



Reminders To Improve Pupil Attendance and Engagement

Nimble Trial Report

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About the evaluator

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Executive summary

The project

The Education Endowment Foundation (EEF) led the management of the Tuition Partners (TP) pillar of the National Tutoring Programme (NTP) in 2020/2021, funded as part of the government's COVID-19 catch-up package. The TP programme allows schools to access subsidised small-group and one-to one tuition from a list of 33 tuition partners, quality-approved by the EEF, to support pupils who have missed out the most as a result of school closures due to the COVID-19 pandemic. The focus is on supporting disadvantaged pupils, in particular those eligible for Pupil Premium, but with flexibility for schools to select those they feel are most in need of the support. The EEF commissioned the Behavioural Insights Team (BIT) to run a reach and engagement nimble randomised controlled trial (RCT) with Pearson, an approved NTP Tuition Partner.

The purpose of this trial was to test whether behaviourally-informed reminder messages sent directly to pupils via email can improve their attendance at tutoring sessions compared to a standard reminder message also sent via email. It is important to note that the intervention was testing the impact of the specific wording of the reminder rather than the effectiveness of sending a reminder message at all versus no message. The target group were secondary school pupils (Years 7 to 11) who took tutoring sessions with the NTP Tuition Partner, Pearson, from 10 March to 27 August 2021.

The intervention involved pupils receiving one behaviourally-informed reminder message each week. Each message also included a behaviourally-informed subject line. The messages aimed to increase pupil motivation for tutoring and to improve their attendance and engagement in tutoring sessions. The messages were automatically sent by Bramble, the online tutoring platform used by Pearson, at 8 a.m. the day before the pupil's tutoring session.

This was a three-armed RCT with pupil-level randomisation. There were two treatment arms, both of which leveraged behavioural insights, and a control arm. In total, 4,463 pupils were included in the trial. The main difference between the two treatment arms was one of framing: one had a positive frame and leveraged a range of behavioural insights (the so-called 'kitchen sink' arm),¹ whereas the other adopted a 'catch-up' frame in which tutoring sessions were framed as important for catching up on missed in-person schooling.

Table 1: Summary of findings

Research question	Finding
Does sending behaviourally-informed reminders to secondary pupils increase their attendance at tutoring sessions?	Pupils in all three arms in the trial had comparable attendance rates at tutoring sessions, meaning that the behaviourally-informed messages did no better or worse than the control messages.
Does sending behaviourally-informed reminders to secondary pupils on Pupil Premium (PP) increase their attendance at tutoring sessions?	Pupil Premium pupils in all three arms in the trial had comparable attendance rates at tutoring sessions, meaning that the behaviourally-informed messages did no better or worse than the control messages.

Additional findings

Pupils in all three arms in the trial had comparable attendance rates at tutoring sessions, meaning that the behaviourally-informed messages did no better or worse than the control messages. This was true for both the

¹ This arm is testing the combined impact of multiple behavioural insights, rather than one single insight, and is therefore named the 'kitchen sink' arm. Behavioural insights include *implementation intentions* (exercises that help people to plan exactly how they intend to complete a goal), *social norms* (signal appropriate behaviour and are classed as behavioural expectations within a group of people), and *messenger effects* (the tendency for people to give different weight to information depending on who is communicating it to them).

kitchen sink arm (Hedges' $g = 0.01$; 95% CI: -0.06, 0.08) and the catch-up arm (Hedges' $g = 0.03$; 95% CI: -0.05, 0.1). Pupil Premium pupils in all three arms in the trial had comparable attendance rates at tutoring sessions, meaning that the behaviourally-informed messages did no better or worse than the control messages. This was true for both the kitchen sink arm (Hedges' $g = 0.04$; 95% CI: -0.05, 0.15) and the catch-up arm (Hedges' $g = -0.01$; 95% CI: -0.12, 0.1).

The proportion of reminder messages opened by pupils was 26%, meaning that a significant number of pupils did not read the body of the reminder message. However, pupils not opening the reminder messages may still have read the subject lines, which varied each week for the treatment conditions, and did incorporate behavioural insights. Comparison of the average open rates for the reminder messages across the trial conditions suggests that the behaviourally-informed messages were more likely to be opened by pupils (a difference of approximately three percentage points).

Pupil feedback forms ($n = 22$) were collected as part of the Implementation and Process Evaluation (IPE). These indicated that, for pupils who did engage with the reminder messages, they thought they were engaging, informative, and useful.

The trial has revealed some of the broader challenges associated with the roll-out of the National Tutoring Programme. From the data gathered from this one provider only, the average attendance rate across the three treatment arms was approximately 49%, considerably lower than expected (estimates reported by Tutoring Providers before the trial in terms of attendance rate ranged from 67% to 80%).

Attendance rates in this trial are likely to be underestimates of pupils' true attendance rate because of the way tutoring sessions were delivered by schools. Schools purchased a specific number of sessions for each pupil (usually a block of 15 sessions) and then proceeded by booking them. In response to the challenges related to school closures, the NTP allowed schools to buy and book shorter blocks of minimum ten hours or to transfer hours to another pupil in a number of accepted circumstances. In practice, this meant that some sessions bought for a particular pupil were not assigned to that same pupil. In the analysis, the attendance rate was computed with the number of sessions initially bought for that pupil by the school as the denominator, rather than the number of sessions that were actually assigned to them. However, the attendance data still highlights the challenges faced by tutoring providers, schools, and tutors in ensuring that pupils attended the sessions that had been bought for them.

Introduction

As part of the government's response to COVID-19-related school closures, the Education Endowment Foundation (EEF) led the management of the Tuition Partners (TP) pillar of the National Tutoring Programme (NTP) in 2020/2021. The TP programme allowed schools to access subsidised tuition from a list of 33 tuition partners, quality approved by the EEF, to support pupils whose learning had been impacted by school disruption. The focus was on supporting disadvantaged pupils, in particular those eligible for Pupil Premium, though schools did have flexibility to select pupils they felt were in most need of support. The NTP subsidised the lessons by 75%, with the schools paying the remaining 25%.²

In addition to the overarching evaluation of the NTP, the EEF commissioned a series of evaluations to assess different strategies to reach and engage schools, tutors, and pupils. This is one such trial that tested whether behaviourally-informed reminder messages, sent directly to pupils via email, can improve their attendance at online tutoring sessions when compared to a simple reminder message.

Background evidence

Interviews with the Tutoring Providers (TPs) during the scoping phase of this project indicated that pupil attendance at tutoring sessions is often an issue, with attendance rates typically varying between 67% and 80%.³ Interviews during the scoping phase also identified a large number of factors that contribute to poor attendance, including the capacity of the lead teacher to follow up with pupils, the timing of lessons, and the support of parents. Based on existing evidence, summarised below, the Behavioural Insights Team (BIT), the EEF, Bramble, and Pearson agreed that testing whether simple, behaviourally-informed, timely reminder messages could increase pupil attendance at sessions would be beneficial for establishing the optimal reminders for tutoring providers to send to improve attendance at tutoring sessions. This is because attendance at tutoring sessions is essential for pupils to receive *any* benefits from tutoring and is therefore an important intermediate outcome.

There is strong evidence—from a range of contexts and countries—that timely reminders are an effective way to influence behaviour: they have been shown to reduce missed hospital appointments (Hallsworth et al., 2015) and careers appointments (BIT, 2018), improve school attendance (BIT, 2020), support medication adherence, and aid smoking cessation (Orr, 2014). Given this, there was sufficient evidence from other contexts to suggest that this approach was worth testing in the context of small-group tutoring sessions.

The literature also provides some evidence that the specific framing of reminders is important, with previous studies showing differences between differently worded reminders. For example, a Harvard University study tested the impact of differently framed parental notification messages on truancy and found that notifications using a loss aversion frame (highlighting the negative incremental effects of missing school) were more effective than the standard messages (Lasky-Fink et al., 2019). Additionally, a previous BIT study demonstrated that motivation-related barriers can be influenced with carefully constructed messaging. Attendance at adult career appointments was improved by emphasising that 'no one is born with a perfect career' and that 'time and effort can boost your skills'. This phrasing sought to help recipients believe in their own ability to progress and significantly outperformed simple information-only reminder messages (BIT, 2018). And finally, Hallsworth et al. (2015) tested multiple message frames to reduce missed hospital appointments, finding that emphasising the specific costs of missed appointments was more effective at reducing missed appointments than other message frames that highlighted the general costs of missing appointments, or the fact that the hospital recorded who missed appointments. Despite the evidence base for behaviourally-informed reminders being slightly weaker than that for reminders in general, it was deemed sufficient to test in this context. The opportunity to test whether behaviourally-informed reminders worked particularly well for disadvantaged pupils was also particularly appealing given the relative lack of evidence in this area.

² For Pearson, an unsubsidised block of 15 sessions cost £900, with schools then paying £225.

³ Data provided by one TP on 25 February 2021 indicated a baseline attendance rate of 71%; data provided by another tutoring provider indicated a baseline rate of 80%; data provided by the EEF on 26 February 2021 indicated a baseline rate of 67%.

Intervention

The intervention involved pupils receiving a reminder message each week. The messages were designed to increase pupils' motivation for tutoring and their attendance and engagement in the sessions. The subject lines in both treatment conditions varied each week and were designed to include behavioural insights to try to account for the fact that some pupils were likely to only read the subject line and not open the email. Both treatment conditions included a link to the tutoring space and a reminder of the time of their session. They also both provided tips on preparing for their sessions and used an encouraging tone. The 'kitchen sink' arm applied a wide range of behavioural insights, including:

- implementation intentions—exercises that help people to plan exactly how they intend to complete a goal (Gollwitzer 1999);
- social norms—social norms signal appropriate behaviour and are classed as behavioural expectations within a group of people (Dolan et al., 2010); and
- messenger effects—refers to the tendency for people to give different weight to information depending on who is communicating it to them (Dolan et al., 2010).

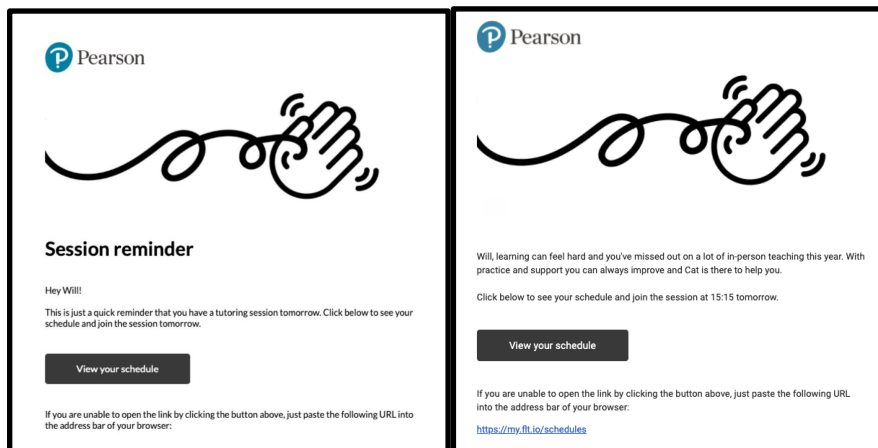
The 'catch-up' arm drew inspiration from the principle of 'loss aversion', the behavioural science concept explaining that individuals tend to respond to losses more strongly than they respond to gains of equal value. These messages highlighted that pupils had missed a significant amount of in-person schooling and positioned the tutoring sessions as an opportunity to 'catch up'.

Figure 1 shows an illustration of the control and treatment conditions, Table 2 contains an overview of the intervention, and Appendix A contains the full set of messages sent to pupils in the control group and the two treatment arms.

Figure 1: Illustration of the control and treatment conditions

Subject line (control): Reminder: you have a tutoring session tomorrow

Subject line (treatment, example): [pupil name], your tutoring session to help you catch up starts at [time] tomorrow



Fifteen different messages were developed for the two treatment arms as at the time of intervention development it was expected that most pupils would receive tutoring in blocks of fifteen lessons.

Table 2: Intervention overview

Intervention name	Reminders to Improve Pupil Attendance and Engagement.
Why (theory/rationale)	There is strong evidence from different contexts that the framing of reminders is important to their efficacy, with previous studies showing substantial differences between differently worded reminders (Hallsworth et al., 2015; BIT, 2018; Orr, 2014).
Who (recipients)	Secondary pupils receiving tutoring sessions from Pearson as part of the NTP. It was expected that a significant proportion of recipients would be disadvantaged pupils given the NTP's focus on supporting

	such pupils, in particular those eligible for Pupil Premium. However schools did have flexibility to select those pupils who they felt were in most need of support.
What (materials)	Pupils received a reminder message the day before their tutoring session. The messages and their subject lines sought to increase pupil motivation for tutoring and to improve their attendance and engagement in lessons. The full set of messages can be found in Appendix A .
What (procedures)	The intervention messages were automatically sent to pupils at 8 a.m. the day before their tutoring session. This email also contained a link to the online learning environment.
Who (provider)	The intervention messages were automatically delivered to pupils by Bramble, the Tutoring Provider's (Pearson's) technology partner.
How (delivery mode)	The intervention messages were sent in an email. Given the age of participating pupils, this was typically their school email, though in some cases it was a personal email account.
Where (location)	Pupils received the intervention materials wherever they happened to be at 8 a.m. the day before their tutoring session and could read the message at a time of their choosing.
When and how much (dosage)	Pupils received a single intervention message each week, at 8 a.m. the day before their tutoring session was scheduled. They received a message before each of their tutoring sessions. If a student was booked for a block of 15 sessions, they typically would have received 15 messages.
Tailoring (adaptation)	The reminder messages were personalised with the pupil's name, their tutor's name, and their lesson time. Both the subject line and the main body of the reminder email were personalised.

Research questions

Impact evaluation

This trial aimed to address the following research questions as set out in the study protocol:

- RQ1** Does sending secondary pupils behaviourally-informed reminders *increase their attendance* at tutoring sessions?
- RQ2** Does sending secondary pupils on Pupil Premium (PP) behaviourally-informed reminders *increase their attendance* at tutoring sessions?⁴
- RQ3** Does sending secondary pupils behaviourally-informed reminders *increase their engagement level* during tutoring sessions as measured by *tutor's engagement ratings of pupils—both overall and among PP pupils specifically* (exploratory analysis)?

The study protocol can be found on the EEF's website (linked [here](#)). Pre-registration can be found on OSF (linked [here](#)).

Implementation and process evaluation

The implementation and process evaluation (IPE) aimed to address the following research questions as set out in the study protocol:

1. What proportion of pupils were sent reminders (compliance)?

⁴ Given the NTP's focus on supporting pupils from disadvantaged backgrounds, and specifically those on Pupil Premium, it was deemed important to understand whether there was a particular impact for this subgroup.

2. What proportion of pupils were sent the correct reminder and were the reminders sent in their intended format (fidelity)?
3. How many reminders were sent to each pupil, and of those sent, how many emails were opened by pupils (dosage)?
4. How did pupils experience the reminders and tutoring sessions (quality)?
5. What were the barriers and facilitators to pupil engagement (mechanisms)?

Methods

Trial design

The trial design was a three-arm,⁵ pupil-randomised RCT that aimed to test the impact of different reminder messages on pupils' attendance and engagement in tutoring sessions. The three arms of the trial were:

- control—pupils in the control arm received the Tutoring Provider's Business-As-Usual (BAU) communications, a reminder email sent the day before their tutoring session at 8 a.m. that included a link to the pupil's tutoring schedule through which they could join their tutoring session; the body of the message was personalised with their name but it did not include personalised information on their lesson time (an example of the BAU control message can be found in Appendix A);
- behavioural insights 'kitchen sink'; and
- 'catch-up'—see Intervention section above for detail.

Table 3 provides a summary of the trial design; Figure 2 is the CONSORT trial diagram.⁶

Table 3: Trial design

Trial design, including number of arms		Three-armed RCT, pupil-level randomisation.
Participants	Inclusion criteria	Secondary pupils who received tutoring sessions with Pearson during the trial period.
	Exclusion criteria	Primary pupils were excluded given that many do not have their own email address to receive the intervention (their parents would typically receive the reminder instead); secondary pupils who started their first tutoring session before the trial launch date (10 March) were also excluded.
	Target number	5,000.
Unit of randomisation		Pupil.
Primary outcome	Variable	Pupil attendance rate for tutoring sessions, expressed as a proportion of sessions attended divided by sessions bought (0–100). ⁷
	Measure (instrument, scale, source)	The proportion (expressed as a percentage) of tutoring sessions attended by each pupil out of those bought by schools. This outcome data was provided by the online tutoring platform used by Pearson, Bramble.
	Direct measure or proxy?	Direct measure.

⁵ A three arm RCT was deemed the most suitable research design to test more than one variation of the reminder message. The suitable number of arms was assessed via power calculations based on the expected sample size, expected mean and standard deviation of the outcome, and the number of comparisons required to answer the research question.

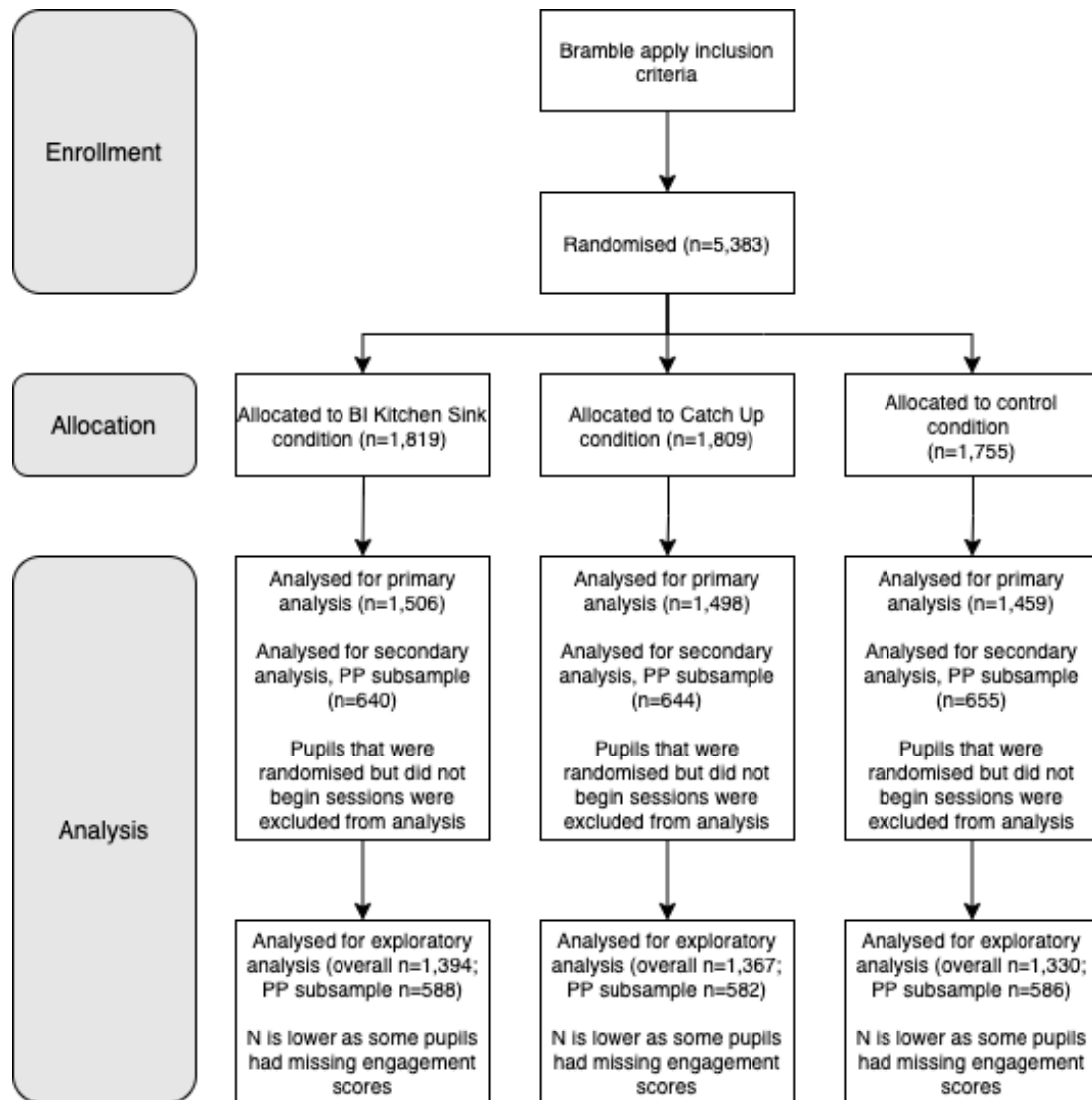
⁶ The CONSORT flow chart is a diagram of the progress through the phases of a parallel randomised trial of two groups (that is, enrolment, intervention allocation, follow-up, and data analysis): <http://www.consort-statement.org/consort-statement/flow-diagram>

⁷ Tutoring was typically sold in packages of 15 sessions. For 93% of pupils, the denominator was 15 sessions bought.

	Expected mean	67%–80%. ⁸
	Time of collection	End of trial (31 August).
	Adjusting for multiple comparisons?	Three comparisons were made, with all treatment groups being compared against the control group and against each other using the Benjamini-Hochberg correction (Benjamini and Hochberg, 1995).
Exploratory outcome	Variable(s)	Tutor's average rating of pupil engagement during tutoring sessions.
	Measure (instrument, scale, source)	The rating for each tutoring session was given by tutors on a 100-point scale (0 = minimum engagement, 100 = maximum engagement) after each session. This outcome data was also provided by the online tutoring platform used by Pearson, Bramble. Sessions that were bought and not attended by a pupil were rated as 0. See more details under the exploratory analysis section.
	Expected mean	This was not known given that it was a new feature on the Bramble platform.
	Time of collection	Tutors inputted their rating at the end of every session.
	Adjusting for multiple comparisons?	Three comparisons were made. All treatment groups were compared against the control group and against each other using the Benjamini-Hochberg correction.

⁸ Data provided from Bramble on 25 February 2021 suggested a baseline attendance rate of 71%; data provided by another tutoring provider suggested a baseline rate of 80%; data provided by EEF on 26 February 2021 suggested a baseline rate of 67%.

Figure 2: Trial overview



Participant selection

All secondary pupils that received tutoring sessions from Pearson during the trial period (from 10 March to 27 August) were eligible to participate in the trial. Provided that a pupil met this inclusion criterion, they were randomised to one of the three arms when they first began their tutoring sessions. The identification of eligible pupils and assignment to a treatment arm was conducted automatically by a programme developed by Bramble, the online tutoring platform used by Pearson. BIT's research team quality assured the code used to conduct the randomisation.

Outcome measures

Primary outcome

The primary outcome measure was pupil attendance at tutoring sessions. This was calculated by dividing the number of sessions attended by the number of sessions bought by the school for the pupil.⁹ This outcome measure was chosen for the following reasons:

⁹ Bramble defines a session as 'attended' when both a pupil and a tutor attended for more than ten minutes. An example may help illustrate how this outcome was constructed. If a school bought 15 sessions for a student, they attended the first five sessions (session 1–5), missed the following five sessions (session 6–10), and the following five sessions were never scheduled because they were reassigned to another student (session 11–15), the average attendance was computed as 5/15 = 33%. This is because, in the spirit of ITT, the number of sessions attended was divided by the number of sessions originally bought by the school. In the data provided by Bramble, we could not distinguish why sessions 6–10 were not attended vs sessions 11–15; we could only observe that ten sessions bought were not attended.

- Importance for learning. Due to this being a nimble trial, there was neither time nor capacity to use an outcome measure that assessed learning directly. However, attendance at tutoring sessions is essential for pupils to receive any of the benefits from tutoring and is therefore an important intermediate outcome.
- Ease of collection. Attendance data is routinely collected after every session by all the TPs. Importantly, collecting it did not create an additional process for Bramble.
- High-quality objective data. The pupil attendance rate is an objective measure. Given the simplicity of recording, the quality of data is typically high.
- Alignment to TP key performance indicators. TPs were particularly interested in targeting the pupil attendance rate as this was one of their KPIs throughout the NTP.

The attendance data was collected automatically by Bramble's platform and shared in anonymised form with BIT for analysis.

Exploratory outcome

The exploratory outcome measure in this trial is the tutor's average rating of pupil engagement across the sessions bought for the student. This was chosen for the following reasons:

- Impact on pupil engagement and motivation. As well as seeking to improve attendance, the intervention messages were designed to improve pupil engagement and motivation within tutoring sessions. This outcome measure allowed for an exploration of whether tutors perceived any difference in engagement and motivation in pupils.
- Ease of collection. All Pearson tutors are invited to provide a subjective rating of each pupils' engagement after every session. Collecting this data did not require any additional processes and was therefore relatively easy to collect.

Tutors were not aware of the trial so there was no risk that the reporting was influenced by this. However, the relative high risk of missing values and the potential noise associated with these measures (a rating of 60% may mean different things to different tutors) drove the decision to have engagement as exploratory analysis.

Like the attendance data, this outcome data was also collected by Bramble's platform and was shared in anonymised form with BIT.

Sample size

During the scoping phase of the project in February 2021, BIT and EEF conservatively estimated that Pearson would reach 5,000 secondary pupils from 10 March (the start of the trial period) until the end of the English academic year in July 2021. During the period for which the trial was live, it was decided that the NTP programme delivery would be expanded to also include the summer holidays (until the end of August 2021).

In total, 5,383 pupils were registered with Pearson to receive tutoring after 10 March and were randomised into one of the three groups (1,755 in control, 1,819 in the kitchen sink intervention, and 1,809 in the catch-up intervention). However, schools bought tutoring sessions for only 4,463 pupils. The analysis only includes those pupils who had tutoring sessions bought for them. The 920 pupils for which schools ended up not buying tutoring sessions were equally spread across trial arms (17.2% kitchen sink, 17.2% catch-up, 16.9% control group).

At the trial protocol drafting stage, it was expected that 25% of pupils receiving tutoring classes received Pupil Premium (PP) funding based on the proportion of PP pupils among those already receiving tutoring by Pearson in February 2021. The proportion of PP pupils in the trial was actually much higher than that, at 43%.

Compared to the data originally provided by Bramble, Pearson, and the EEF in February, mean attendance was significantly lower (about 50% in our data compared to an estimated 67%–80%). This may be for several reasons, for example, that attendance decreased as the term progressed or that Bramble, Pearson, and the EEF measured attendance as sessions attended over sessions scheduled, while due to data availability in this trial it could only be measured as sessions attended over sessions bought. The standard deviation of raw attendance was similar to the one estimated using other tutoring providers' data at the trial protocol drafting stage (28.64%).

In the trial protocol, BIT, EEF, and Pearson agreed that a five percentage point increase in the pupil attendance rate would constitute a substantive effect size. This assessment was informed by the scope of this project, the evidence base for our intervention materials, and the light-touch design of the intervention. The analysis was powered to detect such a change both in the primary analysis (overall effect) and in the secondary analysis (PP subsample).

Table 4: Minimum detectable effect size (MDES) in percentage points at different stages

	Protocol			Analysis	
	Assumptions	Overall	PP	Overall	PP
MDES	Using Bramble data: mean attendance 71%, SD 39%	4.4	8.8	3.4 (mean attendance: 49.17%, SD: 28.64)	5.03 (mean attendance: 49.72%, SD: 28.05)
	Using tutoring partner data: mean attendance 80%, SD 28%	3.1	6.3		
	Using EEF data: mean attendance 67%, SD 21%	2.4	4.7		
Alpha		0.05			
Power		0.8			
One-sided or two-sided?		Two-sided			
Number of pupils	Kitchen sink	1,666	417	1,506	640
	Catch-up	1,666	417	1,498	644
	Control	1,666	417	1,459	655
	Total:	5,000	1,250	4,463	1,939

Randomisation

A rolling randomisation approach was used in this trial whereby pupils were assigned to a treatment arm as soon as they registered their account. The randomisation process was designed and implemented by Bramble and involved a random number from a vector c (1, 2, 3) being generated and assigned to each unique pupil ID. The number assigned corresponded to the relevant treatment arm (for example, '1', control group; '2', the first treatment arm). This process ensured that randomisation was conducted continuously, with no need for batches.

As Bramble designed and implemented the randomisation, Pearson remained blind to randomisation, which is important as a guard against risk of bias. Similarly, BIT researchers had no way of influencing randomisation. BIT researchers were not blinded to group allocation while conducting the analysis (they knew which arm each pupil in the dataset was allocated to). However, a second independent analyst re-analysed the trial under blind allocation of treatment groups to quality assure results.

Statistical analysis

The primary analysis was intention to treat (ITT). A CACE analysis was considered beyond the scope for this nimble trial, considering the complexities associated with CACE analysis in multi-arm trials.¹⁰ The only covariates used in the analysis model (OLS) were pupils' year group, their main subject, whether they belong to the Pupil Premium group, and a set of dummies for fortnight of randomisation, as listed in Table 4. These covariates were chosen as they could potentially influence the outcomes (for example, older pupils may have a higher attendance rate as they are closer to their GCSE exams, or pupils starting earlier in the term may be more motivated as they have more time to improve before the end of term), and so it was felt that controlling for these variables would increase the precision of estimates.

In line with BIT's standard practices, the Benjamini-Hochberg correction technique was used to perform multiple comparisons adjustment (Benjamini and Hochberg, 1995). The adjustment was conducted separately for the primary, secondary, and exploratory analyses.¹¹

Table 5 outlines the key information regarding the statistical analysis approach.

Table 5: Impact analysis summary

RQ	Sample	Dependent variable	Independent variable	Control variable(s)	Analytical method	Interpretation
RQ1 (Prim.)	All secondary pupils with suitable tutoring start date	Attendance (% from 0–100)	Treatment assignment	Pupils: ¹² whether PP; year group; main subject of tutoring; fortnight of randomisation	OLS linear regression	The intervention affects attendance rate by X percentage points.
RQ2 (Sec.)	All PP secondary pupils with suitable tutoring start date	Attendance (% from 0–100)	Treatment assignment	Same as for RQ1, excluding whether PP	OLS linear regression	The intervention affects attendance rate by X percentage points.
RQ3 (Expl.)	All secondary pupils with suitable tutoring start date	Average tutor rating of pupil engagement (measured by a 0–100 point scale)	Treatment assignment	Pupils: whether PP; year group; main subject of tutoring; fortnight of randomisation	OLS linear regression	The intervention changes the average engagement rating by X.X in absolute terms, or by XX per cent in relative terms.

¹⁰ The identifying assumptions for the CACE parameter for the single treatment-control group design do not easily generalise to the multi-armed context. For more details, see Schochet, (2017).

¹¹ The Benjamini-Hochberg technique focuses on false discovery rate (FDR). BH proportionally adjusts the critical threshold for significance, taking into account the desired alpha and the number of tests, whereas Bonferroni applies a blanket (more conservative) correction to statistical significance by dividing alpha by the number of tests. As a result, it is considered less extreme than Bonferroni. AGAP (Evidence in Governance and Politics) provides a good summary of the two methods here: <https://egap.org/resource/10-things-to-know-about-multiple-comparisons/>

¹² Unfortunately Bramble does not collect pupils' gender. As Pearson is a new provider, this will be the first tutoring experience for Pearson. For this reason, it was not possible to control for previous attendance in tutoring sessions in the models.

	All PP secondary pupils with suitable tutoring start date	Average tutor rating of pupil engagement (measured by a 0–100 point scale)	Treatment assignment	Same as for RQ1, excluding whether PP	OLS linear regression	The intervention changes the average engagement rating by X.X in absolute terms, or by XX per cent in relative terms.
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Implementation and process evaluation

The study included a light-touch implementation and process evaluation (IPE) that was based on the EEF's latest IPE guidance.

Quantitative methods

To understand better delivery implementation, researchers collected the average delivery rates, open rates, and click-through rates to a pupil's tutoring schedule across the treatment conditions. These descriptive statistics were calculated by Bramble and involved dividing the total number of delivered, opened, or clicked messages by the total number of messages sent. The delivery rate provided a measure of fidelity to the intervention and the open rate provided useful information on the likelihood of the reminder messages being read in full. This approach to data collection differed from the approach outlined in the trial protocol as BIT researchers were initially instructed by the delivery partner that average delivery rates, open rates, and click-through rates were not going to be possible to collect.

Qualitative methods

The impact evaluation was enhanced by a qualitative exploration of implementation, perceived outcomes, and mechanisms of change. Feedback from Bramble and from pupils provided key insights that helped interpret and explain the quantitative findings of the impact evaluation as well as capture suggestions for improvements to future iterations of the intervention.

Intervention provider interview

A semi-structured interview with a member of staff from Bramble was conducted to understand better the intervention implementation. The interview took place online and lasted around 30 minutes and focused on the intervention setup, the aims of the intervention, and barriers and facilitators to successful delivery. The topic guide was developed using the research questions and in collaboration with the intervention team (see Appendix H for Topic Guide).

Pupil feedback forms

Feedback forms were developed to gain a richer understanding of pupil perceptions of the messages they received. The forms enhanced the impact evaluation by providing first-hand insight into the experiences of pupils, pupil perceptions of the messages, and broader context related to tutoring during the pandemic. Pupils were initially asked to comment on their experience of receiving the messages before being presented with example messages for a deeper exploration of their perspectives on the different types of behavioural messaging. Specifically, the feedback forms collected open text responses across (1) message delivery, (2) message content, (3) message outcomes, (4) experience of tutoring sessions, and (5) suggestions for improvement. Thirty pupils were purposively selected per wave based on which arm they were randomised to as well as whether they had high or low engagement scores where engagement score thresholds were defined by Bramble prior to trial launch. The forms took ten minutes to complete and were distributed to the pupils by Bramble over three waves (totalling 120 sent) following the provision of a sampling frame with agreed sampling criteria to guide purposeful recruitment. A total of 22 responses were received (a response rate of 18%): ten from the catch-up arm, seven from the kitchen sink arm, and five from the control group.

Content fidelity was measured qualitatively through the interview with the delivery partner to ensure the intended reminder content was intact. Furthermore, the interview captured any human or system errors that may have affected compliance and implementation fidelity.

Qualitative analysis

The interview was transcribed and the transcript and free text from the feedback forms were transcribed and analysed in NVIVO. Data was analysed using Braun and Clarke's (2006) six-step approach to thematic analysis, which involved coding the data and identifying emerging themes. Themes underwent a further round of classifying and were sorted into high level themes and sub-themes.

The predetermined topics of the interview and feedback forms were used to interrogate the data. During the analytical process a balance between deduction (using existing knowledge and the research questions to guide the analysis) and induction (allowing concepts and ways of interpreting experience to emerge from the data) was maintained; researcher bias was mitigated by a combination of having multiple researchers code the same data and through an analysis meeting designed to reach agreement among the team.

Table 6 provides an overview of the IPE methods.

Table 6: IPE methods overview

Research methods	Data collection methods	Participants/data sources (type, number)	Data analysis methods	Research theme addressed
Qualitative	Semi-structured interview	1 x provider staff	Thematic analysis	Fidelity Quality Mechanisms
Qualitative	Feedback form	22 x pupil forms	Thematic analysis	Fidelity Quality Mechanisms
Quantitative	Descriptive statistics from provider	– proportion and total of pupils who were sent 15 messages – proportion and total of emails that were opened by pupils – proportion and total number of click-throughs to schedule	Descriptive analysis	Compliance Fidelity Dosage

Deviations from the trial protocol

Design

The only important change made to the original trial design was the delaying of the end of the trial from 31 July to 27 August. This was due to the EEF's decision to permit tutoring sessions to continue over the summer holidays.

Participant selection

At the time of drafting the trial protocol, it was understood that Pearson would only be offering tutoring to pupils in Year 10 and Year 11 (GCSE years). The trial protocol therefore referred to a sample of 'secondary GCSE' pupils. In reality, Pearson did end up tutoring a small number of pupils in Years 7, 8, and 9 (approximately 12% of the trial sample). These pupils were included in the analysis.

Outcome measures—primary outcome

In the trial protocol, the terms 'sessions scheduled' and 'sessions bought' were used interchangeably as at the time of writing both EEF and Pearson expected that all sessions bought would have been scheduled. However, the implementation and delivery of the programme was more complicated than originally envisaged (for example, due to summer delivery of tutoring or the need to shorten some blocks for some pupils). After receiving the data, Bramble informed BIT that in some cases the number of sessions scheduled was fewer than the number of sessions bought but that, crucially, the data did not allow BIT to know the exact number of sessions scheduled. This could have been for several reasons, including the block being shortened or sessions being transferred to another pupil. Hence BIT and the EEF agreed to use the number of sessions bought as the denominator to compute attendance. This is consistent with the ITT nature of the analysis and with how outcomes are defined in the other two National Tutoring Programme nimble trials conducted by BIT.

Outcome measures—exploratory outcome

In the trial protocol, the exploratory outcome was defined as 'tutor's average rating of engagement over the tutoring sessions scheduled for a pupil'. In this calculation, engagement for sessions not attended was treated as value zero. However, Bramble could only provide BIT with average engagement figures already aggregated at the pupil level. In Bramble's calculation of these averages, engagement for sessions not attended was treated as a missing value. Following the same logic as in the trial protocol, a zero value has been re-imputed for the sessions not attended based on the proportion of sessions completed and the average score reported by Bramble as $[(\text{proportion completed} \times \text{average engagement}) + (\text{proportion non completed} \times 0)]$. Similar to the primary outcome, the number of sessions bought was used as the denominator, hence this outcome is interpreted as the average engagement across sessions originally bought.

Quantitative methods (IPE)

BIT researchers were initially instructed by the delivery partner that average delivery rates, open rates, and click-through rates were not going to be possible to collect. At the analysis stage, the delivery partner was able to provide these. They are included in this report as it was felt that they were useful to understand better the pupil experience of the reminder messages.

Findings

Table 7: Summary of findings

Research question	Finding
Does sending behaviourally-informed reminders to secondary pupils increase their attendance at tutoring sessions?	- Pupils in all three arms in the trial had comparable attendance rates at tutoring sessions, meaning that the behaviourally-informed messages did no better or worse than the control message. - This was true for both the kitchen sink arm (Hedges' $g = 0.01$; 95% CI: -0.06, 0.08) and the catch-up arm (Hedges' $g = 0.03$; 95% CI: -0.05, 0.1).
Does sending behaviourally-informed reminders to secondary pupils on Pupil Premium (PP) increase their attendance at tutoring sessions?	- Pupil Premium pupils in all three arms in the trial had comparable attendance rates at tutoring sessions, meaning that the behaviourally-informed messages did no better or worse than the control message. - This was true for both the kitchen sink arm (Hedges' $g = 0.04$; 95% CI: -0.05, 0.15) and the catch-up arm (Hedges' $g = -0.01$; 95% CI: -0.12, 0.1).
Compliance	Bramble's randomisation and allocation programme was rigorously reviewed and compliance with allocation was determined to be high.
Balance	Based on the balance checks (Table 22) there is no reason to suspect that randomisation failed.
Attrition	Attrition of 17.09% was observed from randomisation to analysis. This was because some pupils were signed up for tutoring and randomised but then did not begin sessions for a variety of reasons. Since pupils and schools did not have any information about the trial arm allocation at that time, this could be understood as unbiased attrition; indeed, the level of attrition across the treatment groups was consistent. This level of attrition is close to the average across EEF trials (EEF, 2021).
Process evaluation: implementation and fidelity	Given the automated nature of the reminder message system, there was a high degree of fidelity to the content and administration of the intervention. Every pupil was sent every reminder message that they should have been.
Process evaluation: outcomes	The proportion of reminder messages opened by pupils was 26%, meaning that a significant number of pupils did not read the body of the reminder. However, pupils not opening the reminder messages may still have read the subject lines, which varied each week for the treatment conditions and did incorporate behavioural insights. Comparison of the average open rates for the reminder messages across the trial conditions suggests that the behaviourally-informed messages were more likely to be opened by pupils (a difference of approximately three percentage points). Pupil feedback forms ($n = 22$) were collected as part of the Implementation and Process Evaluation (IPE). These indicated that, for pupils who did engage with the reminder messages, they thought they were engaging, informative, and useful. The IPE also identified a range of structural barriers that pupils face, all of which likely have a significant negative impact on pupils' attendance at sessions. Specifically, the difficulty of learning online, technical issues, and scheduling challenges were commonly

	identified by pupils. It was therefore unlikely that reminder messages targeting pupil motivation could have overcome such significant structural barriers.
Process evaluation: formative findings	For any tutoring providers seeking to implement reminders, based on the qualitative findings in the IPE, it could be useful to factor in the following principles: 1. Carefully consider the subject line, as this may be the only thing that the majority of pupils read. 2. Ensure messages are as concise as possible. 3. Ensure important information (such as lesson times and links to the tutoring session, if applicable) is easily accessible. 4. Incorporate some specific behavioural insights. Pupils responded particularly positively to the following elements: a. social norms, with pupils suggesting they found it reassuring to be told that they were not alone in receiving tutoring; and b. catch-up framing, with pupils noting that they found the highlighting of the amount of school they had missed to be motivating. 5. Make the messages visually attractive, perhaps with the use of colour.

Attrition

As reported in the Sample Size section, the analytical sample includes 920 pupils fewer than the total number of pupils randomised; this is because randomisation happened as schools registered pupils for tutoring sessions with Pearson. However, a minority of schools did not complete the steps needed to confirm and book pupils' tutoring blocks for some pupils. For this reason, there is an attrition of 17.09% from randomisation to analysis, which is close to average for EEF trials (EEF, 2021). Schools, teachers, and pupils were unaware of their randomisation allocation (whether pupils had been assigned to behavioural insights (BI) kitchen sink, catch-up, or control group) before pupils received their first session invite. Hence, attrition can be considered to happen completely at random. To further corroborate this, attrition is very similar across the three groups (less than a percentage point difference).

There were no missing values for the primary outcome (attendance rate). However, there were 372 cases of missing data for the pupil engagement outcome. Differently to attendance, engagement was not automatically recorded by the platform: it was assessed by tutors. Reporting this rating was not compulsory, however Pearson's online portal for the tutor nudged tutors to complete this rating at the end of each lesson, and tutors were reminded in their portal to complete it if they did not fill it in immediately. Missing engagement was not found to be predicted by treatment assignment. As a result, these pupils were excluded from the exploratory analysis (but not from the primary and secondary analyses).

Table 8 provides further detail on the level of attrition in the trial and the Consort Flow Chart (Figure 2) gives a graphical representation of attrition throughout the trial.

Table 8: Attrition from the trial (primary outcome)

		BI kitchen sink	Catch-up	Control	Total
Number of students	Randomised	1,819	1,809	1,755	5,383
	Analysed	1,506	1,498	1,459	4,463
Student attrition (from randomisation to analysis)	Number	313	311	296	920
	Percentage	17.21%	17.19%	16.87%	17.09%

Participant characteristics

Table 9 provides a cross-tabulation for all covariates included in the analysis (all categorical variables) across control and treatment groups. The absolute difference in proportions across arms is always negligible. Therefore, the randomisation is considered to be well-balanced and successful.

Table 9: Balance check

	BI kitchen sink	Catch-up	Control	Total
% in Year 10	76.2%	76.0%	76.8%	76.3%
% PP	42.5%	43.0%	44.9%	43.5%
Maths main subject of tutoring	44.6%	46.7%	46.5%	45.9%
English main subject of tutoring	37.8%	36.7%	36.7%	36.9%
Science main subject of tutoring	17.7%	17.0%	16.8%	17.2%
% of pupils that began to attend sessions in:				
Fortnight 1	10.2%	11.1%	10.6%	10.6%
Fortnight 2	8.4%	7.4%	6.6%	7.5%
Fortnight 3	7.8%	8.2%	7.8%	7.9%
Fortnight 4	17.4%	16.6%	18.1%	17.3%
Fortnight 5	9.4%	10.8%	9.9%	10.0%
Fortnight 6	12.6%	10.8%	12.1%	11.8%

Fortnight 7	16.2%	17.4%	18.4%	17.3%
Fortnight 8	4.3%	5.2%	4.9%	4.8%
Fortnight 9	4.5%	3.6%	2.5%	3.6%
Fortnight 10	8.7%	8.5%	8.5%	8.6%
Fortnight 11	0.4%	0.5%	0.5%	0.4%

Outcomes and analysis

The results of the primary, secondary, and exploratory analyses are presented in Table 10 and Figure 3. The full regression tables can be found in Appendix E. The row numbers below refer to Table 10.

Primary analysis (row 1)

The raw attendance rate for the full analytical sample was 49.17% (SD 28.64). For the BI kitchen sink treatment group it was 49.06% (SD 28.71), for the catch-up group it was 49.63% (SD 28.46), and for the control group it was 48.81% (SD 28.76). Compared to the control group, the pre-specified model found a difference of 0.25 percentage points (95% CI: -1.79pp, 2.28pp; Hedges' $g = 0.01$) for the BI kitchen sink treatment arm and of 0.72 percentage points (95% CI: -1.30pp, 2.75pp; Hedges' $g = 0.03$) for the catch-up reminder arm, which are not statistically significant at conventional significance levels. *This means there was no evidence that the treatment messages performed better than the control message in terms of impacting pupil attendance.*

On average, pupils attended slightly less than half of the sessions originally bought by the schools. This may have been for a variety of reasons, ranging from a possible TP effect (different TPs have different attendance rates) to schools re-assigning some tutoring sessions to other pupils. Attendance was 3.58 percentage points lower among pupils who started their sessions earlier in the year than for students involved in the summer delivery (46.68% for pupils randomised in the trial in March/April versus 50.26% for pupils randomised in the trial in June/July).

Secondary analysis (row 2)

The secondary analysis focuses on the tutoring attendance rate for the PP subgroup. The raw attendance rate for PP pupils is similar to the overall average at 50.07% (BI kitchen sink: 51.08%; catch-up: 49.46%; control group: 49.68%), but not statistically different to the ones of non-PP students at conventional significance levels (see Table 8).

Compared to the control group, the pre-specified model finds a difference of 1.08 percentage points (95% CI: -1.89pp, 4.06pp; Hedges' $g = 0.04$) for the BI kitchen sink treatment arm and of -0.33 percentage points (95% CI: -3.37pp, 2.72pp; Hedges' $g = -0.01$) for the catch-up reminder treatment arm, which are not statistically significant at conventional significance levels. *This means there was no evidence that the treatment messages performed better than the control message in terms of impacting pupil attendance for PP students.*

Exploratory analysis (rows 3 and 4)

The exploratory analysis studied the effect of the treatment emails on a measure of engagement, namely the tutor's average rating of pupil engagement across the sessions bought for the pupil. Average engagement ranged between 42.31% and 42.81% across treatment and control groups (row 3, overall mean 42.59% with 26.92% SD). The sessions bought but not attended by a pupil were rated with engagement rate as 0%, so the low raw engagement rating should not be considered surprising as about 50% of sessions were not attended. Across the control and both treatment arms, we imputed a value of zero for all sessions not attended by the student. Prior to this imputation, the mean engagement across all arms was 80.26%.

Compared to the control group, the pre-specified model finds a difference of -0.13 percentage points (95% CI: -2.13pp, 1.87pp; Hedges' $g = -0.005$) for the BI kitchen sink treatment arm and of -0.56 percentage points (95%

CI: -2.55pp, 1.43pp; Hedges' $g = -0.02$) for the catch-up reminder arm, which are not statistically significant at conventional significance levels. *This means there was no evidence that the treatment messages performed better than the control message in terms of impacting overall pupil engagement.*

Among PP students, average engagement rates are slightly higher than the overall average, ranging from 42.26% to 43.41% (hence about half percentage point higher, see row 4). Nevertheless, the tutors' average rating of pupil engagement across the sessions bought for the student is not significantly different across PP and non-PP students at conventional significance levels .

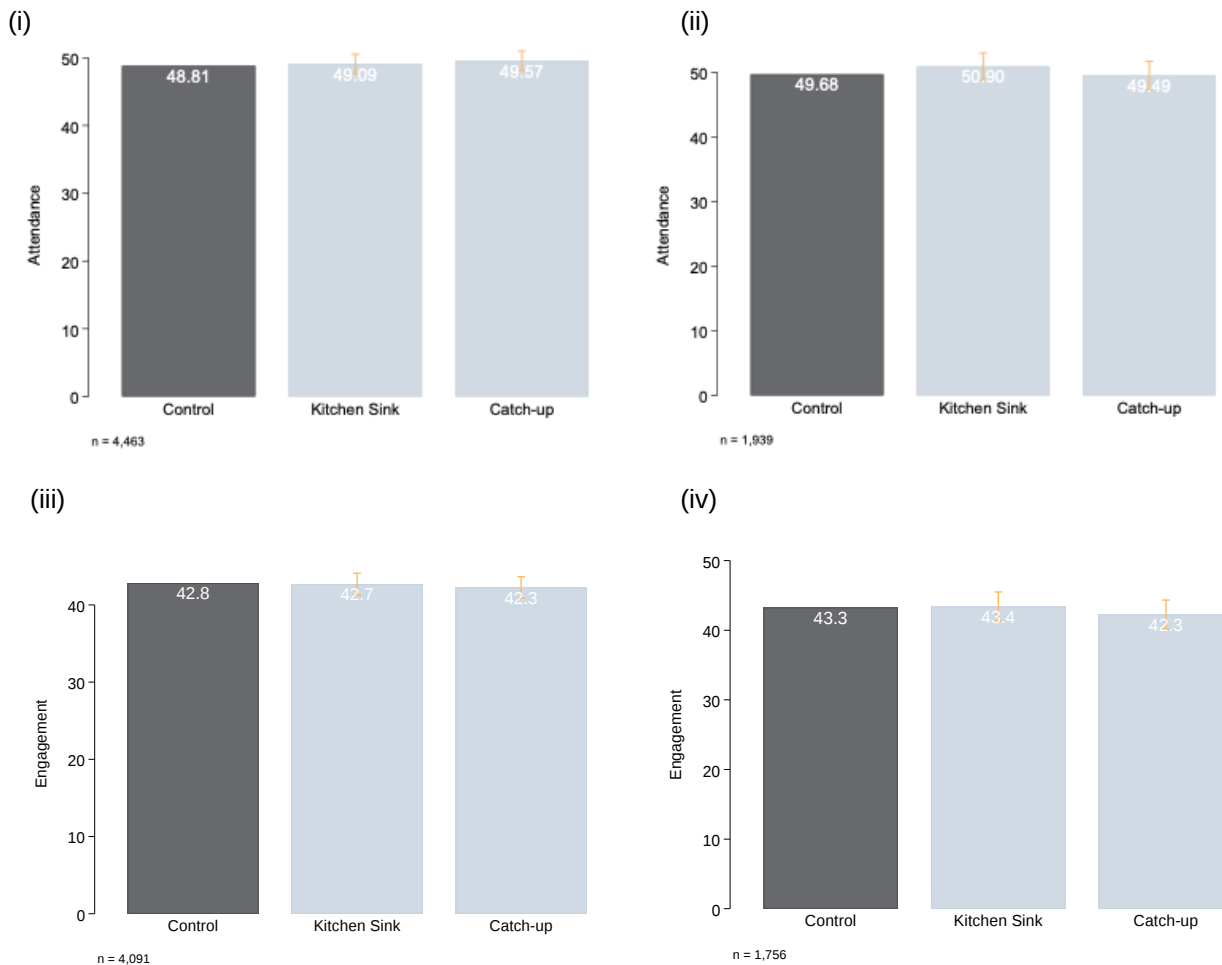
Compared to the control group, the pre-specified model finds a difference of 0.04 percentage points (95% CI: -2.91pp, 2.98pp; Hedges' $g = 0.001$) for the BI kitchen sink arm and of -1.21 percentage points (95% CI: -4.06pp, 1.82pp; Hedges' $g = -0.04$) for the catch-up reminder arm, which are not statistically significant at conventional significance levels. *This means there was no evidence that the treatment messages performed better than the control message in terms of impacting pupil engagement for PP students.*

Table 10: Primary, secondary and exploratory analysis

Outcome	Unadjusted means						Effect size	
	BI kitchen sink		Catch-up		Control group			
	n (missing)	Mean (95% CI)	n (missing)	Mean (95% CI)	n (missing)	Mean (95% CI)	Hedges' g (95% CI)	p-value (adjusted for multiple comparisons)
(1) Primary: attendance n=4,463	1,506 (0)	49.06% (47.61%, 50.51%)	1,498 (0)	49.63% (48.19%, 51.07%)	1,459 (0)	48.81% (47.34%, 50.29%)	Kitchen sink: 0.01 (-0.06, 0.08) Catch-up: 0.03 (-0.05, 0.1)	Kitchen sink: p=1 Catch-up: p=1
(2) Secondary: PP attendance n=1,939	640 (0)	51.08% (48.96%, 53.25%)	644 (0)	49.46% (47.31%, 51.62%)	655 (0)	49.68% (47.54%, 51.82%)	Kitchen sink: 0.04 (-0.05, 0.15) Catch-up: -0.01 (- 0.12 .0.1)	Kitchen sink: p=1 Catch-up: p=1
(3) Exploratory: engagement n=4,019	1,394 (112)	42.66% (41.25%, 44.07%)	1,367 (131)	42.31% (40.88%, 43.74%)	1,330 (129)	42.82% (41.37%, 44.26%)	Kitchen sink: - 0.005 (-0.08, 0.07) Catch-up: -0.02 (- 0.08, 0.07)	Kitchen sink: p=1 Catch-up: p=1
(4) Exploratory: PP engagement n=1,756	588 (52)	43.41% (41.33%, 45.49%)	582 (62)	42.26% (40.17%, 44.34%)	586 (69)	43.38% (41.31%, 45.45%)	Kitchen sink: 0.001 (-0.11, 0.11) Catch-up: -0.04 (- 0.16, 0.07)	Kitchen sink: p=1 Catch-up: p=1

Note: P-values for the treatment variable were adjusted for multiple comparisons using Benjamini-Hochberg correction, whereby the unadjusted p-values were multiplied by the amount of comparisons made and divided by their rank order from smallest to largest. Adjusted p-values >1 were set to equal 1.

Figure 3: Bar graphs for treatment effects for (i) primary, (ii) secondary, and (iii, iv) exploratory outcomes



** $p < 0.01$; * $p < 0.05$.

Key takeaways from IPE

- The average delivery rate was 99%, indicating that almost all messages were successfully delivered.
- The intervention was delivered as intended to all pupils in the treatment groups (that is, they received the right messages at the right time).
- The average email open rate across the trial conditions was 26%, meaning that a significant number of pupils did not read the body of the reminder message. Comparisons of the average open rates for the reminder messages across the trial conditions suggested that the behaviourally-informed messages were more likely to be opened by pupils (a difference of three percentage points).
- The most attractive elements of intervention messages identified by pupils were that they were accessible, informative, and reassuring.
- Pupils also perceived the catch-up framing to be motivating.
- Although the impact evaluation did not find evidence that the treatment messages improved attendance, pupils perceived that the intervention did improve their attendance.
- There do not appear to have been any unintended consequences or negative effects of the intervention.
- During the implementation period, three main necessary conditions for the success of the intervention were identified: school system compatibility, working technology, and effective scheduling.

- Beyond the reminder emails, pupil attendance was also impacted by session, school, and personal factors.
- Facilitators of attendance included having the necessary and appropriate working technology and a good relationship between the pupil and their tutor.

Implementation

RQ1 (compliance): What proportion of pupils were sent reminders?

A total of 68,919 reminder messages were sent to pupils as part of the trial. Table 11 details the average delivery rates, open rates, and click-through rates to a pupil's tutoring schedule across the treatment conditions.

Table 11: Descriptive statistics on delivery, open, and click rates

	Delivery (%)	Opens (%)	Clicks (%)
BI kitchen sink n = 1,819	98.67%	27.57%	13.45%
Catch-up n = 1,809	98.80%	27.42%	12.75%
Control group n = 1,755	98.93%	24.42%	12.69%

As seen in Table 11, the average delivery rate was 99%, indicating that almost all messages were successfully delivered.

BIT researchers reviewed the randomisation and allocation assignment programme developed by Bramble and were confident that the system would not allow for any movement between treatment arms. As such, the compliance with allocation was determined to be high.

In some cases, school systems may have prevented emails from reaching pupils. Primarily this will have occurred where schools have strict firewalls that block external emails. Bramble took steps to mitigate this, which included asking schools to register pupils on their platform at the outset. Fortunately, this problem was limited with just 1% of messages not being delivered.

RQ2 (fidelity): What proportion of pupils were sent the correct reminder and were the reminders sent in their intended format?

The intervention was delivered as intended to all pupils in the treatment groups. Bramble had a strong understanding of what was being tested and its role within the trial. The reminders were sent automatically to pupils and this system was reported to have worked.

Tutors rescheduled sessions for a number of reasons throughout the programme. Bramble highlighted that sessions were rescheduled manually by tutors and, if this process was done correctly and in due time, its automated email system would reflect the updated session time and the reminder emails would be sent automatically to pupils with the new session date and time.

Bramble acknowledged that there may have been instances where tutors did not manually update the session date and time or did so late and in these instances, pupils would not have received a reminder email for their session. Bramble also highlighted that, if the session was rearranged after the original reminder message was

sent (the morning of the day before the session), pupils would then receive the same reminder message again but with the new session date and time.

No adaptations were made to the email reminders. Adaptations to delivery caused by rescheduling would not be considered helpful and, therefore, message scheduling would not be considered as adaptable.

RQ3 (dosage): How many reminders were sent to each pupil and, of those sent, how many emails were opened by pupils?

An average of 12.8 reminders were sent to each pupil.¹³ As seen in Table 9, the average open rate across the trial conditions was 26%, meaning that a significant number of pupils did not read the body of the reminder message, however, pupils not opening the message may still have read the subject lines, which varied each week for the treatment conditions and did incorporate behavioural insights. Comparisons of the average open rates for the reminder messages across the trial conditions suggested that the behaviourally-informed messages were about three percentage points more likely to be opened.

RQ4a (quality): How did pupils experience the reminders? What are the perceived outcomes?

The main perceived outcome of the intervention was that it improved attendance. Pupils receiving the BI kitchen sink and catch-up messages perceived that the reminder emails helped them to attend sessions. However, pupils did report receiving a variety of reminders from other sources such as friends, teachers, parents, using self-set reminders (for example, phone reminders—though it should be noted that one of the kitchen sink intervention messages suggested that pupils do this), and also from their environment: typically this was the school environment where the pupil was in school and had a tutoring session taking place in school.

Pupils in the treatment groups (BI kitchen sink and catch-up) also gave more positive feedback about the usefulness of the messages than those in the control group. Pupils commented that the concise format meant that they were easy to read when a pupil was quickly scanning through their emails. Bramble, the online tutoring platform used by Pearson, also responded positively to the intervention materials, perceiving them to be 'richer' than the business as usual reminder emails sent to pupils:

'I think the content in the emails looked good. It's certainly much richer than the initial reminders we were sending out' (Bramble).

While feedback on the intervention from stakeholders was largely positive, some pupils receiving the BI kitchen sink or catch-up messages indicated that the reminder emails could be further improved with formatting changes, such as adding colour.

The most attractive elements of intervention messages identified by pupils were that they were accessible, informative, and reassuring. The inclusion of a hyperlink in the reminder messages (also present for the control group) was appreciated by pupils who noted that this made it easy for them to access their online sessions quickly:

'The hyperlink to go straight to the Pearson website is always convenient as it means I don't have to search Google for it, thus saving valuable time' (pupil).

In addition to finding the messages accessible, pupils receiving intervention messages reported finding them informative and helpful; in particular, they appreciated the fact that the messages clearly displayed the date and time of upcoming sessions so that they could plan to attend their tutoring session.

Pupils also reported being reassured by the content of the intervention messages. Pupils receiving the BI kitchen sink set of messages identified the social norms message as being particularly reassuring as it gave them a sense that they were not alone in receiving tutoring:

'I like the thought of inclusion with the amount of students involved showing they're not alone' (pupil).

¹³ This is calculated by dividing the total number of reminders sent by the total number of pupils randomised into the trial.

Another perceived outcome of the intervention was that pupils receiving the messages with catch-up framing found these to be motivating. Pupils appeared to appreciate the honesty of the message and the emphasis it gave to tutoring as an opportunity for them to catch-up:

'It makes me aware of how much learning I have missed out on due to isolation and other factors. This allows me to catch up and therefore work well in my final exams in year 11' (pupil).

During the period of intervention development there was debate within the education community about whether making pupils aware of their missed learning and need to catch-up would cause stress and anxiety or whether this could instead be a motivating factor for pupils. During the development of these intervention messages, BIT and EEF carefully considered the potential for the messages to cause distress to pupils, and an interim analysis was performed to check for a backfire effect (no backfire was observed). Contrary to these concerns, feedback from pupils instead indicated that the catch-up messages were appreciated by pupils, who stated that they helped give them a sense that tutoring providers understood the position they were in and the help that they needed:

'It's nice to know Bramble knows the situation we're in with our learning' (catch-up) (pupil).

There do not appear to have been any unintended consequences or negative effects from the intervention. When developing the catch-up messages, there had been some concern that pupils could have found these messages upsetting. Pupil feedback indicates that this was not the case and that instead pupils found the catch-up messaging motivating. One pupil in the catch-up intervention group did mention feeling some anxiety about how much learning they had to catch up on, but this was not explicitly ascribed to the intervention.

RQ4b (quality): What were the barriers and facilitators to pupil engagement?

RQ5 (mechanisms): How did pupils experience the tutoring sessions?

During the implementation period, three main necessary conditions for the success of the intervention were identified: (1) school system compatibility, (2) working technology, and (3) effective scheduling. Where these were not present, they acted as major barriers to delivery being experienced. Barriers to the delivery of the intervention were summarised by Bramble as follows:

'I think, probably, the biggest thing is that [the use of reminders] is probably a small part of what impacted attendance and engagement. Other factors like emails being blocked, teacher organisation, schools being set up technically or not, student access to technology or not: that will have probably been more impactful' (Bramble).

School system compatibility was the first and fundamental necessary condition for the success of the intervention. School systems needed to be able to receive the reminder emails in order to allow pupils to experience the intervention and to allow Bramble's online tutoring platform to be functional in order to allow pupils to attend sessions. Bramble described some variation in how quickly schools could provide the necessary permissions to facilitate tutoring sessions. Where schools were slower to change their own internal systems, pupils' ability to attend sessions would have been impacted:

'Anecdotally we know that schools need to do some work to get their networks set up to use anything external. Some of them are very good at doing that and very quick; others struggle and leave it to the last minute and it has a knock-on effect' (Bramble).

Once school system compatibility was established, **having the necessary and appropriate working technology facilitated attendance at tutoring sessions**. Some pupils reported being motivated to attend their tutoring sessions when their technology was working well. Conversely, issues with technology in some cases prevented pupils from attending sessions. Pupils mentioned having issues with computers, headsets, microphones, online tutoring platforms, and internet access. It is also possible that experiencing problems with technology reduced pupil motivation to attend future tutoring sessions:

'Our school doesn't have particularly great headsets, so often I found that the mic of my headset didn't work meaning I was unable to speak verbally to my tutor on several different occasions' (pupil).

'It didn't work very well, it carried on breaking; for example, it wouldn't let us onto it, we couldn't hear anything, the tutor just simply left' (pupil).

'Sometimes the WiFi is slow or the meeting takes long to open and sometimes I can't hear the teacher and sometimes my pen on the slides doesn't work' (pupil).

For some of the 22 pupils that completed feedback forms, the nature of the online learning environment itself negatively impacted their motivation, and possibly their attendance, at tutoring sessions. These pupils reported finding it difficult to learn virtually in the online learning environment that was available to them during this trial:

'I have struggled with the online learning however excelled in the face to face.'

'It's been ok, it was hard to do online work though.'

'Yes I could never understand online work because I get easily distracted.'

'I find online learning really difficult.'

Where school system compatibility and working technology were both established, **effective scheduling** played a role in facilitating pupil attendance at tutoring sessions. Where this was done well, teachers and tutors scheduled lessons effectively, with plenty of notice of any changes: for example, being aware of holidays and moving the time of a session when there was a known conflict. However, scheduling also acted as a barrier to session delivery in some instances. Scheduling sometimes conflicted with the school day or after-school clubs, which made it difficult or impossible for pupils to attend sessions. Rescheduling sessions at the last-minute also reduced the accuracy of reminders (as these were sent the day before a pupil had a tutoring session). One pupil also described how additional COVID-19 compliance activities impacted their ability to attend their tutoring sessions:

'Making sure the classrooms are clean made us start later and having a long day at school made me tired and want to go home' (pupil).

Beyond the reminder emails, pupil attendance was also impacted by session, school, and personal factors. Pupils were broadly positive about their tutoring experiences, with some perceiving that tutoring sessions were helping their learning as they allowed them to explore topics in more detail. Pupils also referenced the small-group nature of tutoring as being an enabling factor for their learning, helping them to focus. One pupil did feel that some sessions lacked quality when they repeated content pupils had covered in school, or repeated content to allow pupils that had not completed online work to catch-up.

'Very repetitive, we did stuff online which we'd already done in previous school time, but then we'd repeat it again in person for the pupils who didn't do online work. I thought this was unfair to those who did do the online work and wanted to move on with the content' (pupil).

Attendance was facilitated where there was a good relationship between a pupil and their tutor.¹⁴ Pupils described how having an 'amazing' tutor made them 'want to come [to tutoring]'. Pupils described being intrinsically motivated to attend tutoring sessions as they knew it would benefit them in the long run. However, the small group nature of tutoring also acted as a barrier for some pupils who said that they would feel 'ashamed' if they got a question wrong. The unique circumstances of the previous year were also mentioned by a pupil who reported that their motivation to attend tutoring decreased when they had to isolate due to COVID-19.

Formative findings

This section draws out the formative findings about how the intervention could be improved.

Pupils were largely positive about the behaviourally-informed interventions but did identify three main ways in which they felt the content of the reminder messages could be improved. Firstly, pupils in both treatment groups suggested that reminders could include information about the topics that will be covered in the upcoming session. One pupil suggested that reminder messages could also include links to resources that could help pupils improve their understanding and prepare ahead of tutoring sessions:

'Give me websites I could look at to gain a little more knowledge on what I will be working on, so then I get through more of that tutor lesson' (pupil).

¹⁴ Two forthcoming Reach and Engagement Trials evaluated interventions designed to improve the pupil-tutor relationship.

Secondly, pupil feedback included creative ideas for making reminders as engaging as possible. One pupil in the catch-up treatment group suggested incorporating a greater sense of 'social event' to the tutoring sessions by naming the other students that would be attending:

'Possibly mention something like 'Cat and [another student] will be there', so it feels more like a social event with your own peers than a call with a tutor.'

Pupils' desire for more motivational reminders was emphasised by some pupils in the kitchen sink group suggesting that more motivational messages could be included. Pupils suggested highlighting the benefits of attending in terms of grades or using quizzes to demonstrate pupils' progress:

'Percentage of people getting better grades after attending this programme' (pupil).

'I think we could have little quizzes to see if you have gained enough info from the last session, this could last two minutes and even motivate others to join the next session.'

Finally, less related to the written content of the reminders, some pupils felt that making the reminder emails more 'appealing' (for example, through the use of colour or gamification) would make other pupils more likely to attend their tutoring sessions.

Control group activity

Pupils in the control group received Bramble's 'business as usual' reminder message at 8 a.m. the day before the session, which included a link to their schedule and their online learning environment. This is what was intended and we do not think there was any compensatory behaviour in the control group. Control group pupils' feedback forms highlighted the helpfulness of reminders, but did include suggestions for more motivational messages. Pupils suggested that the reminder messages could:

1. highlight the consequences of not attending tutoring: 'I'd probably attend if I was threatened';
2. include the time of the tutoring session (this was done for the treatment messages); and
3. be sent at more timely moments: 'maybe do it the morning of the session'.

Conclusion

Pupils in all three arms in the trial had comparable attendance rates at tutoring sessions, meaning that the behaviourally-informed messages did no better or worse than the control message. Findings from the IPE indicated that pupils thought the intervention messages were engaging, informative, and useful, particularly highlighting that the messages were accessible, informative, and reassuring.

Interpretation

This trial did not find any evidence that behaviourally-informed reminder messages made any significant impact on pupil attendance rates at tutoring sessions when compared to the standard messages. The trial also found no evidence that the reminder messages made any significant impact on pupils' levels of engagement during the sessions.

It is important to note that the intervention was testing the impact of the specific wording of the reminder rather than the effectiveness of sending a reminder message as opposed to no message. In the trial, all three groups received reminders that included a link to their session. As such, it is difficult to say how the impact of these reminders compared to receiving no reminders at all. Given the findings from the IPE, it is possible that the reminders in all three groups went some way to overcoming some of the barriers to attendance but that the use of behavioural insights did not provide a marginal gain in this circumstance. Acknowledging the open rates (average 26% across trial arms), and that it is not possible to know whether pupils read the subject lines or not, it is possible that the intervention messages could have been effective had more pupils read them in full.

However, while the overall findings were that the intervention had no differential impact relative to the control messages, the IPE did find evidence that pupils found the intervention messages to be high quality and of use—although it should be noted that the IPE may have attracted more engaged pupils who found the messages to be useful; mixed feedback and suggestions for improvement were also received, suggesting some balance in their experience of the intervention. Specifically, pupils noted that the messages were particularly informative by clearly displaying the date and time of the upcoming sessions, as well as providing a link to their schedule. Pupils in the catch-up arm reported the messages to be motivating, noting that the messages made them mindful of how much learning they had missed and that this encouraged them to try and catch up. This is particularly interesting given broader concerns about the potential negative impact 'catch-up' messaging may have on pupils. Additionally, a number of pupils noted that the intervention messages were reassuring, with the use of social norms giving pupils a sense that they were not alone in receiving tutoring.

While pupils generally responded positively to the intervention, the IPE also identified a range of structural barriers, all of which likely had a greater (negative) impact on pupils' attendance. The first set of barriers identified related to the difficulty some pupils faced learning in an online environment at this time. Some pupils noted that they were easily distracted when learning virtually as opposed to in-person and that it was often hard to engage in the sessions. The second set of barriers related to technical difficulties they faced in accessing the sessions. Some pupils reported that laptops, headsets, microphones, and speakers often failed to work and that schools were unable to provide pupils with adequate hardware in these instances. There were also reports of school servers blocking pupils from accessing the online tutoring platform and that both tutors and pupils struggled with poor internet connections. Understandably, these technical issues made it difficult for pupils to access and fully participate in the sessions. The third set of barriers commonly identified related to scheduling, with sessions often clashing with pre-existing school and after-school commitments. In some cases, pupils reported that policies developed in response to COVID-19 had changed the timings of the school day, making it impossible for them to attend their scheduled sessions. It was, therefore, unlikely that an intervention targeting pupil motivation would be able to overcome these structural barriers to attendance.

The evidence from the trial has also revealed some of the broader challenges encountered in the roll-out of the National Tutoring Programme. From the data gathered in this trial, the average attendance rate across the three treatment arms was approximately 49%, considerably lower than expected. While this attendance rate is likely an

underestimate,¹⁵ it still highlights the challenges faced by tutoring providers, schools, and tutors in ensuring that pupils attended the sessions that had been bought for them.

Limitations

In response to the challenges related to school closures, the NTP allowed schools to buy and book shorter blocks of a minimum ten hours or to transfer hours to another pupil in a number of accepted circumstances. In practice, this meant that some sessions bought for a particular pupil were not assigned to that same pupil. In the analysis, the attendance rate was computed with the number of sessions initially bought for that pupil by the school as the denominator, rather than the number of sessions that were actually assigned to them. This outcome measure was a 'clean' measure of attendance and it is in line with the ITT analysis pre-specified, but it may be an underestimate of the true attendance rate (computed as the number of sessions attended over the number of sessions that were *scheduled* for the pupil).

The results indicate that for a single tutoring provider in their first year of the NTP, behaviourally-informed reminder emails had no additional impact on pupil attendance or engagement compared to a 'business as usual' reminder email. This is informative for Pearson, which will continue to send reminder emails to pupils this year. Feedback from the IPE suggests that pupils do perceive reminders to be useful and did appreciate some elements of the behaviourally-informed reminder emails.

Feedback from the IPE suggests that other tutoring providers should consider sending email reminders if not doing so already and that the inclusion of behaviourally-informed elements in such emails would be beneficial.

Recommendations

It is important to emphasise that this trial was testing the impact of varying the specific wording of a pre-existing reminder message, not the impact of receiving a reminder message in general. As noted, pupils responded positively across all three trial arms to receiving a reminder message, highlighting that it reminded them that the session was still on and provided useful information such as a link to their schedule. Given this, and the volume of evidence from other contexts suggesting that reminders are a powerful way to influence behaviour, tutoring providers may still find it beneficial to explore the feasibility of sending reminders to pupils if they do not currently do so.

For any tutoring providers seeking to implement reminders, based on the qualitative findings in the IPE, it could be useful to factor in the following principles:

1. Carefully consider the subject line as this may be the only thing that the majority of pupils read.
2. Ensure messages are as concise as possible.
3. Ensure important information—such as lesson times and links to the tutoring session, if applicable—is easily accessible.
4. Incorporate some specific behavioural insights. Pupils responded particularly positively to the following elements:
 - a. social norms, with pupils suggesting they found it reassuring to be told that they were not alone in receiving tutoring; and
 - b. catch-up framing, with pupils noting that they found the highlighting of the amount of school they had missed to be motivating.
5. Make the messages visually attractive, perhaps with the use of colour.

¹⁵ This figure is calculated by dividing the number of sessions attended by a pupil by the number of sessions bought for a pupil. However, in some cases, schools transferred the remaining sessions of a block away from the pupil they had been bought for.

6. Include information about the topics which will be covered in the tutoring session (although BIT's experience suggests that this may be logistically challenging for tutoring providers to deliver) and/or links to useful resources.

Future research and publications

Given the slight difference in open rates between the treatment arms, it may be possible to explore this in more detail. For example, a CACE analysis would be able to determine whether the behaviourally-informed subject lines did affect the likelihood of the emails to be opened.

Future research in this area would benefit from using an outcome measure defined differently to the one used in this trial. Attendance at tutoring sessions is a good (and practical) outcome measure for pupil engagement in tutoring sessions, however, collecting data on the number of sessions scheduled (on top of the number of sessions bought) for a pupil would give a more accurate measure of pupils' behaviour in the flexible and ever-changing context of tutoring delivery. This is because ideally what the trial would like to measure is how many sessions a pupil attended compared to how many they were supposed to attend,¹⁶ rather than the current comparison which is compared to the maximum number of sessions they could have attended (number of sessions the school bought for them).¹⁷

Alternative measures of pupil engagement could also be explored, for example, the (automated) count of number of words said by a pupil during a tutoring class or for how long a pupil looks directly at the screen as a measure of attention and relationship building (Jongerius, 2020).

It is also possible that emails to school accounts are not the ideal communication channel for pupils of this age. Future research could test this hypothesis, exploring whether reminders are more or less effective when sent through other channels (such as SMS or to personal email accounts).

Work by BIT and others has suggested that interventions designed to engage parents can be effective in improving pupil outcomes (Miller et al., 2017). Some pupils stated that their parents are already one of the channels through which they are reminded that they have a tutoring session. Future research could explore whether engaging parents in their child's tutoring (for example, by sending them text messages updating them on their child's progress and informing them when their child has an upcoming tutoring session) is an effective strategy for improving pupil attendance, engagement, and achievement.

¹⁶ A crucial assumption underpinning this suggestion is that the number of sessions that pupils are supposed to attend is not influenced by the treatment assignment.

¹⁷ For example, if for reasons that do not depend on the trial, a school bought 15 sessions for a student but only ten were delivered to them, ideally we would like to measure attendance as the number of sessions attended divided by ten instead of the number of sessions attended divided by 15.

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Appendix A: Intervention materials

Intervention messages

Arm		Arm 1: Control / Business as usual	Arm 2: BI 'kitchen sink'	Arm 3: Catch-up
1	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], your first tutoring session is at [time] tomorrow	[pupil name], your tutoring sessions to help you catch up start at [time] tomorrow
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	[pupil name], your first tutoring session is tomorrow. Put a reminder in your phone now so you don't forget! Click below to see your schedule and join the session at [time] tomorrow.	[pupil name], you've missed out on months of in-person lessons, but your school have set you up with 15 tutoring sessions to help you catch up. Click below to see your schedule and join the session at [time] tomorrow.
2	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], your second tutoring session at [time] tomorrow	[pupil name], you're on your way to catching up! Next tutoring session is [time] tomorrow
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	Hi [pupil name]. You are one of 250,000 pupils benefitting from having a tutor like [tutor name] this year - make the most of it! Click below to see your schedule and join the session at [time] tomorrow.	Hi [pupil name]. You are one of 250,000 pupils catching up with a tutor like [tutor name] this year - make the most of it! Click below to see your schedule and join the session at [time] tomorrow.
3	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], your tutoring place is booked for [time] tomorrow	[pupil name], your tutoring place is booked for [time] tomorrow
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow.	[pupil name], [tutor name] can help you with the topics you find tricky. Write down at least one question you have for [tutor name] tomorrow.	[pupil name], [tutor name] can help you with the topics you didn't get the chance to cover in-person in school.

		Click below to see your schedule and join the session tomorrow.	Click below to see your schedule and join the session at [time] tomorrow.	Click below to see your schedule and join the session at [time] tomorrow.
4	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], be sure to attend your tutoring session at [time] tomorrow	[pupil name], don't miss your tutoring session at [time] tomorrow
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	Tutoring sessions can help you get the grades you need for your next step. Click below to see your schedule and join the session at [time] tomorrow.	Tutoring sessions can help you catch up and get the grades you need for your next step. Click below to see your schedule and join the session at [time] tomorrow.
5	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], most pupils attend their tutoring sessions	Your tutor, [tutor name], is expecting you at [time] tomorrow
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	[pupil name], can you set a goal to attend every remaining session? Click below to see your schedule and join the session at [time] tomorrow.	[pupil name], your tutor [tutor name] is working hard to prepare each tutoring session for you. Don't miss out on a single session. Click below to see your schedule and join the session at [time] tomorrow.
6	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], make sure you attend your tutoring session tomorrow at [time]	[pupil name], a tip for your tutoring session tomorrow at [time]
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow.	Hi [pupil name], I had tutoring sessions a couple of years ago and found them really helpful. Make sure you attend on time each week. - Alex	[pupil name], have you looked at what you learnt last week yet? You'll catch up faster if you look over your notes before each session.

		Click below to see your schedule and join the session tomorrow.	Click below to see your schedule and join the session at [time] tomorrow.	Click below to see your schedule and join the session at [time] tomorrow.
7	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], [tutor name] has prepared another tutoring session for you tomorrow	[pupil name], [tutor name] has prepared another tutoring session for you tomorrow
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	[tutor name] is putting a lot of work into your sessions. Make the most of it by reviewing last week's work and being on time and ready to learn. Click below to see your schedule and join the session at [time] tomorrow.	[pupil name], your tutor, [tutor name], has prepared a lesson on the topics you find tricky. Don't waste the opportunity to fill any gaps in your understanding - be there on time and ready to learn. Click below to see your schedule and join the session at [time] tomorrow.
8	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], ready for [tutor name]'s tutoring session at [time] tomorrow?	[pupil name], ready for [tutor name]'s tutoring session at [time] tomorrow?
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	[pupil name], did [tutor name] set homework last week? If they did, have a go - you can ask [tutor name] about anything you're stuck on tomorrow. Click below to see your schedule and join the session at [time] tomorrow.	[pupil name], did [tutor name] set homework last week? Have a go - giving it a try will help you catch up. Click below to see your schedule and join the session at [time] tomorrow.
9	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name] - join your tutoring session at [time] tomorrow. You're half way through!	[pupil name] - join your tutoring session at [time] tomorrow. You're half way through!
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow.	[pupil name], learning can feel hard, but with practice and support you can always improve. Remember, [tutor name] is there to help you with tricky topics.	[pupil name], learning can feel hard and you've missed out on a lot of in-person teaching this year. With practice and support you can always improve and [tutor name] is there to help you.

		Click below to see your schedule and join the session tomorrow.	Click below to see your schedule and join the session at [time] tomorrow.	Click below to see your schedule and join the session at [time] tomorrow.
10		Reminder: you have a tutoring session tomorrow	Your tutor, [tutor name], is expecting you at [time] tomorrow	Your tutor, [tutor name], is expecting you at [time] tomorrow
		Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	[pupil name], is there something you found tricky this week? Ask [tutor name] about it tomorrow. Click below to see your schedule and join the session at [time] tomorrow.	[pupil name], is there something you could use help catching up on? Ask [tutor name] about it tomorrow. Click below to see your schedule and join the session at [time] tomorrow.
11	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], 5 tutoring sessions left - be sure to attend tomorrow at [time]	[pupil name], 5 tutoring sessions left - don't miss it tomorrow at [time]
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	[pupil name], only 5 sessions left. One session can make a big difference so be sure to attend each one! Click below to see your schedule and join the session at [time] tomorrow.	[pupil name], only 5 sessions left. Missing just one session could make a big difference, so make sure you're there on time. Click below to see your schedule and join the session at [time] tomorrow.
12	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], you've got a tutoring session tomorrow at [time]: be there	[pupil name], you've got a tutoring session tomorrow at [time]: be there
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow.	[pupil name], Maths, English, and Science GCSEs are important no matter your future plans. Tutoring sessions can give you a boost.	[pupil name], Maths, English, and Science GCSEs are important no matter your future plans. Tutoring sessions can help you catch up in your core subjects.

		Click below to see your schedule and join the session tomorrow.	Click below to see your schedule and join the session at [time] tomorrow.	Click below to see your schedule and join the session at [time] tomorrow.
13	Subject Line	Reminder: you have a tutoring session tomorrow	Your tutor [tutor name] is there to help you at [time] tomorrow	Your tutor [tutor name] is there to help you at [time] tomorrow
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	[pupil name], take a minute to think about how much you've learnt in these sessions. Click below to see your schedule and join the session at [time] tomorrow.	[pupil name], take a minute to think about how much you've caught up by attending these sessions. Click below to see your schedule and join the session at [time] tomorrow.
14	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], it's the final countdown! Be at your tutoring session at [time] tomorrow	[pupil name], it's the final countdown! Be at your tutoring session at [time] tomorrow
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow. Click below to see your schedule and join the session tomorrow.	13 down, 2 to go. Click below to see your schedule and join the session at [time] tomorrow.	13 down, 2 to go. Make the most of these last two opportunities to work with your tutor on the topics you want help with. Click below to see your schedule and join the session at [time] tomorrow.
15	Subject Line	Reminder: you have a tutoring session tomorrow	[pupil name], join your final tutoring session at [time] tomorrow!	[pupil name], join your final tutoring session at [time] tomorrow!
	Body	Hi [pupil name], This is just a quick reminder that you have a tutoring session tomorrow.	[pupil name], last session tomorrow! If you've found these sessions helpful, remember to say thanks to [tutor name]. Click below to see your schedule and join the session at [time] tomorrow.	[pupil name], last session tomorrow! If you've found these sessions helpful, remember to say thanks to [tutor name] for helping you catch up.

		Click below to see your schedule and join the session tomorrow.		Click below to see your schedule and join the session at [time] tomorrow.
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Illustration of control condition

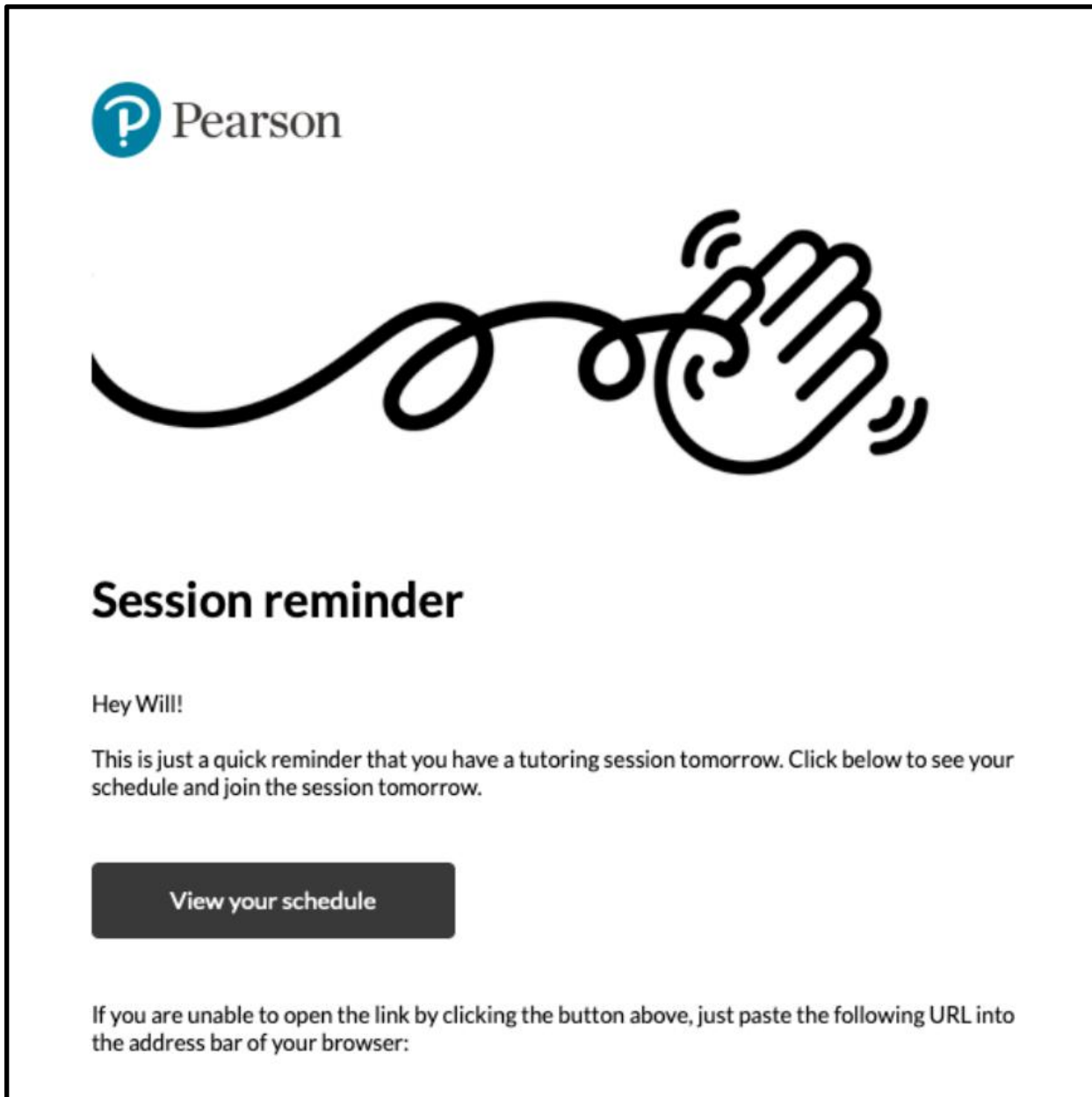


Illustration of treatment conditions





Will, learning can feel hard and you've missed out on a lot of in-person teaching this year. With practice and support you can always improve and Cat is there to help you.

Click below to see your schedule and join the session at 15:15 tomorrow.

[View your schedule](#)

If you are unable to open the link by clicking the button above, just paste the following URL into the address bar of your browser:

<https://my.ftt.io/schedules>

Appendix B: Ethical review

All BIT trials need to have been through BIT's internal research ethics process. This trial was assessed as being Low Risk. On all dimensions barring two, the trial was determined to have minimal ethical risks. This is a light-touch intervention that was delivered within an existing reminder email practice, in an existing tutoring context, with no personal data being collected on pupils.

The first dimension in which the risk was identified as not Low is linked to the age and setting of the participants. Pupils involved in the trial may receive the intervention messages whilst at home and not in a formal setting (such as a school). However, the messages were embedded in a routine reminder email, and we believed there were minimal ethical concerns to pupils receiving this. The messages themselves were rigorously internally reviewed to ensure that they did not contain any potentially sensitive phrasing that could cause harm or upset to the recipients.

The second dimension in which the risk was identified as not Low relates to the nature of the data being collected. No personal data was collected on pupils involved in the Impact Evaluation, and no personal data was collected on pupils involved in the IPE (the level of questioning in the feedback forms did not lead to identification of pupils). However, personal, individual-level data was collected for 1 employee from Bramble that was involved in the delivery of the intervention - this was for the purpose of conducting interviews as part of the IPE. All personal, individual-level data collected was treated with the strictest confidence by BIT, unless safeguarding or whistleblowing concerns were raised during the interview and required disclosure in line with any applicable laws and procedures on data protection and safeguarding that BIT must comply with. Reporting outputs contained anonymised quotes and case examples which can not be traced back to specific individuals. BIT has implemented appropriate measures to ensure secure storage and handling of Personal Data, including obtaining a Cyber Essentials Plus certification and developing a comprehensive Data Handling Protocol. We are registered with the UK ICO under the terms of the Data Protection Act 2018. We are confident that our processes ensured that the interviewee's employer will not be able to link our findings to a particular employee.

The following table highlights in orange where the trial fell in terms of risk for different dimensions:

Table B.1

Dimension	Low risk	Medium risk	High risk
Research methods	Standard research methods commonly applied within the substantive area of the research.	Standard research methods that may not have been applied within a particular substance area and that may prove controversial or be sensitive.	Non-standard research methods that may be highly controversial or sensitive.
Participants	Non-vulnerable adults (i.e. 18 years+ in England & Wales or as stated in applicable national legislation).	Children without vulnerable characteristics in a regular setting (school/youth club).	Individuals from vulnerable groups (e.g. refugees) or are children outside regular settings or do not have legal capacity within the meaning of the Mental Capacity Act 2005 or relevant national legislation.

			(NB: any research with the latter group requires approval via an additional legally mandated process.)
Subject matter	Research relates to a politically and socially uncontroversial area, such as recycling.	Research relates to an issue of some contention but is relatively light-touch	Research relates to a highly-contentious, potentially currently debated or partisan issue
Nature of data	Aggregate anonymous data or data on non-contentious topics (e.g. recycling behaviour) or routinely collected admin data.	Individual-level data not routinely collected.	Individual-level, highly sensitive or special category data routinely or not routinely collected. Also, criminal offence data
Legal exposure	The legal framework in which we are operating is clear. If the project is in a foreign country: we have worked in this country and a similar context before and know the legal requirements.	The legal situation with respect to any aspect (data collection, participant group, intervention) is unclear.	The legal situation with respect to any aspect (data collection, participant group, intervention) is controversial or problematic.
Unknown unknowns	BIT has run a similar project in this domain before	BIT has some experience in the domain, but certain aspects of the project are new to BIT.	BIT has no prior experience in this policy domain.

This trial did not alert participants to the fact that they were taking part in a trial. All participating pupils agreed to an initial Privacy Notice covering the NTP that referenced their possible involvement in Reach & Engagement RCTs. Pupils in the control group still had access to a BAU reminder message delivered by the Tutoring Provider.

Before launching the trial, BIT registered it at the Open Science Framework (<https://osf.io/xj28y>). BIT will ensure the trial registry will be updated with outcomes at the end of the project.

Appendix C: Data protection

No personal data on pupils was collected as part of this study. For the Impact Evaluation, the rolling randomisation process was completed by Bramble, with no need for BIT to have access to personal data. At the end of the project, Bramble sent an encrypted anonymised dataset to BIT, with the following fields: anonymised pupil ID, PP status (Y/N), year group, RCT allocation (e.g. Arm 1, Arm 2, Arm 3.), date of session, attendance (Y/N), sessions bought, engagement rating, main tutoring subject. For the IPE, Pearson and Bramble led the recruitment of pupils to complete the pupil feedback forms. BIT did not collect personal data in the pupil feedback forms, and the level of questioning in these forms was not sufficient to identify pupils.

As part of the IPE, [personal data](#) was collected for 1 employee at Bramble who was directly involved in the delivery of the intervention. For this employee, we collected their name and email address for the purpose of scheduling the interviews.

Additional data protection information

1. Legal bases for data processing

Our lawful basis for processing personal data was legitimate interests (as per Article 6 (1) (f) of the GDPR) and we considered that participants' interests and fundamental rights did not override those legitimate interests.

It was necessary in BIT's 'legitimate interests' to process the personal data identified above in order to deliver a meaningful RCT that had been commissioned by EEF (commercial interests). The research project fulfilled BIT's core business aims including undertaking research, evaluation and information activities in sectors that will deliver social impact. This project had broader societal benefits: it tested the effectiveness of interventions designed to increase pupils' engagement with the National Tutoring Programme - an initiative designed to help address the adverse consequences of COVID-19-related school closures for children's education, especially disadvantaged children.

2. Our approach to GDPR compliance

BIT minimised the collection of personal data wherever possible in this project. We collected individual-level data on pupils for the impact evaluation. However, we performed a risk assessment analysis and concluded that we did not consider these data to be personal.

We did, however, need to collect personal data from one Tutoring Provider employee involved in the delivery of the intervention as part of the IPE. The staff member was sent an information sheet and a privacy notice prior to the interview, which explained what personal data we were collecting and why, our legal basis for doing so, who will have access to the data, our data security arrangements and our plans for data retention. We appointed a Data Protection Officer (DPO) who is responsible for overseeing questions in relation to this privacy notice. The privacy notice contained the DPO's contact details, and informed the reader of their legal rights, including the right to make a complaint at any time to the Information Commissioner's Office (ICO), the UK supervisory authority for data protection issues (www.ico.org.uk). The privacy policy asked these employees to make sure the details they provided were accurate and up to date, and to let us know about any changes as soon as possible.

All personal data collected as part of the study was treated with the strictest confidence by BIT and processed only in accordance with the requirements of the GDPR and the Data Protection Act 2018. BIT did not use any personal data in any report arising from this project. BIT was collecting and processing personal data solely for the purposes of proper delivery, management and evaluation of the project.

3. Data security

We took reasonable steps to protect personal information and followed procedures designed to minimise unauthorised access, alteration, loss or disclosure of personal information.

Taking into account the state of the art, the costs of implementation and the nature, scope, context and purposes of processing as well as the risk of varying likelihood and severity for the rights and freedoms of natural persons, we implemented appropriate technical and organisational measures to ensure a level of security appropriate to the risk of processing.

We ensured that those who have permanent or regular access to personal data, or that are involved in the processing of personal data, are trained and informed of their rights and responsibilities when processing personal data. We provided such access on a need-to-know basis, and have measures in place which are designed to remove that access once it is no longer required.

Physical personal devices used by BIT are encrypted to protect personal data.

We put in place procedures to deal with any suspected personal data breach and notified participants and any applicable regulator of a breach where we were legally required to do so.

4. All parties with access to the data

The personal data that BIT collected was accessed by a limited number of researchers and advisors in BIT's team working on this project.

BIT may disclose information to third parties in connection with the purposes of processing personal data set out in the privacy notices. These third parties may include:

- other companies in BIT's group [that are based within the United Kingdom];
- regulators, law enforcement bodies and the courts, in order to comply with applicable laws and regulations, assist with regulatory enquiries, and cooperate with court mandated processes, including the conduct of litigation;
- suppliers, research assistants, sub-contractors and the NFER Consortium who may process information on behalf of BIT. These third parties are known as data processors and when we use them we have contractual terms and policies and procedures in place to ensure that personal data is protected. This does not always mean that they will have access to information that will directly identify individuals as we will share anonymised or pseudonymised data only wherever possible. We remain responsible for personal information as the controller; and
- any third party to whom we are proposing to sell or transfer some or all of our business or assets.

We may also disclose personal information if required by law, or to protect or defend ourselves or others against illegal or harmful activities, or as part of a reorganisation or restructuring of our organisations.

5. Data retention

We did not retain any personal data longer than it is needed to deliver, manage and evaluate the project. The anticipated date of deletion of personal data is January 2022.

6. Data processing roles

For the personal data we collected: Behavioural Insights Ltd (the legal name of Behavioural Insights Team (BIT)) is the controller and was responsible for the personal data.

As noted in the section above, we may share personal data with a limited number of trusted data processors solely for the purposes of supporting the delivery, management and evaluation of the project. This was detailed in the privacy notice on our intervention website.

It was not necessary to archive any personal data from this project.

Appendix D: Project team

Project team member	Project role
Kimberly Bohling	Principal Investigator
Dr Giulia Tagliaferri	Quantitative Lead (RCT design and analysis)
Dr Matthew Holt	Qualitative Lead (IPE design and analysis)
Lal Chadeesingh	Project Manager and Intervention Design Lead
Nancy Wilkinson	Quality Assurance and Senior Project Advisor
Dr Raj Chande	Quality Assurance and Senior Project Advisor
Dr Alex Sutherland	Quality Assurance and Senior Project Advisor
Dr Kathryn Atherton	Policy Advisor (Education) and Data Management Lead
Dave Wilson	Policy Advisor (Education)
Rizwaan Malik	Policy Advisor (Education)
Dr Yihan Xu	Research and Analysis Advisor
Pujen Shrestha	Research and Analysis Advisor
Stefan Kelly	Research and Analysis Advisor
Sara Halkiopoulos	Research and Analysis Advisor

Callum O'Mahony	Research and Analysis Advisor
Eleanor Collerton	Project Advisor and Data Support

Appendix E: Impact analysis technical detail

Primary outcome model specification

To test the effect of the intervention on completion of tutoring sessions, we used the following OLS regression model:

$$Y_i = \alpha + \beta_T Treatment_i + \beta_C Covariates_i; \epsilon_i \sim N(0, \sigma^2)$$

- Y_i is the outcome of interest (attendance rate [percentage 0-100]) for each pupil i . The primary outcome and secondary outcome is created using the following formula:
- Attendance rate in tutoring sessions for pupil i =

$$\frac{100 \times \text{Total No. of sessions attended by pupil } i}{\text{Total No. of originally bought sessions for pupil } i}$$

- $Treatment_i$ is a dummy variable indicating which treatment group participants were assigned to (0 = Control group, 1 = Treatment 1 group, 2 = Treatment 2 group, etc).
- $Covariates_i$
 - whether PP = 1 if PP; 0 otherwise;
 - year group: a set of dummies, one for each year group
 - main subject of tutoring: a set of dummies, one for each subject of tutoring
 - fortnight of randomisation: a set dummy, one for each 2-week period from the launch of the trial ($fortnightX=1$ if pupil starts tutoring sessions within that fortnight, 0 otherwise).
- ϵ_i is the heteroskedasticity-consistent robust standard error term for each pupil i

As pre-specified in the trial protocol, in line with BIT's standard practice, we used a Benjamini-Hochberg correction to perform MCA. We conducted the adjustment separately for primary and secondary analysis (3 comparisons to account for a 3-arm design, in which we compare all treatment groups against the control group and against each other). Compared to the Bonferroni correction, that focuses on the familywise error rate, the Benjamini-Hochberg focuses on false discovery rate: it penalises more the statistical significance of results that seem more significant, and less results that were statistically less significant to begin with. As a result, it is less extreme than Bonferroni.¹⁸

As attendance was automatically collected by the tutoring platform, there was no missing data for the attendance outcome measure. There was no missing data for the covariates outlined in the primary model specification in this section.

Table E.1 provides the full results for the primary analysis (col. (1) and secondary analysis (col. (2)). The secondary analysis uses the same model and outcome as the primary analysis (omitting PP status as a covariate), but it restricts the sample to PP students.

We report impact estimates as effect sizes as $\hat{\beta}_T$ with CI in the main text. For comparability between EEF projects and with the wider literature, we also report standardised effect sizes calculations using Hedges' g (1981). Hedges' g is used by both the What Works Clearinghouse and Campbell Collaboration, hence it is a suitable choice for these comparisons. Hedge's g is a weighted average of the variance of both groups, not the estimate of the variance of all individuals pooled (See Coe, 2002). Following the EEF Statistical Guidance, we calculated Hedge's g as:

$$ES = \frac{M_1 - M_2}{SD_{pooled}^*}$$

Where,

¹⁸ AGAP (Evidence in Governance and Politics) provides a good summary of the two methods here:

<https://egap.org/resource/10-things-to-know-about-multiple-comparisons/>

- M_1 is the mean value of the outcome in the control group
- M_2 is the mean value of the outcome in the treatment group
- $SD_{pooled}^* = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$

Where, s_1^2 is the variance of group 1; and equally defined for the control group n_2 . n_1 is the number of individuals in group 1; and equally defined for the control group. The difference in means for each outcome variable will be recovered from the relevant regression equation above ($\hat{\beta}_T$). Ninety-five per cent confidence intervals (95% CIs) of the effect size will be estimated by inputting the upper and lower confidence limits from the regression model into the effect size formula.

BIT analysts received anonymised data from Bramble and Pearson for analysis. As Bramble was running and implementing the randomisation, Pearson was blind to randomisation. The main analyst at BIT was not blinded to group allocation when doing the analysis (they knew which arm each pupil in the dataset was allocated to). However, a second independent analyst re-analysed the trial under blind allocation of treatment groups to quality assure results.

	(1) Overall Attendance Rate	(2) Attendance Rate for PP Students
Treatment (reference category is Control)		
BI Kitchen Sink	0.249 (1.038)	1.081 (1.517)
Catch-up	0.724 (1.034)	-0.328 (1.553)
PP Status	0.669 (0.898)	
School year (reference category is Year 9)		
Year 7	8.062** (2.552)	5.843 (3.208)
Year 8	2.605 (3.882)	1.111 (4.33)

Year 10	-3.7*	-2.379
	(.173)	(2.25)
Year 11	-8.091**	1.663
	(2.374)	(3.759)
Main subject of tutoring (reference category is Science)		
English	-3.889**	-3.531
	(1.257)	(1.941)
Maths	-0.435	-1.706
	(1.229)	(1.92)
Fortnight of randomisation (reference category is fortnight 1)		
Fortnight 2	-.2.244	-0.687
	(2.044)	(3.435)
Fortnight 3	6.184**	2.599
	(2.067)	(3.313)
Fortnight 4	5.853**	2.985
	(1.848)	(3.017)
Fortnight 5	10.623**	7.22*
	(2.128)	(3.346)
Fortnight 6	2.971	0.472

	(2.002)	(3.006)
Fortnight 7	1.794	-1.477
	(1.88)	(3.008)
Fortnight 8	7.462**	10.191**
	(2.49)	(3.542)
Fortnight 9	5.198	-12.081*
	(3.13)	(6.546)
Fortnight 10	3.243	3.367*
	(2.357)	(3.167)
Fortnight 11	28.627**	35.87**
	(5.791)	(4.537)
Constant	49.577**	50.767**
	(2.615)	(3.823)
Observations	4,463	1,939
R ²	.037	.035

* p<0.05; ** p<0.01

P-values for the treatment variable were adjusted for multiple comparisons using Benjamini-Hochberg correction.

Exploratory outcome model specification

We envisaged two exploratory analyses for this trial:

- ITT on pupils' average engagement across classes
- ITT on pupils' average engagement across classes - PP subgroup

In the exploratory analysis, we turned to a measure of engagement - pupils' average engagement score across classes, as rated by tutors at the end of each class.

In the trial protocol, the exploratory outcome was defined as "Tutor's average rating of engagement over the tutoring sessions scheduled for a pupil". In this calculation, engagement for sessions not attended was treated as value 0. However, Bramble could only provide BIT with average engagement figures already aggregated at the pupil level. In Bramble's calculation of these averages, engagement for sessions not attended was treated as a missing value. Following the same logic as in the trial protocol, a 0 value was re-imputed for the sessions not attended based on the proportion of sessions completed and the average score reported by Bramble as

$[(\text{proportion completed} \times \text{average engagement}) + (\text{proportion non completed} \times 0)]$. Across the control and both treatment arms, we imputed a value 0 for the 51% of all sessions not attended by the student. Prior to this imputation, the mean engagement across all arms was 80.26%.

Similar to the primary outcome, the number of sessions bought was used as the denominator - hence this outcome is interpreted as the average engagement across sessions originally bought (rather than scheduled).

In contrast to attendance, engagement was not automatically recorded by the platform - it was assessed by tutors. Reporting this rating was not compulsory, however Pearson's online portal for the tutor nudged them to complete this rating at the end of each lesson, and they were reminded in their portal to complete it if they didn't fill it in immediately.¹⁹ Tutors were not aware of the trial, so there was no risk that the reporting was influenced by this. We only included ratings for attended sessions when they are available i.e. we excluded from the calculation sessions that a pupil attended but for which there was no rating.

The relatively high risk of missing values, and the potential noise associated with these measures (a rating of 60% may mean different things to different tutors) drove our decision to have engagement as an exploratory outcome.

There were 372 cases of missing data for the pupil engagement outcome, but this was not found to be predicted by treatment assignment. As a result, we excluded these pupils from the exploratory analysis.

The regression model followed the same specification as for the primary analysis.

	(1) Overall Engagement	(2) Engagement for PP Students
<i>Treatment</i> (reference category is control)		
BI Kitchen Sink	-0.131 (1.022)	0.035 (1.501)
Catch-up	-0.560 (1.015)	-1.122 (1.501)
<i>PP Status</i>	-0.109 (0.878)	
<i>School year</i> (reference category is Year 9)		

¹⁹ Guidance for tutors on how to leave ratings available on Pearson's website here: <https://about.bramble.io/help/cue-ratings-explained.html>

Year 7	5.804*	4.997
	(2.541)	(2.213)
Year 8	-1.064	0.162
	(4.180)	(4.733)
Year 10	-2.843	-0.542
	(1.704)	(2.214)
Year 11	-4.879*	5.775
	(2.330)	(3.699)
<i>Main subject of tutoring</i> (reference category is Science)		
English	-6.103**	-4.952**
	(1.227)	(1.888)
Maths	-0.421	-1.138
	(1.217)	(1.907)
<i>Fortnight of randomisation</i> (reference category is fortnight 1)		
Fortnight 2	-0.713	1.796
	(2.001)	(3.371)
Fortnight 3	6.537**	2.313
	(2.045)	(3.308)
Fortnight 4	5.396**	1.210
	(1.754)	(2.854)

Fortnight 5	11.324** (1.973)	7.884 (3.132)
Fortnight 6	5.988** (1.918)	2.155 (2.869)
Fortnight 7	4.405* (1.792)	1.069 (2.913)
Fortnight 8	10.121** (2.535)	13.301** (3.502)
Fortnight 9	7.714* (3.041)	-8.844 (5.528)
Fortnight 10	6.246** (2.331)	6.548* (3.087)
Fortnight 11	36.207** (4.756)	43.095** (4.142)
Constant	42.266** (2.518)	41.642** (3.679)
Observations	4,091	1,756
R ²	.038	.049

* p<0.05; ** p<0.01

P-values for the treatment variable were adjusted for multiple comparisons using Benjamini-Hochberg correction.

Appendix F: IPE analysis technical detail

The overall qualitative approach was selected to complement the impact evaluation by providing context, depth and explanatory power. Where the impact evaluation focused on whether the intervention worked, the IPE methods were selected to understand why and how the intervention worked or did not work. More specifically, the semi-structured interview with Bramble allowed researchers to better understand project delivery in relation to programme aims and objectives, practicalities of delivery, technical capabilities and communication with schools and pupils. This provided rich context with which to assess implementation alongside the attendance data collected in the impact evaluation. The feedback forms provided an important opportunity to capture the perspectives and experiences of pupils who took part in the intervention, and more specifically, to isolate the mechanisms that were more and less motivating for them to attend their sessions. The forms also allowed researchers to better understand the experience of the pandemic for pupils, and to collect insightful suggestions for improvement for future iterations of the intervention.

Method	Research question	Research topic	Detail
Delivery provider interview	What proportion of pupils were sent the correct reminder and were the reminders sent in their intended format?	Fidelity	Interview questions asked respondent to comment on whether messages were delivered in the intended format, number and schedule.
Feedback forms	How did pupils experience the reminders and tutoring sessions?	Quality	Forms asked pupils to comment on their perception of the reminders and the positives and negatives of their tutoring sessions.
Feedback forms	What were the barriers and facilitators to pupil engagement?	Mechanisms	Forms asked pupils to describe the motivating and off putting aspects of the messages and the tutoring sessions.
Delivery provider interview	What were the barriers to successful delivery?	Compliance	Interview asked respondent to comment on any barriers to delivery of messages to pupils and via schools.

A purposive sampling approach was used for both the delivery partner interview and the pupil feedback forms. It was intended that one staff member from Bramble and Pearson would take part in an interview, selected based on their role in delivering the project, however only Bramble responded to BIT's invitation. Pupils were sampled based on their participation in the three trial arms, as well as using Bramble's classification of engagement (high and low). Engagement was seen as a helpful way of understanding the quality of the intervention and the mechanisms that contributed to intervention success, based on the idea that high engagement may be attributed to pupil's responding well to the messages and the sessions and low engagement being attributed to perceived

issues with the interventions or the sessions. Bramble was responsible for identifying the pupils based on their engagement, mostly due to BIT's priority of minimising the processing of personal data from young people.

Data were collected by the evaluation team at BIT. BIT researchers conducted interviews with tutoring providers and tutors, and the feedback forms were developed with restricted access to responses. The project delivery team was involved in disseminating recruitment materials to their staff and disseminating the materials and feedback forms to pupils, using a sampling frame provided by BIT.

A thematic analysis was conducted using Braun & Clarke's²⁰ six-step approach to thematic analysis. Specifically, researchers undertook the following steps:

Step 1: Become familiar with the data, Step 2: Generate initial codes, Step 3: Search for themes, Step 4: Review themes, Step 5: Define themes, Step 6: Write-up.

A coding frame was constructed deductively based on the research questions and topics of exploration in the interview and feedback forms. BIT researchers coded the interview transcript and feedback form responses using the following codebook:

1. Quality

- 1.1 Positives about messages

- 1.2 Negatives about messages

- 1.3 Perceived positive outcomes on attendance

- 1.4 Perceived negative outcomes on attendance

- 1.5 Other perceived outcomes

- 1.6 Suggestions for improvement

2. Fidelity

- 2.1 Evidence of fidelity

3. Compliance

- 3.1 Evidence of compliance

- 3.2 Barriers to compliance

4. Mechanisms

- 4.1 Facilitators to pupil attendance

- 4.2 Barriers to pupil attendance

Researchers then conducted a thematic analysis on the coded data, inductively identifying patterns within each code and labelling themes. Themes underwent a further round of classifying, and were sorted into high-level themes and sub-themes.

²⁰ Virginia Braun & Victoria Clarke (2006) Using thematic analysis in psychology, *Qualitative Research in Psychology*, 3:2, 77-101, DOI: 10.1191/1478088706qp0630a

Appendix G: Randomisation and analysis code

Randomisation code (Bramble):

```
import crypto from 'crypto';

const getGroupId = (index: number) => index.toString();

const groupId = getGroupId(crypto.randomInt(0, experiment.data.groupCount) + 1);
```

Analysis code:

*familiarise with data;

br

tab year_group

tab pupil_randomisations

*Clean the data as ready for analysis

lab de treatment 1 "Control" 2 "Kitchen Sink" 3 "Catch-up"

lab val pupil_randomisations treatment

rename pupil_randomisations treatment

rename attendance_bought attendance

gen attendanceperc=attendance*100

*Deleting observations pre-March and creating time covariate xfortnight

generate first2 = date(first_session, "YMD")

// first2 now counts days since 1/1/1960, gen first3 to count days since March 10th

gen first3= first2-22349

gen first4=first3/14

/// first4 now shows how many fortnights have passed since the earliest first_session

gen fortnightx=0

replace fortnightx=1 if first4<1

replace fortnightx=2 if first4<2&first4>=1

replace fortnightx=3 if first4<3&first4>=2

replace fortnightx=4 if first4<4&first4>=3

replace fortnightx=5 if first4<5&first4>=4

replace fortnightx=6 if first4<6&first4>=5

```
replace fortnightx=7 if first4<7&first4>=6
```

```
replace fortnightx=8 if first4<8&first4>=7
```

```
replace fortnightx=9 if first4<9&first4>=8
```

```
replace fortnightx=10 if first4<10&first4>=9
```

```
replace fortnightx=11 if first4<11&first4>=10
```

```
tab fortnightx, gen(fortnight)
```

```
rename fortnightx xfortnight
```

```
//deleting observations per March 10th
```

```
format first2 %td
```

```
drop if first2<td(10mar2021)
```

```
// checking for missing values
```

```
mdesc
```

```
destring average_engagement, generate(engagement_average) ignore(%      NULL )
```

```
gen missingengagement=1
```

```
replace missingengagement=0 if engagement_average>0&engagement_average<1000
```

```
tab missingengagement
```

```
// check if missing data for engagement relates to treatment
```

```
reg missingengagement i.treatment, vce(r) // it doesn't
```

```
//generate new engagement variable as per updated outcome measures note
```

```
gen engagement = engagement_average*attendance
```

```
// making dummies for analysis
```

```
describe
```

```
*pp and send status
```

```
foreach v of var whether*{
    gen `v'_2=0
    replace `v'_2=1 if `v'=="Y"
}

*year groups
tab year_group, gen(yeargroup)

*main subjects
tab main_subject, gen(subject)


//checking if attendance varies by point of randomisation
sum attendance if xfortnight==4|xfortnight==5|xfortnight==6|xfortnight==7
sum attendance if xfortnight>9
sort xfortnight
by xfortnight: sum attendance


*Complete report section about sample size
//replicating power calcs from TP
power twomeans 71, sd(39) n(3333) alpha(0.0167) power(0.8)
power twomeans 80, sd(28) n(3333) alpha(0.0167) power(0.8)
power twomeans 67, sd(21) n(3333) alpha(0.0167) power(0.8)


// new MDES with attendance data
power twomeans 49.17, sd(28.64) n(2975) alpha(0.0167) power(0.8)
power twomeans 50.07, sd(27.93) n(1293) alpha(0.0167) power(0.8)


*Complete report section about balance test (called Participant characteristics)
sort treatment
by treatment: tab year_group
tab year_group
by treatment: tab whether_pp
```

```
tab whether_pp
```

```
by treatment: tab subject1
```

```
by treatment: tab subject2
```

```
by treatment: tab subject3
```

```
tab xfortnight if treatment==1
```

```
tab xfortnight if treatment==2
```

```
tab xfortnight if treatment==3
```

```
// regressions for analysis
```

```
// Primary outcome: treatment on attendance
```

```
reg attendanceperc i.treatment whether_pp_2 yeargroup* subject* i.xfortnight, vce(r)
```

```
// Secondary outcome: treatment on attendance for PP students only
```

```
reg attendanceperc i.treatment yeargroup* subject* i.xfortnight if whether_pp_2==1, vce(r)
```

```
// exploratory outcome: treatment on engagement where outcome=average_engagement*attendance
```

```
reg engagement i.treatment whether_pp_2 yeargroup* subject* i.xfortnight, vce(r)
```

```
// exploratory outcome: treatment on engagement where outcome=average_engagement*attendance FOR PP STUDENTS ONLY
```

```
reg engagement i.treatment yeargroup* subject* i.xfortnight if whether_pp_2==1, vce(r)
```

```
** filling in primary analysis table w/ unadjusted means
```

```
//unadjusted means
```

```
reg attendanceperc i.treatment
```

```
margins treatment
```

```
reg attendanceperc i.treatment if whether_pp_2==1
```

```
margins treatment if whether_pp_2==1
```

```
reg engagement i.treatment
```

```
margins treatment
```

```
reg engagement i.treatment if whether_pp_2==1
```

```
margins treatment if whether_pp_2==1
```

```
//effect sizes - primary outcome

tabstat attendanceperc, by(treatment) statistics(mean sd N)

* Kitchen sink vs control

display "Hedges's g: = " .2492382 / sqrt((1505*(28.71)^2+1458*(28.76)^2)/2963)

// confidence interval

display "Hedges's g lower: = " -1.785218 / sqrt((1505*(28.71)^2+1458*(28.76)^2)/2963)

display "Hedges's g upper: = " 2.283694 / sqrt((1505*(28.71)^2+1458*(28.76)^2)/2963)


* Catch up vs control

display "Hedges's g: = " .7239893 / sqrt((1497*(28.45)^2+1458*(28.76)^2)/2955)

// confidence interval

display "Hedges's g lower: = " -1.303536 / sqrt((1497*(28.45)^2+1458*(28.76)^2)/2955)

display "Hedges's g upper: = " 2.751514 / sqrt((1497*(28.45)^2+1458*(28.76)^2)/2955)


//effect sizes - secondary outcome

sort whether_pp_2

by whether_pp_2: tabstat attendanceperc, by(treatment) statistics(mean sd N)

* Kitchen sink vs control for PP students

display "Hedges's g: = " 1.08126 / sqrt((639*(27.31)^2+654*(27.83)^2)/1293)

display "Hedges's g lower: = " -1.894318 / sqrt((639*(27.31)^2+654*(27.83)^2)/1293)

display "Hedges's g upper: = " 4.056839 / sqrt((639*(27.31)^2+654*(27.83)^2)/1293)

* Catch up vs control for PP students

display "Hedges's g: = " -.3279519 / sqrt((643*(28.63)^2+654*(27.83)^2)/1282)

display "Hedges's g lower: = " -3.374173 / sqrt((643*(28.63)^2+654*(27.83)^2)/1282)

display "Hedges's g upper: = " 2.718269 / sqrt((643*(28.63)^2+654*(27.83)^2)/1282)


//effect sizes - exploratory outcome I

tabstat engage3, by(treatment) statistics(mean sd N)

* Kitchen sink vs control
```

```
display "Hedges's g: = " -.131365 / sqrt((1393*(27.18)^2+1329*(27.14)^2)/2722)
```

```
// confidence interval
```

```
display "Hedges's g lower: = " -2.134942 / sqrt((1393*(27.18)^2+1329*(27.14)^2)/2722)
```

```
display "Hedges's g upper: = " 1.872212 / sqrt((1393*(27.18)^2+1329*(27.14)^2)/2722)
```

```
* Catch up vs control
```

```
display "Hedges's g: = " -.5595727 / sqrt((1366*(26.45)^2+1329*(27.14)^2)/2695)
```

```
// confidence interval
```

```
display "Hedges's g lower: = " -2.134942 / sqrt((1366*(26.45)^2+1329*(27.14)^2)/2695)
```

```
display "Hedges's g upper: = " 1.872212 / sqrt((1366*(26.45)^2+1329*(27.14)^2)/2695)
```

```
//effect sizes - exploratory outcome II
```

```
sort whether_pp_2
```

```
by whether_pp_2: tabstat engage3, by(treatment) statistics(mean sd N)
```

```
* Kitchen sink vs control for PP students
```

```
display "Hedges's g: = " .0351238 / sqrt((587*(26.18)^2+585*(26.08)^2)/1172)
```

```
// confidence interval
```

```
display "Hedges's g lower: = " -2.907263 / sqrt((587*(26.18)^2+585*(26.08)^2)/1172)
```

```
display "Hedges's g upper: = " 2.977511 / sqrt((587*(26.18)^2+585*(26.08)^2)/1172)
```

```
* Catch up vs control for PP students
```

```
display "Hedges's g: = " -1.121532 / sqrt((581*(26.01)^2+585*(26.08)^2)/1166)
```

```
// confidence interval
```

```
display "Hedges's g lower: = " -4.064977 / sqrt((581*(26.01)^2+585*(26.08)^2)/1166)
```

```
display "Hedges's g upper: = " 1.821913 / sqrt((581*(26.01)^2+585*(26.08)^2)/1166)
```

```
// graphing primary outcome
```

```
bitbar attendance, over1(treatment) covariates (whether_pp_2 yeargroup* subject* i.xfortnight) barcol  
(bitdarkgrey ebg ebg)
```

```
bitbar engagement, over1(treatment) covariates (whether_pp_2 yeargroup* subject* i.xfortnight) barcol  
(bitdarkgrey ebg ebg) scale(1)
```

```
bitbar attendance if whether_pp_2==1, over1(treatment) covariates (whether_pp_2 yeargroup* subject*  
i.xfortnight) barcol (bitdarkgrey ebg ebg)
```

```
bitbar engagement if whether_pp_2==1, over1(treatment) covariates (whether_pp_2 yeargroup* subject*  
i.xfortnight) barcol (bitdarkgrey ebg biebgblue) scale(1)
```

Appendix H: IPE materials

Interview guide

Main objective	Purpose of section	Guide timings
1. Introductions and background	Explain the purpose and ground rules for the interview.	2.5 mins
2. Overview of the NTP tutoring program	To get an overview of interviewee's background and their experiences working on the NTP	5 mins
3. Overview of TP's typical engagement with tutors	To understand how Bramble interact with the tutors, pupils and parents and how they prepare them for their pupils' sessions.	10 mins
4. Overall thoughts on delivering the intervention - compliance/fidelity	To understand the extent to which the Bramble delivered the intervention with fidelity and the barriers and facilitators which may have impacted the delivery.	10 mins
5. Ideas and feedback on changing the process	To understand how the delivery of the intervention could be improved	5 mins
6. Close	Thank you and close.	2.5 mins

1. Introductions and background	2.5 mins
My name is Callum, I work for the Behavioural Insights Team. We apply behavioural insights to inform policy, improve public services and deliver positive results for people and communities. We're running an implementation and process evaluation alongside the trial and in coordination with the Education Endowment Foundation. The implementation and process evaluation allows us to understand how an intervention has been delivered and outcomes reported by stakeholders such as yourself.	

Aim of this interview: • The purpose of this interview is to gain understanding of your experiences of the supporting tutors in delivering the intervention. • We'd like to explore your views and perceptions of these processes, as well as any feedback you have regarding the intervention. This interview • Should take up to 45 minutes • We would like to know your thoughts and understand your point of view - there are no right or wrong answers to any of our questions Reiterate key points • Will not use your name in any reports we write up; we might use quotes, but we will de-identify them first • If you feel uncomfortable answering a question we can just skip it • If you later change your mind about anything you have said - let me know, that's absolutely fine too • Just say at any point if you want to stop altogether - this is not a problem and you do not have to give a reason for stopping • Check if they have any questions before starting Recording • With your permission, I'd like to audio record the conversation, to ensure we capture everything you said correctly, in your own words; will have transcript • [Suggest switching video off if not possible to only record audio] • Gain verbal consent (not recorded) and start the audio recorder	
2. Overview of the NTP tutoring programme	5 mins
Introductory rapport building 1. Can you tell me a bit about your current role at Bramble? - How long have you had this role for? - What are your day-to-day responsibilities? 2. Can you tell me about how you work with tutor providers? - Which tutor providers you work with - Size, location etc. 3. Can you tell me a bit about the service you are providing as part of the NTP? 4. How have you found your role on the NTP project? - What challenges, if any, have you faced?	

3. Overview of Bramble's typical engagement with tutors, pupils and parents	5 mins
1. How do you typically interact with tutors once their tutoring relationships are set-up? - What channels do you use? - How often do you reach out to tutors? - What challenges, if any, do you face? Prompts: a. Tutor engagement b. Tutor responsiveness - What factors make it [easier / more difficult] to interact with tutors? Prompts: c. Tutors level of experience d. Tutors level of motivation e. Time f. Number of pupils per tutor 2. How do you typically interact with pupils once their tutoring relationships are set-up?	
4. Overall thoughts on delivering the intervention - compliance/fidelity	10 mins
1. What role did you play in delivering the Engagement-Boosting Reminder emails? E.g. The intervention messages should be automatically delivered to pupils by Bramble, the Tutoring Provider's (Pearson) technology partner at 8:00 am the day before their tutoring session. This email will also contain a link to the online learning environment. - How were you briefed on your role? - Were the requirements clear? - If not, what could be done to improve this if the intervention was repeated? 2. Could you describe how you delivered the Engagement-Boosting Reminder emails to pupils? - Who did you send the emails to and why? - Was there a clear distinction between control and treatment? - If no one - why not? - How were the emails sent to pupils? (Fidelity) (E.g. Usually to pupils' school email addresses but occasionally this will be to pupils' personal email addresses.) - How many emails were sent to pupils (Dosage) - Were there any issues sending the emails? - Were there any reported issues in receiving the emails? - When were the emails sent to pupils?	

- Was this standardised or did it differ between the sessions? - Was this an effective way to send the emails - Why/ Why not? - If not, are you able to suggest any ways to improve this process in future? 3. How did you know that pupils received the Engagement-Boosting Reminder emails? - Was there a process to check whether pupils received emails? - Was there a process to check whether pupils responded to the emails? - Clicking the link in the email to attend the session etc. 4. How did you find the process of delivering the messages to pupils? - What worked well? - What was challenging? - How easy, or difficult, was it to embed the emails within your existing contact channels for pupils? - What could be done to solve these issues? 5. How do the reminder emails compare with the other communications that you typically send to pupils? - Frequency? - Timing (8:00 am the day before the tutor session) - Length and detail - Content - Technology (e.g. Is the embedding a tutor session link in the email). 6. Did tutors, parents or pupils contact you in relation to the Engagement-Boosting reminder emails? - What sort of questions did they ask you? - How easy, or difficult, was it for you to answer their questions? - If difficult - what could have been done to better support you? 7. Is there anything that could be done to improve in the delivery process? - More communication or information on the activity from BIT? - Any additional information within the emails ? - Should the intervention have been sent to pupils sooner, later or more frequently?	
7. Close	2.5 mins
Is there anything else we have not covered that you think would be helpful for us to know? Thank you for your time.	

Appendix I: Timeline

Table I.1 sets out the timeline of activities for the trial.

Table I.1: Timeline

Date	Activity	Staff responsible
March 2021	Trial set up	BIT, Pearson, Bramble, EEF
	Finalise intervention materials	BIT, Pearson, Bramble, EEF
	Rolling randomisation for new pupils begins (10 Mar)	BIT, Bramble
	Launch trial (10 Mar)	BIT, Bramble
March - August 2021	Monitoring trial	BIT, Bramble
	Rolling randomisation by Bramble, ongoing monitoring from BIT	BIT, Bramble
	IPE interviews conducted	BIT, Bramble
	IPE pupil surveys collected	BIT, Bramble
September 2021	BIT receives anonymised data from Bramble (10 Sep)	BIT, Bramble
	Impact and IPE analysis	BIT
	Reporting	BIT
October 2021	BIT sends results to EEF (7 Oct)	BIT
	Report review and publication	BIT, Pearson, Bramble, EEF

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