

Tips By Text

Evaluation Protocol

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PROJECT TITLE	Tips by Text
DEVELOPER (INSTITUTION)	BIT
EVALUATOR (INSTITUTION)	IES and NIESR
PRINCIPAL INVESTIGATOR(S)	Anneka Dawson and Lucy Stokes
PROTOCOL AUTHOR(S)	Anneka Dawson, Nathan Hudson-Sharp, Lucy Stokes and Ceri Williams
TRIAL DESIGN	Two-arm individual-level randomised controlled trial
PUPIL AGE RANGE AND KEY STAGE	EYFS Reception
NUMBER OF SCHOOLS	105
NUMBER OF PUPILS	2730
PRIMARY OUTCOME	YARC
SECONDARY OUTCOME	EYFSP outcomes on literacy, numeracy and social development. Strengths and Difficulties Questionnaire Update v1.1: EYFSP outcomes will no longer be analysed as not collected in 2020 due to Covid-19.

Protocol version history

VERSION	DATE	REASON FOR REVISION
1.2	April 2021	Updated to note stopping of post-assessments in January 2021 as a result of Covid-19.
1.1	October 2020	Updated to reflect changes as a result of Covid-19 (key changes: postponement of outcome assessments and change to outcomes collected; corresponding change in research questions where EYFSP outcomes no longer available; extension of intervention period; incorporation of Covid-19 themes into IPE; case studies to be conducted online or by phone rather than as in-person visits; and extended timeline for evaluation)
1.0 [original]	October 2019	

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Intervention

Tips by Text is a text message curriculum developed by Professor Susanna Loeb and colleagues (Director, Annenberg Institute and Professor in Education and International and Public Affairs, Brown University) which aims to improve the developmental outcomes of young children. The curriculum has been adapted to the UK context by the Behavioural Insights Team (BIT). BIT have edited the content of the text messages so that they are aligned with the Early Years Foundation Stage Profile and have piloted it in a number of schools in the North East of England. Several robust RCTs in the US and UK have shown that timely, personalised and actionable text messages to parents can yield educational benefits across many different age groups (see for example Bergman and Chan, 2017; Kraft & Rogers, 2015). Studies involving preschool children specifically have also shown promise, e.g. Doss, Fahle, Loeb and York (2017). In this project, we aim to test the impact of a text message intervention compared to business as usual using a two-arm randomised controlled trial (RCT). Tips by Text will be evaluated with ~2,730 children in Reception year (4-5 year olds) and their parents. We will recruit ~105 (and a maximum of 125) nurseries from the North- East of England to participate in the trial. Larger schools and those with higher intakes of free school meals pupils will be prioritised in the recruitment. Parents will be randomly allocated to one of two groups; (1) the control group (no text messages) or (2) the treatment group who will receive three text messages per week. Parents randomly allocated to the treatment group will receive text messages from early November 2019 to late July 2020 (9 months in total). The text messages are designed to provide parents with information and strategies to help their children's development outside of the school environment. Three types of messages are sent every week including during the school holidays which parents can tailor to work with their children. The three types of messages are: "FACT" texts, designed to inform and motivate parents by highlighting the importance of a particular skill or set of skills, "TIP" texts, designed to minimise the cognitive, emotional, and time burdens of engaged parenting by include short, simple, and highly-specific activities for parents to do with their children that build on existing family routines and "GROWTH" texts, which provide encouragement, reinforcement, and extends the TIP texts. We will examine literacy outcomes using the York Assessment for Reading Comprehension (YARC) and then secondary outcomes will include communication and language, maths and socio-emotional outcomes using the Early Years Foundation Stage Profile outcomes and the Strengths and Difficulties Questionnaire (socio- emotional outcomes only).

Update v1.1: Due to Covid-19, the intervention period was extended so that text messages continued to be sent to parents until end October 2020 (as outcome assessment was postponed until November 2020-January 2021). While children were therefore in Reception year at the start of the programme, by the end of the programme children are in Year 1. Outcomes from the EYFSP will no longer be analysed as, in line with other national assessments, these were no longer collected in summer 2020.

Study rationale and background

Building upon pre-existing work that explores the value of text-based parental interventions (Doss et al. 2017; Doss et al. 2018; Cortes et al., 2018; Miller et al., 2016; York and Loeb, 2018), 'Tips by Text' seeks to improve children's language, literacy, numeracy and socio-emotional skills by providing information and strategies that empowers parents, and encourages them to do more developmental activities at home with their young children.

Evidence widely suggests both home and school-based parental engagement positively affects children's learning and academic achievement (Fan & Chen, 2001; Cox, 2005; Jeynes, 2007; Pomerantz, Moorman & Litwack 2007). Notably, several robust randomised controlled trials (RCTs) in the US have shown that timely, personalised and actionable text messages to parents can yield educational benefits. For example, Bergman and Chan (2017) report results from a text message programme for parents of pupils in middle and high schools in West Virginia, alerting parents to absences, missed assignments and grades. They find a positive impact of the intervention on attendance as well as reducing course failure, although there was no impact on test scores. In another US study, Kraft and Rogers (2015) find that sending weekly text messages to parents of high

school students about their child's performance increased their child's chance of gaining course credits.

Studies have also shown positive impacts for preschool children; indeed, the Tips by Text project is inspired by York & Loeb (2018)'s READY4K! trial, an 8-month texting programme conducted in the US where 1,031 parents of 4 year olds received 3 texts per week structured around a 'FACT, TIP, GROWTH' format as described in the intervention section above. Parents in the control group received placebo texts on a fortnightly basis, for example, about vaccinations or enrolment requirements. The trial showed positive cognitive outcomes, with treated children improving their literacy skills by 0.11 standard deviations. The trial showed even larger impacts for lower attainers, with those with poor baseline literacy skills improving by 0.31 standard deviations (York et al. 2018). The trial also showed positive impacts on parental engagement, with treated parents engaging more in home literacy activities (0.16 SD) and communicating more with the school (0.14 SD).

The Tips by Text curriculum will be developed by Professor Susannah Loeb, and updated by BIT to fit the UK context and fit with the Early Years Stage Foundation Profile outcomes.

Update v1.1: The development of an extra three months of messages was necessary given the extension to the evaluation and these were also developed by BIT in collaboration with Professor Loeb.

A follow-up study examining the optimal dosage of text messages per week within READY4K! found that 3 texts was most effective (Cortes et al., 2018). This is reinforced by Fricke et al. (2018), which showed increased drop-out amongst parents receiving a higher dosage of texts, as well as amongst those subject to more complex content.

Impact Evaluation

Research questions

The logic model for Tips by Text is given in Figure 1 on the following page¹:

¹ **Update v1.1:** Note that ultimately 109 schools were selected rather than the 105 stated in the logic model diagram, and that messages were sent for 12 months rather than 9 months, due to Covid-19.

RATIONALE / NEED FOR INTERVENTION

- Parents can get overwhelmed with knowing what to do at home to help improve children's abilities in literacy, numeracy, language and socio-emotional development. Evidence based suggestions delivered via text message every week can help minimise the cognitive, emotional, and time burdens of engaged parenting
- Parental engagement programmes are often time consuming, burdensome and expensive so there is a need for a cost effective and easy way for parents be contacted
- Home activities need to be easy to implement in day to day life and ideally free so that all families can avail of them

Long term outputs/ Impacts

- Improved home learning environment (HLE)- demonstrated by parents reporting greater warmth, more consistent behaviour and more frequent activities with their children
- Improved HLE leads to improved child outcomes in literacy, numeracy, language and communication and social development
- Improved later school readiness due to improved self-regulation skills
- Improved parental and school relationships

Theory of change

To provide a digital curriculum in literacy, numeracy and socio-emotional development that can be communicated to parents through texts:

- No school or teacher based requirements once parents details have been passed on
- Can be sent over school holidays
- Impacts positively on parental engagement with their children's learning.

Inputs

- Selection of 105 schools from the North- East.
- Parent and pupil details collected (by evaluator for trial only, normally this will be the delivery team).
- Time needed to send out weekly messages from delivery team
- Time needed for monitoring any messages from parents and other support needed

Activities

- Parents are sent three messages a week for 9 months.
- The three types of messages are: "FACT" texts, designed to inform and motivate parents by highlighting the importance of a particular skill or set of skills, "TIP" texts, designed to be short, simple, and highly-specific activities for parents to do with their children that build on existing family routines and "GROWTH" texts, which provide encouragement, reinforcement, and extends the TIP texts.
- Ongoing support is provided by email/ text response

Outputs

- Parents carry out the 'tip' activities with their children on a weekly basis
- Parents carry out 'growth' activities with their children on a weekly basis and think of their own ways to extend the practice.

Short term outcomes/ Mediators

- Parents report more confidence in including new activities with their children
- Parents have greater knowledge of activities derived from the EYFSP to help with their children's development
- Parents are more engaged in their children's learning
- Parents use their new knowledge of child development to provide more focused teaching and learning opportunities

Enabling factors / conditions for success

- Parents from low income families may be more or less willing to implement the activities (evaluated by free schools meals analysis)
- Children's baseline attainment may act as a moderator and make the intervention more or less effective for some children (evaluated by examination of low and high baseline assessment)
- Spillover- effect to parents not involved in the trial is a possible risk through sharing messages or activities and this could reduce the size of the impact. This will be monitored in the implementation and process evaluation
- Geographical region may also have an impact on intervention effectiveness due to different family demographics, but this will not be examined in the current trial

The primary research question is:

RQ1. Does the Tips by Text intervention improve Reception children's literacy outcomes?

The secondary research questions are:

RQ2. Does the Tips by Text intervention improve Reception children's numeracy outcomes?

RQ3. Does the Tips by Text intervention improve Reception children's language and communication outcomes?

RQ4. Does the Tips by Text intervention improve Reception children's social development skills?

RQ5. Does the Tips by Text intervention improve literacy outcomes differentially for children eligible for Free School Meals (FSM)?

RQ6. Does the Tips by Text intervention improve literacy outcomes differentially for children with low and high baseline attainment?

Full details of the outcome measures to be used are given later in this protocol. The primary research question will focus on literacy outcomes as measured by the York Assessment of Reading for Comprehension (YARC).

Update v1.1: RQ2 and RQ3 will no longer be considered as EYFSP outcomes as they are no longer available due to Covid-19. RQ4 will be explored using SDQ outcomes only.

Design

Trial type and number of arms	Two- arm randomised controlled trial	
Unit of randomisation	Parent	
Stratification variables (if applicable)	None	
Primary outcome	variable	Literacy attainment
	measure (instrument, scale)	YARC total score
Secondary outcome(s)	variable(s)	Numeracy attainment, Language attainment, Literacy attainment, Social Development
	measure(s) (instrument, scale)	Update v1.1: Social Development only Early Years Foundation Stage scores and the Strengths and Difficulties Questionnaire Update v1.1: Strengths and Difficulties Questionnaire only

In collaboration with the delivery team, we have agreed to run an individual level randomisation (at the parent level, in order to avoid a scenario whereby twins are assigned to different groups) to reduce the number of schools needed for the trial and to maximise the power to detect an effect. Although we cannot rule out the possibility of contamination of the control group, it is expected that the number of parents who speak to each other about the text messages, or directly share the messages with one another, will be limited (this is also being explored as part of the piloting being undertaken by the delivery team). The trial will have two-arms so that half the eligible children's parents within participating schools are allocated to the treatment arm (receiving the programme) and half to the control arm (who do not receive the programme and operate business as usual). All reception classes will be randomised, so that for each reception class half will be randomly allocated to receive the intervention and half will not. Depending on recruitment, not all classes recruited will receive the

assessment that will form the primary outcome for the trial; we discuss this further later in this protocol.

Further details of the outcomes are given in the outcome measures section below.

Randomisation

As noted above, randomisation will take place at parent level. All reception classes in all participating schools will be randomised so that half will be assigned to the treatment group and half to the control group. We will randomise within reception classes using simple randomisation.

The randomisation will be conducted by the evaluation team, using Stata. The randomisation process and results will be recorded in a log file. The process will be as follows:

- Each parent will be assigned a randomly generated number
- Parents will be sorted within school on the basis of this random number
- The first parent will be randomised to treatment or control
- Each subsequent parent will have the opposite outcome of the previous parent.

The results of the randomisation will be shared with BIT in order to facilitate the sending of text messages to those parents allocated to the treatment arm. Analysts will not be blind to trial arm allocation. Due to a small number of schools having an earlier half-term, the randomisation will take place in two batches, with this group of schools randomised earlier. This will enable parents in these schools to start receiving the texts immediately following half-term.

In addition, if sufficient schools are recruited to the trial, only one class per school (in schools where there are multiple classes) will be randomly selected for the YARC assessment and SDQ measures. This is to reduce burden on the schools and to keep costs and time for the testing to a minimum. In this case, for schools with multiple classes, each class will be assigned a randomly generated number. The class assigned with the highest number value in each school will be selected to receive the YARC assessment and SDQ.

Update v1.1: Given the number of schools recruited, in multiple class schools, one Reception class was randomly selected for the YARC assessments and SDQ. This means that while a total of 2,646 pupils were in classes eligible for testing, a total of 3,662 pupils form part of the overall trial. Pupils in the classes that were not selected for testing were still randomised to treatment or control groups; the original intention being that outcomes from the Early Years Foundation Stage Profile (EYFSP) would be analysed as secondary outcomes for the full sample of 3,662 pupils. As documented above, analysis of EYFSP outcomes is no longer possible. While beyond the scope of the current planned analysis, this larger sample could potentially be followed up in future longitudinal analysis.

Participants

Eligible schools are based in the North-East of England. Those with more than one Reception class and with larger numbers of free school meals pupils will be prioritised in recruitment. All pupils in the Reception year group of the schools will be eligible to take part.

Sample size calculations

		OVERALL	FSM
MDES		0.10	0.14
Pre-test/ post-test correlations	level 1 (pupil)	0.4	0.4
	level 2 (class)	-	-
	level 3 (school)	-	-
Intracluster correlations (ICCs)	level 2 (class)	-	-
	level 3 (school)	0.10	0.10

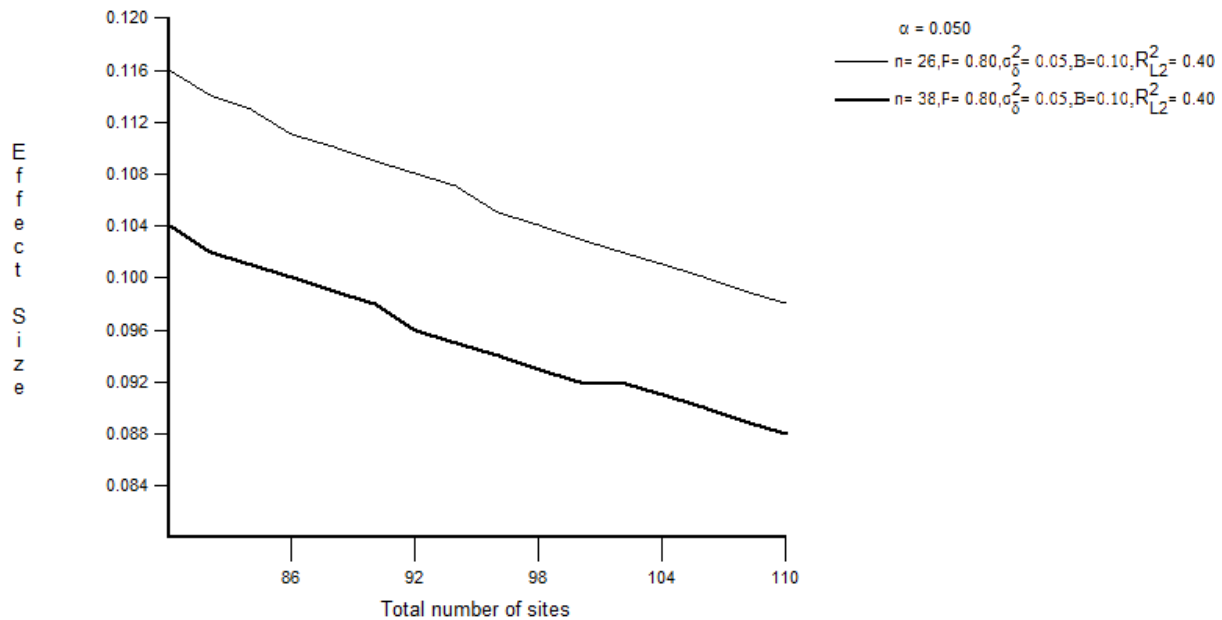
Alpha		0.05	0.05
Power		0.8	0.8
One-sided or two-sided?		2	2
Average cluster size		26	10
Number of schools	Intervention	105	105
	Control	105	105
	Total	105	105
Number of pupils	Intervention	1365	525
	Control	1365	525
	Total	2730	1050

The sample size was determined with the aim of establishing a MDES of 0.1, given the previous research by York et al., 2018, which found an impact of the programme on literacy of 0.11 standard deviations. MDES calculations were conducted using Optimal Design software.

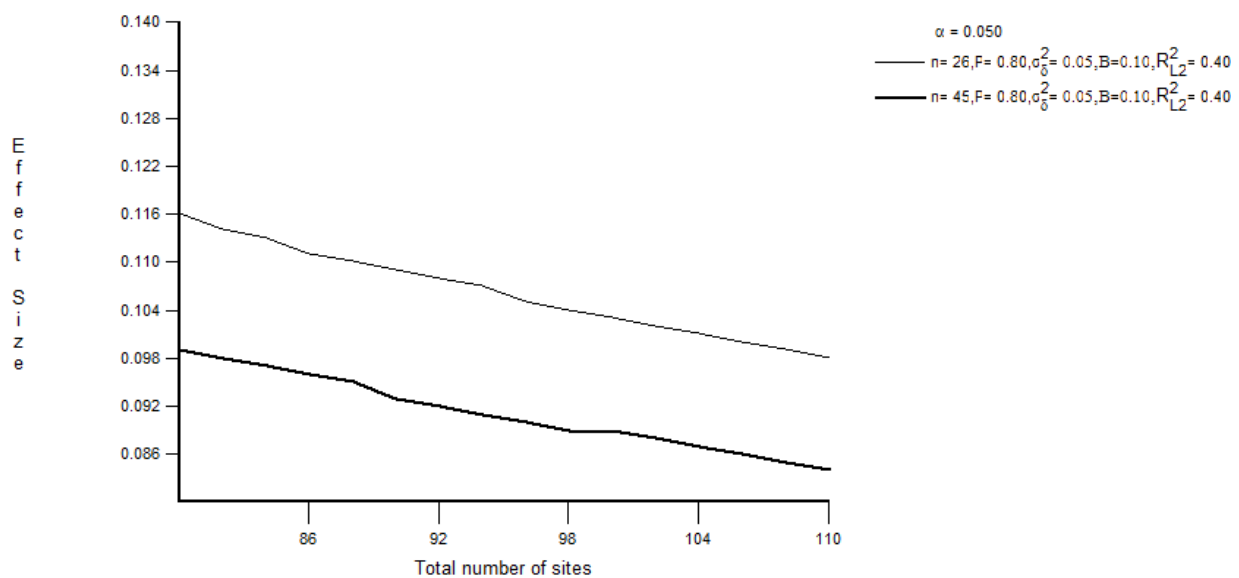
The diagram below shows the variation in the estimated effect size as the number of schools increases. This further distinguishes between a scenario with an average of 26 pupils per school (assuming an average of 30 pupils per school, and then allowing for around 5 per cent of pupils to withdraw before randomisation and around 10 per cent of the remainder lost to follow-up) and a scenario with an average of 38 pupils per school (assuming around 45 pupils per school and again with some withdrawal prior to randomisation and some lost to follow-up). All estimates are based on standard assumptions of 80% power and 5% significance level. Further, we assume the pre-test explains 40 per cent of the variation in the post-test scores², and that 10 per cent of variance is explained by the blocking variable³. To achieve an MDES of 0.1 this suggests a required sample size of around 105 schools based on an average of 26 pupils per school. Our suggestion is therefore to aim for an ultimate sample size of around 105 schools, which we understand is the maximum number of schools that it would be feasible to deliver to in this trial. The power calculations are based on 105 schools at the point of analysis. In order to achieve this number, we recommend that the delivery team aims to over-recruit in the first instance.

² To our knowledge, there is currently no publicly available information on the likely correlation between pre- and post-test scores for our primary outcome measure, the York Assessment of Reading for Comprehension. The efficacy trial of the Nuffield Early Language Intervention (implemented with a similar age group) found that around 55% of the variation in post-test scores (a composite language score) was explained by the pre-test and pupil characteristics (Sibieta et al., 2016). This would be higher due to the additional inclusion of pupil characteristics; we therefore use a lower estimate of 40 per cent for our assumptions.

³ Although based on secondary schools, previous research has indicated that schools explain around 10 per cent of the variation in pupil attainment at the end of Key Stage 4 (Wilkinson et al., 2018).



Depending on the progress of recruitment, that is, if it proves feasible to recruit around 105 schools, then only 1 class per school will receive the assessment that will form the primary outcome for the trial. Alternatively, where recruitment proves more challenging, the trial could still be powered to detect an MDES of 0.1 with a smaller number of participating schools, as long as those schools have on average a higher number of pupils (and therefore more than one class would be assessed). For this reason larger schools will be targeted in recruitment. The diagram below presents a scenario based on an average of 45 pupils per school (after attrition). In this case, and with all other assumptions remaining the same as above, this would imply a sample size of around 80 schools to obtain an MDES of 0.1.



The sample size calculations presented in the table above are based on the first scenario, that is, testing one class per school.

Department for Education Statistics for January 2019 show that 15.8 per cent of pupils in primary schools were eligible for and claiming free school meals (Department for Education, 2019). However, schools with above average proportions of pupils eligible for free school meals (FSM) are being targeted in recruitment. On the assumption that on average 10 pupils per school will be eligible for FSM, equivalent to around 38 per cent of pupils (at the time of writing this protocol, this was the

average percentage of pupils eligible for FSM in recruited schools to date), and keeping all other assumptions the same, results in an MDES of 0.14.

Outcome measures

The primary outcome to be assessed in this trial is literacy, as measured by the York Assessment of Reading for Comprehension (YARC)⁴. The version of the YARC suitable for 4-7 year olds is called Early Reading and covers four dimensions: sound isolation, sound deletion, letter sound knowledge and early word recognition. To reduce testing time and burden on the school, only the former two measures will be used as a pre-test as they are considered the most sensitive and more appropriate for the younger age of the children by GL⁵ and then all four dimensions will be used at post-test. The primary outcome will be the total raw score, constructed by summing scores for each of the four dimensions. The YARC assessments will be administered by QA Research. The team of test administrators will receive training in the use of the YARC from Dr Sue Stothard, an expert in the field. We will pilot the training of test administrators and testing process in June 2019 in one school to ensure that both work effectively and the timings for the pre-testing is planned robustly as there is such a small testing window. Pre-tests will be administered in September-October 2019, prior to randomisation, with post-tests conducted towards the end of children's reception year in June-July 2020.

Update v1.1: YARC post-tests have been postponed until November 2020-January 2021 due to Covid-19, and as such pupils will be in Year 1. All pupils who were in classes selected for testing at baseline will be attempted for post-testing. Where possible, assessments will be conducted in-person by trained administrators, following all relevant safety protocols. Some post-tests may take place remotely, rather than in-person, according to school preferences and any developments in government guidance. Remote testing would involve a trained test administrator carrying out the assessment virtually using a laptop and Zoom or other video conferencing software. A teaching assistant will need to sit with the pupil (ideally behind them so not as to prompt them and in line with safety protocols) while the assessments take place. The assessment will otherwise remain the same. The testing window has also been extended by an additional month relative to the original protocol to give schools more time to schedule the assessments amid other disruptions caused by Covid. While this may increase the distance between the end of programme delivery and outcome assessment for some pupils, it may also help to increase the final sample size for analysis. This and other adaptations due to Covid-19 have been accounted for in the Statistical Analysis Plan.

Update v1.2: In January 2021, in light of the third national lockdown and associated disruption and pressures on schools as a result of Covid-19, the decision was taken to stop the remaining post-testing. This means that ultimately around a third of the anticipated sample have completed post-tests. This is also documented in an update to the SAP and the implications will be discussed within the evaluation report.

The secondary outcomes to be assessed in this trial are:

Children's performance on the Early Years Foundation Stage (EYFS) Profile in communication and language and numeracy:

EYFSP scores will be obtained through linkage to the National Pupil Database (NPD). This will help to reduce burdens on schools and children rather than testing all pupils additionally on all three areas.

⁴ Available from GL at <https://www.gl-assessment.co.uk/products/york-assessment-of-reading-for-comprehension-yarc/>

⁵ See <https://www.gl-assessment.co.uk/support/yarc-support/> on early word reading assessment

EYFS data from the NPD will be linked to pupil level data collected prior to randomisation (unless parents withdraw their child's data from being used in the study). Given randomisation is taking place at individual level it is not possible to use de-identified data.

We will use the following variables available on the NPD that relate to the relevant early learning goals:

- FSP_COM_G01: Communication and Language – Listening and attention
- FSP_COM_G02: Communication and Language – Understanding
- FSP_COM_G03: Communication and Language – Speaking
- FSP_MAT_G11: Mathematics – Numbers
- FSP_MAT_G12: Mathematics – Shape, space and measures

Each variable is scored on a 3-point scale. The resulting scores will be combined into the four areas of learning that will be considered as part of this evaluation. Note that EYFS outcomes are teacher-assessed, and teachers are not necessarily blind to treatment allocation.

Update v1.1: EYFSP outcomes will no longer be analysed as these are no longer available for this cohort.

Children's social and behavioural development:

This will be measured through the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997), using the Total Difficulties Score. The SDQ has been widely used for both research and clinical purposes and has been shown to have robust psychometric properties, particularly for the teacher version (Stone et al., 2010). At the same time, it is user-friendly and fairly quick to complete. The SDQ will be completed by children's class teachers, at post-test only. Although teachers will not necessarily be blind to trial arm allocation (as parents may choose to contact the teacher and discuss the text messages), the SDQ must still be completed by teachers as it must be conducted by someone who is familiar with the child.

If sufficient schools are recruited (with sufficient numbers of pupils per school) for the study to have an MDES of 0.1, the YARC will be administered with one class per school only (with this class randomly selected in schools with more than one reception class). This should reduce burdens on schools and make for a more cost-effective trial. However, this will be monitored during recruitment to assess whether there may be a need to increase the number of classes tested. EYFS outcomes will be collected for all participating pupils through linkage to the NPD (unless parents have withdrawn permission for data on their child to be used as part of the evaluation).

To reduce burdens on schools and teachers, the SDQ will only be collected for one randomly selected class per school (which will be the same as the class chosen for the YARC measure).

Update v1.1: The SDQ will be sent to teachers by email in November 2020 for completion online. Given the extension to the evaluation and pupils' progression into a new school year, the SDQ will be completed by Year 1 rather than Reception teachers. The SDQ has been developed in SNAP software and approved by YouthInMind who hold the licence for the SDQ.⁶ Year 1 teachers will receive an individualised email with a personalised link for each pupil they need to complete the SDQ for. The Year 1 teacher will complete the SDQs for the same pupils that are eligible to complete the YARC testing, so in multiple form entry schools this will be children from the randomly selected class. The classes will sometimes be now split across more than one Y1 teacher, in which case both teachers will receive the email and asked to complete this for their relevant pupils.

Exploratory analysis

⁶ <https://youthinmind.com/products-and-services/sdq/>

We will also conduct exploratory analysis of children's outcomes for literacy and social development as measured by scores on the EYFS profile. This will use the variables listed below:

- FSP_LIT_G09: Literacy – Reading
- FSP_LIT_G10: Literacy – Writing
- FSP_PSE_G06: Personal, Social and Emotional Development - Self-confidence and self-awareness
- FSP_PSE_G07: Personal, Social and Emotional Development – Managing feelings and behaviour
- FSP_PSE_G08: Personal, Social and Emotional Development – Making relationships

Update v1.1: These exploratory analyses will no longer be conducted as EYFSP outcomes are no longer available.

Analysis plan

The outcome measures to be used in the analysis were described in the above section. Note that two measures of social development will be used (the SDQ as well as the EYFS measure of personal, social and emotional development, as described above). These two measures will be analysed separately.

For each measure, we will estimate outcomes using a linear regression model including a dummy variable indicating trial arm allocation and clustered standard errors at the school level. We prefer this approach over multi-level analysis which relies on an assumption that random effects are independent of regressors (Ebbes, 2004).

The estimated impact will be based on the difference between those assigned to the treatment and control groups, regardless of contamination of the control group or drop out. This is in order to estimate the “intention-to-treat” (ITT) effect. In addition, the regression models used for the primary analysis will include controls for prior attainment.

Estimated impact in terms of pupil's outcomes will be converted into a Hedges' g effect size (1981). This will use the estimated total pooled standard deviation of the treatment and control groups, rather than the within-school pooled standard deviation as this is a more conservative approach.

We will also conduct separate analysis of the subgroup of pupils eligible for Free School Meals. Pupils eligible for FSM will be identified using the variable EVERFSM available from the NPD.

Given existing research has suggested differences in impact according to prior attainment (e.g. York and Loeb, 2018), as noted earlier in the study rationale, we will also conduct a separate subgroup analysis for high and low attaining pupils, based on the pre-test assessments.

We will also aim to construct an indicator of compliance for use in a CACE analysis, based on information on whether parents opt-out of receiving the texts. Non-compliance will also be examined through the process evaluation.

A full Statistical Analysis Plan (SAP) will be produced using the EEF template three months after randomisation has taken place.

Update v1.1: Only one measure of social development (the SDQ) will now be used as EYFSP outcomes are no longer available. Please see the Statistical Analysis Plan (v1.0) for a complete description of the analysis approach.

Implementation and process evaluation

The aim of the IPE is to establish fidelity and identify the factors influencing impact and which may explain the quantitative findings. We would also look for evidence of effectiveness and issues which would need to be considered for a wider roll-out.

Fidelity. To establish fidelity in implementation, we will look particularly at whether the programme is delivered as intended and examine what compliance to the intervention means for BIT and how well schools have achieved this using the following research questions:

- Is the intervention acceptable and useful for parents?
- Could the intervention be rolled out on a larger scale? Would anything need to be adapted for large scale work?

Implementation. We will consider the wider range of issues which affect implementation including the necessary conditions for success and barriers to successful implementation using the following questions:

- What are parents doing after receiving the texts and how different is this to their usual practice? This includes exploring activities that have happened at home after receiving the texts, and how these activities were carried out.
- Are there any unintended or negative effects of the intervention?
- What are the facilitators/barriers to the programme?
- Would parents and teachers find additional in-person support useful, and if so, from whom?
- Does engagement with the intervention change (decline) over time?
- Is the intervention a worthwhile investment from the perspective of management (monetary if the delivery team are charging for the set-up/ sending of messages and considering any staff time input required)?
- Would schools be able to deliver the intervention themselves in the future?

Outcomes. It is important to explore how parents and teachers perceive the impact of the programme, both anticipated and actual, since it is likely to affect their commitment, and therefore its impact and effectiveness. To understand outcomes, it will also be necessary to establish what takes place in the control group at the time of the intervention around parental engagement and particularly texting interventions). We will explore:

- Does the intervention lead to higher literacy and numeracy child outcomes?
- Does the intervention lead to improved behavioural outcomes?
- Does the intervention increase parental engagement with the school?
- Does the intervention improve parent- child relationships?
- Does the intervention improve the HLE?
- Do parents prefer one area of support (e.g. literacy) over another (e.g. social development or numeracy)?

Update v1.1: The IPE will now also explore implications of Covid-19; including implications for how this may have impacted upon schools' communications with parents, and how this may have influenced how parents used the messages.

Process evaluation methods and analysis

Drawing on the EEF Implementation and process evaluation guidance (Humphrey et al., 2016) we are using a multiphase design, based around a triangulation of mixed methods, to examine the research questions outlined above. To do this, we are utilising the following methods:

- A parental online survey towards the end of the programme
- Case study visits to 8 schools towards the end of the programme to carry out brief interviews with reception teachers/member of senior leadership team (**Update v1.1:** physical visits will no longer take place due to Covid-19, instead interviews will be conducted online or via telephone)
- Telephone interviews with 25 parents towards the end of the programme
- Review of texts sent and any other programme materials
- Online survey (baseline and post-treatment) of teachers/other relevant school staff to capture change in practices in texting and parental engagement with schools
- Telephone interviews with parents who withdraw from the intervention, to explore the reasons why
- Analysis of any data collected by delivery team such as responses to texts or feedback surveys

These methods have been designed to enhance the impact evaluation by providing rich data from a wide range of sources and at different stages of the process. This will enable us to explore in greater detail the implementation process and understand the outcomes of the impact evaluation.

The parental survey will be developed with an online platform (SNAP which is always used by the IES team) which could be made smartphone/smart device compatible so that it could be completed on whatever is easiest for parents. The survey will examine how interesting and useful the parents found the texts, what they did after receiving the texts, whether the frequency, length, and time of day that they received the texts was appropriate and any changes they would like to make. We will also ask about contamination here and if the parents shared the texts with other parents in the same or different year groups. The survey will have a prize draw where parents can win £100 (potentially split into two separate draws of £50 each to increase parents' chances of winning a prize).

The 8 semi-structured case studies. Case studies will be selected to cover a spread of areas and school characteristics (such as school size). As part of the visit, we will also hold brief interviews with the reception teacher/ member of senior leadership team at each school which can explore their input (if any) to the intervention and any perceived impacts on children, parental engagement with children and parental engagement with them and the school. We can also ask them if they believe there has been any contamination with parents sharing texts. We will also ask the school about any costs incurred or time taken for the intervention although we expect this to be minimal.

Update v1.1: these interviews will now take place online or via telephone due to Covid-19.

Telephone interviews with 25 parents will allow greater exploration of the perspectives of parents. To maximise response from parents we will use short 20 minute semi- structured telephone interviews at a time to suit them. The interview questions will build on the parental survey questions but be able to delve into more detail and allow parents to talk about their experiences of the texts and activities, any barriers or facilitators and what they found useful (or not) about the intervention, as well as any perceived outcomes on parental engagement, on children's abilities or any unintended outcomes. To ease recruitment and cover any potential incurred costs such as childcare we will offer a monetary incentive of £20 for each parent. We will recruit parents by emailing them with an invite to take part and will ensure that we get a range of different schools so the sample will be part- self- selected and part- chosen on their school demographics.

A review of programme texts will enable us to explore in more detail what has been sent to parents and when and if there is any relationship to opt-outs from parents by text. These reviews will also mean that the evaluation team will be able to monitor any adaptations to the intervention as it progresses.

The baseline and post-treatment surveys of teachers will be focused on establishing an indicator of existing practices within the school for using texts with parents and the purpose of these and also any other parental engagement methodologies the school may be using (therefore establishing usual practice). Through these surveys, it will be possible to see if schools appear to adopt any compensating behaviours for parents who are assigned to the control group. As the intervention is not focused on teacher change we will keep questions very brief and ask about any perceived impacts. The surveys with staff will both establish the counter-factual and enable an assessment of programme differentiation, at the two main time points (baseline and endline) and during the intervention.

Finally, the delivery team will supply the evaluation team with **any relevant data they collect** during the project such as any response to texts they get, requests for extra support or feedback from families or teachers. These will be analysed in light of the purpose of its collection, and data would be triangulated with the main evaluation findings. At this point, any adaptations that are required will be communicated to the evaluation team for analysis in the IPE. The delivery team would also inform the evaluation team if any schools or parents decide to withdraw from the programme, in which case they would be contacted by the evaluation team and asked about their reasons for doing so via a short telephone interview (up to a maximum of 9 interviews) if they are willing or else via a brief email form. In addition, we would collect any cost data from the delivery team to calculate the cost per pupil over three years.

The interviews and surveys with staff and parents, together with a review of the texts sent (and related feedback) will enable us to assess the quality of the intervention. With regard to dosage, due to the nature of the intervention i.e. using text messages, the delivery team are unable to report whether a text has been received or not. However, the survey and focus groups with parents will enable us to explore text delivery. Similarly, the work with parents also provides us with an opportunity to assess the reach and responsiveness of the intervention as we will be able to ask them about their participation in reading the texts and engagement with the activities/tasks set by the texts.

Qualitative data analysis: Interviews and focus groups will be digitally recorded with the agreement of participants and transcribed verbatim. We will analyse the data using a 'framework' approach, drawing themes and messages from an analysis of interview transcripts, observations of training and quarterly monitoring sessions, and other materials collected by evaluation and delivery teams.

Update v1.1: Focus groups are no longer taking place; it had previously been decided to replace these with parent interviews instead.

Cost evaluation

Cost data will be collected from BIT directly and also teachers will be asked in the online survey if there have been any financial or time costs to the school taking part in the intervention. In addition, parents will be asked in the interviews/ survey if they had any financial costs associated with the programme and also how much time it has taken. A per pupil cost over three years will be calculated from the schools perspective as per the EEF cost guidance recommendations (so this will not include parent cost or time but this will be noted separately).

Ethics and registration

We take seriously the ethical issues raised in both the quantitative and qualitative elements of the research. An ethics application describing the evaluation was prepared by the evaluation team and submitted to the NIESR Research Ethics Committee for review; this was approved in February 2019.

Schools will be given a memorandum of understanding (MOU) during recruitment which details the requirements of the trial from the schools' perspective and what roles the delivery team and evaluation team will play and their responsibilities. This also includes a statement on how the data from the trial will be used and kept securely. Schools will have to sign this MOU to be recruited to the trial. Once a school has been recruited, parents of children in reception year will be given a letter in September 2019, detailing what will be involved from their perspective and given access to a privacy notice which details which data of theirs and their children's is collected and how it will be shared and stored. The letter includes a short form for parents to complete and return if they do not wish to participate, or if they do not wish their child to participate. They are also able to withdraw from the study at any time.

In regards to taking part in the evaluation activities including surveys and interviews, participants will be told they can withdraw at any time from any research activity.

All recruitment materials have been jointly developed and agreed by the delivery and evaluation teams, as well as by EEF.

The trial will be registered at www.controlled-trials.com when it is finalised and we will include the [ISRCTN](#) (International Standard Randomised Controlled Trial Number) as soon as it becomes available.

Update v1.1: An addendum to the MOU was issued to schools in summer 2020 to explain the changes to the project arising as a result of Covid-19. An updated parent information letter explaining the changes was also provided to schools to distribute to parents as their children returned to school in September 2020. The NIESR Research Ethics Committee was also notified of the changes to the evaluation.

Data protection

We also recognise the utmost importance of data protection and are fully committed to complying with the Data Protection Act 2018 and GDPR legislation. Our proposed approach does not include the collection of special personal data, but does involve the collection of personal data. For processing personal data we are using legitimate interest as the legal basis, which was subject to a full legitimate interest assessment which has been approved 12/04/19. This is in line with both NIESR and IES organisation policies which both list research as one of the purposes of the organisation. All participants interviewed for the research will be asked to sign a consent form to indicate that they have understood the aims of the research and agree to the interview being recorded and transcribed, and will be given assurance of anonymity. Schools will sign an MOU at the start of the project clearly laying out the requirements of the project and how the data will be used, shared and stored. Parents will receive an information letter explaining the project and clearly detailing how they can withdraw from receiving the text messages and how they can withdraw their data and/or their child's data from the study.

We have developed a privacy notice in collaboration with the delivery team explaining how information collected from participants would be used and stored, and communicating to participants their right to withdraw from data processing at any time. This is available at: <https://rebrand.ly/tipsbytext>

We have also developed a data sharing agreement between both evaluation teams, the delivery team and EEF which states which data will be shared by who, how and why to ensure full data security throughout the project.

Update v1.1: The project privacy notice was updated in Autumn 2020 to reflect the changes to the evaluation as a result of Covid-19.

Personnel

Delivery team

Tips by Text is being delivered by the education team at BIT who have collectively run over 40 randomised controlled trials in educational settings over the past 5+ years. Key personnel include:

Fionnuala O'Reilly is the project lead for BIT. She has led research in several areas of education policy including parental engagement, fostering social and emotional learning in the classroom and improving student motivation. She now leads BIT's work in Early Years, exploring ways to improve the home learning environment and empowering early years practitioners to foster key skills in the earliest years of life.

Anna Bird oversees BIT's education, skills and early years work. Before BIT, she was the Head of Research at the Social Mobility Commission, where she focused on reducing attainment gaps throughout school. She also led research on youth welfare for the Department for Work and Pensions. Prior to moving to Government, Anna spent 10 years at a global research consultancy with public and private sector clients. Anna holds an MSc in social psychology from The London School of Economics and an undergraduate degree from The University of Oxford.

Alice Farrell is an Associate Advisor in the Education team and focuses primarily on Early Years learning and development. Prior to BIT, Alice worked for an EdTech start up where she headed up their impact evaluation and research arm. She holds a degree in Biological Sciences from Oxford University.

Elsbeth Kirkman is a Senior Director at BIT. She is responsible for BIT's work on health, education, and local government. Prior to this role she oversaw the establishment and growth of BIT's North American office from New York. She has taught behavioural science at Harvard, acts as an expert advisor to a number of global institutions, and serves as a Senior Fellow for Casey Family Programs, advising on the applications of behavioural and decision science to child welfare systems. Prior to joining BIT in 2013, Elsbeth was a management consultant working with government clients around the world.

Evaluation team

The team comprises highly experienced staff across NIESR and IES; brief biographies are below. Lucy and Anneka will be co-principal investigators for the project and will design, project manage and quality assure all stages of the project. Heather Rolfe (Associate Research Director, NIESR) will provide expert advice on the IPE and David Wilkinson (NIESR Fellow) will provide expert input on the impact evaluation.

Lucy Stokes (Co-PI, Principal Economist, NIESR) has 15 years' research experience, with a particular interest in education, especially early years. She is leading NIESR's input into the EEF evaluation of Using Research Tools to Improve Language in the Early Years (URLEY) and is co-principal investigator for the pilot evaluation of Early Years Toolbox (EYT). She has also previously conducted research on the relationship between quality of early years' provision and children's outcomes. Lucy will be co-PI on the project and will lead on the impact evaluation.

Francesca Foliano (Economist, NIESR) is an economist with expertise in applied economics of education, Francesca is working on the EEF evaluation of Changing Mindsets and has also worked on Embedding Formative Assessment. Francesca will work on the impact evaluation.

Nathan Hudson-Sharp (Senior Social Researcher, NIESR) is a mixed methods researcher with extensive experience in researching barriers to academic attainment. Having previously worked on several EEF projects, he is experienced in undertaking process evaluations within trials of complex

interventions, and exploring both cognitive and non-cognitive outcomes. Nathan will lead NIESR's input to the implementation and process evaluation.

Johnny Runge (Social Researcher, NIESR) has extensive experience in qualitative evaluation methods. He recently led the evaluation of the pilot intervention Embedding Contextualisation in English and Maths GCSE Teaching, and has been part of the process evaluation teams on Embedding Formative Assessment, Improving Working Memory, Growing Learners, URLEY and EYT. He is highly experienced in designing and analysing surveys and conducting focus groups and interviews in schools. Prior to starting at NIESR, Johnny worked as a primary school teacher. Johnny will support the process evaluation activities on the project.

Chiara Manzoni (Social Researcher, NIESR) is a mixed methods sociologist and her main interests lie in the field of vulnerable groups, including disadvantaged pupils. She has worked on a number of different policy and impact evaluations. Chiara will support the process evaluation activities on the project.

Anneka Dawson (Co-PI, Principal Research Fellow, IES) has vast experience in education and family research. She was formerly the Senior Evaluation Manager at the EEF and had responsibility for the Early Years research including managing URLEY, NELI, Easy Peasy as well as projects in Year 1 including One Billion and FAST. She also worked with the UCL IOE team to produce the Early Years measures database in 2017⁷ She currently leads the IES' research on pre-16 education and directs the EYT project for EEF and other projects with DfE and CEC. Anneka will co-direct the project and help develop research instruments, provide quality assurance across all stages of the project and write some of the report.

Ceri Williams (Research Fellow, IES) has over 15 years' research experience on educational topics including teachers' pensions, examination board provision, girls' participation in sports and use of government department resources in schools. She has experience conducting case study visits in primary and secondary schools, interviewing pupils, teachers and other staff for various projects. Ceri is a qualified teacher, with experience of working in the primary sector and is currently project managing a project for Teach First and supporting the Early Years Toolbox (EYT) project. Ceri will be the project manager for the IES team and will work across all activities on the project.

Clare Huxley (Research Fellow, IES). Clare's research interests include education and learning, equality and diversity and she is experienced in a range of qualitative and quantitative approaches. Clare received a PhD in psycholinguistics from the University of Edinburgh and has knowledge of language processing and acquisition development from childhood. Clare is currently the project manager on the EEF EYT project. Clare will support the process evaluation activities on the Tips by Text project.

Helena Takala (Research Officer, IES) is a mixed methods researcher interested in education policy, and has experience conducting focus groups and semi-structured and in-depth interviews, producing systematic literature reviews and survey analysis on SPSS. Helena is currently also working on the EEF EYT project. Helena will support the process evaluation activities on the project

Administration of the YARC assessments that form the primary outcome for the trial will be conducted by QA Research, with the QA team led by Helen Hardcastle (Research Director).

Dr Sue Stothard (independent consultant) will train the test administrators in the use of the YARC.

⁷ (Dockerell et al 2017).

Risks

Issue/risk	Action to address issue/reduce risk	Likelihood	Impact
Difficulty in obtaining EYFSP data from the NPD	Allowing a flexible timeline for starting analysis and reporting if there are delays. Working to submit the application for data as early as possible and responding to queries in good time.	High	Medium
Pre- or post- test data completion rates are low	We will work with the test administrator organisation (QA Research) and BIT to have school details as early as possible to plan testing in both time points. Mop-up visits will be completed by the test administrators wherever possible when there is absence to maximise the number of pupils tested. Progress will be monitored carefully throughout the testing period so that action can be taken swiftly if required.	Medium	High
Contamination from the intervention to control group	As this intervention is implemented outside of school this should keep the likelihood of spill-over fairly low, but it is possible and therefore it will be explored in the implementation and process evaluation.	Medium	High
Reluctance of parents to sign up to the intervention	The benefits of the intervention have been made attractive to parents in the letter and privacy notice and the intervention is designed to be easy to implement. The delivery team will manage this relationship with support from the evaluators and school staff if necessary.	Medium	High
Reluctance of parents to participate in interviews and parent surveys	Parents will need to be made aware of the expectations of the study when they agree to take part and we will use incentives to encourage a good response. Times and dates will be designed to be convenient for parents and surveys will be short and in a medium that suits the largest number of respondents possible.	Medium	High
Reluctance of schools to participate in case study research or survey research	Schools have their responsibilities clearly laid out in the Memorandum of Understanding. We will work to reduce burdens on participants as much as possible with short surveys and interview times. A broad team means we can be flexible about dates for case studies.	Low	High
Schools drop out	Evaluators have limited ability to affect participant numbers other than explore reasons for low participation, identify	Low	Medium

Issue/risk	Action to address issue/reduce risk	Likelihood	Impact
	good practice in maximising participant engagement and share this across schools. We can work to maximise research participation among those taking part.		
Update v1.1: Covid- 19 impacts on the testing/ IPE dates as schools were closed to most pupils in June- July.	The IPE and testing were moved to November 2020- January 2021 and remote testing has been offered to schools if there are problems with external visitors or space to do tests. We will continue to offer flexibility in when to do interviews and the IPE and testing periods have been extended. We are now also sending SDQ by email to complete as an online survey rather than by post to maximise the response.	High	High

Timeline

Dates	Activity	Responsibility
Oct 2018- Feb 2019	Set up meetings and IDEA workshop	Delivery team and evaluation team
Jan- June 2019	Piloting and finalisation of research materials	Delivery team
Feb- June 2019	Recruitment of schools	Delivery team with support from evaluation team
June 2019	Piloting of YARC measure	Evaluation team*
Sep- Oct 2019	Recruitment of parents Business as usual survey of teachers Collection of pre-test data* (YARC assessments) Collection of schools and parents data Randomisation	Delivery team and evaluation team
Nov 2019- July 2020 (Update v1.1: extended to October 2020)	Approximately 9 month intervention period (Update v1.1: Approximately 12 month intervention period)	Delivery team
Apr- Jun 2020 (Update v1.1: postponed until November- December 2020)	School case studies Parent telephone interviews Collection of data from delivery team	Evaluation team
June-July 2020 (Update v1.1: postponed until November –January 2021)	Administration of post-test data (YARC assessments)	Evaluation team*
July 2020 (Update v1.1: postponed until November 2020- January 2021)	SDQ collection Post- intervention survey of teachers Online parental survey	Evaluation team

Dates	Activity	Responsibility
Autumn 2020 (Update v1.1: extended to Autumn/Winter; EYFSP no longer collected, but NPD still required for FSM indicator)	Collection of EYFSP data from NPD Analysis of project and evaluation data	Evaluation team
Jan- Feb 2021 (Update v1.1: Feb- April 2021)	Report writing	Evaluation team
Feb 27 th 2021 (Update v1.1: April 2021)	First draft of evaluation report	Evaluation team

*Carried out by independent test administrator on behalf of the evaluation team.

Please note we will randomise after collection of pre-test data, randomising at the end of October and the intervention will start in November. With approximately 9 months delivery time the programme would then complete in July 2020 (in the last week of the school term), with collection of any post-test data in June- July 2020. This will mean that there will be an overlap of the final stage of the intervention and when post- testing will take place

Update v1.1: This overlap is no longer applicable, due to the change in timing of the post-tests and the intervention period.

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