

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

## EDUCATIONAL RESEARCH

### **Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial**

Stephen P. Morris\*

*Manchester Metropolitan University, Department of Sociology, Geoffrey Manton Building, Rosamond St W, Manchester M15 6EB, UK. Telephone: 07887 553926, email:s.morris@mmu.ac.uk. ORCiDs: 0000-0001-6869-8933*

Robert Wishart

*Natcen Social Research, London, UK, 35 Northampton Square, London, EC1V 0AX. Telephone 020 7250 1866, robert.wishart@natcen.ac.uk*

Fatima Husain

*Natcen Social Research, London, UK, 35 Northampton Square, London, EC1V 0AX. Telephone 020 7250 1866, fatima.husain@natcen.ac.uk*

Lydia Marshall

*Natcen Social Research, London, UK, 35 Northampton Square, London, EC1V 0AX. Telephone 020 7250 1866, lydia.marshall@natcen.ac.uk*

Martina Vojtkova

*Natcen Social Research, London, UK, 35 Northampton Square, London, EC1V 0AX. Telephone 020 7250 1866, martina.vojtkova@natcen.ac.uk*

\*Corresponding author

WORD COUNT: 7,812 [excluding Tables and Figures]

## Structured Abstract

**Background:** A cluster randomised controlled trial was conducted to test whether the offer of Family Skills, a programme targeted at the parents of reception year (4 – 5 year-old) pupils with English as an Additional Language (EAL), raised attainment.

**Purpose:** There is little existing evidence of whether family literacy programmes delivered in school settings are effective in raising attainment among pupils with EAL in the English context. This study seeks to address this gap.

**Programme description:** Eleven two and a half hour sessions were delivered during the school day, by trained trainers, to the parents of pupils with EAL. Sessions aimed to enhance parents' knowledge of effective literacy strategies.

**Sample:** In total, 115 primary schools in England were recruited to the study. Each school identified pupils in reception year that had EAL. The parents of these children were invited to take up the programme.

**Design and methods:** A two-arm parallel cluster randomised control trial was conducted, with schools randomised to intervention and control conditions. The primary outcome measure was literacy attainment. The evaluation also included a mixed methods process evaluation.

**Results:** The estimated effect size for the primary outcome based on adjusted intention-to-treat analysis, with a full set of covariates, was 0.03 (95% CI: -.14 to .21). Not all parents invited to take up the intervention did so and it proved difficult to obtain a reliable measure of take-up.

**Conclusions:** Estimated effect sizes ranged from 0.13 in an unadjusted analysis to 0.03 in the full adjusted analysis. Our results do not reach statistical significance at the 95 per cent level. We discuss ways the intervention might be improved and address the issue of the low take-up of Family Skills.

**Keywords:** family literacy programme, English as an additional language (EAL), literacy attainment, primary education, cluster randomised controlled trial (RCT)

## Introduction

Between September 2016 and July 2017, 115 primary schools in England took part in a trial to test the effectiveness of Family Skills, a programme that aimed to improve the language and literacy of pupils with English as an Additional Language (EAL). The intervention was targeted at the parents of reception year pupils with EAL. It had the

## Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

intention of improving parents' knowledge of how children are taught language and literacy in the English education system, whilst also addressing parents' own language needs. It was hypothesised that through enhancing parents' understanding, encouraging the home literacy environment and improving parents' knowledge, children's language and literacy attainment would also improve. Family Skills was delivered by a consortium of not-for-profit providers overseen by the intervention developers.

The Family Skills programme was targeted at parents whose children entered reception year in September 2016. Reception year is the first year of formal schooling in the English education system, where pupils are four or five years old. Parents were invited to attend a series of 11 sessions at the child's school, which was delivered by a trained tutor. For one of these sessions, children were invited to attend with their parent(s). Sessions covered topics such as bilingualism, reading to children, phonics, home literacy, and an overview of primary education in England.

This paper reports findings from both an impact and process evaluation of Family Skills. It also highlights lessons learnt from the design and execution of the trial, which might inform the design of future similar studies. The impact evaluation took the form of a two-arm cluster randomised controlled trial, involving the assignment at random of participating schools to intervention and control groups. Within schools assigned to the intervention group, parents with children identified as pupils with EAL by the school were invited to take part in Family Skills. No such offer was made to parents of children with EAL in the control schools, where 'business as usual' conditions prevailed. The process evaluation assessed how Family Skills was delivered in practice, the extent of fidelity to the intervention design, and how the programme was perceived by parents and by education professionals in the participating schools.

## Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

This paper is organised as follows. The following section considers the existing evidence on the effectiveness of family literacy-type interventions. It identifies the genesis of the Family Skills programme, emerging from, and sharing much in common with family literacy interventions, a more familiar feature of the educational landscape in Britain. Section three of this paper describes the objectives of both impact and process elements of the evaluation, whilst section four provides further details of the Family Skills programme. Section five gives an overview of the evaluation design: outcome measures, randomisation and sample size calculations. The process evaluation is also discussed. Section six describes the main findings from the impact evaluation. Section seven discusses these findings in the light of evidence emerging from the process evaluation, suggesting ways the intervention might be improved as well as addressing the problem of low take-up of Family Skills, which was significant challenge faced in this study. Finally, section eight provides a conclusion.

The results and discussion of them presented in this paper will be of interest to both policy makers and practitioners seeking to identify interventions that might raise literacy attainment among pupils with EAL in Britain and also internationally. Our findings will also be of use to researchers designing and implementing school-based intervention studies, targeted at parents and using randomised designs. Reported effect sizes range from 0.13 (95% CI: -0.04, 0.30) in an unadjusted analysis to 0.03 (95% CI: -0.14, 0.21) in an adjusted analysis with a full set of covariates. For each analysis, we fail to reject the null hypothesis at the 95 per cent level. The process evaluation provides insights into how the implementation of Family Skills might be adapted and improved. The limitations of the evaluation are discussed. As noted above, one of the most important challenges faced in this study was low take-up of Family Skills by parents of pupils with EAL in intervention schools. Evidence from qualitative research

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial  
carried out as part of a process evaluation and feedback from staff in schools suggested that take-up of Family Skills was low. Registers recording parents' attendance provided unreliable measures of take-up, which meant it was not possible to examine reliably the consequences of low take-up for effect size estimates. The challenges associated with low take-up and its measurement are examined in detail in the discussion section of this paper.

A protocol for this study, authored by Vojtkova, Morris, Cara, & Marshall, (2016) was published prior to randomisation. Subsequent to this, a study protocol and statistical analysis plan were also published on the Education Endowment Foundation's (EEF) website (NatCen Social Research, 2016; Vojtkova & Jabin, 2017). A report of the results of this trial for policymakers is also available (Husain et al., 2018). Ethical clearance for the study was obtained from the NatCen Social Research ethics committee in April 2016.

## **Background**

Just over a fifth (21.2 per cent) of pupils in English primary schools are believed or known to be exposed to a language other than English at home (Department for Education, 2018). Moreover, there has been a substantial rise in the numbers of pupils with EAL in English schools over recent years (Department for Education, 2017; Strand, Malmberg, & Hall, 2015). In general, the evidence suggests that pupils with EAL on average do less well than their monolingual peers in primary school in England but the association between EAL status and lower attainment weakens as children age (Demie, 2018; Strand et al., 2015; Whiteside, Gooch, & Norbury, 2017). Importantly, this finding is reversed when level of proficiency or fluency is taken into account and also type of language spoken at home. Pupils with EAL who have higher levels of

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial  
proficiency have been shown to out-perform monolingual children at the end of primary school (aged 10/11) as well as by Year 2 of primary school (age 6/7) and at GCSE (age 15/16) (Demie & Hau, 2013; Demie & Strand, 2006; Strand & Demie, 2005; Whiteside et al., 2017)<sup>1</sup>.

Studies have, in general, concluded that pupils referred to as having EAL are a diverse group (Demie, 2018; Strand & Demie, 2005; Strand et al., 2015; Whiteside et al., 2017). As will be shown, this diversity has implications for the intervention discussed in this paper. However, and despite this heterogeneity, Whiteside et al. (2017, page 825) conclude from the findings of their study that:

*“boosting English language proficiency in the early school years, or prior to school entry, among children with EAL will improve social, emotional, and behavioral profiles and attenuate the existing academic attainment gap between children with EAL and monolingual peers”*

It is generally acknowledged that parents have an important role to play in the development of their children’s literacy and language skills (Anderson, Anderson, Friedrich, & Kim, 2010; Anderson & Morrison, 2007; Carpentieri, Fairfax--Cholmeley, Litster, & Vorhaus, 2011; Desforges & Abouchaar, 2003; Feinstein, Duckworth, & Sabates, 2004; Hodge, 2006; Sénéchal & Young, 2008; Swain et al., 2009; Swain, Brooks, & Bosley, 2013). This is so despite the fact that some parents may not

---

<sup>1</sup> It is important to note that the relative improvement in performance of pupils with EAL who have higher levels of language proficiency does not appear to be related to their EAL status per se, but rather other socio-demographic and economic factors correlated with both proficiency and higher attainment, specifically socio-economic factors (Demie & Hau, 2013; Strand & Demie, 2005).

## Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

recognise the critical nature of their role (Swain & Cara, 2018). Family literacy programmes aim to support the connection between parents, children and the school in the attainment of literacy and language skills through enhancing the ‘home literacy environment’. As noted by Swain et al. (2015), family literacy programmes in England have tended to be delivered through schools and have involved parents and their children ‘and offer classes for families to develop their literacy skills, attitudes, understandings and practices together’ (Swain et al., 2015, page 13).

Family Skills is a programme deriving many of its principles, ideas and content from family literacy interventions. Its focus is on applying the concepts of family literacy to EAL pupils and their parents. In general, there is not a well-developed evidence base for either family literacy programmes, nor for programmes with family-literacy-style content for children whose first language is not English, relevant in the English context.

Carpentieri et al. (2011) provide the most recent review of reviews of family literacy programmes. The report summarises findings from six meta-analyses of family literacy intervention studies. The authors find family literacy programmes to be effective at raising children’s literacy attainment, with effect sizes ranging from 0.25 to 0.68 (Carpentieri et al., 2011, Table 1.1, page 10). The study concludes that: ‘child literacy strategies should include a family literacy component, and that policymakers should more actively support the widespread proliferation of family literacy interventions’ (Carpentieri et al., 2011, pages 10-11). Due to its age, this review does not include one recent study conducted in the UK by Swain et al. (2015) which, on the basis of a quasi-experimental design, provided evidence in support of the effectiveness of general family literacy programmes (Effect Size=0.17, p=.08).

## Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

Switching focus to consider the effectiveness of interventions to raise literacy among pupils with EAL, Murphy & Unthiah (2015) report the most complete assessment of the existing evidence. As Jerrim (2018) points out, however, only one study assessed by Murphy & Unthiah comes from the UK. The authors themselves highlight the problems in drawing conclusions from North American studies (which make up the majority of included studies) for the UK. Moreover, only two of the studies reviewed involved interventions that focused on family literacy practices. Of these, one was found to be effective.

Jerrim (2018) highlights the existence of three randomised studies, which, at the time he wrote, were in progress. One of these is this present study, which he hoped would add to the evidence base. At a time of increased migration into England, there is a gap in the evidence base regarding what is known about the effectiveness of initiatives to raise attainment in literacy and language skills among EAL pupils in the UK. This study aimed to address this gap, through undertaking a rigorous evaluation of the effectiveness of a well-defined ‘manualised’ intervention that aimed to raise attainment among reception year pupils with EAL.

### **Aims of the study**

The main aim of the impact evaluation was to examine whether the offer of the Family Skills programme made to parents raised children’s attainment in literacy relative to the ‘business-as-usual support’ received by families of pupils with EAL. Furthermore, it aimed to examine whether any observed effects of receiving an offer to take-up Family Skills varied by whether pupils qualified for the pupil premium (additional funding from government to raise the attainment of disadvantaged pupils), by sex and by baseline (pre-randomisation) attainment in literacy. The original intention of the study



Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

was also to estimate the average effect of the intervention on children’s test scores among those pupils whose parents took up the intervention (average effect on the treated) rather than only on those offered it (average effect of intention-to-treat). As will be discussed, although such analyses were attempted, they are not reported, as they are considered to be unreliable due to the poor quality of take-up data. Furthermore, the published protocol for this study (Vojtkova et al., 2016), set out the intention not only to estimate the effects of the offer of Family Skills to parents on pupils’ literacy attainment but also to examine the impact of such an offer on the home literacy environment. The intention was to collect home literacy measures both pre and post-randomisation through a parent survey. This element of the study was abandoned due to low response to the survey at the baseline (35 per cent).

The process evaluation focused on understanding the views and experiences of practitioners delivering Family Skills and parents participating in it. The process evaluation also examined fidelity to the programme design. As discussed, the take-up of the intervention by parents was lower than anticipated. Therefore, the scope of the process evaluation was expanded to pay greater attention to the challenges encountered in encouraging parents to engage with Family Skills.

## **The intervention**

The intervention consisted of approximately 30 hours of sessions delivered by a trained Family Skills tutor in schools between January and April 2017. Tutors were, in the main, experienced practitioners with a background in adult education. Some 33 tutors were involved in the intervention and were engaged locally by provider organisations. Tutors were required to attend a ‘train the trainer’ day delivered by the programme developers prior to the trial. They were supported on an ongoing basis through an online

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

group that enabled them to share experience and which supported attempted adaptation of the programme to address the diverse needs of participating parents. The intervention was fully ‘manualised’, with guidance on how to adapt the course content to different levels of language skill and knowledge, and such adaptations were encouraged.

Each session delivered to participating parents was approximately two and a half hours in length. In only one of the sessions were parents expected to attend with their child. Most sessions were delivered during the school day, usually at 2.30 p.m. Up to an additional three sessions could be added to the programme at the discretion of the trainer.

Sessions encouraged interaction between tutors and parents. Parents were typically required to complete worksheets. The topics covered in sessions included: bilingualism, reading and phonics, reading to children, home literacy, learning through play and the nature of primary education in the English system. A key element of the intervention was to raise parents’ awareness of the benefits of bilingualism and multilingualism, and the importance of language in the home in the development of children’s literacy and linguistic skills.

It was left to primary schools participating in the study to identify pupils with EAL, and thus the parents to whom the intervention would be offered, according to the school’s usual practices consistent with how they would complete returns to the English school census.

## **Study design**

The evaluation consisted of both impact and process evaluation elements. The impact evaluation was a two-arm cluster randomised controlled trial, with primary schools allocated at random to intervention and control conditions. The primary outcome was

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial  
pupil attainment in literacy. The study sample, comprising pupils rather than parents, had several levels of clustering: pupils within classes, classes within schools and schools within delivery partner (delivery partners were responsible for delivering the intervention to more than one school).

As outlined below, the primary outcome measure was a standardised assessment in literacy and English language. Tests were administered to pupils with EAL identified by schools at baseline, prior to randomisation, and then again post-intervention. Baseline testing took place over the period October to November 2016, and post intervention testing between June and July 2017.

The initial position of the researchers was that schools should recruit eligible parents of children with EAL to Family Skills prior to randomisation (Vojtkova et al., 2016). The implementation team was reluctant to do this. As a result, schools were asked to identify all pupils that they considered to have EAL prior to randomisation. Parents of children with EAL were approached with the offer Family Skills subsequent to randomisation.

The process evaluation was initially designed to assess fidelity and identify critical success factors or barriers to implementation. Due to low take-up of Family Skills among parents, the focus of the process evaluation was widened to explore reasons for low parental-attendance and strategies to improve take-up.

The process evaluation involved data collected in the form of an online school survey, observations of sessions (n=10), in-depth interviews with tutors (n=7), parents (n=21) and school staff (n=18) (including teaching staff).

### ***Outcome measures***

The primary outcome was the child's literacy attainment measured approximately at 10-

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

12 weeks post intervention (follow-up). The CEM BASE Reception Baseline

Assessment<sup>2</sup> is a standardised assessment that was administered to all reception year pupils with EAL in the schools (whose parents had not withdrawn their child from the study) by teachers and teaching assistants at baseline (prior to randomisation) and at follow-up. The chosen assessment tool measures aspects of reading, vocabulary, letter and word recognition and language comprehension. The measure is adaptive, avoiding ceiling and floor effects and is delivered in an online environment with automatic scoring. Teachers and teaching assistants encountering difficulties in administering tests could seek support through a telephone helpline.

### ***Randomisation***

Randomisation was conducted in four batches as schools agreed to take part in the programme over the period October to December 2016. One hundred and fifteen schools were randomised in total. Randomisation was undertaken using STATA v14 statistical software. Schools were stratified by provider and each school was allocated a random number. Schools were then arranged in descending order on the basis of the random number within each stratum. Schools were divided in half within each stratum; those with the lowest random numbers were allocated to the intervention and highest to control. Where strata contained an odd number of schools, the final school was allocated on the basis of a replication correction procedure.

### ***Sample size***

In the trial protocol, a sample of 140 schools was estimated as necessary for the study,

---

<sup>2</sup> For further details see <https://www.cem.org/reception-baseline-assessment> (accessed, 23 May, 2018).

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

given the clustered nature of the sample, to obtain minimum detectable effect size of 0.2 (standardised mean difference) (NatCen Social Research, 2016). Put crudely, the minimum detectable effect size is the smallest true effect size that a sample would be capable of detecting at a 95 per cent level of statistical significance (the smaller the minimum detectable effect size the more sensitive the study design). Sample size calculations conducted at the point of randomisation reported an achieved sample size of some 115 schools and 2,500 pupils (Vojtkova & Jabin, 2017). Such a sample size was consistent with a minimum detectable effect size estimated at that point of between 0.19 to 0.24 (standardised mean difference), depending on the extent to which regression adjustment involving a covariate capturing baseline attainment might contribute to variance explained. Due to schools leaving the study or failing to provide the required data, the final study sample size ‘as analysed’ (as opposed to the ‘as randomised’ sample) comprised 102 schools and 1,985 pupils (see Figure 1, Annex A). As sample of this size equated to a minimum detectable effect size of 0.23. Thus, despite the challenges encountered, the study design remained consistent with a relatively modest minimum detectable effect size<sup>3</sup>.

### ***Process evaluation***

The process evaluation of Family Skills was initially designed to address the following: 1) the extent of fidelity to the programme design; 2) the delivery of the intervention in practice; and 3) any barriers to, and enablers of, successful implementation. The process evaluation maintained a focus on these questions, but in addition, due to the

---

<sup>3</sup> See Hattie (2008) for a discussion of effect sizes in education, in which he suggests an effect size of 0.20 is considered small or modest.

## Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

problems encountered with low take-up, was adjusted to address this issue. More specifically, the process evaluation examined engagement activities that had been attempted, school support for these activities, reasons given for non-attendance among parents and approaches for addressing non-attendance.

These additional emphasises required the sampling strategy deployed for the process evaluation to be adjusted. As discussed above, the process evaluation was largely qualitative, with the exception of a school survey, which gathered data on delivery and staff time spent on the programme. The qualitative component of the research comprised observations of sessions in a small sample of schools, and interviews with class teachers, tutors and parents. In order to address the issue of low-take-up, in-depth interviews with parents involved the sampling of parents who were eligible but had not attended sessions, parents who had attended only some sessions, as well as those who attended all sessions. The number of interviews conducted with school staff were increased from 10 to 18, in order to gain additional insights as to why parents had not attended sessions.

The majority of interviews were conducted over the phone, with a small minority completed face to face during the period February to June 2017. The content of each interview was based on a topic guide covering themes and sub-themes of interest that addressed the process evaluation research objectives. Topic guides were designed to be flexible and interactive, allowing issues of relevance to be covered through detailed follow-up questioning. Separate topic guides were produced for each type of respondent.

Parents who agreed to be interviewed were offered a £20 voucher in recognition of the time they had given up to take part in the research. All interviews were digitally

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial recorded and professionally transcribed, with the analysis conducted using ‘Framework’ (Ritchie, Lewis, McNaughton-Nicholls, & Ormston, 2013).

## **Results of the impact evaluation**

In this section, we present the findings of the impact analysis. However, before doing so, we turn our attention to the recruitment of schools and the degree to which subsequent sample loss resulted in intervention and control samples that were unbalanced on pre-randomisation variables. Figure 1, Annex A, provides an overview of the processes through which the final trial sample was obtained. Of the 155 schools approached to take part in the study, 23 refused to participate and 17 did not meet the study’s school-inclusion-criteria. Schools were considered eligible if they had a minimum of six pupils with EAL per class in the reception year. In addition, schools that did not complete baseline assessments were excluded from the trial and so were not randomised.

One hundred and fifteen schools were randomised, though it transpired that of these 115, five schools did not provide useable baseline assessments. This post-randomisation loss of schools resulted in a sample of 110 schools; 56 schools in the intervention group and 54 in the control group. A further two schools were lost from the intervention group and four schools from the control group, resulting in 54 intervention and 50 control schools in range of the analysis. A further two schools from the control group provided only age-adjusted CEM Base scores at follow-up and were excluded from the ‘as analysed’ sample. Table 1 compares the characteristics of the intervention and control schools and pupil samples on the basis of pre-randomisation variables in the ‘as analysed’ sample. For continuous measures, statistical comparisons

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

are made on the basis of t-tests (Welch’s T-test for unequal variances and sample sizes)

and for proportions Fisher’s exact tests<sup>4</sup>.

	<b>Intervention (%)</b>	<b>Control (%)</b>	<b>Effect size</b>	<b>P-value</b>
<b>School level variables</b>				
School type: LA maintained	72.9	73.2	0.01	1.000
School type: Academy	27.1	26.8	0.01	1.000
Pupils receiving free meals	18.8	20.1	0.13	0.502
Pupils with EAL	45.2	46.4	0.05	0.786
Pupils with SEN	11.7	12.4	0.12	0.514
CEM BASE (school means)	100.1	98.6	0.17	0.387
<b>School sample size (N=)</b>	<b>54</b>	<b>48</b>		
	<b>Intervention (%)</b>	<b>Control (%)</b>	<b>Effect size</b>	<b>P-value</b>
<b>Pupil level variables</b>				
Eligible for pupil premium	11.7	13.7	0.06	0.181
Male	52.1	49.2	0.06	0.147
Term of birth:				
Autumn	32.2	33.0	0.02	0.694
Spring	31.2	34.7	0.07	0.074
Summer	36.6	32.3	0.09	0.031
<b>Pupil sample size (N=)</b>	<b>940</b>	<b>1045</b>		
Proficiency in English*				
A – New to English	22.9	37.7	0.33	0.000
B – Early acquisition	30.2	29.4	0.02	0.803
C – Developing competence	28.8	22.9	0.13	0.023
D - Competent	12.3	5.2	0.25	0.000
E - Fluent	5.8	4.7	0.05	0.445
<b>Pupil sample size (N=)</b>	<b>487</b>	<b>584</b>		
CEM BASE attainment measures at baseline (pupil means)	100.9	98.1	0.11	0.001
<b>Pupil sample size (N=)</b>	<b>940</b>	<b>1045</b>		
*From September 2016, schools had been required (but are no longer required) to record a Proficiency in English rating (using the 5-point Proficiency in English scale) in the school census for all pupils in reception year and above for whom primary language is anything other than ‘English’ or ‘Believed to be English’. In a number of schools in the sample the Proficiency in English assessments were not carried out. This means that the base sample size for the Proficiency in English measures in this table are lower than the full sample size.				

**Table 1: School and pupil characteristics at baseline by intervention and control groups – as analysed sample (pupils with EAL only)**

<sup>4</sup> Neither test corrects for the clustered nature of the data and therefore results represent conservative tests for baseline imbalances between intervention and control samples.



## Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

Generally, the comparisons in Table 1 suggest reasonably balanced samples but they do reveal that pupils in intervention schools scored higher at baseline, on average, on the CEM Base assessment than those in control schools (ES=0.11,  $p=0.001$ ). The inclusion of baseline test scores as a covariate in an adjusted intention-to-treat analysis was set out as the primary analysis in the study statistical analysis plan (Vojtkova & Jabin, 2017). This imbalance provided further justification for including a measure of prior attainment as a covariate to correct for possible bias in the intention to treat analysis that follows.

Table 2 presents the results of the intention-to-treat analysis. Four separate models are reported. Results come from three-level hierarchical linear models in which the pupil CEM Base assessment raw score<sup>5</sup> at 10-12 weeks post intervention is the outcome or dependent variable. Two effects are reported for each model. The ‘effect’ is the regression coefficient on the treatment indicator variable included in each model. The ‘effect size’ is derived from the ‘effect’ or regression coefficient<sup>6</sup>. Ninety-five per

---

<sup>5</sup> The raw score is the score obtained in the CEM Base assessment which is unstandardized and not age-adjusted. Simple mean outcomes at follow-up on the CEM Base assessment were 137.5 (SD=25.02) and 133.4 (SD= 24.67) for intervention and control groups respectively.

<sup>6</sup> The effect sizes reported in Table 2 are derived from results obtained from fitting a series of hierarchical linear regression models using maximum likelihood. Effect sizes were derived from the regression results according to an equation provided by Hedges (2011, equation 31, page 360). The standard derivation required for the derivation of effect sizes is calculated from the pooled within treatment group unconditional variance. The intra-class correlation coefficients required to adjust the pooled within treatment group variance were obtained

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial  
cent confidence intervals are reported for both the ‘effect’ and ‘effect size’ as well as other covariates reported.

Model 1 in Table 2 reveals the effect and effect size obtained from a hierarchical linear model containing an intervention group indicator variable as the sole covariate. This is the unadjusted analysis. The effect size is 0.13 with 95 per cent confidence interval -.04 to 0.30, leading to failure to reject the null hypothesis. However, as we suspected, our results might be affected by some imbalances and maintaining consistency with the primary analysis specified in the study statistical analysis plan (Vojtkova & Jabin, 2017), Model 2 controls for, in addition, prior attainment at the pupil level (the covariate was derived from the raw scores on the CEM Base assessments completed by pupils prior to randomisation)<sup>7</sup>.

---

from Model 1. The ratio between the effect size and regression coefficient for each of the four models in Table 2 is constant across the models (subject to rounding and a slightly smaller estimation sample for Model 4) as the same unconditional variances and intra-class correlation coefficients used in the calculations. The 95 per cent confidence intervals were obtained from an equation for an approximation of the variance for the effect size provided by Hedges (2011, equation 33, page 361); this yields a conservative estimate of the variance.

<sup>7</sup> The correlation between pre and post-test scores for the full sample was 0.73.

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

	Model 1 (unadjusted)	Model 2 (with individual baseline measures)	Model 3 (as model 2 but with school level mean baseline test score)	Model 4 (full model – all available covariates)
<b>Treatment effects:</b>				
Effect size (confidence interval)	0.13 (-0.04, 0.30)	0.06 (-0.11,0.23)	0.07 (-0.10,0.24)	0.03 ( -0.14, 0.21)
Effect (confidence interval)	3.32 (-0.56, 7.21)	1.44 (-1.25,4.14)	1.70 (-0.95, 4.35)	0.81 (-1.89, 3.50)
<b>Individual level covariates:</b>				
Baseline test score (individual)	-	0.95 (0.91, 1.00)	0.97 (0.92, 1.01)	1.01 (0.96, 1.05)
Female	-	-	-	2.60 (1.10, 4.10)
Date of Birth	-	-	-	0.03 (0.02, 0.04)
Pupil premium status – qualifies	-	-	-	-1.20 (-3.56, 1.16)
<b>School level covariates:</b>				
Baseline test score (school mean)	-	-	-0.21 (-0.39, -0.03)	-0.17 (-0.36, 0.01)
% free school meals	-	-	-	-0.01 (-0.22, 0.19)
% SEN	-	-	-	-0.06 (-0.34, 0.22)
School type: academy	-	-	-	-1.36 (-5.16, - 2.43)
Total sample size pupils	1,985	1,985	1,985	1,861
Total sample size classes	234	234	234	216
Total sample sizes schools	102	102	102	99
ICC School	0.05	0.02	0.02	0.01
ICC Class	0.10	0.14	0.14	<b>0.15</b>
Log likelihood	-9143.8959	-8470.216	-8467.697	-7901.327
Notes: Models 2-4 also contain covariates capturing delivery partner – estimated coefficients not shown				

**Table 2: Intention-to-treat effect estimates on attainment at follow-up (pupils with EAL)**

Inclusion of pupil level prior attainment as a covariate in Model 2 attenuates the effect size estimate from 0.13 in Model 1, to 0.06. This suggests that the inclusion of prior attainment in the model may be correcting for bias as well as reducing the variance of the outcome. The coverage of the 95 per cent confidence interval again includes zero, which is consistent with failure to reject the null hypothesis at the 95 per cent level. Thus, including a baseline pre-randomisation measure of attainment in our analysis led to a quite large reduction in the estimated effect size. Models 3 and 4

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

represent further adjusted analysis including additional covariates. Model 3 controls for prior attainment at the school and pupil levels, whilst Model 4 includes, in addition, covariates controlling for sex, date of birth, whether the child qualified for pupil premium, as well as percentage of the school roll receiving free school meals and with special educational needs (SEN). School type is also included as a covariate. Effect sizes in these models are 0.07 and 0.03, with confidence intervals whose coverage includes zero. Point estimates derived in a similar manner for subgroups receiving pupil premium, by baseline English language attainment and by gender, are all modest, with estimates that fail to reach statistical significance.

## Discussion

Reported effect sizes range from 0.13 (95% CI: -0.04, 0.30) in the unadjusted analysis to 0.03 (95% CI: -0.14, 0.21) in an adjusted analysis with a full set of available pre-randomisation covariates. For each analysis, we fail to reject the null hypothesis at the 95 per cent level. Nonetheless, it is important for studies with results that are not statistically significant at conventional levels to be reported in the literature. Failure to do so can lead to reporting and publication biases, whereby over time findings that do not reach standard thresholds for statistical significance are omitted from study reports or whole studies are not published at all (Dwan et al., 2008). This can result in a body of literature that, when considered as a whole, gives a misleading picture. Furthermore, there may be useful lessons that can be learnt for the design of future trials from studies, regardless of their findings (Karlan & Appel, 2016).

In this section of the paper, we first consider two potentially important limitations of the analysis presented in Table 2: (1) the extent to which our results might suffer from bias; and (2) whether we focused attention on the most relevant or

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial  
appropriate outcome measure given the nature of the intervention. We also consider the extent of fidelity to the intervention and the issue of low take-up (non-compliance) of family skills among intervention group parents.

### *Limitations of the analysis*

Of the 115 schools randomised, 102 schools were included in the ‘as analysed’ sample (54 intervention schools and 48 control schools). This loss of sample being greater among control than intervention schools raises questions as to whether intention to treat estimates in Table 2 are biased. Descriptive statistics reported in Table 1 suggest that the ‘as analysed’ sample may be unbalanced due to sample attrition. Of particular concern is the possibility of imbalances between intervention and control samples in pre-randomisation pupil-level measures of attainment, given that prior attainment is likely to be highly correlated with the primary outcome. Table 1 reveals that pupil level average prior attainment appears to be higher in intervention schools (effect size 0.11,  $p=0.001$ , see Table 1). Furthermore, including prior attainment as a covariate in the models reported in Table 2 greatly attenuates estimates of effect size. However, given that we have been able to adjust our estimated effect sizes through the inclusion of prior attainment in our analysis, it is reasonable to conclude that any bias arising from this imbalance has been adjusted for.

Other limitations in the study design relate to the choice of primary outcome measure – that is, pupil attainment. To meet the reporting timetable required by the study’s funders, the post-intervention primary outcome needed to be measured soon after the intervention finished. Within this time frame, it may have been advisable to focus attention instead on a primary outcome defined at the family or parent level, rather than devote resources to measuring pupil attainment, a more distal outcome in

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

terms of the intervention logic. There must, therefore, be some doubt as to whether it was too soon to expect the effects of the intervention to be seen in improved literacy and language among pupils.

### ***Implementation and fidelity***

The process evaluation component of this study provided a rich account of implementation, fidelity to the intervention design and the engagement, or otherwise, of parents. In broad terms, the process study found that tutors were faithful to the design-intentions of the intervention, particularly with respect to the content and delivery of sessions. As would be expected, some adjustments were made to the way sessions were delivered in order to address local constraints and challenges. These adjustments and adaptations, however, did not appear to prevent participants having access to the full Family Skills curriculum.

As noted previously, evidence from qualitative research and feedback received from tutors and school staff revealed that take-up of Family Skills among eligible parents in intervention schools was lower than anticipated. Given the way Family Skills was delivered, three factors were identified as significant in explaining low take-up. Furthermore, the results from our analysis raise questions concerning whether relatively small changes in delivery could lead to appreciable changes in who participated in Family Skills from the target group and, therefore, effectiveness. This is on the basis that it is possible that those parents and, therefore, children who might have benefited most were those who did not, or could not, take part in the intervention.

Firstly, the process evaluation suggests that Family Skills was not sufficiently well targeted. This conclusion stems from the observation that the population of pupils with EAL is a heterogeneous one, with families arranged on a continuum from those

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

with high levels of English proficiency through to families of recent migrants with either no or very limited command of English. It is clearly a challenge to market a course such as Family Skills to such a diverse group. Second, some groups of parents of pupils with EAL were effectively excluded from the programme due to the timing of sessions. Sessions commenced in most settings at 2.30 p.m. This made it difficult for working parents to attend. In some settings, it also proved difficult for parents with younger children to attend due to the absence of crèche facilities. Third, a further factor that seems to have hampered effective implementation was the compressed time window available to recruit schools, establish the intervention, properly brief schools and, most importantly, recruit parents (particularly those hardest to reach). Delivery partners found school recruitment challenging which led to delays in finalising the sample ahead of the commencement of the programme. The start date of the programme was fixed and the delay in finalising the sample meant that delivery partners had to recruit parents to the intervention over quite a short time period (October / December 2016). Findings from the process evaluation suggested that too limited a time frame was available for establishing contact with schools, preparing the ground for the programme and engaging with parents of children with EAL.

### ***The problem of low take-up (non-compliance)***

In studies where those eligible for an intervention and allocated to an intervention group fail to take-up the intervention, or those allocated to control do take-up the intervention, the problem of non-compliance is said to exist. In cases where the first of these forms of non-compliance is present, researchers often take intention-to-treat estimates of effectiveness (such as those reported in Table 2 above, representing the effect of Family Skills on those that were offered it) and adjust these using a measure of take-up (or

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial  
compliance) to obtain estimates of the effect of the intervention on those that took part<sup>8</sup>; those allocated to the intervention that take part, who would not have done so had they not been offered the intervention, are referred to in the technical literature as compliers (Angrist, Imbens, & Rubin, 1996).

As previously discussed, in this study, the take-up of Family Skills by those eligible and in intervention schools is known to have been low. This means that, ideally, we would take the intention-to-treat estimates presented in Table 2 and adjust these by a statistical estimate of the take-up in order to then estimate the effect of Family Skills on those pupils whose parents actually took part. Some attempt was made to do this; however, estimates of take-up (or compliance) were felt to be inaccurate, so we do not present this analysis here. Although known to be unreliable, such estimates that are available, gathered from attendance registers, suggest that 36 percent of eligible parents took-up Family Skills in some form. Instead, attention is paid to the reasons why such estimates were considered unreliable and what lessons could be learnt for future similar evaluations.

The initial intention of the research team was for attendance, and therefore take-up, to be recorded electronically, in an auditable fashion, and in a way that made it possible to link parental attendance to pupil level records. In this way, it was hoped researchers could identify which pupils, on the basis of parental attendance, were compliers and which pupils were not.

---

<sup>8</sup> It is important to note that parents in control schools were generally unable to access Family Skills. Technically, therefore, one sided non-compliance is assumed. There was some evidence that one school in the control group did access Family Skills but that the number of children implicated in this was so low as to make this form of non-compliance in the control group effectively ignorable.



## Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

As noted, the study produced poor quality take-up data in the form of measures of parental attendance at sessions. Qualitative research and reports from tutors and other school staff suggested that some attendance was not recorded. In other cases, recorded attendance by parents proved difficult to link to pupil-level records. Given that our analysis was conducted at the pupil-level and that recorded compliance or take-up among parents needed to be converted in to effective pupil-take-up or compliance, this created obvious difficulties.

As it is not unusual for early years interventions to target children through their parents, and with the growing emphasis on randomised designs for evaluation in mind, the current study offers some useful lessons for those embarking on the design of such trials. First, the experience gained during this study highlights the importance of obtaining a reliable and valid measure of take-up (and therefore compliance). Without such a measure, the by now well understood approaches to the estimation of average effects on compliers are not possible (Angrist et al., 1996). Second, where evaluations are concerned with measuring the effects of parental exposure to some intervention on child outcomes, it is essential that parental attendance can be linked to pupil or child level records. Thirdly, we suggest that, if possible, researchers should be responsible for the collection of take-up or compliance data, as it is frequently the case that service providers and school staff are not fully aware of their importance and do not appreciate where errors can creep in and the consequences for analysis. Fourth, if costs prohibit the involvement of researchers or people with research training from collecting compliance records, systems should be developed that enable researchers to monitor record-keeping and identify problems as they emerge. Such strategies can help avoid the situation whereby researchers get to the end of a study only to realise, at that point,

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial  
that they have poor measures of take-up / compliance and as a result are unable to conduct potentially important analysis.

## **Concluding remarks**

The process evaluation element of this trial leads rather straightforwardly to a number of suggested reforms to the family skills / literacy model in meeting the needs of populations with EAL. Firstly, due to the heterogeneous nature of populations with EAL, programmes need to be better targeted. Second, parents need to be able to choose when they attend, so that courses should be available both during the school day and in the evenings. Some consideration might also be given to delivering course content online. Third, settings in which courses are delivered need also to provide crèche facilities. Finally, if such interventions are to be accessed through schools, providers require a sustain period of engagement and preparation within the school prior to the commencement of sessions. As noted earlier, evidence of whether family literacy programmes delivered in school settings are effective in raising attainment among pupils with EAL in the English context is limited. Overall, it is hoped that this report of findings, from both an impact and process evaluation of a family literacy programme, will be of use to those seeking to identify suitable interventions and those involved in the design and implementation of future school-based intervention studies, in England and internationally.

## **Funding**

The research described in the paper was funded by a consortium led by the Education Endowment Foundation with Unbound Philanthropy and The Bell Foundation.

## **Acknowledgements**

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

We are grateful for the comments of anonymous referees on earlier drafts of this paper.

**Declaration of interests**

The researchers declare no conflicts of interest.

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

## References

- Anderson, J., Anderson, A., Friedrich, N., & Kim, J. E. (2010). Taking stock of family literacy: Some contemporary perspectives. *Journal of Early Childhood Literacy*, *10*(1), 33–53.
- Anderson, J., & Morrison, F. (2007). “A Great Program... for Me as a Gramma”: Caregivers Evaluate a Family Literacy Initiative. *Canadian Journal of Education/Revue Canadienne de l'éducation*, *30*(1), 68–89.
- Angrist, J. D., Imbens, G. W., & Rubin, D. B. (1996). Identification of causal effects using instrumental variables. *Journal of the American Statistical Association*, *91*(434), 444–455.
- Carpentieri, J., Fairfax--Cholmeley, K., Litster, J., & Vorhaus, J. (2011). *Family literacy in Europe: using parental support initiatives to enhance early literacy development*. London: NRDC, Institute of Education.
- Demie, F. (2018). English as an additional language and attainment in primary schools in England. *Journal of Multilingual and Multicultural Development*, *39*(3), 210–223.
- Demie, F., & Hau, A. (2013). *The Achievement of Pupils with English as an Additional Language: An Empirical Study*. London: Lambeth Council.
- Demie, Feysa, & Strand, S. (2006). English language acquisition and educational attainment at the end of secondary school. *Educational Studies*, *32*(2), 215–231.
- Department for Education. (2017). *Collection of data on pupil nationality, country of birth and proficiency in English Summary report*. London: Department for Education.
- Department for Education. (2018). *Schools, pupils and their characteristics: January 2018*. Retrieved from <https://www.gov.uk/government/statistics/schools-pupils-and-their-characteristics-january-2018>
- Desforges, C., & Abouchaar, A. (2003). *The impact of parental involvement, parental support and family education on pupil achievement and adjustment: A literature review*. Nottingham: DfES Publications.
- Dwan, K., Altman, D. G., Arnaiz, J. A., Bloom, J., Chan, A.-W., Cronin, E., ...

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

- Williamson, P. R. (2008). Systematic Review of the Empirical Evidence of Study Publication Bias and Outcome Reporting Bias. *PLOS ONE*, 3(8), e3081. Retrieved from <https://doi.org/10.1371/journal.pone.0003081>
- Feinstein, L., Duckworth, K., & Sabates, R. (2004). *A model of the inter-generational transmission of educational success*. Research Report No.10, London: The Centre for Research on the Wider Benefits of Learning, Institute of Education.
- Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. routledge.
- Hedges, L. V. (2011). Effect sizes in three-level cluster-randomized experiments. *Journal of Educational and Behavioral Statistics*, 36(3), 346–380.
- Hodge, R. (2006). *Effective practices in family literacy, language and numeracy project: Report of Phase 2 Case Study: Inspiration and aspiration: exploring the nature and success of FLLN provision in a multilingual context*. Lancaster Literacy Research Centre: NRDC/CfBT Trust.
- Husain, F., Wishart, R., Marshall, L., Frankenberg, S., Bussard, L., Chidley, S., ... Morris, S. (2018). *Family Skills Evaluation report and executive summary*. London: Education Endowment Foundation. Retrieved from [https://educationendowmentfoundation.org.uk/public/files/Projects/Evaluation\\_Reports/Family\\_Skills.pdf](https://educationendowmentfoundation.org.uk/public/files/Projects/Evaluation_Reports/Family_Skills.pdf)
- Jerrim, J. (2018). Immigrant Student Achievement and Educational Policy in England. In *Immigrant Student Achievement and Education Policy* (pp. 19–33). Springer.
- Karlan, D., & Appel, J. (2016). *Failing in the field: What we can learn when field research goes wrong*. Princeton, New Jersey: Princeton University Press.
- Murphy, V. A., & Unthiah, A. (2015). *A systematic review of intervention research examining English language and literacy development in children with English as an Additional Language (EAL)*. London, Education Endowment Foundation. Retrieved from [https://educationendowmentfoundation.org.uk/public/.../EAL\\_Systematic\\_review.pdf](https://educationendowmentfoundation.org.uk/public/.../EAL_Systematic_review.pdf)
- NatCen Social Research. (2016). *Family SKILLS Evaluation: Testing the impact of a family literacy programme to improve attainment of reception year EAL pupils*

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

*Protocol for the Education Endowment Foundation*. London, Education

Endowment Foundation. Retrieved from

[https://educationendowmentfoundation.org.uk/public/files/Projects/Evaluation\\_Protocols/Round\\_9\\_-\\_Family\\_SKILLS.pdf](https://educationendowmentfoundation.org.uk/public/files/Projects/Evaluation_Protocols/Round_9_-_Family_SKILLS.pdf)

Ritchie, J., Lewis, J., McNaughton-Nicholls, C., & Ormston, R. (2013). *Qualitative research in practice*. London, Sage.

Sénéchal, M., & Young, L. (2008). The effect of family literacy interventions on children's acquisition of reading from kindergarten to grade 3: A meta-analytic review. *Review of Educational Research*, 78(4), 880–907.

Strand, S., & Demie, F. (2005). English language acquisition and educational attainment at the end of primary school. *Educational Studies*, 31(3), 275–291.

Strand, S., Malmberg, L., & Hall, J. (2015). *English as an Additional Language (EAL) and educational achievement in England: An analysis of the National Pupil Database*. London, Education Endowment Foundation.

Swain, J., Brooks, G., & Bosley, S. (2013). The benefits of family literacy provision for parents in England. *Journal of Early Childhood Research*, 1476718X13498335.

Swain, J., & Cara, O. (2018). The role of family literacy classes in demystifying school literacies and developing closer parent–school relations. *Cambridge Journal of Education*, 1–21.

Swain, J., Cara, O., Vorhaus, J., & Litster, J. (2015). *The impact of family literacy programmes on children's literacy skills and the home literacy environment: Research Report*. London: UCL, Institute of Education.

Swain, J., Welby, S., Brooks, G., Bosley, S., Frumkin, L., Fairfax-Cholmeley, K., ... Cara, O. (2009). *Learning literacy together: The impact and effectiveness of family literacy on parents, children, families and schools*. Learning and Skills Improvement Service. Coventry: Learning and Skills Improvement Service.

Vojtkova, M., & Jabin, N. (2017). *Family Skills Analysis Plan*. London, Education Endowment Foundation.

Vojtkova, M., Morris, S. P., Cara, O., & Marshall, L. (2016). Research Protocol: A cluster randomised controlled trial to evaluate the Family SKILLS programme for

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

reception year students from families in which English is an additional language.

*International Journal of Educational Research*, 80, 101–110.

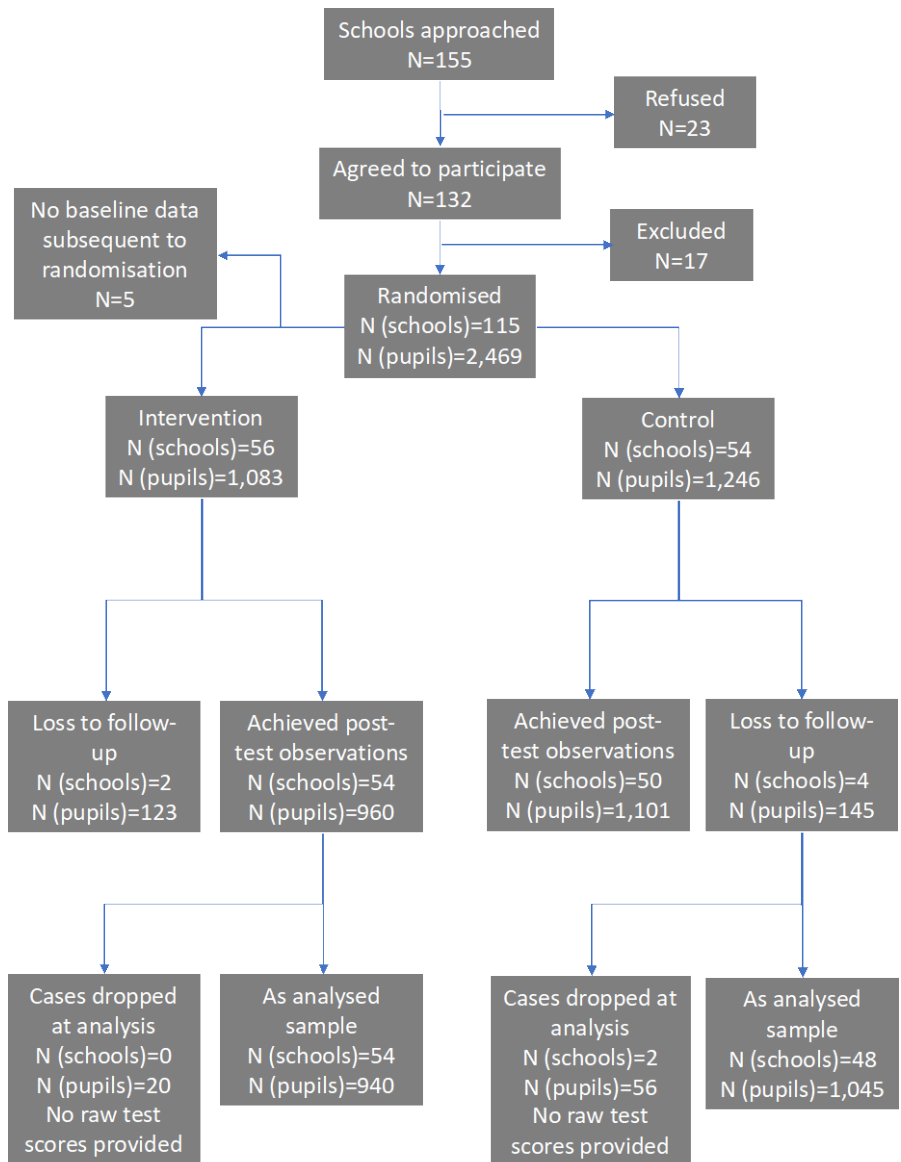
<https://doi.org/10.1016/j.ijer.2016.10.003>

Wagner, A., Soumerai, S., Zhang, F., & Ross-Degnan, D. (2002). Segmented regression analysis of interrupted time series studies in medication use research. *J Clin Pharm Ther*, 27.

Whiteside, K. E., Gooch, D., & Norbury, C. F. (2017). English language proficiency and early school attainment among children learning English as an additional language. *Child Development*, 88(3), 812–827.

Evaluating the effectiveness of a family literacy programme on the attainment of children with English as an additional language – a Cluster Randomised Controlled Trial

**Annex A**



**Figure 1: Consort diagram – Family Skills Impact evaluation**