

## Registry of Efficacy and Effectiveness Studies

### Study Title:

A Factorial Design to Understand Parental Text Messaging Interventions

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### Version History

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### Section I: General Study Information

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Institute of Education Sciences

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2018-10-24

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AEARCTR-0003489

**Study Start Date:**

2018-10-24

**Study End Date:**

2020-02-01

**Intervention Start Date:**

2019-06-25

**Timing of entry:**

Prior to implementation of the intervention

**Brief Abstract:**

Evidence has shown that parental engagement over the summer can be critical for helping students. Recent interventions have found that text messaging to parents over the summer can lead to better reading scores for students (Kim, Armstrong, Burkhauser, Mesite, & Levya, under review; Kraft & Monti-Nussbaum, 2018). This study tests how to maximize the effectiveness of a text messaging campaign designed to support reading and use of an instructional app over the summer. We investigate three potential levers to correct informational gaps and misbeliefs among parents: goal setting at the beginning of the summer; provision of differentiated and personalized information about student progress; and reinforcing either the instrumental or entertainment values of reading or a combination of the two. Using a sample of approximately 5000 rising second- and third-grade students from thirty elementary schools, this study will systematically vary the types of messages that parents receive using a 2 x 2 x 3 factorial design. We assess outcomes in three primary domains: student engagement, parental engagement, and student reading comprehension.

**Keywords:**

informational nudge, educational software, randomized controlled trial

**Comments:**

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*Section II starts on the next page.*

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## **Section II: Description of Study**

### **Type of Intervention:**

Curriculum/Product, Practice

### **Topic Area of Intervention:**

Education Technology, Reading and Writing

### **Number of intervention arms:**

3

### **Target school level:**

1, 2

### **Target school type:**

Suburban, Urban

### **Location of Implementation:**

*United States:* United States : South

### **Further description of location:**

30 schools in one large, urban and suburban district in North Carolina

### **Brief Description of Intervention Arm 1:**

At the beginning of the texting intervention, parents are encouraged to set summer reading goals using mental contrasting, a strategy for pursuing goals, with the formation of implementation intentions, a strategy for planning one's goals. Throughout the summer, messages will periodically remind parents about their goals and check in on progress towards them. In the "control" group for this arm, there is no goal-setting or monitoring of progress towards the goal.

### **Brief Description of Intervention Arm 2:**

Throughout the texting intervention, messages will be personalized and differentiated according to information on the students' reading activities and use of the MORE@Home app over the summer. In the "control" group for this arm, the only personalization will come from directory information, such as using the student or parent name or the student-specific password to access the app.

### **Brief Description of Intervention Arm 3:**

Intervention Arm 3 differentiates between the types of reading values that are emphasized by text messages. Some families will receive messages that emphasize the instrumental (or skill-building) value of reading. Other families will receive messages that emphasize the entertainment value of reading. Other families will receive messages that, over the course of the summer, emphasize both values.

### **Brief Description of Comparison Condition:**

As described above, each branch has its own comparison condition. A small subset of families (1/13 of the sample) will not receive any text messages at all. This is the overall control condition.

### **Comparison condition:**

Business-as-usual

### **Comments:**

Instead of a traditional RCT, this study uses a factorial for each of the three branches defined in the intervention

arms. Two of the branches have 2 levels, and one branch has 3 levels. This results in a 2 x 2 x 3 factorial, and when the control group is included, 13 different groups represented by all combinations of treatments.

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### **Section III: Research Questions**

#### **Confirmatory research questions:**

##### **Question 1:**

Within each factor, which types of text messages (goals vs. no goals, personalized information vs. not, instrumental vs. enjoyment vs. both) are most effective at increasing rising second- and third-grade students' engagement with reading over the summer?

##### **Question 2:**

Within each factor, which types of text messages (goals vs. no goals, personalized information vs. not, instrumental vs. enjoyment vs. both) are most effective at increasing parental engagement with their rising second- and third-grade students' summer reading?

##### **Question 3:**

Within each factor, which types of text messages (goals vs. no goals, personalized information vs. not, instrumental vs. enjoyment vs. both) are most effective at increasing rising second- and third-grade student reading comprehension upon the return to school in the fall?

##### **Question 4:**

How does changing the emphasized value of reading effect differ based on the poverty level of students?

#### **Exploratory research questions:**

##### **Question 1:**

How do the effects of intervention components differ based on the levels of other factors?

##### **Question 2:**

How do the effects of intervention components differ based on the poverty level of students?

##### **Question 3:**

How do the effects of intervention components differ based on the prior achievement levels of students?

##### **Question 4:**

Do specific days of the week or times of the day yield more app usage immediately following the receipt of a text message?

#### **Comments:**

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### **Section IV-A: Study Design (Selection)**

#### **Study Design:**

Randomized Trial (RT)

#### **Comments:**

The study uses a factorial design of type  $2^2 \times 3$  (plus an additional control group). This yields ~13 equal sized groups.

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## **Section IV-B: Study Design (Input)**

### ***Study Design: Input***

**Unit of random assignment of intervention:**

family

**Assignment within sites or blocks:**

Yes

**Define the sites or blocks:**

school-by-grade

**Probability of assignment to treatment the same across sites or blocks:**

Yes

**Probability of assignment to treatment:**

0.50

**Unit outcome data measured:**

Student

**Intermediate clusters between unit of random assignment and unit of measurement:**

No

**Comments:**

One-thirteenth of the sample will be designated as the control group. The remaining sample will then be randomized for each of the factors (50% goal-setting vs. 50% no goal-setting; 50% personalized information vs. 50% no personalized information; 33% instrumental value vs. 33% entertainment value vs. 33% both values).

### ***Design Classification***

**Based on the responses above, this study has been classified as:**

RT: Multisite (Blocked) Cluster Randomized Trial

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## **Section V: Sample Characteristics**

**Approximate number of students per randomization unit (family):** 1.1

**Approximate number of randomization unit (family) in the comparison condition within each block (school-by-grade):** 75

**Approximate number of randomization unit (family) in the intervention condition within each block (school-by-grade)1:** 300

**Approximate number of randomization unit (family) in the intervention condition within each block (school-by-grade)2:** 300

**Approximate number of randomization unit (family) in the intervention condition within each block (school-by-grade)3:** 300

**Number of blocks (school-by-grade):** 60

No Yes - The students in this study are all part of a larger, classroom-based cluster RCT. To be included in that study, parents had to provide informed consent. Additionally, students whose parents did not provide a valid cell phone number or who opted out of text messaging were excluded prior to randomization for this study. No Yes - The students in this study are all part of a larger, classroom-based cluster RCT. To be included in that study, parents had to provide informed consent. Additionally, students whose parents did not provide a valid cell phone number were excluded prior to randomization for this study. The families of those students were also excluded, as were any families who opted out of receiving text messages. Yes - All of the first- and second-grade classrooms in these 30 schools were recruited to be a part of the larger classroom-based cluster RCT. No

**Comments:**

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## **Section VI: Outcomes (Input)**

### **Confirmatory question 1: Outcome Measure 1**

**Outcome domain:** Student Social, Emotional, & please ffs Behavior - Engagement

**Minimum detectable effect size:** 0.07 (estimate using Stata's power command, with 2500 treated units and 2500 control units)

**Outcome measure:** Number of books completed on the app

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:** N/A

**Internal consistency:** N/A

**Inter-rater reliability:** N/A

**Same outcome measure in treatment and comparison groups:** Yes

### **Confirmatory question 1: Outcome Measure 2**

**Outcome domain:** Student Social, Emotional, & please ffs Behavior - Engagement

**Minimum detectable effect size:** 0.07 (estimate using Stata's power command, with 2500 treated units and 2500 control units)

**Outcome measure:** Self-reported books read over summer

**Scale of outcome measure:** Ordinal

**Normed or state test:** No

**Test-retest reliability:** N/A

**Internal consistency:** N/A

**Inter-rater reliability:** N/A

**Same outcome measure in treatment and comparison groups:** Yes

### **Confirmatory question 1: Outcome Measure 3**

**Outcome domain:** Student Social, Emotional, & please ffs Behavior - Engagement

**Minimum detectable effect size:** 0.07 (estimate using Stata's power command, with 2500 treated units and 2500 control units)

**Outcome measure:** Total time on the app

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:** N/A

**Internal consistency:** N/A

**Inter-rater reliability:** N/A

**Same outcome measure in treatment and comparison groups:** Yes

**Confirmatory question 1: Outcome Measure 4**

**Outcome domain:** Student Social, Emotional, & please ffs Behavior - Engagement

**Minimum detectable effect size:** 0.07 (estimate using Stata's power command, with 2500 treated units and 2500 control units)

**Outcome measure:** Reported enjoyment of app activities

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:** N/A

**Internal consistency:** N/A

**Inter-rater reliability:** N/A

**Same outcome measure in treatment and comparison groups:** Yes

**Confirmatory question 1: Outcome Measure 5**

**Outcome domain:** Student Social, Emotional, & please ffs Behavior - Engagement

**Minimum detectable effect size:** 0.07 (estimate using Stata's power command, with 2500 treated units and 2500 control units)

**Outcome measure:** Self-reported reading motivation (Me and My Reading Profile, MMRP)

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:**

**Internal consistency:** 0.87

**Inter-rater reliability:**

**Same outcome measure in treatment and comparison groups:** Yes

**Confirmatory question 2: Outcome Measure 1**

**Outcome domain:** Other Outcome Domain - Parent behavioral engagement

**Minimum detectable effect size:** 0.14 (estimate using Stata's power command, with 800 treated units and 800 control units)

**Outcome measure:** Self-reported reading activity with student

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:** N/A

**Internal consistency:** N/A

**Inter-rater reliability:** N/A

**Same outcome measure in treatment and comparison groups:** No

**Please Describe:**

Parent outcomes will be measured with a survey. To minimize costs associated with survey administration and follow-up, we will select a random sample of parents within each randomization block to target for the survey.

**Confirmatory question 2: Outcome Measure 2**

**Outcome domain:** Other Outcome Domain - Parent behavioral engagement

**Minimum detectable effect size:** 0.14 (estimate using Stata's power command, with 800 treated units and 800 control units)

**Outcome measure:** Completion of goal-setting survey

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:**

**Internal consistency:**

**Inter-rater reliability:**

**Same outcome measure in treatment and comparison groups:** No

**Please Describe:**

This will be a subgroup analysis only. Among those in the goal-setting treatment, we will look at the effects of the other treatments on parental goal-setting.

### **Confirmatory question 2: Outcome Measure 3**

**Outcome domain:** Other Outcome Domain - Parent behavioral engagement

**Minimum detectable effect size:** 0.14 (estimate using Stata's power command, with 800 treated units and 800 control units)

**Outcome measure:** Opting out of text messages

**Scale of outcome measure:** Binary

**Normed or state test:** No

**Test-retest reliability:** N/A

**Internal consistency:** N/A

**Inter-rater reliability:** N/A

**Same outcome measure in treatment and comparison groups:** Yes

### **Confirmatory question 3: Outcome Measure 1**

**Outcome domain:** Student Achievement - Literacy

**Minimum detectable effect size:** 0.07 (conservative estimate using Stata's power command, with 2500 treated and control units)

**Outcome measure:** MAP RIT scores

**Scale of outcome measure:** Continuous

**Normed or state test:** Yes

**Same outcome measure in treatment and comparison groups:** Yes

### **Confirmatory question 3: Outcome Measure 2**

**Outcome domain:** Student Achievement - Literacy

**Minimum detectable effect size:** 0.07 (conservative estimate using Stata's power command, with 2500 treated and control units)

**Outcome measure:** DIBELS composite score

**Scale of outcome measure:** Continuous

**Normed or state test:** Yes

**Same outcome measure in treatment and comparison groups:** Yes

### **Confirmatory question 3: Outcome Measure 3**

**Outcome domain:** Student Achievement - Literacy

**Minimum detectable effect size:** 0.07 (conservative estimate using Stata's power command, with 2500 treated and control units)

**Outcome measure:** MAP subscores

**Scale of outcome measure:** Continuous

**Normed or state test:** Yes



Same outcome measure in treatment and comparison groups: Yes

**Confirmatory question 4: Outcome Measure 1**

**Outcome domain:** Student Achievement - Literacy

**Minimum detectable effect size:**

**Outcome measure:** MAP RIT Scores

**Scale of outcome measure:** Continuous

**Normed or state test:** Yes

**Same outcome measure in treatment and comparison groups:** Yes

**Confirmatory question 4: Outcome Measure 2**

**Outcome domain:** Student Achievement - Literacy

**Minimum detectable effect size:**

**Outcome measure:** DIBELS composite score

**Scale of outcome measure:** Continuous

**Normed or state test:** Yes

**Same outcome measure in treatment and comparison groups:** Yes

**Confirmatory question 4: Outcome Measure 3**

**Outcome domain:** Student Achievement - Literacy

**Minimum detectable effect size:**

**Outcome measure:** MAP subscores

**Scale of outcome measure:** Continuous

**Normed or state test:** Yes

**Same outcome measure in treatment and comparison groups:** Yes

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**Section VII: Analysis Plan**

**Baseline data collected prior to start of intervention:**

Yes

**Description of baseline data:**

The school district provides demographic characteristics as well as attendance, reading and math test scores from the school year prior to the intervention

**Covariates you plan to include in the model:**

English Language Learner Status, Gender, Grade, The district does not provide FRL status, but we will construct a student-level poverty indicator us, Race, Student Pretest

**Covariates you plan to include in the model:**

Fixed effect for the randomization block

**Analytic model:**



**Plan to handle cases with missing outcome data:**

Delete cases with missing data for the outcome being analyzed

**Planned multiple comparisons adjustment, confirmatory question 1 (Other Outcome Domain):**

No

**Planned multiple comparisons adjustment, confirmatory question 2 (Student Achievement - Literacy):**

No

**Planned multiple comparisons adjustment, confirmatory question 3 (Student Achievement - Literacy):**

No

**Planned multiple comparisons adjustment, confirmatory question 4 :**

No

**Comments:**

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### **Section VIII: Additional Information**

**Links:**

No links have been added yet.

**Files:**

File Name: [TextingStudy\\_PreReg\\_AP.docx](#)

Description: Analytic model for treatment effects

**Comments:**

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