ANNENBERG
BROWN UNIVERSITY

EdWorkingPaper No. 20-282

Parent Engagement Interventions are Not Costless: Opportunity Cost and Crowd Out of Parental Investment

Carly D. Robinson
Brown University

Raj Chande
The Behavioural Insights Team

Simon Burgess
University of Bristol

Todd Rogers
Harvard University

Many educational interventions encourage parents to engage in their child's education as if parental time and attention is limitless. Sadly, though, it is not. Successfully encouraging certain parental investments may crowd out other productive behaviors. A randomized field experiment (N = 2,212) assessed the impact of an intervention in which parents of middle and high school students received multiple text messages per week encouraging them to ask their children specific questions tied to their science curriculum. The intervention increased parent-child at-home conversations about science but did not detectably impact science test scores. At the same time, the intervention decreased parent engagement in other, potentially productive, behaviors, such as turning off the television or monitoring their child's studying. These findings illustrate that parent engagement interventions are not costless: there are opportunity costs to shifting parental effort.

VERSION: August 2020

Suggested citation: Robinson, Carly D., Raj Chande, Simon Burgess, and Todd Rogers. (2020). Parent Engagement Interventions are Not Costless: Opportunity Cost and Crowd Out of Parental Investment. (EdWorkingPaper: 20-282). Retrieved from Annenberg Institute at Brown University: https://doi.org/10.26300/e9my-qn80

Parent Engagement Interventions are Not Costless: Opportunity Cost and Crowd Out of Parental Investment

Carly D. Robinson
Brown University

Raj Chande
The Behavioural Insights Team

Simon Burgess
University of Bristol

Todd Rogers
Harvard Kennedy School

August 2020

Abstract

Many educational interventions encourage parents to engage in their child's education as if parental time and attention is limitless. Sadly, though, it is not. Successfully encouraging certain parental investments may crowd out other productive behaviors. A randomized field experiment (N = 2,212) assessed the impact of an intervention in which parents of middle and high school students received multiple text messages per week encouraging them to ask their children specific questions tied to their science curriculum. The intervention increased parent-child at-home conversations about science but did not detectably impact science test scores. At the same time, the intervention *decreased* parent engagement in other, potentially productive, behaviors, such as turning off the television or monitoring their child's studying. These findings illustrate that parent engagement interventions are not costless: there are opportunity costs to shifting parental effort.

Introduction

Parents are integral in shaping children's academic and life successes (Henderson & Mapp, 2002; Reardon, 2011). Barack Obama (2009) endorsed this sentiment when he stated, "There is no program or policy that can substitute for a mother or father who will attend those parent-teacher conferences or help with the homework or turn off the TV, put away the video games, read to their child." The former president's words remind us of the power of parents investing in their child's education, while simultaneously highlighting the complexity of parenting—these are just a handful of the many education-promoting behaviors we expect engaged parents will take on.

But parents have limited time and resources to dedicate to parenting their child. In the face of these realities, parents necessarily need to make decisions about what parenting behaviors they will engage in and, consequently, which behaviors they will not (Shah et al., 2012). Ideally, policies and educators can direct parents toward the most productive behaviors that would promote their child's educational success.

Recent research suggests behavioral interventions that encourage and motivate parents to engage in specific ways can improve various educational outcomes, including attendance (Kalil et al., 2019; Lasky-Fink et al., 2020; Robinson et al., 2018; Rogers & Feller, 2018), academic performance (Bergman & Chan, 2019; Bergman et al., 2020), literacy (Cortes et al., 2018; Cortes et al., 2019; Mayer et al., 2019; York et al., 2019), and dropout from summer school (Kraft & Rogers, 2015). In many ways, the benefits of these interventions are clear. They are low-cost, scalable, and meaningfully improve student outcomes. Less straightforward, however, are the potential opportunity costs associated with these interventions. That is, what behaviors are parents foregoing when they redirect their time and efforts as the result of an intervention?

Consider an intervention that aims to increase homework submissions by alerting parents that their child failed to complete a homework assignment. If all goes according to plan, when parents receive that alert, they will take action to get their child to submit the missing assignment or act to make sure they do not neglect assignments in the future. If the child improves their homework submission rate, the intervention is a success. However, parents' time and cognitive bandwidth are finite. By directing the parent to attend to on-time homework assignments, they will necessarily have to sacrifice other behaviors. Maybe a parent will redirect the time they would otherwise spend scrolling Twitter, in which case the opportunity cost in terms of educational benefit to the child would be low. Or, perhaps, encouraging their child to complete an overdue assignment replaced the parent making sure their child went to bed at an appropriate time. In this case, the opportunity cost in terms of educational benefit to the child may be greater.

In this brief, we report on a randomized field experiment where we sent parents of 3,483 middle and high school students text messages reporting what their child learned in science class that day and encouraging parents to ask their children specific questions about that content. Parents received an average of two text messages per week over four-to-six weeks. Nearly two-thirds of the students (N = 2,212) completed a survey at the end of this period reporting on their at-home behaviors and interactions with their parents. The intervention increased parent-child at-home conversations about science but did not have a discernable impact on students' science test scores. At the same time, the intervention decreased the likelihood that parents engaged in other behaviors that would help children prepare for school (e.g., turned off the TV/computer games when the child was playing them) and school-related discussions (e.g., talked about current homework assignments). This pattern shows that parent engagement interventions are not costless. Successfully directing parental investments toward some parent engagement behaviors

can crowd out other, potentially productive, behaviors. Parents have limited time, attention, and resources to invest in their child's education, so there can be opportunity costs to shifting parental effort.

Present Study

Sample & Design

The study took place during the 2013-14 school year in five secondary schools (grades 7-11) in England, with a total of 5,078 students. (See the Supplementary Online Materials [SOM] for additional sample details.) All students who were enrolled in a science class that had a unit test during the study window (February-April) were eligible to participate (n = 3,725). Across the five schools, we excluded 116 students (3.1%) because their parent opted them out of the study and an additional 146 students (3.9%) because the school did not have a working mobile phone number for any parent. We performed a stratified randomization participating students by school, science class, prior attainment (on their most recent low-stakes science test), and free and reduced priced lunch (FRPL) status. Of the students in our final sample, 1,729 were assigned to the treatment condition and 1,754 to the control group. Of these 3,483 students, 2,212 students completed the final student survey. There were no statistically significant differences between the conditions on the pre-treatment covariates (see SOM).

Procedure & Intervention Details

The intervention involved texting parents about what their child learned in science class that day. To do this, research assistants used an existing texting platform which was mostly employed for administrative purposes by the participating schools. Over the course of the intervention period, science teachers wrote "conversational prompts" for parents after each class period that they shared with the research team. The research team encouraged teachers to first

describe what was taught in a non-technical manner and then pose a question that might stimulate genuine curiosity in the parent. For example: “Hi, today [Student First Name] learned about solids, liquid and gases. Please ask them which one is shaving foam? Thanks, [Teacher Name].” These prompts were occasionally edited by research assistants to fit the texting software’s character limit or for typos and clarity.

By the end of the school day, parents in the treatment condition received a text with the conversational prompt relating to the day’s science lesson. Over the course of the science unit (which lasted between four and six weeks), treatment parents received an average of two texts per week, $M = 2.03$, $SD = 0.93$, range: 0.20, 4.19. Parents in the control group did not receive any texts related to science class from the school.

Measures

Our preregistered primary outcome was students’ test scores at the end of the targeted science unit. In England, secondary school students will typically be tested five times per year in each subject. These are low-stakes tests that schools use to monitor their students’ progress. To compare across schools, we standardized the science tests within school and grade.

At the end of the experiment and after all students completed the unit tests, we administered a survey to both treatment and control group students. The number of students who completed the survey was balanced between the two conditions (control = 63.7%, treatment = 63.3%), $p = .68$. Students responded to questions about how often they discussed science at home, their perceptions of their parents’ behaviors and their parent-child interactions, as well as their own attitudes towards schooling and parent engagement. In particular, we asked students to report on whether their parents received texts about what they learned about in science class, how often they talked to their parents about science class, whether their parents tested them on

what they had learned in the past month, and whether their parents discussed what they were learning about in class. Students also answered whether they *wanted* their parents to receive science-class related texts and whether they would *enjoy* it.

To explore whether the treatment crowded out other parenting behaviors and discussions, we constructed a Parenting Behavior Index and a Parent-Child Discussion Topic Index. The Parenting Behavior Index tallied the number of behaviors students reported their parents engaged in the prior month to help them prepare for school (i.e., testing on what they had learned, turned off the TV/computer/video games, made them go to sleep at a reasonable hour, made sure they had a quiet place to study, checked what they were studying, or another behavior not listed). The Parent-Child Discussion Topic Index tallied the number of school-related topics students reported discussing with their parents in the prior month (i.e., attendance, behavior, participation, focus, effort, current homework, missing homework, studying for tests, grades, or their overall performance). The SOM provides details on all survey items.

Analytic Strategy

We used the following model specification for an Intent-to-Treat (ITT) estimate of the treatment effects:

$$Y_i = \alpha + \beta T_i + \boldsymbol{X}_i + \gamma_c + \varepsilon_i$$

where Y_i is the student level outcome of interest, T_i is an indicator for random assignment to treatment, $\boldsymbol{X}_i$ is a vector of covariates including FRPL status and prior science attainment, and γ_c is a dummy variable for each class. We use cluster-robust standard errors to account for within-class correlations across students in outcomes. The parameter of interest is β, which captures the causal effect of the intervention.

Results

As a manipulation check, we asked students to report whether their parents had received texts about what they were learning in science class in the prior month. 83.7% of students in the treatment groups correctly responded that their parents received the texts, compared to 10.5% of control students who said their parents received the texts. Thus, the treatment group were 73.2 percentage points (pp) more likely to report their parents received the texts, which aligns with prior self-reported manipulation checks (e.g., Rogers & Feller, 2018). Relatedly, parents of treatment students discussed science class 0.27 times more per week ($SD = 0.059$, $p < .001$) compared to the control group baseline of 1.27 times per week. We also found 53.8% of treatment students reported that their parents tested them on what they learned in school in the prior month compared to only 42.4% of control students, $SD = 2.2\%$, $p < .001$. However, treatment students did not indicate that their parents discussed what they were learning about in class more generally (i.e., not science-specific) at a higher rate than control students (59.5% vs. 57%, $p = .283$).

Despite the increase in reported discussions about science class and testing on what was learned in school, we did not find evidence that the treatment increased students' performance on their science unit test scores, $\beta = 0.027$-standard deviations, $SD = 0.021$, $p = .202$. See the SOM for robustness checks and details on heterogeneity analyses.

On the other hand, parenting behaviors that were not related to discussions about science or testing what was learned in school appeared to fall in response to the intervention. Table 1 details the treatment impact on students' reports of their parents' behaviors (Panel A) and parent-child discussions (Panel B). The treatment decreased the likelihood that parents engaged in other parenting behaviors by 0.24 instances in the prior month or 0.18-standard deviations, $p < .001$.

Table 1: Impact of Sending Parents Conversational Prompts on Student Perceptions of Parenting Behaviors and Parent-Child Discussions

Panel A

Outcome	Control Mean	Treatment Effect	*p*-value	R^2
Parenting Behavior Index	2.50	-0.242***	.000	0.123
		(0.053)		
Turned off TV/computer/video game	44.8%	-0.074***	.000	0.113
		(0.020)		
Made child go to sleep	57.8%	-0.054**	.036	0.104
		(0.026)		
Quiet place to study	53.8%	-0.033	.152	0.094
		(0.023)		
Checked child was studying	67.7%	-0.050**	.02	0.090
		(0.021)		
Other	26.0%	-0.029*	.09	0.100
		(0.017)		
None of these things	6.0%	0.005	.781	0.074
		(0.012)		

Panel B

	Control Mean	Treatment Effect	*p*-value	R^2
Parent-Child Discussion Topic Index	4.82	-0.261**	.036	0.160
		(0.123)		
Attendance	36.2%	-0.007	.743	0.127
		(0.021)		
Behaviour	47.0%	-0.023	.248	0.202
		(0.020)		
Participation	27.0%	-0.010	.638	0.136
		(0.021)		
Focus	40.0%	-0.017	0.810	0.115
		(0.023)		
Effort	51.0%	-0.018	0.409	0.118
		(0.022)		
Current homework	69.4%	-0.054***	0.005	0.130
		(0.019)		
Missing homework	34.2%	-0.042**	0.050	0.079
		(0.021)		
Studying for tests	62.4%	-0.031	0.107	0.124
		(0.019)		
Grades	69.4%	-0.027	0.169	0.137
		(0.019)		
Overall performance	45.2%	-0.027	0.259	0.110
		(0.021)		
Did not ask about school	3.0%	-0.003	0.681	0.064
		(0.007)		

Notes:
The Parenting Behavior Index sums all the sub-behaviors (excluding "None of these things"). The Parent-Child Discussion Topic Index sums all the sub-discussion topics (excluding "Did not ask about school").
All of the models include class student prior attainment and FRPL as covariates, school-level fixed-effects, and robust standard errors are clustered at the class level. The observations for each row range from 2,201 to 2,212.
*p<0.1, **p<0.05, ***p<0.01

Specifically, students whose parents received the text messages reported that their parents were less likely to turn off the TV/computer/video games (-7.4 pp), making them go to sleep (-5.4 pp), and checking that they were studying (-5 pp). Similarly, students in the treatment group reported their parents discussed 0.26 fewer non-science, school-related topics with them in the prior month, $p = .036$.

Finally, students appear to have liked the treatment more than they would have predicted. Compared to the students in the control group, treatment students were more likely to report they *wanted* their parents to receive texts about what they were learning in science class next term (34% vs. 41.3%, respectively, $p < .001$) and that they would *enjoy* it if their parents received texts about what they were learning science class so they could talk about it together (31.8% vs. 37.6%, respectively, $p = .007$).

Discussion

Interventions aimed at parents can increase student success if they increase productive parental investment (Cunha et al., 2006). This can be achieved by some combination of increasing the total productive time parents invest in their child or substituting less productive time investments with more productive ones. Of course, this requires parents to discern which investments will be more or less likely to produce educational gains by their child. The recent successes of parent-focused behavioral interventions suggest that parents' time investments are malleable and can be shifted toward certain behaviors that impact student outcomes (see Bergman, 2019).

In the present study, we successfully increased the amount of time parents invested in talking with their child about science class and testing them on what they learned that day. Counter to our expectations, we did not find support that this investment increased students'

science test scores. Instead, we discovered that the intervention substituted some parental investments (e.g., turning off electronic devices) with another (i.e., talking with their child about science) that was not necessarily more productive at increasing the targeted educational outcome (i.e., science test scores). While the end-of-unit science test score was our intended outcome, we acknowledge that the intervention could have positively impacted other beneficial outcomes that we did not measure, like curiosity or parent-child relationships.

On one hand, these results are promising because they demonstrate parents will respond to encouragements from schools to get involved in their child's education and that students like such interventions more than they would expect. Parents act when they receive simple, timely, accurate, and reliable messages that are easy to take-up. Policymakers and educators should continue to partner with parents in service of increasing student success. On the other hand, policymakers and educators must consider what other, potentially productive, parenting behaviors may be crowded out as a result of redirecting parents' efforts.

Though not the focus of this manuscript, we note that the final experimental sample may not have been large enough to detect an effect size on achievement of this magnitude. The not-statistically-significant 0.027-standard deviation increase in test scores corresponds to approximately one month of additional schooling (Hill et al., 2008). Nonetheless, the present study suggests the subsequent crowd out of other parental investments would still occur. Therefore, if the intervention led to a meaningful increase in student test scores, the question would become, what is the more productive parental investment? In that case, the benefits of the intervention would have to be weighed against the associated opportunity costs.

Future research could involve designing an experiment that varies the educational productivity of the encouraged parental behaviors. Such a design could confirm the current

manuscript's thesis by finding that all encouragements crowded out other parental investments but encouraging behaviors that have high (as compared to low) educational productivity would result in better student outcomes. Second, a future experiment might directly observe parental investment behavior rather than relying on self-report. This would allow for closer observation of the mechanical process of how and why parents substitute and adjust their investments (see Dizon-Ross, 2019).

This study shows that parent engagement interventions are not costless. Successfully directing parent investment toward a particular behavior can crowd out other, potentially productive, behaviors. Parents have limited time, attention, and resources to invest in their child's education. When developing interventions and communications for parents, policymakers must be aware that, as economists say, there are no free lunches.

References

Bergman, P. (2019). How behavioral science can empower parents to improve children's educational outcomes. *Behavioral Science & Policy, 5*(1), 52-67.

Bergman, P., & Chan, E. W. (2019). Leveraging parents through low-cost technology: The impact of high-frequency information on student achievement. *Journal of Human Resources*, 1118-9837R1111.

Bergman, P., Lasky-Fink, J., & Rogers, T. (2020). Simplification and defaults affect adoption and impact of technology, but decision makers do not realize it. *Organizational Behavior and Human Decision Processes, 158*, 66-79.

Cortes, K. E., Fricke, H., Loeb, S., Song, D. S., & York, B. N. (2018). Too little or too much? Actionable advice in an early-childhood text messaging experiment. *Education Finance and Policy*, 1-44.

Cortes, K. E., Fricke, H. D., Loeb, S., Song, D. S., & York, B. N. (2019). *When behavioral barriers are too high or low–How timing matters for parenting interventions* (0898-2937).

Cunha, F., Heckman, J. J., Lochner, L., & Masterov, D. V. (2006). Interpreting the evidence on life cycle skill formation. *Handbook of the Economics of Education, 1*, 697-812.

Dizon-Ross, R. (2019). Parents' beliefs about their children's academic ability: Implications for educational investments. *American Economic Review, 109*(8), 2728-2765.

Henderson, A. T., & Mapp, K. L. (2002). A New Wave of Evidence: The Impact of School, Family, and Community Connections on Student Achievement. Annual Synthesis 2002. *National Center for Family and Community Connections with Schools.*

Hill, C. J., Bloom, H. S., Black, A. R., & Lipsey, M. W. (2008). Empirical benchmarks for interpreting effect sizes in research. *Child development perspectives, 2*(3), 172-177.

Kalil, A., Mayer, S. E., & Gallegos, S. (2019). Using behavioral insights to increase attendance at subsidized preschool programs: The Show Up to Grow Up intervention. *Organizational Behavior and Human Decision Processes.*

Kraft, M. A., & Rogers, T. (2015). The underutilized potential of teacher-to-parent communication: Evidence from a field experiment. *Economics of Education Review, 47*, 49-63.

Lasky-Fink, J., Robinson, C. D., Chang, H. N., & Rogers, T. (2020). Using Behavioral Insights to Improve School Administrative Communications: The Case of Truancy Notifications.

Mayer, S. E., Kalil, A., Oreopoulos, P., & Gallegos, S. (2019). Using Behavioral Insights to Increase Parental Engagement: The Parents and Children Together Intervention [Article]. *Journal of Human Resources, 54*(4), 900-925. http://search.ebscohost.com/login.aspx?direct=true&db=edspmu&AN=edspmu.S1548800419400027&site=eds-live&scope=site

Obama, B. (2009, February 24, 2009). *Address to Joint Session of Congress* https://obamawhitehouse.archives.gov/the-press-office/remarks-president-barack-obama-address-joint-session-congress

Reardon, S. F. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. *Whither opportunity*, 91-116.

Robinson, C. D., Lee, M. G., Dearing, E., & Rogers, T. (2018). Reducing Student Absenteeism in the Early Grades by Targeting Parental Beliefs. *American Educational Research Journal, 55*(6), 1163-1192. https://doi.org/10.3102/0002831218772274

Rogers, T., & Feller, A. (2018). Reducing student absences at scale by targeting parents' misbeliefs. *Nature Human Behaviour, 2*(5), 335-342. https://doi.org/10.1038/s41562-018-0328-1

Shah, A. K., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. *Science, 338*(6107), 682-685. https://doi.org/10.1126/science.1222426

York, B. N., Loeb, S., & Doss, C. (2019). One step at a time the effects of an early literacy text-messaging program for parents of preschoolers. *Journal of Human Resources, 54*(3), 537-566.