Online Appendix For

Information and Student Achievement:
Evidence from a Cellular Phone Experiment

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Not for Publication

Online Appendix A: Implementation Manual (Not For Publication)

The experiment was implemented and managed by the Education Innovation Laboratory (EdLabs) at Harvard University.

SCHOOLS

EdLabs first presented the basics of the program to OKCPS district leaders on July 27, 2010, at which point it was decided to offer participation to schools with sixth and seventh grade students. District leaders informally provided schools with additional details as part of the recruitment process over the summer. On August 16, 2010, EdLabs presented the research design and program details to the OKCPS Board of Education, spurring further internal discussions about exactly which schools would be eligible to participate.

On August 25, 2010, the district identified all non-alternative district schools that served 6th or 7th grade students. On September 27, 2010, the principals and library media specialists (LMS) from those schools were invited to an introductory meeting to review the basics of the program and to prepare the process of starting the experiment in the subsequent weeks. Schools were also able to "opt out" of participating; however, all twenty-two schools elected to participate and allow consenting students to be randomized into treatment and control groups.

STUDENTS

Sixth and seventh grade students attending twenty-two elementary and secondary schools in OKCPS were eligible to participate in the experiment. Students were required to obtain parental consent to be a part of the study. Students received information packets on September

28, 2010 and were required to return a signed parental consent form by October 1, 2010 in order to be eligible for the lottery to determine participation. We received 1,907 student consent forms and randomized students into one of three treatment groups and a control group: (1) 490 students received a cell phone and were required to read books and complete quizzes about those books in order to receive phone credits on a biweekly schedule; (2) 490 students received a cell phone and daily text messages and were required to read books and complete quizzes in order to receive credits; (3) 490 students received a cell phone with daily text messages and a fixed number (i.e. non-performance-based) of credits on a monthly schedule; and (C) 437 students did not receive a phone. Phones pre-loaded with 300 airtime credits were distributed to schools on the morning of October 8, 2010. Students in treatments (1) and (2) were eligible to earn credits by reading books starting on October 11, 2010. Students last received credits on May 18, 2011. Students or their parents could opt to return the phone or discontinue active participation in the program at any time.

TEXT MESSAGING

We worked closely with Droga5, an advertising firm based in New York City, to determine the messaging and branding components of the program. We met initially with Droga5 to discuss the types of text messages that would be written and sent to students on a daily basis. Writing text messages throughout the year was a collaborative and iterative process. Text messages were sent to students in the appropriate treatment groups on a daily basis, including weekends, at approximately 6:00 p.m. Messages were divided between "informative" and "persuasive" messages. Through the duration of the program, Droga5 drafted persuasive messages and sent to us for review; concurrently, we drafted informative messages based on our

understanding of the relationship between educational attainment and relevant life outcomes gleaned from national data sets and sent potential messages to Droga5 for review. Approved messages were sent to TracFone for distribution.

SOFTWARE AND INCENTIVE STRUCTURE

The *Accelerated Reader* platform allows students to select from a vast library of popular literature to demonstrate their knowledge of its plot. Upon finishing a book, each student took an *Accelerated Reader* (AR) computer-based comprehension quiz, which provided evidence as to whether the student read the book. Each book in AR is assigned a point value based on length and difficulty. Students were allowed to select and read books of their choice and at their leisure, not as a classroom assignment. The books came from the existing stock available at their school (in the library or in the classroom), though additional copies of books that proved to be particularly popular were ordered during the year.

For those students required to read books in order to receive credits, the incentive scheme was strictly linear: each point earned during each biweekly reward period translated to ten phone credits. Because phone credits could only be distributed (i.e. uploaded electronically) in increments of 200, point earnings of less than or greater than a multiple of 20 were banked and carried over to subsequent reward periods. Once a student reached or passed any 20 point interval, blocks of 200 credits were uploaded at the next scheduled "payday" according to the predetermined biweekly reward schedule. For students who received a fixed stipend of credits, 200 credits were uploaded to their account by EdLabs according to a pre-determined monthly schedule.

PHONE PROBLEMS

A spreadsheet was established to track all student phone issues throughout the program. Once per week, the Project Manager would update the spreadsheet and send it to Droga5. Droga5 would then communicate all phone issues to the Million TracFone representative. TracFone troubleshot phones, and remedies would be communicated back to Droga5, then the Project Manager, and then the LMS if appropriate.

The most common phone issue was blocked SIM cards, which occurred when students attempted to lock their phones with a four-digit passcode, then forgot the passcodes and entered incorrect passcodes three times. A blocked SIM would require a new SIM to be shipped from TracFone to the student's school, where LMS would have to replace the card. Typically the SIMS were pre-activated, so they required no further action from the LMS other than adding the new SIM to the correct students' phones. However, there were a few cases toward the end of the year in which it was possible to expedite fixing phones by shipping un-activated SIMs, and having LMSs call TracFone to complete the activation. The first 10-15 students who reported their phones stolen had them replaced. Subsequently, students who reported their phone as lost or stolen had their SIM-card deactivated and no longer received informational text messages, monthly uploads of credits, or credits in exchange for accumulating Accelerate Reader points. All other issues were addressed remotely by TracFone, or via instructions emailed to the LMS to resolve the problem.

SITE VISITS AND PROGRAM MONITORING

In an effort to gather extensive qualitative data on the implementation of the experiment, EdLabs conducted brief site visits to all twenty-two experimental schools. EdLabs observed

classrooms and interviewed students, teachers, and school leaders. These visits helped to ensure fidelity of implementation and allowed EdLabs to share best practices among LMS to improve program implementation. Starting in November and continuing into January, we visited schools and reviewed the basics of the program with treatment students to reinforce their understanding. To diagnose specific misunderstandings of the reward algorithm or distribution system, we also administered brief quizzes to check for student understanding. We revisited schools with particularly low quiz scores to target specific areas of misunderstanding. By the end of this cycle, students scored an average of 79 percent on the quiz, in response to questions about the basics of the program, including the incentive structure, reward schedule, and how to report phone problems.

Online Appendix B: Data Appendix (Not For Publication)

OKC Public School Administrative Data

Attendance Rates

Individual attendance rates account for all presences and absences for each student, regardless of which school the student had enrolled in when the absence occurred, as long as the student was enrolled in OKCPS. The attendance rate is calculated by dividing the number of days present by the number of days a student was enrolled in the district during the 2010-2011 school year. The attendance rate is standardized over the OKCPS district to have a mean of zero and a standard deviation of one.

Free Lunch Status

Controlled regressions include a dummy variable equal to one if a student is eligible for free or reduced-price lunch and zero otherwise. Free lunch status is recorded in the district enrollment files.

Socioeconomic Status

Controlled regressions include a dummy variable equal to one if a student is identified as economically disadvantaged and zero otherwise. Socioeconomic status is recorded in the district enrollment files.

Special Education Services

Controlled regressions include a dummy variable equal to one if a student has an Individualized Education Program (IEP) and is eligible to receive special education services. IEP status is recorded in the district enrollment files. Whether a student is eligible to receive special education services as part of an IEP is determined by the OKCPS Special Services Office.

English Language Learner Status

Controlled regressions include a dummy variable equal to one if a student is designated as an English Language Learner. English Language Learner status is recorded in the district enrollment files. Whether a student is designated as an English Language Learner is determined by the OKCPS Language and Cultural Services Office.

Behavioral Incidents

Behavioral incidents are recorded in the district behavior file, counted, and summed for each student by student id. Behavioral incidents are recorded individually by date of infraction, as well as cumulatively, as a count of the total number of times a student was involved in a behavioral incident throughout the year, regardless of the length or nature of the incident.

Suspensions

Suspensions are recorded in the district behavior file, counted, and summed for each student by student id. Suspensions are recorded individually by date of infraction, as well as cumulatively, as a count of the total number of times a student was suspended throughout the year, regardless of the length or nature of the suspension.

Race/Ethnicity

We code the race variables such that the five categories -- white, black, Hispanic, Asian and other -- are collectively exhaustive and mutually exclusive. Hispanic ethnicity is an absorbing state. Hence "white" implies non-Hispanic white, "black" non-Hispanic black, and so on.

State Test Scores

We observe results from the Oklahoma Core Curriculum Criterion Referenced Tests (CRT) in math and ELA. For ease of interpretation, we normalize raw scores to have a mean of zero and a standard deviation of one within grades and subjects for 2010-2011 scores, when they are used as outcomes in our analysis and for 2009-2010 scores when they are reported in the summary statistics. Raw and controlled regressions control for non-normalized 2009-09 and 2009-2010 scale scores from district testing files as well as their squares and cubes. We report results normalized both to the OKCPS distribution and to the national distribution. To normalize state test scores to the national distribution, we standardize CRT scores to the state of Oklahoma, calculate predicted scores on the National Assessment of Educational Progress (NAEP) using the distribution of NAEP scores in Oklahoma, and then standardize those predicted scores to the national distribution of NAEP scores.

ACT scores

ACT scores are normalized to the national distribution of the most recent test score of the graduating class of 2015-2016. Students who were in 7th grade at the time of the experiment would have been members of that graduating class if they completed each grade on time; an

analysis of the trend in ACT scores in each subject over the past 3 years shows no statistically significant change from year to year and thus we felt comfortable using these scores to also normalize the scores of the class of 2016-2017 (students in 6th grade at the time of the experiment).

Treatment

Our randomization files record which students were randomized into each treatment arm and the control group. Each treatment is recorded as a binary variable equal to one if the student was randomized into that arm of treatment and zero if a student was randomized into the control group. When regressions are run on multiple treatment groups, an additional binary variable was created that is equal to one if a student was randomized into any of the treatment arms being analyzed and zero if the student was randomized into the control group.

Teacher Value-Added

Teacher value-added scores are a measure of the independent impact of teachers on student growth. The construction of Teacher Value Added estimates follows Chetty, Friedman, and Rockoff (2011). We use the test data from OKCPS 6th, 7th, and 8th grade students from 2006-2010 to regress students test scores on lagged scores and observable characteristics to generate score residuals for each student. We then compute the mean of residuals for each student taught by a given teacher. We then use the empirical Bayes procedure outlined in Chetty, Friedman, and Rockoff (2011) to reduce noise by shrinking estimate towards mean based on number of students that are observed for each teacher. Students are linked to teachers using district course grade administrative files. The analysis code used to generate the estimates in Chetty, Friedman, and

Rockoff (2011) that we base our estimates on is publicly available at http://obs.rc.fas.harvard.edu/chetty/va_bias_code.zip

Survey Data

Some of the indirect outcomes reported in the paper include survey responses from a student survey administered to all students in the experimental group. We include responses to several survey questions as outcome variables:

For the question "Since the Million Program started, do you think you are more focused on or excited about doing well in school?" we code student responses as a binary variable equal to one if the student responded "Definitely, I am much more focused/excited since the Million" or "Yes, I am more focused/excited since the Million" and zero if the student responded "Maybe, I am somewhat more focused since the Million" or "No, I was just as focused/excited before the Million."

For the question "What impact do you think the Million Program has had at your school? (check all that apply)" we coded each possible response as a separate binary variable equal to one if the student checked that response and zero if a student checked at least one other response but left that one blank. The outcomes include: "Students are working harder," "Students are studying more together," "Students are more competitive with each other in a good way," "Students are more competitive with each other in a bad way," "Students and teachers interact more," or "No difference." We code a binary variable equal to one if students respond "students are working harder" and zero otherwise.

The students were also asked quiz questions about the importance of educational attainment based upon text messages that students in the information treatment groups received. We use the following questions in our analysis (correct answers are in italics):

(1) "True or false: college graduates make 54% more money than college dropouts."

A. True

B. False

(2) Your income as an adult increases by _____ for every year you spend in school.

A. 10%

B. $5,000

C. 50%

D. $100

(3) "Are high school dropouts more likely to go to prison than high school graduates?"

A. Yes, much more likely

B. Yes, but it's really close

C. No, there's no difference

(4) "15.5% of high school students are unemployed. What percentage of college graduates are unemployed?"

A. 1%

B. 4.8%

C. 20%

D. 25%

Student responses to each question are recorded as binary variable equal to one if their answer is correct and a zero if their answer is incorrect. In addition, we analyze a binary variable equal to

one if a student answered questions (1), (2), and (3) correctly and a zero if a student answered at least one incorrectly. Question (4) was not referenced in any text message during the year; hence, we consider it a placebo question.

US Census Data

Black Dissimilarity Index

The Black Dissimilarity Index is a measure of neighborhood segregation relative to the full city (Jahn, Schmid, and Schrag 1947). The racial composition of each zip code of taken from the 2000 United States Census, available at http://www.census.gov/epcd/www/zipstats.html. The dissimilarity index is defined as follows:

$$Black\ Dissimilarity\ Index = \frac{1}{2}\left|\frac{black_{zip}}{black_{city}} - \frac{nonblack_{zip}}{nonblack_{city}}\right|$$

The Black Dissimilarity Index score for a given neighborhood is the absolute difference between the ratio of the percentage of black individuals who reside in a given zip code to the percentage of black individuals who live in the city and the ratio of the percentage of non-black individuals who reside in that zip code to the percentage of non-black individuals who live in the city. Aggregating across zip codes, the dissimilarity index measures the percentage of the city's population that would have to change zip codes for each section to have the same percentage of black individuals as the city.

Poverty Rates

Poverty rate data by zip code was taken from the 2000 United States Census, available at http://www.census.gov/epcd/www/zipstats.html and merged to pre-treatment students address records from district enrollment administrative files.

Appendix Table 1 - Student Baseline Characteristics

	OKCPS - Grades 6 and 7			Experimental Sample				*p-values*		
	Non Participating	Participating	*p-value* (1) = (2)	Information	Information & Incentives	Incentives	Control	(4)=(7)	(5)=(7)	(6)=(7)
Student Characteristics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Male	0.521	0.486	0.019	0.453	0.504	0.453	0.538	0.010	0.306	0.010
	(0.500)	(0.500)		(0.498)	(0.500)	(0.498)	(0.499)			
White	0.200	0.163	0.002	0.149	0.167	0.163	0.172	0.348	0.863	0.734
	(0.400)	(0.369)		(0.356)	(0.374)	(0.370)	(0.377)			
Black	0.290	0.311	0.125	0.294	0.327	0.314	0.309	0.619	0.566	0.861
	(0.454)	(0.463)		(0.456)	(0.469)	(0.465)	(0.463)			
Hispanic	0.435	0.443	0.634	0.469	0.424	0.441	0.435	0.291	0.752	0.854
	(0.496)	(0.497)		(0.500)	(0.495)	(0.497)	(0.496)			
Asian	0.025	0.026	0.824	0.018	0.031	0.018	0.037	0.087	0.612	0.087
	(0.155)	(0.158)		(0.134)	(0.172)	(0.134)	(0.188)			
Other Race	0.051	0.058	0.288	0.069	0.051	0.063	0.048	0.170	0.836	0.316
	(0.220)	(0.234)		(0.254)	(0.220)	(0.244)	(0.214)			
Special Education Services	0.149	0.139	0.326	0.131	0.141	0.147	0.137	0.766	0.877	0.675
	(0.356)	(0.346)		(0.337)	(0.348)	(0.354)	(0.345)			
English Language Learner	0.154	0.159	0.612	0.165	0.153	0.159	0.160	0.833	0.766	0.967
	(0.361)	(0.366)		(0.372)	(0.360)	(0.366)	(0.367)			
Free Lunch	0.857	0.917	0.000	0.922	0.920	0.908	0.918	0.787	0.877	0.611
	(0.351)	(0.276)		(0.268)	(0.271)	(0.289)	(0.275)			
Economically Disadvantaged	0.741	0.915	0.000	0.922	0.914	0.908	0.915	0.692	0.955	0.702
	(0.438)	(0.279)		(0.268)	(0.280)	(0.289)	(0.279)			
Baseline Math	0.010	0.030	0.565	-0.009	0.028	0.006	0.108	0.097	0.279	0.159
	(1.022)	(0.983)		(0.978)	(1.035)	(0.993)	(0.916)			
Baseline Reading	0.037	-0.021	0.098	-0.086	0.007	-0.053	0.062	0.046	0.459	0.107
	(1.015)	(1.010)		(1.071)	(1.049)	(0.989)	(0.905)			
Missing: Baseline Math	0.319	0.216	0.000	0.169	0.224	0.237	0.233	0.015	0.747	0.905
	(0.466)	(0.411)		(0.375)	(0.418)	(0.426)	(0.423)			
Missing: Baseline Reading	0.326	0.219	0.000	0.176	0.231	0.231	0.243	0.012	0.669	0.669
	(0.469)	(0.414)		(0.381)	(0.422)	(0.422)	(0.429)			
p-value from joint F-test			0.000					0.042	0.998	0.174
Observations	2903	1907		490	490	490	437			

Notes: This table reports summary statistics for the field experiment. Columns (1), (2), (4), (5), (6) and (7) represent the sample means of the variable indicated in each row for the group indicated in each column The treatment groups are restricted to randomly selected 6th and 7th grade students in Oklahoma City Public Schools experimental schools who opted into the randomization for the field experiment. Column (3) reports the p-value from a test of equality between non-participating and participating students for the given variable. Columns (8), (9), and (10) report p-values from a test of equality between each treatment group and the control control group for the given variable. The joint F-tests report the p-value from a test of the null hypothesis that there are no differences between the given groups across all reported variables in the table.

Appendix Table 2 - Mean Effect Size (2SLS Estimates) on Direct and Indirect Outcomes

	First Stage	Reduced Form	2SLS
	(1)	(2)	(3)
A. Direct Outcomes			
Knows Wage Gap btw BA and Dropouts - Information	0.942***	0.054*	0.060*
	(0.009)	(0.032)	(0.034)
	564	569	564
Knows Schooling & Income Relationship - Information	0.942***	-0.005	0.002
	(0.009)	(0.044)	(0.047)
	559	563	559
Knows Prison Rates - Information	0.943***	0.174***	0.183***
	(0.009)	(0.045)	(0.048)
	556	561	556
Number of Questions Correct - Information	0.943***	0.228***	0.247***
	(0.009)	(0.073)	(0.078)
	540	544	540
Knows Wage Gap btw BA and Dropouts - Info. & Incent.	0.944***	0.042	0.039
	(0.009)	(0.031)	(0.033)
	582	592	582
Knows Schooling & Income Relationship - Info. & Incent.	0.943***	-0.023	-0.030
	(0.009)	(0.043)	(0.046)
	567	577	567
Knows Prison Rates - Info. & Incent.	0.943***	0.172***	0.193***
	(0.009)	(0.043)	(0.045)
	577	587	577
Number of Questions Correct - Info. & Incent.	0.943***	0.195***	0.207***
	(0.009)	(0.070)	(0.075)
	553	563	553
Knows Wage Gap btw BA and Dropouts - Incentives	0.934***	0.014	0.022
	(0.010)	(0.033)	(0.036)
	576	589	576
Knows Schooling & Income Relationship - Incentives	0.932***	0.030	0.035
	(0.010)	(0.042)	(0.046)
	567	581	567
Knows Prison Rates - Incentives	0.932***	-0.043	-0.058
	(0.010)	(0.043)	(0.047)
	572	585	572
Number of Questions Correct - Incentives	0.934***	-0.005	-0.008
	(0.010)	(0.072)	(0.077)
	551	564	551
B. Indirect Survey Outcomes			
Effort Index - Information	0.942***	0.009	0.001
	(0.009)	(0.048)	(0.051)
	577	582	577
Effort Index - Info. & Incent.	0.944***	-0.016	-0.020
	(0.008)	(0.046)	(0.049)
	594	604	594
Effort Index - Incentives	0.932***	-0.033	-0.050
	(0.010)	(0.046)	(0.050)
	593	607	593
C. Indirect Administrative Data Outcomes			
OK State Math Test Post-Treatment - Information	0.949***	0.012	0.009

	(0.007)	(0.046)	(0.049)
	787	794	787
OK State Reading Test Post-Treatment - Information	0.949***	0.068	0.076
	(0.007)	(0.046)	(0.049)
	779	786	779
OK State Math Test Post-Treatment - Info. & Incent.	0.941***	-0.062	-0.065
	(0.008)	(0.045)	(0.048)
	780	790	780
OK State Reading Test Post-Treatment - Info. & Incent.	0.939***	0.014	0.012
	(0.008)	(0.047)	(0.050)
	780	790	780
OK State Math Test Post-Treatment - Incentives	0.939***	-0.034	-0.036
	(0.008)	(0.047)	(0.050)
	770	782	770
OK State Reading Test Post-Treatment - Incentives	0.939***	0.027	0.030
	(0.008)	(0.049)	(0.053)
	768	780	768

Notes: This table reports first stage, reduced form, and 2SLS estimates for participation on a variety of outcomes. First stage estimates report the causal effect of treatment on the percentage of the year each student had access to a functioning Million cellular phone (number of days without a reported phone problem divided by 225), controlling for our full set of covariates. Reduced form estimates mirror the ITT estimates presented in earlier tables. 2SLS estimates use randomized assignment to a treatment group to instrument for time spent with access to a functioning phone; the estimates can be interpreted as the effect of spending a full year with phone access for treated individuals in each treatment group. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 3 - Mean Effect Sizes (Intent-to-Treat) without Controls

	Information	Information & Incentives	Incentives	*p-value*
	(1)	(2)	(3)	(4)
A. Treatment Questions				
Knows Wage Gap btw BA and Dropouts	0.057*	0.031	0.006	0.532
	(0.031)	(0.032)	(0.033)	
	569	592	589	
Knows Schooling & Income Relationship	0.006	-0.028	0.019	0.733
	(0.044)	(0.043)	(0.042)	
	563	577	581	
Knows Prison Rates	0.174***	0.176***	-0.039	0.000
	(0.043)	(0.042)	(0.042)	
	561	587	585	
Number of Questions Correct	0.240***	0.177**	-0.021	0.028
	(0.072)	(0.071)	(0.072)	
	544	563	564	
B. Placebo Question				
Knows Unemployment Rate of College Grads	0.043	-0.024	0.043	0.404
	(0.042)	(0.040)	(0.041)	
	573	590	590	
C. Survey Questions				
Effort Index	0.013	-0.015	-0.031	0.793
	(0.048)	(0.047)	(0.046)	
	582	604	607	
D. Administrative Data Outcomes				
OK State Math Test Post-Treatment	-0.012	-0.113*	-0.042	0.484
	(0.061)	(0.061)	(0.062)	
	794	790	782	
OK State Reading Test Post-Treatment	0.049	0.001	0.043	0.838
	(0.063)	(0.062)	(0.064)	
	786	790	780	
Attendance Rate	0.016	-0.003	0.024	0.956
	(0.066)	(0.067)	(0.065)	
	856	863	861	
Number of Suspensions	0.037	0.041	0.028	0.992
	(0.073)	(0.074)	(0.074)	
	927	927	927	

Notes: This table reports ITT estimates for the effect of being offered a chance to participate in the field experiment on a variety of outcomes. All regressions only control for school fixed effects. The sample is restricted to randomly selected 6th and 7th grade students in Oklahoma City Public Schools. Randomization was done at the student level. Treatment is defined as returning a signed consent form to participate and being lotteried into the specified treatment group. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 4 - Differences in Outcomes by Message Dosage

	Information Dose	Persuasion Dose	*p-value* (1)=(2)
	(1)	(2)	(3)
A. Treatment Questions			
Knows Wage Gap btw BA and Dropouts	0.267	-0.073	0.589
	(0.314)	(0.339)	
	171		
Knows Schooling & Income Relationship	-0.738**	1.004***	0.011
	(0.336)	(0.373)	
	169		
Knows Prison Rates	0.440	-0.348	0.246
	(0.330)	(0.379)	
	168		
Number of Questions Correct	-0.057	0.717	0.505
	(0.581)	(0.628)	
	163		
B. Placebo Question			
Knows Unemployment Rate of College Grads	-0.473	0.453	0.185
	(0.347)	(0.378)	
	172		
C. Survey Questions			
Effort Index	0.001	0.252	0.764
	(0.407)	(0.470)	
	174		
D. Administrative Data Outcomes			
OK State Math Test Post-Treatment	0.561	-0.343	0.369
	(0.482)	(0.545)	
	206		
OK State Reading Test Post-Treatment	0.024	0.379	0.710
	(0.478)	(0.511)	
	205		

Notes: This table reports OLS estimates for the effect of receiving a full dose of informational and persuasive informational texts for individuals in the informational treatment groups who experienced some period of time without access to a functioning phone. Columns (1) and (2) respectively report the coefficient on the proportion of informational and persuasive texts a student received. A student is considered to have received a given informational or persuasive text if he or she was randomly assigned to an informational treatment group and did not report a problem with his or her phone (e.g., technical problems, stolen phone, lost phone, etc. Column (3) All regressions include school fixed effects and controls for 2009 state test scores, 2010 state test scores, and their squares and cubes. The sample is restricted to individuals in the informational treatment groups who experienced some period of time without access to a functioning phone. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 5 - Responses for Information Questions

	All	Control	Information	Information & Incentives	Incentives
	(1)	(2)	(3)	(4)	(5)
Question 1: True or false - college graduates make 54% more money than college dropouts.					
True	83.85	81.85	86.13	85.29	81.82
False	16.15	18.15	13.87	14.71	18.18
Question 2: Your income as an adult increases by _____ for every year you spend in school.					
10%	47.23	48.24	46.75	44.72	49.39
$5,000	17.26	13.73	19.81	17.70	17.18
50%	27.09	26.67	25.97	29.81	25.77
$100	8.42	11.37	7.47	7.76	7.67
Question 3: Are high school dropouts more likely to go to prison than high school graduates?					
Yes, much more likely	53.65	45.91	63.49	62.73	41.46
Yes, but it's really close	29.12	34.24	23.36	25.76	33.84
No, there's no difference	17.23	19.84	13.16	11.52	24.70
Placebo Question: 15.5% of high school dropouts are unemployed. What percentage of college graduates are unemployed?					
1%	9.41	9.62	7.99	9.70	10.30
4.8%	33.58	32.69	34.82	30.00	36.67
20%	30.82	34.62	25.56	32.42	31.21
25%	26.20	23.08	31.63	27.88	21.82

Notes: This table reports percentage of experimental students that responded with each answer on questions about human capital development. The correct answer to each question is bolded. Column (1) presents the percentages for all experimental students. Columns (2), (3), (4) and (5) present the percentages for students randomly assigned to the given treatment arm.

Appendix Table 6 - Mean Effect Sizes (Intent-to-Treat) on Effort-Related Survey Questions

	Control Mean	Information	Information & Incentives	Incentives	*p-value*
	(1)	(2)	(3)	(4)	(5)
More Focused Since Million	0.431	0.166***	0.132***	0.158***	0.845
		(0.044)	(0.043)	(0.043)	
		571	594	592	
Number of Books Read	15.490	-0.722	-1.555**	-1.890***	0.397
		(0.629)	(0.603)	(0.622)	
		577	598	598	
Number of Hours/day Spent on HW	1.561	-0.205*	-0.231**	-0.245**	0.966
		(0.111)	(0.107)	(0.108)	
		577	601	603	
Completes All Math HW Daily	0.523	-0.007	-0.023	-0.009	0.957
		(0.042)	(0.041)	(0.042)	
		576	601	602	
Completes All Reading HW Daily	0.525	-0.026	0.024	-0.021	0.685
		(0.044)	(0.044)	(0.046)	
		530	539	536	
Effort Index	-0.009	0.009	-0.016	-0.033	0.814
		(0.048)	(0.046)	(0.046)	
		582	604	607	

Notes: This table reports ITT estimates for the effect of being offered a chance to participate in the field experiment on students' answers to select survey questions that capture effort. The bottom row is a summary index equal to the average of the standardized value of each of the preceding variables. Each standardized outcome is renormed using the mean and standard deviation of the control group. All regressions include school fixed effects and controls for student grade, gender, race, SES, special education status, and English language learner status, as well as 2009 state test scores, 2010 state test scores, and their squares and cubes. The sample is restricted to randomly selected 6th and 7th grade students in Oklahoma City Public Schools. Randomization was done at the student level. Treatment is defined as returning a signed consent form to participate and being lotteried into the specified treatment group. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 7A - Analysis of Subsamples for the Information Treatment

	Number of Questions Correct	Effort Index	State Math	State Reading
	(1)	(2)	(3)	(4)
Common Sample	0.228***	0.009	0.012	0.068
	(0.073)	(0.048)	(0.046)	(0.046)
	544	582	794	786
A. Gender				
Male	0.351***	0.047	-0.026	0.170**
	(0.109)	(0.075)	(0.075)	(0.075)
	267	287	383	379
Female	0.051	-0.080	0.045	-0.027
	(0.107)	(0.071)	(0.066)	(0.062)
	277	295	411	407
p-value	0.032	0.179	0.450	0.033
B. Race				
Black	0.339**	0.056	-0.092	0.060
	(0.165)	(0.106)	(0.092)	(0.083)
	132	143	224	221
Hispanic	0.156	0.084	0.037	-0.003
	(0.107)	(0.070)	(0.065)	(0.066)
	273	293	382	381
White	0.209	-0.312*	0.035	0.175
	(0.227)	(0.163)	(0.160)	(0.173)
	88	93	120	118
p-value	0.558	0.020	0.450	0.514
C. Special Education				
Yes	-0.220	-0.262	0.029	0.021
	(0.505)	(0.356)	(0.403)	(0.421)
	69	74	58	51
No	0.224***	0.005	-0.004	0.041
	(0.075)	(0.051)	(0.044)	(0.045)
	475	508	736	735
p-value	0.200	0.284	0.903	0.939
D. Baseline Scores				
Above Median	0.250**	-0.032	-0.034	0.057
	(0.101)	(0.071)	(0.060)	(0.062)
	236	247	323	323
Below Median	0.374***	0.032	0.010	0.006
	(0.132)	(0.085)	(0.066)	(0.065)
	208	224	342	341
Missing	-0.294	-0.103	0.046	0.352*
	(0.221)	(0.163)	(0.183)	(0.190)
	100	111	129	122
p-value	0.006	0.640	0.810	0.137
E. English Language Learner				
Yes	0.088	-0.026	-0.048	-0.015
	(0.321)	(0.204)	(0.132)	(0.135)
	94	101	132	127
No	0.219***	0.007	0.012	0.054

	(0.078)	(0.052)	(0.051)	(0.050)
	450	481	662	659
p-value	0.618	0.845	0.626	0.581

Notes: This table reports ITT estimates for the effect of being offered a chance to participate in the information treatment arm on a subset of direct and indirect outcomes for a variety of subgroups. Columns indicate outcome measure, and rows indicate the subgroup to which the regression sample is limited. All regressions compare the informational treatment group with the control group. Regressions follow the same specification as Tables 3 and 4. The first row reports ITT estimates for the common sample with valid demographic information for all the subgroups we consider. Within the racial subgroups, we limit our analysis to racial groups represented by at least 100 students in the common sample. In addition to the racial subgroups represented in panel B, there are 40 Asian students, 77 Native American students, and 3 multi-racial students in the common sample. Randomization was done at the student level. Treatment is defined as being lotteried into the specified treatment group and returning a signed consent form to participate. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 7B - Analysis of Subsamples for the Information & Incentives Treatment

	Number of Questions Correct	Effort Index	State Math	State Reading
	(1)	(2)	(3)	(4)
Common Sample	0.195***	-0.016	-0.062	0.014
	(0.070)	(0.046)	(0.045)	(0.047)
	563	604	790	790
A. Gender				
Male	0.308***	0.016	-0.178***	0.042
	(0.107)	(0.067)	(0.068)	(0.073)
	279	301	402	403
Female	0.083	-0.063	0.062	-0.003
	(0.105)	(0.070)	(0.063)	(0.066)
	284	303	388	387
p-value	0.101	0.374	0.006	0.629
B. Race				
Black	0.238*	0.063	-0.199**	0.049
	(0.141)	(0.094)	(0.088)	(0.090)
	162	172	235	235
Hispanic	0.214*	0.022	0.040	0.011
	(0.113)	(0.072)	(0.064)	(0.069)
	252	276	362	364
White	-0.101	-0.191	-0.040	-0.027
	(0.199)	(0.126)	(0.122)	(0.146)
	99	106	126	126
p-value	0.195	0.124	0.063	0.870
C. Special Education				
Yes	0.148	-0.118	0.248	0.401
	(0.282)	(0.177)	(0.303)	(0.355)
	72	79	54	51
No	0.180**	-0.003	-0.067	0.000
	(0.074)	(0.049)	(0.044)	(0.046)
	491	525	736	739
p-value	0.881	0.405	0.135	0.091
D. Baseline Scores				
Above Median	0.106	-0.125*	-0.025	0.034
	(0.106)	(0.066)	(0.052)	(0.062)
	248	259	335	336
Below Median	0.264**	0.096	-0.125	0.038
	(0.133)	(0.089)	(0.082)	(0.071)
	203	219	312	312
Missing	0.135	0.020	-0.055	-0.034
	(0.203)	(0.121)	(0.122)	(0.154)
	112	126	143	142
p-value	0.575	0.074	0.543	0.884
E. English Language Learner				
Yes	0.070	0.015	-0.007	-0.046
	(0.269)	(0.147)	(0.132)	(0.119)
	82	91	127	125
No	0.216***	-0.017	-0.082*	0.028

	(0.075)	(0.050)	(0.048)	(0.051)
	481	513	663	665
p-value	0.501	0.802	0.544	0.520

Notes: This table reports ITT estimates for the effect of being offered a chance to participate in the information and incentives treatment arm on a subset of direct and indirect outcomes for a variety of subgroups. Columns indicate outcome measure, and rows indicate the subgroup to which the regression sample is limited. All regressions compare the information and incentives treatment group with the control group. Regressions follow the same specification as Tables 3 and 4. The first row reports ITT estimates for the common sample with valid demographic information for all the subgroups we consider. Within the racial subgroups, we limit our analysis to racial groups represented by at least 100 students in the common sample. In addition to the racial subgroups represented in panel B, there are 40 Asian students, 77 Native American students, and 3 multi-racial students in the common sample. Randomization was done at the student level. Treatment is defined as being lotteried into the specified treatment group and returning a signed consent form to participate. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 7C - Analysis of Subsamples for the Incentives Treatment

	Number of Questions Correct	Effort Index	State Math	State Reading
	(1)	(2)	(3)	(4)
Common Sample	-0.005	-0.033	-0.034	0.027
	(0.072)	(0.046)	(0.047)	(0.049)
	564	607	782	780
A. Gender				
Male	0.100	-0.026	-0.100	0.122
	(0.107)	(0.071)	(0.072)	(0.078)
	264	290	371	370
Female	-0.095	-0.058	0.022	-0.024
	(0.107)	(0.070)	(0.062)	(0.069)
	300	317	411	410
p-value	0.160	0.720	0.174	0.137
B. Race				
Black	0.066	-0.077	-0.080	0.071
	(0.145)	(0.083)	(0.087)	(0.093)
	168	179	228	227
Hispanic	-0.040	-0.034	-0.037	-0.003
	(0.107)	(0.072)	(0.067)	(0.071)
	254	277	365	367
White	0.047	-0.005	0.054	0.081
	(0.205)	(0.124)	(0.119)	(0.147)
	97	103	125	124
p-value	0.775	0.830	0.592	0.733
C. Special Education				
Yes	0.394	-0.027	0.288	0.361
	(0.310)	(0.178)	(0.386)	(0.389)
	81	90	50	47
No	-0.030	-0.046	-0.043	0.019
	(0.077)	(0.049)	(0.046)	(0.049)
	483	517	732	733
p-value	0.065	0.891	0.183	0.153
D. Baseline Scores				
Above Median	-0.031	-0.168**	-0.032	0.145**
	(0.114)	(0.074)	(0.054)	(0.064)
	243	257	330	331
Below Median	0.248*	0.081	-0.051	-0.041
	(0.129)	(0.084)	(0.077)	(0.080)
	208	221	316	316
Missing	-0.071	0.114	-0.009	-0.199
	(0.233)	(0.129)	(0.163)	(0.175)
	113	129	136	133
p-value	0.137	0.016	0.959	0.036
E. English Language Learner				
Yes	0.121	0.185	-0.139	-0.110
	(0.276)	(0.199)	(0.131)	(0.185)
	81	91	125	124
No	0.004	-0.059	-0.015	0.058

	(0.078)	(0.049)	(0.051)	(0.052)
	483	516	657	656
p-value	0.593	0.132	0.312	0.314

Notes: This table reports ITT estimates for the effect of being offered a chance to participate in the incentives treatment arm on a subset of direct and indirect outcomes for a variety of subgroups. Columns indicate outcome measure, and rows indicate the subgroup to which the regression sample is limited. All regressions compare the incentives treatment group with the control group. Regressions follow the same specification as Tables 3 and 4. The first row reports ITT estimates for the common sample with valid demographic information for all the subgroups we consider. Within the racial subgroups, we limit our analysis to racial groups represented by at least 100 students in the common sample. In addition to the racial subgroups represented in panel B, there are 40 Asian students, 77 Native American students, and 3 multi-racial students in the common sample. Randomization was done at the student level. Treatment is defined as being lotteried into the specified treatment group and returning a signed consent form to participate. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 8 - Bounding, ACT Scores

	ITT	Lee Lower Bound	*p-value* (1)=(2)	Lee Upper Bound	*p-value* (1)=(4)
	(1)	(2)	(3)	(4)	(5)
A. Information Treatment versus Control					
First ACT Comprehensive Score	0.143**	0.117*	0.772	0.175***	0.715
	(0.063)	(0.062)		(0.062)	
	308	304		304	
First ACT Math Score	0.089	0.061	0.741	0.112*	0.781
	(0.060)	(0.058)		(0.059)	
	308	304		304	
First ACT English Score	0.186***	0.158**	0.773	0.232***	0.617
	(0.067)	(0.066)		(0.064)	
	308	304		304	
First ACT Reading Score	0.168**	0.131*	0.729	0.208***	0.714
	(0.077)	(0.076)		(0.075)	
	308	304		304	
First ACT Science Score	0.117	0.074	0.692	0.147*	0.779
	(0.078)	(0.076)		(0.077)	
	308	304		304	
B. Information & Incentives Treatment versus Control					
First ACT Comprehensive Score	0.069	0.033	0.672	0.111*	0.614
	(0.060)	(0.059)		(0.058)	
	327	321		321	
First ACT Math Score	0.030	-0.001	0.678	0.068	0.625
	(0.055)	(0.053)		(0.053)	
	327	321		321	
First ACT English Score	0.100*	0.062	0.649	0.148**	0.564
	(0.060)	(0.059)		(0.057)	
	327	321		321	
First ACT Reading Score	0.068	0.021	0.664	0.124*	0.601
	(0.078)	(0.076)		(0.074)	
	327	321		321	
First ACT Science Score	0.060	-0.005	0.525	0.115	0.587
	(0.074)	(0.070)		(0.071)	
	327	321		321	
C. Incentives Treatment versus Control					
First ACT Comprehensive Score	0.091	0.061	0.718	0.126**	0.662
	(0.058)	(0.057)		(0.057)	
	320	316		316	
First ACT Math Score	0.069	0.042	0.711	0.092*	0.760
	(0.053)	(0.051)		(0.052)	
	320	316		316	
First ACT English Score	0.153**	0.122*	0.741	0.203***	0.582
	(0.067)	(0.065)		(0.063)	
	320	316		316	
First ACT Reading Score	0.066	0.024	0.696	0.109	0.693
	(0.077)	(0.076)		(0.075)	
	320	316		316	
First ACT Science Score	0.043	0.000	0.655	0.083	0.680
	(0.069)	(0.067)		(0.068)	
	320	316		316	

Notes: This table reports upper and lower Lee bounds to account for attrition in taking the ACT. Scores are normalized to the national distribution of scores among high school graduates of 2015-2016. For ease of comparison, Column (1) reproduces the long-term results from Table 9. Column (2) reports lower Lee Bounds. These bounds are generated by predicting the residuals from a regression of the ACT outcome of interest on baseline test scores, demographics, and treatment-year test scores within the control group only. The treatment group is then sorted and individuals with the largest residuals from the regressions are removed from the regression to equate ACT-taking rates between treatment and control. The resulting Lee lower bounds are from an OLS regression identical to our main specification after trimming the sample in this way. Column (4) reports upper Lee Bounds. These bounds are generated by the same process as lower Lee Bounds, except individuals with the smallest residuals are removed from the regression to equate response rates between treatment and control. Columns (3) and (5) report p-values on the null hypothesis that the treatment coefficients from theLEE bounds are equal to the treatment coefficient from the main ITT specification for the treatment group indicated in the panel title. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 9 - Mean Effect Sizes (Intent-to-Treat) on Student Outcomes (ACT Takers Only)

	Control Mean	Information	Information & Incentives	Incentives	*p-value*
	(1)	(2)	(3)	(4)	(5)
Panel I: Direct Outcomes					
A. Treatment Questions					
Knows Wage Gap btw BA and Dropouts	0.883	-0.061	-0.021	-0.089*	0.587
		(0.045)	(0.045)	(0.049)	
		216	232	230	
Knows Schooling & Income Relationship	0.465	0.011	-0.007	0.011	0.981
		(0.076)	(0.076)	(0.077)	
		211	228	221	
Knows Prison Rates	0.520	0.224***	0.155**	-0.137*	0.001
		(0.070)	(0.072)	(0.074)	
		214	233	227	
Number of Questions Correct	1.878	0.192*	0.126	-0.223*	0.032
		(0.112)	(0.109)	(0.125)	
		207	225	220	
B. Placebo Question					
Knows Unemployment Rate of College Grads	0.382	-0.012	-0.034	-0.083	0.784
		(0.073)	(0.071)	(0.074)	
		216	232	225	
Panel II: Indirect Outcomes					
C. Survey Outcomes					
Effort Index	0.148	-0.047	-0.093	-0.107	0.847
		(0.077)	(0.076)	(0.077)	
		219	237	234	
D. Administrative Data Outcomes					
OK State Math Test Post-Treatment	0.386	0.191**	-0.066	0.099	0.037
		(0.074)	(0.070)	(0.064)	
		285	302	300	
OK State Reading Test Post-Treatment	0.288	0.057	0.013	0.143*	0.474
		(0.081)	(0.078)	(0.076)	
		286	301	300	
Attendance Rate	0.233	0.176**	0.120	0.114	0.853
		(0.088)	(0.077)	(0.081)	
		301	321	313	
Number of Suspensions	0.247	-0.081	0.020	-0.025	0.667
		(0.082)	(0.076)	(0.082)	
		308	327	320	

Notes: This table reports ITT estimates for the effect of being offered a chance to participate in the field experiment for students who go on to take the ACT. Column 1 presents means for students that were randomly assigned to the the control group. Questions are coded as a 1 if the student answered the question correctly and a 0 otherwise. All regressions include school fixed effects and controls for student grade, gender, race, SES, special education status, and English language learner status, as well as 2009 state test scores, 2010 state test scores, and their squares and cubes. The sample is restricted to randomly selected 6th and 7th grade students in Oklahoma City Public Schools. Randomization was done at the student level. Treatment is defined as returning a signed consent form to participate and being lotteried into the specified treatment group. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 10: Student Baseline Characteristics, ACT Takers Only

	Non Participating	Participating	*p-value*		Incentives &			*p-value*
				Information	Information	Incentives	Control	
			(1) = (2)					(4)=(5)=(6)=(7)
Student Characteristics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Male	0.457	0.467	0.704	0.442	0.538	0.355	0.532	0.002
	(0.498)	(0.499)		(0.500)	(0.500)	(0.480)	(0.501)	
White	0.190	0.116	0.000	0.104	0.110	0.127	0.123	0.910
	(0.392)	(0.320)		(0.314)	(0.314)	(0.333)	(0.330)	
Black	0.243	0.270	0.241	0.240	0.283	0.289	0.266	0.763
	(0.429)	(0.445)		(0.452)	(0.452)	(0.455)	(0.443)	
Hispanic	0.487	0.532	0.098	0.565	0.526	0.524	0.513	0.812
	(0.500)	(0.499)		(0.501)	(0.501)	(0.501)	(0.501)	
Asian	0.045	0.040	0.633	0.032	0.040	0.024	0.065	0.285
	(0.208)	(0.197)		(0.198)	(0.198)	(0.154)	(0.247)	
Other Race	0.035	0.042	0.494	0.058	0.040	0.036	0.032	0.674
	(0.183)	(0.200)		(0.198)	(0.198)	(0.187)	(0.178)	
Special Education Services	0.111	0.097	0.405	0.123	0.098	0.054	0.117	0.147
	(0.314)	(0.297)		(0.299)	(0.299)	(0.227)	(0.322)	
English Language Learner	0.158	0.144	0.462	0.156	0.162	0.096	0.162	0.252
	(0.365)	(0.351)		(0.369)	(0.369)	(0.296)	(0.370)	
Free Lunch	0.835	0.898	0.001	0.896	0.890	0.898	0.909	0.955
	(0.371)	(0.303)		(0.314)	(0.314)	(0.304)	(0.288)	
Economically Disadvantaged	0.770	0.903	0.000	0.896	0.908	0.904	0.903	0.989
	(0.421)	(0.297)		(0.291)	(0.291)	(0.296)	(0.297)	
Baseline Math	0.289	0.317	0.618	0.332	0.243	0.260	0.452	0.244
	(0.976)	(0.925)		(0.996)	(0.996)	(0.814)	(0.908)	
Baseline Reading	0.296	0.225	0.207	0.173	0.209	0.199	0.329	0.563
	(0.974)	(0.941)		(1.048)	(1.048)	(0.846)	(0.911)	
Missing: Baseline Math	0.207	0.158	0.016	0.156	0.150	0.139	0.188	0.656
	(0.405)	(0.365)		(0.358)	(0.358)	(0.347)	(0.392)	
Missing: Baseline Reading	0.218	0.165	0.012	0.182	0.150	0.139	0.195	0.492
	(0.413)	(0.372)		(0.358)	(0.358)	(0.347)	(0.397)	
p-value from joint F-test			0.000					0.066
Observations	812	647	1459	154	173	166	154	647

Notes: This table reports summary statistics for the field experiment. Columns (1), (2), (4), (5), (6) and (7) represent the sample means of the variable indicated in each row for the group indicated in each column The treatment groups are restricted to randomly selected 6th and 7th grade students in Oklahoma City Public Schools experimental schools who opted into the randomization for the field experiment. Columns (3) and (8) report the p-value from a test of equality across treatment indicators (or experimental group indicators) from a regression of the variable in each row on indicators for each treatment group and the control group (or experimental group status). The joint F-tests report the p-value from a test of the null hypothesis that there are no differences between the given groups across all reported variables in the table.

Appendix Table 11A - Analysis of Subsamples for the Information Treatment

	Number of Questions Correct	Effort Index	State Math	State Reading
	(1)	(2)	(3)	(4)
A. Black Dissimilarity Index				
Above Median	0.220**	0.027	0.123**	0.141**
	(0.107)	(0.069)	(0.059)	(0.061)
	274	294	429	429
Below Median	0.271**	0.016	-0.086	-0.018
	(0.107)	(0.072)	(0.076)	(0.074)
	270	288	365	357
p-value	0.713	0.911	0.022	0.081
B. Zip Code Poverty Rate				
Above Median	0.251*	-0.050	0.002	0.100
	(0.146)	(0.094)	(0.065)	(0.075)
	194	204	313	308
Below Median	0.239***	0.051	0.046	0.075
	(0.089)	(0.061)	(0.063)	(0.062)
	350	378	481	478
p-value	0.940	0.316	0.600	0.785
C. Teacher Value-Added				
Above Median	0.257**	-0.017	-0.011	0.010
	(0.101)	(0.072)	(0.070)	(0.073)
	266	277	325	320
Below Median	0.302**	0.110	-0.030	0.088
	(0.127)	(0.080)	(0.068)	(0.070)
	200	219	357	358
Missing	0.033	-0.255	0.161	0.036
	(0.280)	(0.181)	(0.113)	(0.127)
	78	86	112	108
p-value (High=Low)	0.763	0.203	0.838	0.418

Notes: This table reports ITT estimates for the effect of being offered a chance to participate in the information treatment arm on a subset of direct and indirect outcomes for a variety of subgroups. Columns indicate outcome measure, and rows indicate the subgroup to which the regression sample is limited. All regressions compare the information treatment group with the control group. Regressions follow the same specification as Tables 3 and 4. Panel A presents ITT estimates for students based upon the Black Dissimilarity Index score of their zip code relative to the rest of the experimental group. Panel B presents ITT estimates for students based upon the poverty rate of their zip code relative to the rest of the experimental group. Panel C presents ITT estimates based upon the average Teacher Value-Added score of each student's math and reading/ELA teachers relative to the rest of the experimental group. See Online Appendix B for details about the construction of the Black Dissimilarity Index, zip code poverty rates, and TVA scores. The last row in each panel reports a p-value on the null hypothesis that treatment coefficients across the subgroups in that panel are equal for the indicated outcome. Randomization was done at the student level. Treatment is defined as being lotteried into the specified treatment group and returning a signed consent form to participate. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 11B - Analysis of Subsamples for the Information & Incentives Treatment

	Number of Questions Correct	Effort Index	State Math	State Reading
	(1)	(2)	(3)	(4)
A. Black Dissimilarity Index				
Above Median	0.169	-0.020	0.059	0.158**
	(0.103)	(0.067)	(0.068)	(0.067)
	268	295	408	411
Below Median	0.278***	-0.040	-0.192***	-0.140*
	(0.101)	(0.070)	(0.066)	(0.073)
	295	309	382	379
p-value	0.412	0.818	0.005	0.002
B. Zip Code Poverty Rate				
Above Median	0.165	-0.076	-0.194***	0.033
	(0.159)	(0.100)	(0.067)	(0.084)
	178	189	293	288
Below Median	0.292***	0.012	-0.016	-0.008
	(0.082)	(0.057)	(0.061)	(0.061)
	385	415	497	502
p-value	0.420	0.390	0.038	0.673
C. Teacher Value-Added				
Above Median	0.189*	-0.025	-0.016	-0.069
	(0.097)	(0.066)	(0.066)	(0.070)
	297	313	361	365
Below Median	0.245*	0.035	-0.077	0.151**
	(0.135)	(0.082)	(0.076)	(0.076)
	196	212	321	321
Missing	0.158	0.057	-0.109	-0.126
	(0.364)	(0.194)	(0.107)	(0.119)
	70	79	108	104
p-value (High=Low)	0.715	0.544	0.530	0.026

Notes: This table reports ITT estimates for the effect of being offered a chance to participate in the information and incentives treatment arm on a subset of direct and indirect outcomes for a variety of subgroups. Columns indicate outcome measure, and rows indicate the subgroup to which the regression sample is limited. All regressions compare the information and incentives treatment group with the control group. Regressions follow the same specification as Tables 3 and 4. Panel A presents ITT estimates for students based upon the Black Dissimilarity Index score of their zip code relative to the rest of the experimental group. Panel B presents ITT estimates for students based upon the poverty rate of their zip code relative to the rest of the experimental group. Panel C presents ITT estimates based upon the average Teacher Value-Added score of each student's math and reading/ELA teachers relative to the rest of the experimental group. See Online Appendix B for details about the construction of the Black Dissimilarity Index, zip code poverty rates, and TVA scores. The last row in each panel reports a p-value on the null hypothesis that treatment coefficients across the subgroups in that panel are equal for the indicated outcome. Randomization was done at the student level. Treatment is defined as being lotteried into the specified treatment group and returning a signed consent form to participate. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 11C - Analysis of Subsamples for the Incentives Treatment

	Number of Questions Correct	Effort Index	State Math	State Reading
	(1)	(2)	(3)	(4)
A. Black Dissimilarity Index				
Above Median	0.058	-0.023	0.018	0.077
	(0.106)	(0.066)	(0.063)	(0.067)
	284	309	426	426
Below Median	-0.049	-0.024	-0.023	0.003
	(0.107)	(0.072)	(0.072)	(0.075)
	280	298	356	354
p-value	0.438	0.986	0.652	0.439
B. Zip Code Poverty Rate				
Above Median	-0.147	-0.077	-0.080	0.020
	(0.147)	(0.091)	(0.064)	(0.076)
	197	215	316	314
Below Median	0.102	0.011	-0.026	0.041
	(0.084)	(0.057)	(0.064)	(0.064)
	367	392	466	466
p-value	0.099	0.362	0.529	0.826
C. Teacher Value-Added				
Above Median	-0.076	-0.123*	-0.025	-0.037
	(0.105)	(0.069)	(0.074)	(0.075)
	260	280	333	333
Below Median	0.111	0.092	-0.071	0.152*
	(0.131)	(0.079)	(0.073)	(0.078)
	210	224	330	330
Missing	0.191	-0.128	0.019	-0.038
	(0.235)	(0.148)	(0.126)	(0.122)
	94	103	119	117
p-value (High=Low)	0.226	0.026	0.647	0.070

Notes: This table reports ITT estimates for the effect of being offered a chance to participate in the incentives treatment arm on a subset of direct and indirect outcomes for a variety of subgroups. Columns indicate outcome measure, and rows indicate the subgroup to which the regression sample is limited. All regressions compare the incentives treatment group with the control group. Regressions follow the same specification as Tables 3 and 4. Panel A presents ITT estimates for students based upon the Black Dissimilarity Index score of their zip code relative to the rest of the experimental group. Panel B presents ITT estimates for students based upon the poverty rate of their zip code relative to the rest of the experimental group. Panel C presents ITT estimates based upon the average Teacher Value-Added score of each student's math and reading/ELA teachers relative to the rest of the experimental group. See Online Appendix B for details about the construction of the Black Dissimilarity Index, zip code poverty rates, and TVA scores. The last row in each panel reports a p-value on the null hypothesis that treatment coefficients across the subgroups in that panel are equal for the indicated outcome. Randomization was done at the student level. Treatment is defined as being lotteried into the specified treatment group and returning a signed consent form to participate. Heteroskedasticity-robust errors are reported in parentheses below each estimate. The number of observations in each regression is reported directly below the standard errors. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table 12A: Student Baseline Characteristics for Black Dissimilarity Index Subgroups

	Above Median Black Dissimilarity Index					Below Median Black Dissimilarity Index				
	Information	Information & Incentives	Incentives	Control	*p-value*	Information	Information & Incentives	Incentives	Control	*p-value*
Student Characteristics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Male	0.455	0.496	0.480	0.502	0.714	0.451	0.513	0.419	0.574	0.006
	(0.499)	(0.501)	(0.501)	(0.501)		(0.499)	(0.501)	(0.494)	(0.496)	
White	0.102	0.106	0.138	0.122	0.557	0.204	0.233	0.195	0.222	0.757
	(0.304)	(0.309)	(0.346)	(0.328)		(0.404)	(0.424)	(0.397)	(0.417)	
Black	0.337	0.346	0.327	0.308	0.832	0.243	0.305	0.298	0.310	0.372
	(0.474)	(0.477)	(0.470)	(0.463)		(0.430)	(0.461)	(0.458)	(0.464)	
Hispanic	0.519	0.488	0.458	0.516	0.472	0.412	0.356	0.419	0.352	0.316
	(0.501)	(0.501)	(0.499)	(0.501)		(0.493)	(0.480)	(0.494)	(0.479)	
Asian	0.000	0.012	0.007	0.009	0.411	0.040	0.051	0.033	0.065	0.414
	(0.000)	(0.108)	(0.085)	(0.095)		(0.196)	(0.220)	(0.178)	(0.247)	
Other Race	0.042	0.047	0.069	0.045	0.468	0.102	0.055	0.056	0.051	0.098
	(0.200)	(0.213)	(0.254)	(0.208)		(0.303)	(0.229)	(0.230)	(0.220)	
Special Education Services	0.095	0.150	0.138	0.140	0.248	0.173	0.131	0.158	0.134	0.557
	(0.293)	(0.357)	(0.346)	(0.348)		(0.379)	(0.339)	(0.366)	(0.342)	
English Language Learner	0.186	0.169	0.185	0.208	0.758	0.142	0.136	0.126	0.111	0.790
	(0.390)	(0.376)	(0.389)	(0.407)		(0.349)	(0.343)	(0.332)	(0.315)	
Free Lunch	0.973	0.965	0.935	0.964	0.119	0.863	0.873	0.874	0.870	0.984
	(0.161)	(0.185)	(0.248)	(0.187)		(0.345)	(0.334)	(0.332)	(0.337)	
Economically Disadvantaged	0.973	0.957	0.949	0.977	0.271	0.863	0.869	0.856	0.852	0.958
	(0.161)	(0.204)	(0.220)	(0.149)		(0.345)	(0.339)	(0.352)	(0.356)	
Baseline Math	-0.114	-0.100	-0.110	-0.023	0.742	0.124	0.170	0.164	0.272	0.900
	(0.902)	(0.951)	(0.981)	(0.886)		(1.055)	(1.107)	(0.991)	(0.930)	
Baseline Reading	-0.178	-0.091	-0.148	-0.108	0.762	0.030	0.117	0.076	0.270	0.241
	(1.012)	(0.886)	(0.906)	(0.823)		(1.132)	(1.198)	(1.082)	(0.958)	
Missing: Baseline Math	0.140	0.213	0.215	0.154	0.049	0.204	0.237	0.265	0.315	0.052
	(0.348)	(0.410)	(0.411)	(0.362)		(0.404)	(0.426)	(0.442)	(0.466)	
Missing: Baseline Reading	0.148	0.217	0.207	0.176	0.170	0.208	0.246	0.260	0.310	0.101
	(0.356)	(0.413)	(0.406)	(0.382)		(0.407)	(0.431)	(0.440)	(0.464)	
p-value from joint F-test					0.540					0.171
Observations	264	254	275	221	1014	226	236	215	216	893

Notes: This table reports summary statistics for students in each Black Dissimilarity Index subgroup. Columns (1), (2), (3), (4), (6), (7), (8) and (9) represent the sample means of the variable indicated in each row for the group indicated in each column The treatment groups are restricted to randomly selected 6th and 7th grade students in Oklahoma City Public Schools experimental schools who opted into the randomization for the field experiment. Columns (5) and (10) reports the p-value from a test of equality across treatment indicators from a regression of the variable in each row on indicators for each treatment group and the control group within each subgroup. The joint F-tests report the p-value from a test of the null hypothesis that there are no differences between the given groups across all reported variables in the table.

Appendix Table 12B: Student Baseline Characteristics for Zip Code Poverty Rate Subgroups

	Above Median Zip Code Poverty Rate					Below Median Zip Code Poverty Rate				
	Information	Information & Incentives	Incentives	Control	*p-value*	Information	Information & Incentives	Incentives	Control	*p-value*
Student Characteristics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Male	0.417	0.527	0.423	0.531	0.028	0.479	0.490	0.477	0.542	0.940
	(0.494)	(0.501)	(0.495)	(0.501)		(0.500)	(0.501)	(0.500)	(0.499)	
White	0.078	0.102	0.131	0.117	0.349	0.199	0.207	0.188	0.204	0.841
	(0.270)	(0.304)	(0.339)	(0.323)		(0.400)	(0.406)	(0.391)	(0.403)	
Black	0.319	0.355	0.291	0.278	0.400	0.276	0.309	0.332	0.327	0.354
	(0.467)	(0.480)	(0.455)	(0.449)		(0.448)	(0.463)	(0.472)	(0.470)	
Hispanic	0.520	0.478	0.512	0.525	0.814	0.434	0.391	0.386	0.382	0.449
	(0.501)	(0.501)	(0.501)	(0.501)		(0.496)	(0.489)	(0.488)	(0.487)	
Asian	0.000	0.016	0.019	0.019	0.291	0.031	0.039	0.018	0.047	0.360
	(0.000)	(0.126)	(0.136)	(0.135)		(0.175)	(0.195)	(0.133)	(0.213)	
Other Race	0.083	0.048	0.047	0.062	0.384	0.059	0.053	0.076	0.040	0.469
	(0.277)	(0.215)	(0.212)	(0.241)		(0.237)	(0.224)	(0.265)	(0.196)	
Special Education Services	0.108	0.124	0.117	0.160	0.473	0.147	0.151	0.170	0.124	0.722
	(0.311)	(0.330)	(0.323)	(0.368)		(0.355)	(0.359)	(0.376)	(0.330)	
English Language Learner	0.162	0.161	0.155	0.185	0.881	0.168	0.148	0.162	0.145	0.790
	(0.369)	(0.369)	(0.363)	(0.390)		(0.374)	(0.356)	(0.370)	(0.353)	
Free Lunch	0.966	0.952	0.939	0.969	0.451	0.892	0.901	0.884	0.887	0.807
	(0.182)	(0.215)	(0.240)	(0.173)		(0.311)	(0.299)	(0.320)	(0.317)	
Economically Disadvantaged	0.956	0.946	0.944	0.969	0.665	0.899	0.895	0.881	0.884	0.780
	(0.206)	(0.226)	(0.231)	(0.173)		(0.302)	(0.307)	(0.325)	(0.321)	
Baseline Math	-0.073	-0.145	-0.098	0.199	0.805	0.033	0.123	0.079	0.056	0.611
	(0.955)	(0.944)	(0.953)	(0.918)		(0.993)	(1.072)	(1.016)	(0.914)	
Baseline Reading	-0.206	-0.176	-0.158	0.141	0.903	-0.005	0.111	0.020	0.019	0.627
	(1.042)	(0.965)	(0.853)	(0.951)		(1.084)	(1.081)	(1.070)	(0.878)	
Missing: Baseline Math	0.206	0.274	0.277	0.259	0.320	0.143	0.194	0.206	0.218	0.130
	(0.405)	(0.447)	(0.449)	(0.440)		(0.351)	(0.396)	(0.405)	(0.414)	
Missing: Baseline Reading	0.201	0.269	0.272	0.278	0.251	0.157	0.207	0.199	0.222	0.271
	(0.402)	(0.445)	(0.446)	(0.449)		(0.365)	(0.406)	(0.400)	(0.416)	
p-value from joint F-test					0.211					0.805
Observations	204	186	213	162	765	286	304	277	275	1142

Notes: This table reports summary statistics for students in each Zip Code Poverty Rate subgroup. Columns (1), (2), (3), (4), (6), (7), (8) and (9) represent the sample means of the variable indicated in each row for the group indicated in each column The treatment groups are restricted to randomly selected 6th and 7th grade students in Oklahoma City Public Schools experimental schools who opted into the randomization for the field experiment. Columns (5) and (10) reports the p-value from a test of equality across treatment indicators from a regression of the variable in each row on indicators for each treatment group and the control group within each subgroup. The joint F-tests report the p-value from a test of the null hypothesis that there are no differences between the given groups across all reported variables in the table.

Appendix Table 12C: Student Baseline Characteristics for TVA Subgroups

	Above Median TVA					Below Median TVA				
	Information	Information & Incentives	Incentives	Control	*p-value*	Information	Information & Incentives	Incentives	Control	*p-value*
Student Characteristics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Male	0.500	0.482	0.489	0.541	0.662	0.434	0.524	0.438	0.541	0.130
	(0.501)	(0.501)	(0.501)	(0.500)		(0.497)	(0.501)	(0.497)	(0.500)	
White	0.191	0.241	0.226	0.213	0.677	0.133	0.097	0.146	0.138	0.347
	(0.394)	(0.429)	(0.420)	(0.411)		(0.340)	(0.297)	(0.354)	(0.346)	
Black	0.191	0.241	0.253	0.284	0.222	0.381	0.422	0.349	0.343	0.345
	(0.394)	(0.429)	(0.436)	(0.452)		(0.487)	(0.495)	(0.478)	(0.476)	
Hispanic	0.489	0.441	0.416	0.383	0.219	0.429	0.389	0.438	0.453	0.597
	(0.501)	(0.498)	(0.494)	(0.487)		(0.496)	(0.489)	(0.497)	(0.499)	
Asian	0.045	0.045	0.037	0.066	0.611	0.004	0.016	0.005	0.017	0.436
	(0.208)	(0.209)	(0.189)	(0.248)		(0.067)	(0.127)	(0.072)	(0.128)	
Other Race	0.084	0.032	0.068	0.055	0.146	0.053	0.076	0.063	0.050	0.632
	(0.279)	(0.176)	(0.253)	(0.228)		(0.225)	(0.265)	(0.243)	(0.218)	
Special Education Services	0.129	0.091	0.084	0.120	0.409	0.093	0.157	0.146	0.122	0.111
	(0.336)	(0.288)	(0.278)	(0.326)		(0.291)	(0.365)	(0.354)	(0.328)	
English Language Learner	0.202	0.136	0.132	0.126	0.138	0.142	0.124	0.151	0.155	0.755
	(0.403)	(0.344)	(0.339)	(0.332)		(0.349)	(0.331)	(0.359)	(0.363)	
Free Lunch	0.854	0.845	0.816	0.874	0.467	0.965	0.978	0.958	0.945	0.584
	(0.354)	(0.362)	(0.389)	(0.332)		(0.185)	(0.146)	(0.200)	(0.229)	
Economically Disadvantaged	0.860	0.845	0.832	0.863	0.821	0.960	0.968	0.964	0.950	0.930
	(0.348)	(0.362)	(0.375)	(0.344)		(0.196)	(0.178)	(0.188)	(0.218)	
Baseline Math	0.209	0.356	0.301	0.276	0.582	-0.169	-0.183	-0.121	-0.040	0.529
	(1.004)	(0.990)	(0.952)	(0.935)		(0.943)	(0.887)	(0.946)	(0.860)	
Baseline Reading	0.185	0.325	0.323	0.262	0.574	-0.275	-0.189	-0.212	-0.112	0.466
	(1.121)	(1.035)	(1.007)	(0.893)		(1.017)	(0.896)	(0.832)	(0.884)	
Missing: Baseline Math	0.135	0.159	0.189	0.180	0.504	0.142	0.243	0.193	0.227	0.036
	(0.343)	(0.367)	(0.393)	(0.386)		(0.349)	(0.430)	(0.395)	(0.420)	
Missing: Baseline Reading	0.146	0.173	0.189	0.186	0.692	0.150	0.243	0.188	0.243	0.066
	(0.354)	(0.379)	(0.393)	(0.390)		(0.358)	(0.430)	(0.391)	(0.430)	
p-value from joint F-test					0.642					0.519
Observations	178	220	190	183	771	226	185	192	181	784

Notes: This table reports summary statistics for students in each TVA subgroup. Columns (1), (2), (3), (4), (6), (7), (8) and (9) represent the sample means of the variable indicated in each row for the group indicated in each column The treatment groups are restricted to randomly selected 6th and 7th grade students in Oklahoma City Public Schools experimental schools who opted into the randomization for the field experiment. Columns (5) and (10) reports the p-value from a test of equality across treatment indicators from a regression of the variable in each row on indicators for each treatment group and the control group within each subgroup. The joint F-tests report the p-value from a test of the null hypothesis that there are no differences between the given groups across all reported variables in the table.

Appendix Figure 1: Samsung t401g Cell Phone

a) Closed View b) Open View