intervention was progressing. The evaluator also attended one training session. An email survey of delivery staff was also conducted by the evaluator. Staff were assured that their anonymity would be preserved.

Impact evaluation

Timeline

Date	Event
November 2012	Project team had recruited three secondary schools and their feeder primaries in three different parts of the county of Norfolk.
April 2013	Pre-testing with NGRT, SWRT and PhAB, followed by randomisation in April.
June–July 2013	Intervention took place in Year 6.
July 2013	SWRT 2 testing before summer break.
September 2013	SWRT 1 testing after summer break.
September–December 2013	Intervention took place in Year 7.
December 2013	Post-tests of NGRT, SWRT and PhAB.

Participants

One hundred children were randomly allocated to the treatment group and 101 to the control group.

Backgrounds of the schools

The participant schools were located in the three areas of Norwich, Kings Lynn and Breckland within the County of Norfolk. Their catchments ranged from those of marked social deprivation to affluent areas. The clusters of schools were chosen because they had high numbers of children eligible for Pupil Premium.

The Income Deprivation Affecting Children Index (IDACI) scores for the areas in which the schools were located are shown in Table 4. Twenty-one primary schools were located in urban settings and one in a rural setting. Fifteen of the secondary schools were in urban environments and four were in rural locations (education.gov.uk).

Table 4: IDACI scores for schools participating in the study

Bands of IDACI scores indicating increasing deprivation (1 = most deprived)								
		0–0.2 Least deprived	0.2–0.25	0.25–0.35	0.35–0.4	0.4–0.5	0.5–0.6	0.6–1 Most Deprived
Number of schools falling in each band of IDACI scores	Primary schools	5	2	1	5	6	2	1
	Secondary schools	12	1	2	1	2	1	0

The most recent Ofsted grades awarded to the participating schools varied between 1: 'Outstanding' and 4: 'Inadequate'. Table 5 shows the breakdown for the schools. The national background for these categories (Ofsted.gov.uk) for state primary schools and primary converter academies, respectively, are: 17% and 33% 'Outstanding'; 61% and 57% 'Good'; 19% and 10% 'Requires Improvement'; 2% and 0% were 'Inadequate'. The national background for these categories (Ofsted.gov.uk) for state secondary schools and secondary converter academies, respectively, are: 23% and 36% 'Outstanding'; 48% and 50% 'Good'; 24% and 13% 'Requires Improvement'; 5% and 1% 'Inadequate'.

Table 5: Ofsted grades for schools participating in the study

	Outstanding	Good	Requires Improvement	Inadequate
Primary schools	1 (4.5%)	7 (31.8%)	11 (50%)	3 (13.6%)
Secondary schools	3 (15.8%)	6 (31.6%)	6 (31.6%)	4 (21%)

Figure 1: Participant flow diagram

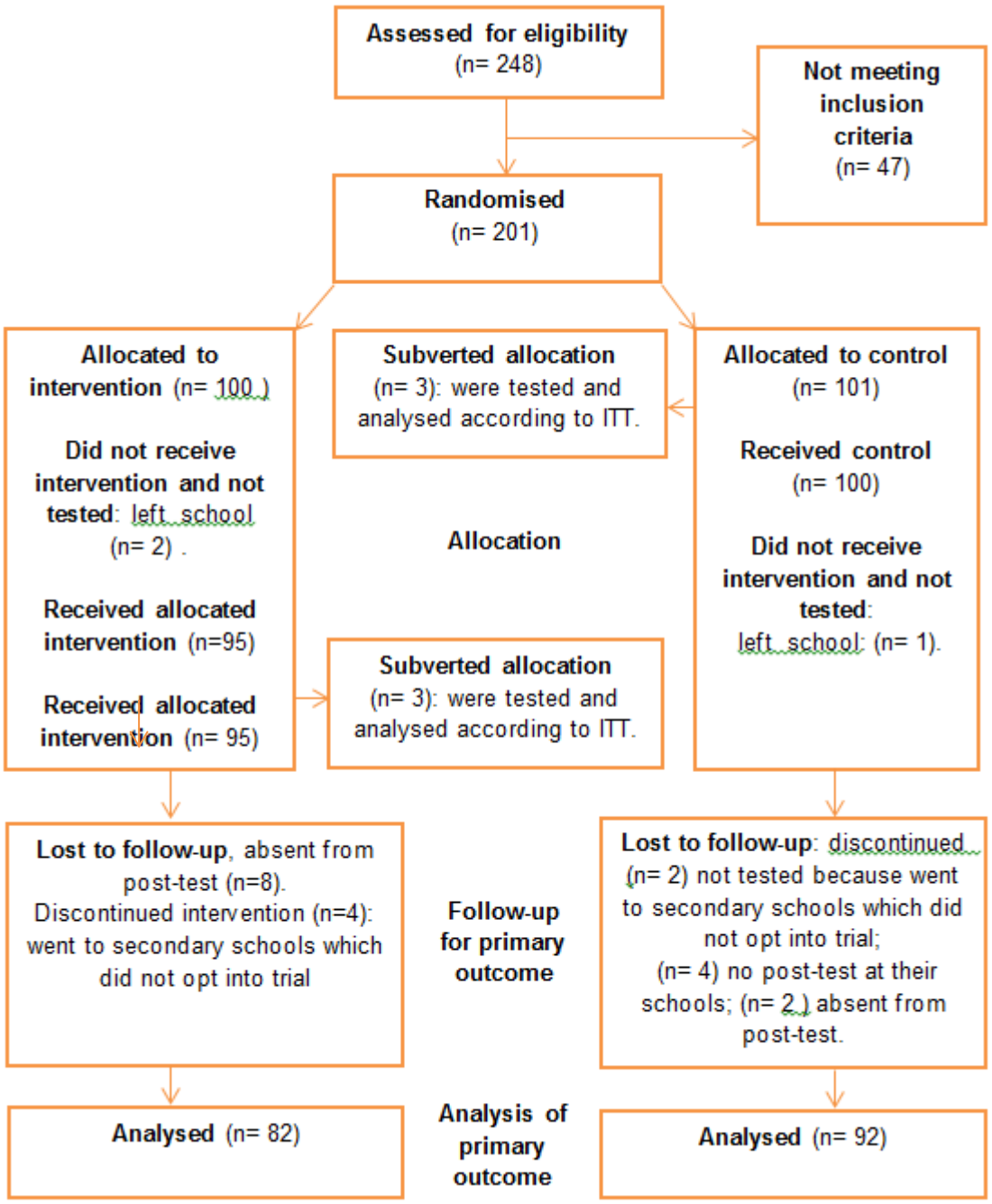


Figure 1 is the participant flow diagram for the study, which summarises the loss of participants from randomisation to outcome.

Initially, four main secondary schools and 22 of their feeder primaries agreed to participate. The intervention was delivered in all 22 primary schools. Due to children deciding on secondary schools outside of the original four, the number of secondary schools attended by participants of the trial was eventually 19. Two of these 19 declined to join the study.

In terms of intention to treat, there was an overall attrition rate of 11.4%, comprising 14% of the treatment group and 8.9% of the control group who did not sit the NGRT post-test. Of the total attrition of 23 pupils, 13% left for primary schools outside of the area and 26% were lost because they moved to secondary schools which were not originally in the trial and which declined to participate. In addition, absence on the day of the test was the main cause of attrition, accounting for 60% of the 23 pupils missing the NGRT post-test. Figure 1 shows that there was some subversion of the random allocation whereby three children were accidentally swapped from the treatment to the control group and a further three pupils were erroneously swapped from the control group to the treatment group. However, these were analysed as intended (intention to treat). This swapping of pupils occurred within the same primary school.

Baseline Characteristics

The baseline characteristics of the pupils are presented in Table 6. The proportions of the male and female pupils were comparable between the intervention and the control groups, which was expected due to randomisation. The proportion of children with English as an Additional Language (EAL) was also comparable between the intervention and the control groups, however there were minor imbalances in the distribution of pupils with Pupil Premium status (PP), those eligible for free school meals (FSM), those with Special Educational Needs (SEN), and ethnicity.

Table 6: Baseline characteristics of the pupils

	Intervention	Control		Intervention	Control
Gender			English as a Second Language (EAL)		
Female	42 (49%)	43 (51%)	No	78 (50%)	79 (50%)
Male	58 (51%)	55 (49%)	Yes	22 (55%)	18 (45%)
Pupil Premium (PP)			Free School Meals (FSM)		
No	41 (54%)	35 (46%)	No	40 (45%)	49 (55%)
Yes	54 (47%)	60 (53%)	Yes	59 (55%)	48 (45%)
Special Educational Needs (SEN)			Ethnicity		
No	33 (52%)	31 (48%)	White British	61 (53%)	54 (47%)
Yes	54 (55%)	45 (45%)	Others	22 (51%)	21 (49%)

The descriptive statistics for the pre-test scores are presented in Table 7. The average standardised scores of the outcomes were comparable between the intervention and the control group, which is expected due to the randomisation scheme. The spread of the data were also comparable between the intervention and the control group.

Table 7: Descriptive statistics for the pre-test standardised scores with mean and SD before intervention

Outcome	Mean (SD)		Median (IQR)		After dropout	
	Intervention	Control	Intervention	Control	Intervention	Control
NGRT	81.27 (10.07)	81.51 (9.57)	94 (10.00)	95 (12.25)	81.05 (9.91)	81.97 (9.31)
SWRT	82.56 (9.42)	82.92 (8.74)	83.5 (13.00)	84.5 (13.00)	82.24 (9.33)	83.23 (8.76)
PhAB	94.99 (9.36)	95.69 (9.23)	82.5 (12.75)	82.0 (11.00)	94.48 (8.54)	96.14 (9.23)

Note. NGRT = New Group Reading Test; SWRT = Single Word Reading Test; PhAB= Phonological Ability non-word reading test; SD = standard deviation; IQR = interquartile range.

Figures 2 and 3 in the Appendix show the distribution of the NGRT 3A pre-test standardised and raw scores.

Outcomes and analysis

Intervention effect

Using intention to treat, the multilevel model showed no evidence of significant intervention effects on the primary or secondary outcomes. Although the randomisation was at pupil level, the multilevel model accounted for the nested nature of pupils within schools. The model is flexible enough to produce the same results as the ordinary ANCOVA model if indeed the heterogeneity between schools is zero. Table 8 shows that the effect sizes for the intervention ranged from -0.05 to 0.17, and suggests that the intervention was of limited benefit in enhancing reading skills in the children in the treatment group compared to the control group, according to intention to treat analysis using age standardised scores. Figures 4 and 5 in the Appendix show the distribution of standardised and raw scores for the NGRT 3B post-tests.

Further analyses taking into account other factors such as gender, free school meal status and SEN were performed without evidence that these baseline factors had any significant affect. The results of the multilevel model with random effects are presented in Table 11 in the Appendix. A separate model, using intention to treat, was calculated for FSM pupils (presented in Table 9 below) which revealed small effect sizes of 0.2 and 0.3 relating to single word reading and non-word reading respectively (intervention compared to control). No improvement was detected in respect of reading comprehension (-0.07). None of these measures are statistically significant.

Table 8: Intention to treat analysis of the standardised scores with mean and SD after intervention—intervention effect (95% CI)

Outcome	Group	N	Mean (SD)	Effect size (g)*	Estimate**
NGRT	Intervention	86	80.53 (9.26)		ICC = 0.00
	Control	92	81.40 (8.94)	-0.05 (-0.34, 0.25)	-0.35 (-2.53, 1.83)
SWRT	Intervention	90	85.63 (11.10)		ICC= 0.16
	Control	94	86.09 (10.89)	0.01 (-0.37, 0.40)	0.10 (-0.65, 4.87)
PhAB	Intervention	88	98.97 (11.60)		ICC = 0.22
	Control	94	98.48 (12.43)	0.17 (-0.24, 0.58)	2.11 (-0.68, 4.87)

*Note. *Calculated based on Hedges (2007); **Estimates based on multilevel model to account for school effects; N = number of participants; Confidence Intervals (CIs) are shown in brackets in the Effect Size column. CIs represent the possible range of the effect size. The MDES was calculated as suggested by Hutchinson and Styles (2010) for cluster randomised trials.*

Table 9: Subgroup analysis for FSM with mean and SD after intervention—intervention effect (95% CI)

Outcome	Group	N	Mean (SD)	Effect size (g)*	Estimate**	MDES
NGRT	Intervention	40	80.13 (10.27)		ICC = 0.00	
	Control	53	80.13 (8.91)	-0.07 (-0.36, 0.23)	-0.51 (-3.74,2.73)	0.58
SWRT	Intervention	42	85.31 (12.06)		ICC = 0.07	
	Control	54	84.17 (9.66)	0.2 (-1.31, 0.53)	1.34 (-1.31,4.00)	0.44
PhAB	Intervention	41	97.56 (10.61)		ICC = 0.03	
	Control	54	95.43 (10.14)	0.3 (-0.01, 0.62)	2.48 (0.83,5.99)	0.51

*Note. *Calculated based on Hedges (2007); **Estimates based on multilevel model to account for school effects; N = number of participants. Confidence Intervals (CIs) are shown in brackets in the Effect Size column: CIs represent the possible range of the effect size. The MDES was calculated as suggested by Hutchinson and Styles (2010) for cluster randomised trials.*

Sensitivity Analysis

Table 8 shows the results on an intention to treat (ITT) basis, whereby analysis is conducted strictly according to the group to which each participant is allocated, as opposed to whether the participant is

actually treated as a member of that particular group. A sensitivity analysis was conducted in addition to the ITT analysis. Table 10 shows the results of this sensitivity analysis, where the standardised scores of the reading outcomes were analysed using the actual experience of the treatment. This was necessary because one of the schools had inadvertently swapped pupils between the intervention and control groups. As a result, three children in the treatment group failed to receive the Rapid Phonics intervention, whilst three other children who had been allocated to the control group mistakenly received the intervention. Table 10 therefore shows the results of the participants according to which treatment they actually received, the intervention or control condition. There was a small effect size of 0.24 for the PhAB non-word reading scores after adjusting for the pre-test scores. This, however, failed to reach statistical significance as the lower confidence interval crossed zero, indicating that the null hypothesis cannot be discounted (that there is no significant difference between the treatment and control groups). The analyses of the raw scores in Tables 12 and 13 in the appendix also show a weak, but not statistically significant, intervention effect on the PhAB scores with effect sizes of 0.27 and 0.37 respectively.

Table 10: Group analysis of the standardised scores based on the actual treatment received, with mean and SD after intervention—intervention effect (95% CI)

Outcome	Group	N	Mean (SD)	Effect size (g)*	Estimate**
NGRT	Intervention	86	80.58 (9.30)		ICC = 0
	Control	92	81.36 (8.90)	-0.02 (-0.32, 0.27)	-0.18 (-2.37, 2.00)
SWRT	Intervention	90	86.03 (11.89)		ICC = 0.15
	Control	94	85.70 (10.07)	0.09 (-0.29, 0.47)	0.73 (-1.28, 2.74)
PhAB	Intervention	88	99.56 (12.27)		ICC = 0.22
	Control	94	97.93 (11.76)	0.24 (-0.17, 0.65)	2.85 (0.11, 5.59)

**Calculated based on Hedges (2007). **Estimates based on multilevel model to account for school effects.*

Missing data

The data were also investigated for missing data: 6% and 9% of children in the control and intervention groups respectively had missing values for PhAB post-test scores; 6% (control) and 8% (intervention) had missing values for SWRT post-test scores; and 6% (control) and 12% (Intervention) had missing values for NGRT post-test scores. Further analysis based on attendance data was limited due to large missing values—95% and 20% for the control and the intervention groups respectively.

SWRT fall-back analysis

The additional single word tests (SWRT) were intended to assess whether there had been a decline in reading scores after the summer holiday. The SWRT did not detect any impact of the intervention, either in intention to treat, or in those who actually received the intervention compared to those who did not, neither did it find any decline in word reading scores after the summer break. The mean score for the intervention group rose from 82.51 in July (SWRT2) to 85.48 (SWRT1) in September, and the control score increased from 81.67 to 86.22; these did not constitute significant differences. It was concluded, therefore, that there was no fall-back in single word reading after the summer break. See Table 14 in the Appendix for the full analysis of SWRT results throughout the intervention.

Conclusion

There was no robust evidence produced by this study to suggest a beneficial effect of Rapid Phonics on reading comprehension when delivered across the transition from primary to secondary school.

Sensitivity analysis comparing those who did and did not experience the intervention revealed that there was a small—but statistically non-significant—impact on non-word reading, which is associated with decoding using the phonological route. No such impact was detected in the case of single word reading recognition (SWRT) and no fall-back after the summer break was detected in single word reading.

Cost

The publisher of Rapid Phonics supplies a starting pack at a cost of approximately £636, which includes teaching guides, a starter pack of readers, online training, an e-book licence, handbook, wall charts and flash cards. The individual magnetic boards for the students cost around £5 each and the specialised magnetic letter packs (which have, for example, split digraph letter patterns) cost approximately £10 each, although these can be shared between pupils, and letters can be supplemented by cheaper magnetic letters.

Teaching costs need to be added to these costs. The average number of students in a teaching group for the intervention was four, but as the programme is flexible, schools may decide that bigger (probably up to a maximum of six) or smaller groups are appropriate. The estimated cost per school to deliver Rapid Phonics to four students over a total period of 18 hours would include approximately £540 for an experienced teacher's time.

To obtain an estimate of the cost per child, it should be taken into account that this intervention involves a primary school and a secondary school each of which would have to purchase the starter pack from the publisher and the magnetic boards. Assuming that the intervention is purchased for 20 children who are taught in five groups of four, the teaching cost of £540 must be multiplied by five—a cost of £2,700. This results in an estimated cost per pupil of approximately £205.

This figure would decline when used for several groups and over subsequent years due to the reusability of resources. Specialist training in the teaching of Rapid Phonics is not included in this estimate.

Process evaluation

A 'light touch' process evaluation took place as described above.

Implementation

The delivery team made every effort to deliver the intervention as effectively as possible, and were able to do this in all but two schools. Children were released from their normal lessons to attend the intervention, and the rooms in which lessons took place were acceptable.

The design of the intervention provided a challenge in that it was in two parts and was implemented at a time of disruption for both schools and children. During the last six weeks of primary school there are numerous activities such as visits to the children's secondary schools, school trips and sports events which the children do not want to miss: the project staff had to work around these commitments. Furthermore, the first six weeks of secondary school is a confusing time for children who are in a new environment with very new routines and a different peer group. The project teachers sometimes had to go and find students who had forgotten their Rapid Phonics lessons. Unexpected situations arose which required a lot of re-allocation of resources in order to overcome. These included the children unexpectedly attending nineteen instead of four secondary schools. There were substantial logistical problems to overcome in welcoming new schools to the project and in timetabling so that staff could teach at the many new locations. If scaled up, this intervention might be best timetabled for twelve consecutive weeks in the middle of a school year when the children are all in one place, as opposed to moving to different schools. They would be more likely to be settled and in an established routine.

A lot of activity was packed into a short time during the lessons that were observed. The children were kept busy. The teaching was responsive to the children's needs. For instance, when children needed more time to absorb a teaching point, the pace of the lesson was adjusted accordingly and more examples were given and discussed. In the opinion of the evaluator, the expertise of the teachers clearly enhanced the effectiveness of the children's learning experience.

Feedback from the delivery team was positive about the Snappy Lesson format and the appropriate nature of the support materials for Rapid Phonics. The judgements of the specialist teachers were that the intervention was worthwhile, enjoyable for the children, and that it was a programme that should be pursued in the future, as its benefit could be seen in the children's progress.

Fidelity

Not all the children received the full number of hours of intervention. Of the 79 children for whom accurate records were available, 6 received exactly the intended 18 hours of the intervention, 49 received more than 18 hours, and 24 received less than 18 hours. The mean number of hours was 16.1. Absence and the children being called away for end of Year 6 activities were the commonest reasons offered for those whose attendance fell below the intended 18 hours.

Apart from these variations in overall time of delivery and lesson length, the intervention was delivered as intended to the treatment group (see Intervention section above). It was the observation of the evaluator that the lessons were consistent with the instruction the teachers had received in training, and the evaluator's opinion was that the intervention was professionally delivered to a high standard. This is despite some adverse circumstances external to the trial, such as the end of term disruptions as described in the Implementation section. The Rapid Phonics programme is very adaptable: it can be used to teach a whole class of beginner readers, or may be used for Year 2 children struggling to keep up with whole-class teaching, or—as in this study—can help older readers who are struggling..

Outcomes

The staff perceived an improvement in the children's literacy skills and reported an improvement in the children's confidence. No negative effects were reported to the evaluator as to children being unhappy at having to attend or about missing lessons.

Formative findings

The lesson observations and comments from the teachers delivering Rapid Phonics suggested that the content of the intervention is appropriate to meet the need of the children to understand the rules that underlie decoding and help them to convert graphemes (letters or letter groupings) to phonemes (the sounds in words that correspond to letters / letter groups) and to blend phonemes. The PhAB non-word reading results would support this. It is difficult to see obvious improvements in this training in reading via the phonological route, which involves grapheme-phoneme conversion and phoneme blending.

In order to improve the skills relating to reading comprehension, the intervention would need to be extended to include the teaching of specific sub-skills pertinent to comprehension. As the EEF Teaching and Learning Toolkit (Education Endowment Foundation Toolkit, 2014) points out: 'Phonics improves the accuracy of the child's reading but not the comprehension'.

Control group activity

No reports reached the evaluator of the children in the control group displaying any negative behaviours.

There was no evidence of any spill-over effect from the treatment group to the control group. However, neither spill over nor placebo effects can be completely discounted.

Conclusion

This pragmatic randomised controlled trial of Rapid Phonics found no positive effect for the primary outcome measure of reading comprehension, neither was a beneficial impact observed in the secondary outcome of single word reading. Intention to treat and age standardised scores were employed in these analyses. Using these same criteria, an effect size of +0.17 was observed for the other secondary outcome of non-word reading. This rose to a small positive effect size of +0.24 in the sensitivity analysis which took into account the minor allocation subversion (involving six children) and was also calculated using standardised scores. When intention to treat groupings and raw scores were considered, this rose to +0.27, which represents an estimated benefit for the intervention equivalent to three months' progress in non-word reading. None of these results reached statistical significance and so the null hypothesis was accepted—in other words, there was no statistically significant difference between the treatment and the business-as-usual control groups after the intervention.

Strengths

The contribution that can be made by an experienced teacher to the effectiveness of a reading intervention is important (Slavin et al., 2011), and the delivery of this intervention was by expert staff.

This study made use of best practice, conforming to the CONSORT standards for randomised controlled trials. Allocation concealment was conducted by the independent statistical evaluator so as to prevent selection bias associated with knowledge of trial or control allocation. The intention to treat directive ensured that all participants were included in the final analysis according to their original allocation. Invigilators and markers were blinded as to the group membership of the participants.

Limitations

There were several factors relating to the design of this study, and some unanticipated situations occurring during it, which may have reduced the effectiveness of the programme. The last six weeks of primary school and the first six weeks of secondary school are times of upheaval in children's lives when they may not be at their most receptive to a period of concentrated study of skills that they have always found difficult. The practical problems of providing continuity for the participants going from 22 primary schools to 19 secondary schools across the county are not to be underestimated, and it is a tribute to the management and resourcefulness of the delivery team that its delivery was accomplished so well. The original plan targeted four secondary schools and their satellite primary schools: when children transferred to secondary schools outside the scheme, it took much persuasion to bring these new schools on board. Two secondary schools declined to participate, resulting in four children receiving only half of the intervention.

One possible improvement to the implementation of the intervention would be to schedule it in a continuous 12-week stretch (as much as interruptions from half terms would allow) and within the same school year. The intervention is likely to have more success with children at an earlier point in their primary school careers. Consideration could be given to what complementary skills might be taught to Year 6 and Year 7 children to prepare them to access the secondary school curriculum, such as vocabulary boosting and the acquisition of higher order cognitive skills.

The rate of attrition from the research was not high at 11.4%, which is a positive aspect of the study. However, only 86 from the treatment group and 92 controls were post-tested for the primary outcome of reading comprehension. These figures are considerably below the 150 originally intended for each group—treatment and control: if the numbers in each group had been this, or had the number in each group reached 100, the results would have been more secure.

The SWRT failed to find a significant impact on single word reading in the post-tests but neither did it detect any decline in this respect following the summer break. There was, however, a small effect size suggesting some impact in PhAB non-word reading at post-testing. It would therefore have been better to have tested non-word reading before and after the summer break. This was not done because PhAB does not exist in parallel forms and assessing the children with the same test on four occasions within such a short period was not thought to be valid. As it stands, we cannot make a judgement as to whether phonic skills, as shown by non-word reading ability, suffered a post-holiday set back. If this timetable for an intervention study were repeated, a test with four parallel forms, such as TOWRE2 (Torgesen et al., 2012), should be used. It is also a quick test, assessing real-word and non-word reading, and has a timed element which is useful in assessing a programme which expressly seeks to improve fluency, as does Rapid Phonics.

Interpretation

The main analysis in this randomised controlled trial was conducted on an intention to treat basis. Based on the criterion that the primary outcome measure was reading comprehension, there is no robust evidence to support the efficacy of Rapid Phonics as an intervention for struggling readers at the Year 6/7 transition. This raises the question as to whether a pure phonics scheme can be effective in improving reading comprehension for children at the primary–secondary transition without there also being an accompanying element of explicit training in comprehension skills.

No significant improvement was detected in the reading of single words (SWRT). A single word reading test provides additional difficulties for readers as words which are 'tricky' to decode via regular letter–sound conversions are not set within a context that provides clues to assist their reading.

Synthetic phonics programmes aim to teach children both the basic and advanced alphabetic codes and to teach the main phonological skills of blending (for reading) and segmenting (for spelling) so that when children are reading they do not need to guess from visual cues (such as pictures) or from contextual cues. Phonics is their primary strategy for word decoding. But as reading comprehension is a product of word decoding and language comprehension children being taught through synthetic phonics are provided with opportunities to apply their phonic knowledge and skills from the very beginning to real reading and real writing. In other words, their phonics is set within the context of language comprehension.

Marlynne Grant, the author of Rapid Phonics and Sound Discovery, points out that the decodable texts within these schemes offer practice with 'tricky' words, and that there are also specific advanced lessons on this subject, noting that perhaps the short length of the present trial may have limited the opportunity for children to master these skills within the time constraints. In connection with reading comprehension skills, Dr Grant suggests that phonics training needs time to embed before it translates into improved comprehension.

Another element that should be considered in interpreting the trial's results is that the reading difficulties experienced by the children by the time they reach Year 6 are likely to have hindered their acquisition of an age-appropriate reading vocabulary. The lack of measurable improvement in both SWRT and NGRT could have been affected by such a deficit. NGRT was not just a challenging test of reading vocabulary but also of the general knowledge associated with that vocabulary. The children in this study whose decoding ability has improved may improve their comprehension in the future as they gain access to the world of books, boost their general knowledge, and develop more holistic skills such as understanding text structure and inference-making—key to good reading comprehension.

Achieving a positive result in this randomised controlled trial hinged upon the children's ability to understand some complex texts in the NGRT: such a skill grows with practice and formal training.

These children started behind the rest of most of the year group and it is unlikely that the sorts of questions asked in the very challenging NGRT would have been accessible to them without such practice. For children of this age, improvement in their decoding skills would not be as evident as for younger children in comprehension because of the increased complexity and abstractness of the language that they encounter in the primary outcome test of this study.

Future research and publications

Reading comprehension was intended to test how well this sample of struggling readers could access the Year 7 curriculum. The results suggest that they will struggle if they only receive catch-up phonics tuition at the point of transition from primary to secondary school. Perhaps earlier intervention would be advised and so a recommendation would be to repeat this trial at an earlier point in Key Stage 2.

This study has highlighted the difficulty of delivering a teaching programme which is split across school years and between primary and secondary school. Future research might examine the efficacy of the intervention during a more settled period in the children's school lives, and when it is not interrupted by the school summer holiday.

The improvement in PhAB non-word reading for the treatment group, as evidenced by a small effect size (although not statistically significant), suggests that any phonological benefit conferred by the intervention had not yet transferred to single word reading or comprehension. Further research could examine how phonological improvements brought about by the programme feed into these higher order literacy skills.

The lack of a significant impact in the SWRT could also be investigated. For instance, would complementary training in visual holistic word recognition help children of this age group?

An element of literacy not assessed in this trial was spelling. An intervention study of Sound Discovery conducted in a middle school in Bedfordshire between 2005 and 2007 (cited by Brooks, 2013) reported noticeable progress in spelling among Year 5 pupils. The evaluator observed that each lesson incorporated a considerable element of teaching spelling rules. Future research might investigate the impact that the Rapid Phonics catch-up programme has on spelling in Years 6 and 7 within the context of a randomised controlled trial. This would be a logical extension of the research objectives of this study as spelling is an essential skill, not least because so much of the assessment in secondary school is mediated through the written work the children produce.

Finally, if these Year 6 and Year 7 struggling readers are empowered through learning phonics to decode written material, then the next limiting factor for them must be considered. The difficulty they had with the NGRT is consistent with a restriction associated with the unfamiliarity of formal written language. This is the type of language that they will become increasingly exposed to as they progress at secondary school. Shanahan (2006) suggests that older children are limited in applying their decoding skills to their reading comprehension because of the mismatch between their spoken vocabulary and the written vocabulary they encounter. To assess this idea, a complementary programme to boost written vocabulary knowledge could be investigated in conjunction with Rapid Phonics for children before they go to secondary school.

References

Altman, D.G., Moher, D. and Schulz, K.F. (2012) 'Improving the reporting of randomised trials: the CONSORT Statement and beyond'. *Statist. Med*., 31: 2985–2997.

Brooks, G. (2013) *What works for children and young people with literacy difficulties? The effectiveness of intervention schemes*. Fourth Edition, The Dyslexia-SpLD Trust (ISBN 978-1-872653-01-3).

Burge, B., Styles, B., Brzyska, B., Cooper, L., Shamsan, Y., Saltini, F. and Twist, L. (2010) *New Group Reading Test (NGRT)*. Third Edition, London: GL Assessment.

Coltheart, M. (1978) 'Lexical access in simple reading tasks' in G. Underwood (Ed.), *Strategies of information processing*. London: Academic Press.

Coltheart, M., Rastle, K., Perry, C., Langdon, R., and Ziegler, J. (2001) 'DRC: A dual route cascaded model of visual word recognition and reading aloud'. *Psychological Review*, 108(1), 204–256.

Department for Education *IDACI Score and Rank of IDACI tool*. Retrieved 23 July 2014 from http://www.education.gov.uk/cgi-bin/inyourarea/idaci.pl?postcode=nr8+6hp

Department for Education 'Attainment gap between FSM pupils and the rest', on gov.uk/government/publications. Retrieved 23 July 2014 from https://www.gov.uk/government/publications/attainment-gap-between-fsm-pupils-and-the-rest

EEF 'Education Endowment Foundation Toolkit'. Retrieved 20 March 2014 from http://educationendowmentfoundation.org.uk/toolkit/phonics/

Foster, H. (2007) *Single Word Reading Test 6-16*. London: GL Assessment Limited.

Frederickson, N., Frith, U. and Reason, R. (1997) *The Phonological Assessment Battery*. London: GL Assessment.

Grant, M. (2011). 'Matched Funding for Teaching Phonics – Opportunity or straightjacket?' Retrieved 30 March 2014 from http://rrf.org.uk/pdf/Matched%20Funding%20Article-august%2011a%20_MG_.pdf

Hedges, L.V. (2007) 'Effect Sizes in Cluster-Randomized Designs'. *Journal of Educational and Behavioral Statistics*, 32, 4, 341–370.

Shanahan, T. (2006) *The National Reading Panel Report: Practical advice for teachers*. Illinois: Learning Point. Retrieved 15 March 2014 from http://www.learningpt.org/pdfs/literacy/nationalreading.pdf

Slavin, R. E., Lake, C., Davis, S. and Madden, N. A. (2011) 'Effective programs for struggling readers: A best-evidence synthesis'. *Educational Research Review*, 6,1–26.

Torgesen, J.K., Wagner, R.K., and Rashotte, C.A. (2012) *Test of Word Reading Efficiency*. 2nd Edition, Austin: Pro-ed.

Worsley, J. (2005) 'Sound Discovery: A synthetic phonics programme for the teaching of reading, writing and spelling. A report of the Sound Discovery trial. Cognition and Learning group spring and summer term 2005'. *Educational Psychology and Specialist Support*. Children's Services, Norfolk County Council.

Appendix A: Raw scores analysis

Table 11: Multilevel model results for Table 6—intervention effect (95% CI)

Group	NGRT	SWRT	PhAB
Intercept	35.37 (25.90, 44.84)	10.14 (1.03, 19.25)	17.99 (3.88, 32.05)
Pre-test	00.56 (0.45, 0.68)	0.92 (0.81, 1.02)	0.84 (0.74, 0.98)
Intervention effect	-0.35 (-2.53, 1.83)	0.10 (-1.91, 2.12)	2.11 (-0.65, 4.87)
Random effects (variance)			
Schools	0.00	7.45	19.10
Pupils	53.97	38.30	68.83

Table 12: Intention to treat analysis of the raw scores—intervention effect (95% CI)

Outcome	Group	N	Mean (SD)	Effect size (g)*	Estimate**
NGRT	Intervention	85	16.28 (6.11)		ICC = 0.0
	Control	91	16.41 (6.04)	0.07 (-0.23, 0.36)	0.32 (-1.13, 1.76)
SWRT	Intervention	90	38.54 (8.78)		ICC = 0.06
	Control	91	39.31 (8.14)	0.02 (-0.31, 0.35)	0.09 (-1.32, 1.50)
PhAB	Intervention	87	14.71 (3.82)		ICC = 0.19
	Control	93	14.46 (4.54)	0.27 (-0.14, 0.67)	0.99 (0.11, 1.87)

**Calculated based on Hedges (2007); **Estimates based on multilevel model to account for school effects.*

Table 13: Group analysis of the raw scores based on the actual treatment received—intervention effect (95% CI)

Outcome	Group	N	Mean (SD)	Effect size (g)*	Estimate**
NGRT	Intervention	85	16.38 (6.18)		ICC = 0.00
	Control	91	16.32 (5.97)	0.12 (-0.18, 0.41)	0.56 (-0.94, 2.00)
SWRT	Intervention	90	38.71 (9.03)		ICC = 0.05
	Control	91	39.14 (7.88)	0.09 (-0.23, 0.42)	0.46 (-0.94, 1.87)
PhAB	Intervention	87	19.91 (4.12)		ICC = 0.15
	Control	93	14.28 (4.26)	0.37 (-0.02, 0.75)	1.26 (0.39, 2.13)

**Calculated based on Hedges (2007); **Estimates based on multilevel model to account for school effects.*

Table 14: Sensitivity analysis of SWRT scores

Outcome	Group	N	Mean (SD)	Effect size (g)*	Estimate**
July	Intervention	87	82.51 (8.01)		
	Control	80	81.67 (9.05)	-0.01 (-0.35, 0.33)	-0.5 (-1.50, 1.41)
September	Intervention	87	85.48 (10.88)		
	Control	80	86.22 (12.10)	0.07 (-0.25, 0.39)	0.45 (-1.45, 2.35)
Year 6	Intervention	93	81.81 (8.18)		
	Control	90	82.23 (8.27)	-0.02 (-0.29, 0.24)	-0.11 (-1.46, 1.24)
	Intervention	84	85.27 (11.22)		
Year 7	Control	86	85.80 (10.01)	0.02 (-0.25, 0.29)	0.11 (-1.66, 1.88)
Raw Data					
July	Intervention	78	34.25 (7.04)		
	Control	79	36.33 (7.49)	-0.10 (-0.45, 0.25)	-0.42 (-1.69, 0.85)
September	Intervention	88	37.60 (9.30)		
	Control	88	38.44 (9.42)	0.12 (-0.23, 0.47)	0.56 (-0.77, 1.89)

**Calculated based on Hedges (2007) and adjusted for pre-test scores; **Estimates based on multilevel model to account for school effects and pre-test scores.*

Figure 2

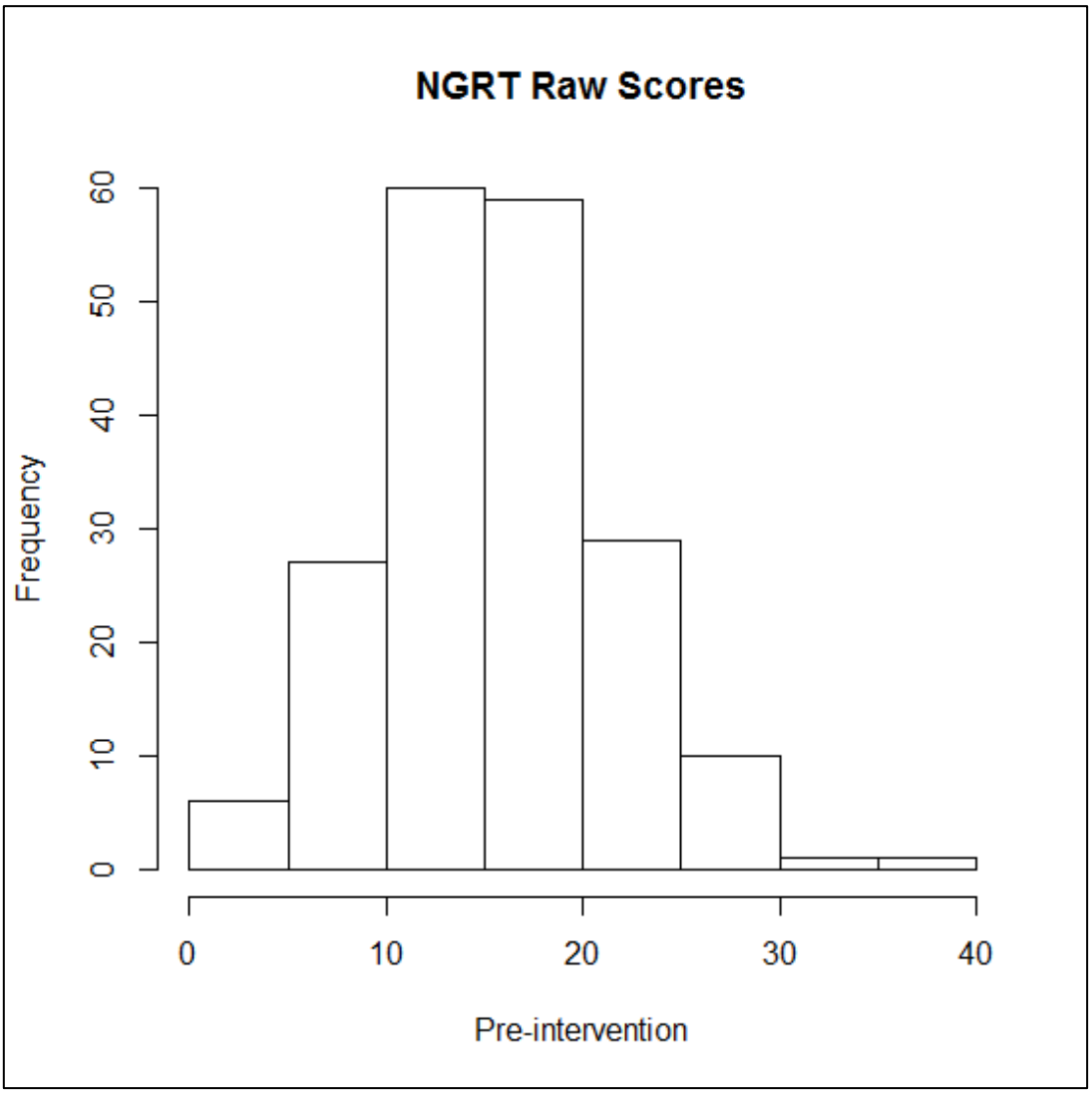

NGRT Raw Scores
Frequency
0
10
20
30
40
50
60
0
10
20
30
40
Pre-intervention

Figure 3

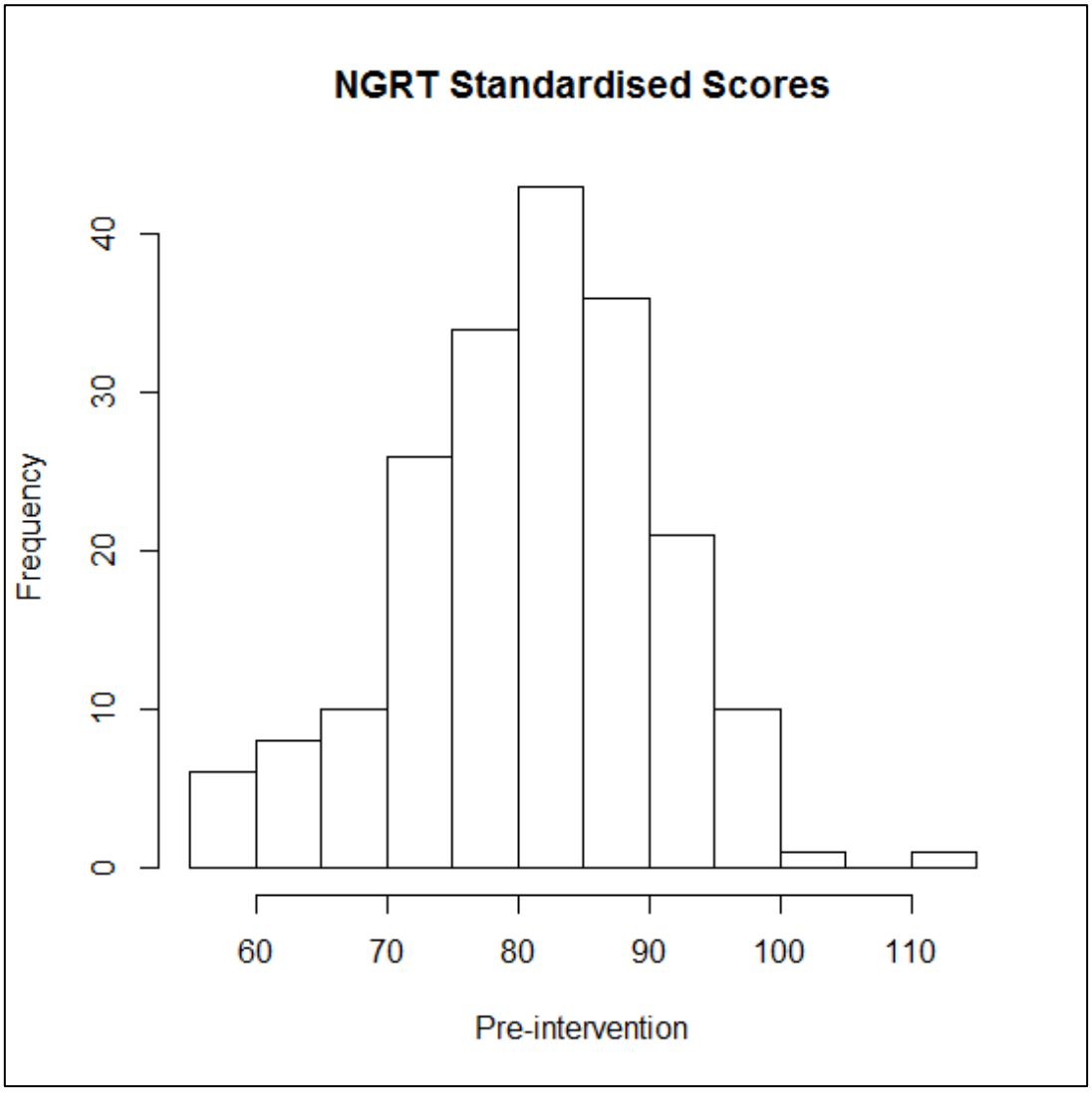

NGRT Standardised Scores
Frequency
0
10
20
30
40
60
70
80
90
100
110
Pre-intervention

Figure 4

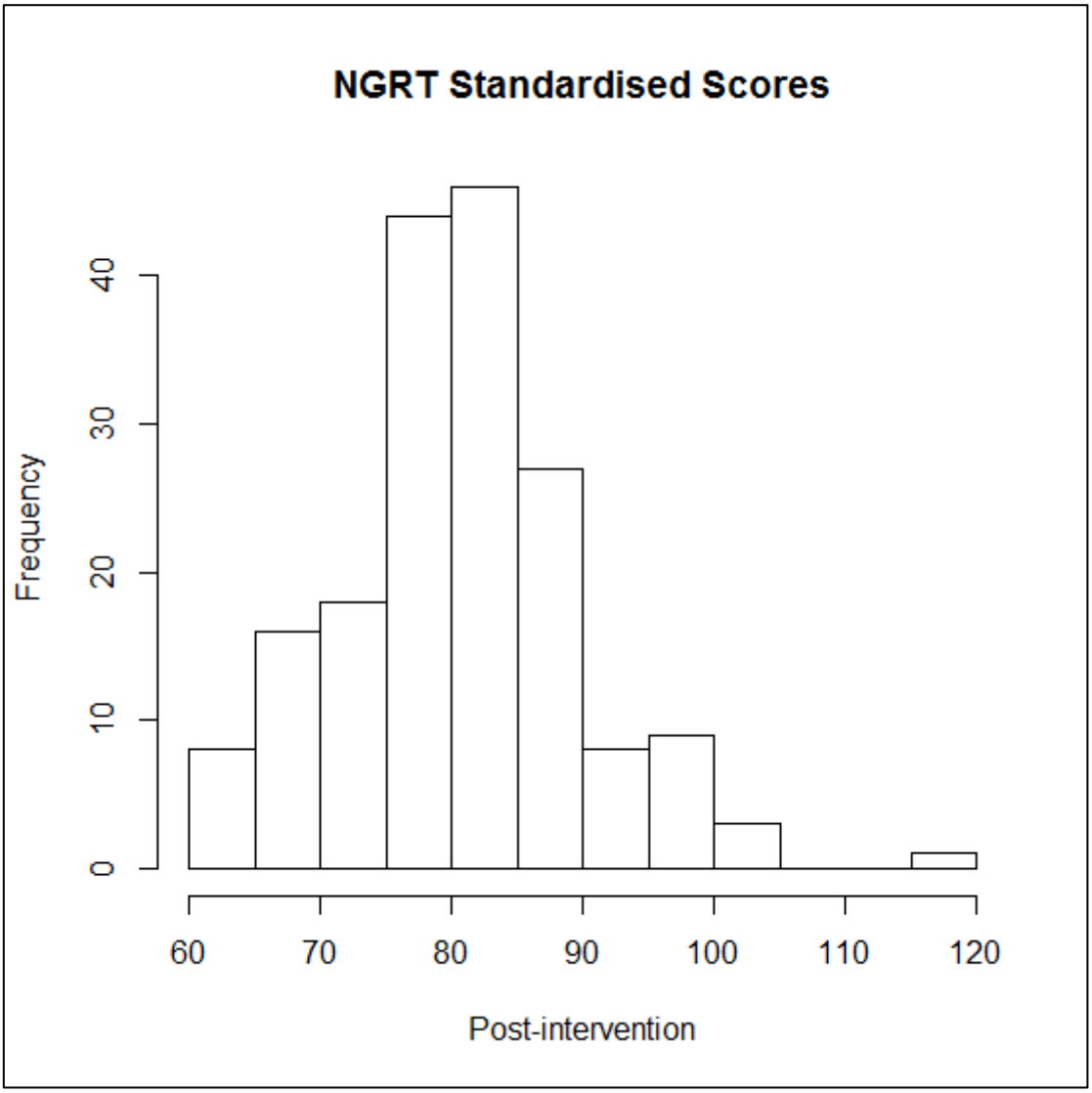

NGRT Standardised Scores
Frequency
0
10
20
30
40
60
70
80
90
100
110
120
Post-intervention

Figure 5


NGRT Raw Scores
Frequency
0
10
20
30
40
50
10
20
30
40
Post-intervention

Appendix B: Parental consent letter

Norfolk County Council
at your service

Snappy catch up phonics: targeted synthetic phonics intervention for children in Norfolk in transition from Year 6 to Year 7

Dear Parents

In July 2012 the Department for Education welcomed bids from schools and Local Authorities to undertake research projects aimed at increasing pupils reading skills in the transition from Primary to Secondary schools.

On behalf of Norfolk County Council, Educational Psychology and Specialist Support submitted a bid for funding to undertake research aiming to increase pupils' reading skills through use of a structured phonics intervention.

Good news was received in November 2012. Our bid was successful. Funding will be provided by the Education Endowment Fund (EEF). Pupils in 12 Primary Schools across the county will benefit from this project. The children will receive assessment and teaching intervention in Y6 through to their transfer into the Autumn term of Y7 to three targeted High Schools. All work will be done in close collaboration with school staff.

Because this is a research project, strict guidelines must be followed to ensure fair and equal access to the intervention across the schools involved and to ensure that assessment and teaching is undertaken uniformly in every school concerned. The project work will be undertaken by experienced and qualified Advisory Learning Support Teachers working closely with teaching staff in schools. In many cases the teachers concerned will already be known to the schools.

In all, around 300 pupils will be assessed to find out if they would benefit from this type of intervention. Half of the children (chosen at random) will receive teaching at the end of Yr6 and start of Yr 7 while the other half (the control group) will receive it later on during Yr7.

All of the pupil data will be treated confidentially with children mainly being identified only by their Unique Pupil Number and not their names. The E.E.F. may keep the data for study purposes in the future. Educational Psychology and Specialist Support will share data with schools in order to support the children's learning in future and names will be used but shared only with the children's own schools.

All Head Teachers are fully aware and in agreement with the research happening in their schools. If you feel that you would prefer your child *not* to be included in the research please can you tell the school. You will be receiving a short letter from them letting you know of the person to contact to do this. There will also be a form you can give to the school *if* you do *not* wish your child to take part. It is also the case that you can withdraw your child or your child's data from the project at any time.

Snappy catch up phonics

During the Spring term of 2013, primary schools in the Hewett, Norwich, King Edward VII, Kings Lynn and Great Yarmouth Academy, Great Yarmouth clusters will share data with Educational Psychology & Specialist Support which identifies pupils who are predicted to gain a National Curriculum Level 2 or 3 at in the end of Key Stage 2 SATs in May 2013. .

Of those pupils, 300 will be chosen to have their reading and phonological skills assessed. The assessments to be used are fairly quick to administer and will not unduly burden the children. The children's attitudes to literacy will also be rated by a simple scale which they will give information towards in conversation with the Advisory Learning Support Teachers because we are also interested in boosting their motivation towards literacy on transfer to High School although this is not an integral part of the research.

The project is being independently evaluated by Durham University who will randomly choose around 150 pupils to have teaching intervention in the summer term of 2013 after the KS 2 SATs are completed.

Teaching will be in small groups of no more than four children. There will be three sessions of around 45 minutes per week in the six weeks prior to the summer break. The Rapid Phonics teaching approach will be used as will access to e-learning reading books.

In the week just before the children transfer to High School they will meet again with the Advisory Learning Support Teachers for a Catch Up session to revise some of the principles of the teaching in Y6, share experiences of the e-readers, share reading games and prepare to look forward to sessions at High School.

In the Autumn term of Y7 2013 the same pupils will receive another six weeks of intensive teaching to ensure that they remember their learning from the Y6 sessions and to move their reading skills forward again. Throughout the project the children's progress will be regularly assessed in addition to the pre and post testing which will evaluate the impact of the intervention.

Much more detail around the organisation and content of the teaching sessions will take place throughout the Spring term and further information will be shared with you through project newsletters and parents' meetings. The general findings of the study will be communicated to parents at the end of the project and individual parents can request their own child's test results.

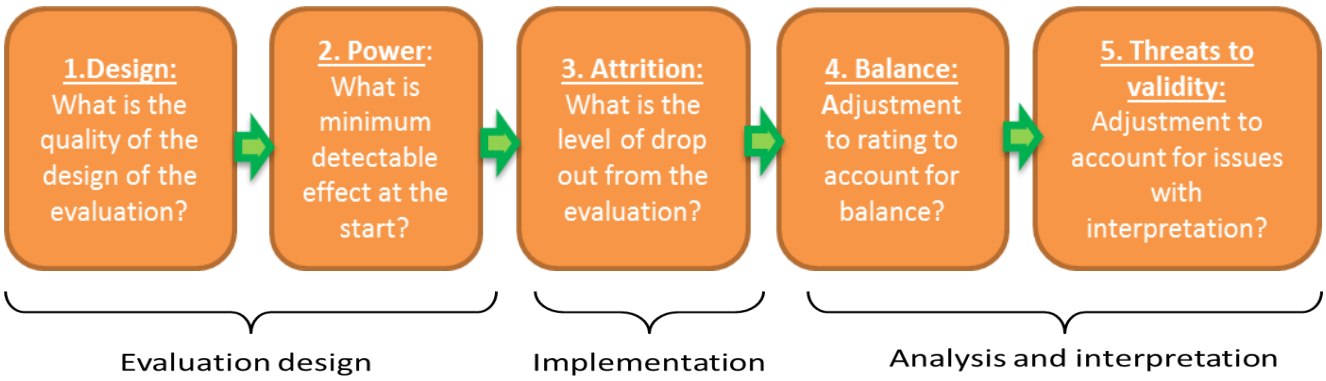
It is essential that the children attend all sessions and a record of attendance will be kept.

We very much hope that this project will be successful in aiding children to improve their reading and that you will be happy for your child's participation.

Joan McLauchlan, Divisional Senior Specialist Lead Teacher, Project Manager &
James Thatcher, Divisional Senior Educational Psychologist, Project Lead
Children's Services, Educational Psychology & Specialist Support
Carrow House, Level 2, King Street, Norwich, NR1 2TN

Telephone 01603 307550
Email joan.mclauchlan@norfolk.gov.uk, james.thatcher@norfolk.gov.uk

Appendix C: Padlock rating



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

The final security rating for this trial is 3 🔒. This means that the conclusions have a moderate level of security.

The trial was designed as an efficacy trial and could achieve a maximum of 5 🔒. This was a well conducted trial during the difficult 'transition' period. The MDES was relatively large (0.32), which resulted in a loss of 2 padlocks. There was moderate attrition (11%), so the padlocks were not changed. There was little indication of baseline imbalance or threats to validity. Therefore the final padlock rating is 3 🔒.

Appendix D: Cost rating

Cost ratings are based on the approximate cost per pupil of implementing the intervention over one year. Cost ratings are awarded using the following criteria.

Cost	Description
£	*Very low:* less than £80 per pupil per year.
£ £	*Low:* up to about £170 per pupil per year.
£ £ £	*Moderate:* up to about £700 per pupil per year.
£ £ £ £	*High:* up to £1,200 per pupil per year.
£ £ £ £ £	*Very high:* over £1,200 per pupil per year.

This document is available for download at **www.educationendowmentfoundation.org.uk**

Education
Endowment
Foundation

The Education Endowment Foundation
9th Floor, Millbank Tower
21–24 Millbank
London
SW1P 4QP
www.educationendowmentfoundation.org.uk