

How behavioral science can empower parents to improve children's educational outcomes

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abstract

Parents powerfully influence their children's educational outcomes. Yet psychological and informational barriers impede parents' ability to engage with their children in ways that improve outcomes: parents tend to have inflated perceptions of their children's performance, which can deter them from taking helpful steps to effectively support their learning, and parenting is complex. Limited cognitive bandwidth for coping with complexities can steer parents' attention away from actions that have long-term benefits for their children and toward actions yielding immediate returns. Poor school-to-parent communication and poverty exacerbate all of these problems. In this article, the author demonstrates how providing timely, actionable information to parents can lower these barriers and help parents engage with their children more productively from kindergarten through high school. Moreover, providing this information can improve educational outcomes at low cost.

Families powerfully influence children’s learning.^{1,2} In 1966, the Coleman Report surveyed the state of educational opportunity in public schools across the United States³ and concluded that families are a more significant source of inequality than schools are.¹ Differences in home inputs, such as the number of words a child hears in an hour, can differ substantially across families: a child in a low-income family typically hears less than a third the number of words heard by a child in a professional-class family.⁴ These types of differences are meaningful. Researchers at the University of Pennsylvania showed that equalizing these types of home inputs can reduce the Black–White and Hispanic–White achievement gaps by more than 25%—a far greater reduction than would be achieved by equalizing inputs from schools.⁵

This evidence suggests that interventions aimed at parents could increase student achievement. Unfortunately, these interventions are often expensive and difficult to implement, despite being cost-effective in the long run (see note A). Until recently, there was a dearth of rigorous research into low-cost strategies to engage parents.^{6,7} In the last six years, however, randomized controlled trials have shown that inexpensive behavioral interventions can empower parents to improve children’s educational outcomes; in such trials, investigators randomly assign participants to receive an intervention (treatment) or to be part of a control group not receiving the intervention. In this review, I summarize the relevant research and discuss the policy implications of the findings as well as the potential to scale useful interventions. Because this research is recent, many of the findings appear in working papers and await peer review.

Barriers to Parental Engagement in Children’s Education

Parents face a number of barriers to engaging in activities that enhance their children’s education. I loosely categorize these barriers as being either psychological (such as having biased beliefs and limited bandwidth for attending to

complexities and educational issues) or informational (such as experiencing difficulty obtaining clear information about a child’s academic progress). Many of these factors interact with one another and with other detrimental features in families’ environments, as the studies that follow, which are not exhaustive, indicate.

Biased Beliefs

Research into parents’ views of how well their children are doing in school shows that, on average, parents are overly optimistic about several aspects of their kids’ educational performance. Specifically, they overestimate assignment completion,^{8,9} attendance,^{9–11} and grades.^{9,12} In 2018, for instance, Rebecca Dizon-Ross found that parents in Malawi overestimated their children’s test scores and that lower income families estimated less accurately than did higher income families.¹³ And I have found that the worse children perform, the less accurate their parents’ beliefs tend to be.⁸ Inflated beliefs could have consequences if they cause a family to make educational investments that are poorly aligned with their child’s skill level. Such investments

In Brief:

Psychological and informational barriers impede parents’ ability to engage with their children in ways that improve educational outcomes.

Parents overestimate their children’s academic performance along multiple dimensions.

Parenting is complex, and limited cognitive bandwidth steers parents’ attention away from steps that would have long-term benefits for education and toward steps having immediate returns.

Poor school-to-parent communication makes it difficult to monitor children and make accurate assessments of their performance.

Poverty exacerbates these problems for families.

The provision of simple, timely, actionable information to parents can attenuate these barriers and promote effective parental engagement from kindergarten through high school.

Providing this information via text message can improve student learning at low cost.

Core Findings

What is the issue?

Parents often do not make the right long-term investments in their children’s educational outcomes. Both psychological and informational barriers impede parental decision-making about these outcomes. Timely and actionable interventions are required to address cognitive biases, limited cognitive bandwidth, and low salience.

How can you act?

Selected recommendations include:

- 1) Automating the gathering and delivery of information about a child’s educational outcomes to parents
- 2) Investing in efficacious opt-out rather than opt-in communication strategies about outcomes

Who should take the lead?

Researchers, policymakers, and stakeholders in education

“the worse children perform, the less accurate their parents’ beliefs tend to be”

can be money spent on remedial or enrichment programs or put aside for later school expenses but can also be nonmonetary investments, such as time spent assisting with homework.

Not only do parents misperceive absolute performance, but they also tend to overestimate performance relative to a child’s peers—such as by misjudging differences in attendance and test scores.^{11,14} These mistakes matter, because families alter investments in their children on the basis of how the students perform relative to others in their peer group.¹⁴ Improper relative assessments could lead to too little parent and teacher engagement and thus to disappointing outcomes. Evidence indicates that a child’s class rank affects long-term academic performance.^{15,16} Given that families tend to overestimate their child’s relative performance, more accurate information could enhance parental engagement and improve educational outcomes.

Parents may formulate inaccurate beliefs because monitoring children requires time and attention and because school report cards are often complex, among other reasons. A study I conducted in the 2010–2011 school year at a combined middle school and high school in Los Angeles indicated that 11% of families did not understand the A-to-F grading system.⁸ This difficulty may seem surprising, but many families emigrate from countries that rely on different grading schemes. Children who are underperforming may exacerbate misperceptions because they have an incentive to avoid telling their parents about their poor grades. In 2015, I incorporated biased beliefs and monitoring difficulties into a model of parent–child interactions and found that each can independently impede parental engagement and reduce student effort.⁸

Parents may also misunderstand how their child learns. For example, they may underestimate the benefits of investing in their child’s education

early in childhood, as well as the importance of reinforcing these early investments further as the child gets older.^{17,18} Flávio Cunha and his collaborators surveyed mothers to elicit their beliefs about the benefits of early childhood investments.¹⁹ Compared with the authors’ calculations, these mothers understated the returns, on average. In terms of a child’s effort and resulting learning in school, parents tend to overstate their child’s willingness to compete,²⁰ particularly for their sons. This misperception is potentially worrisome, because willingness to compete can predict educational and occupational decisions.

Other misperceptions extend to higher education. In 2018, Zachary Bleemer and Basit Zafar reported that parents inaccurately estimate the costs of and economic returns to attending college.²¹ In a nationally representative survey, they found that 60% of families overestimated net college costs. Further, almost 75% of families underestimated the average returns to a college degree. These misestimations were larger for less educated and lower income households. Complexity again may be an issue, given that determining the net cost of college after financial aid is difficult.²²

Limited Cognitive Bandwidth & Attention & Low Salience

Parenting involves the frequent need to make complex decisions.²³ Often, the correct decision is not obvious; each choice may have uncertain implications. These challenges may be more significant for low-income families, who contend with higher cognitive loads.^{24,25} Low-income families face burdens such as more unpredictable work schedules, varying incomes, and language barriers.^{26,27} These uncertainties and budget constraints, although outside the domain of education, can impose a psychological tax on families that has broad ramifications for attention, impulse control, and the smooth function of working memory, which facilitate reasoned decisionmaking.^{25,28}

This psychological tax could impede parental engagement in their children's education in several ways. First, families' attention may be drawn away from education-related decisions and toward financial decisions. In other words, the educational decisions become less salient. Second, the complexity and number of educational choices may cause parents to disengage with these decisions.^{23,29,30} For instance, in many school districts, parents can view their child's missed assignments, attendance, and grades online via a district website. This requires logging in with a username and password. However, parents may forget to log in or misplace their log-in information. I have found that less than one third of parents across several hundred schools in multiple districts have ever logged in to view their child's grades online.³¹ Log-in rates are lower in schools that have more low-income families, as measured by the percentage of recipients of free and reduced-price lunches. (I find that periodically providing families with their log-in information increases usage.)

Guilherme Lichand and his collaborators have provided the most direct evidence that limited cognitive bandwidth and low salience can impede parental engagement.³² The authors conducted a survey of parents in Brazil and primed a random sample to think about financial concerns (primed parents are more likely to have financial concerns top of mind). Subsequently, primed parents were less likely to pay for an evidence-based education intervention. The authors also found that families divert cognitive resources away from education decisions with returns experienced only after a delay, such as participation in beneficial education programs, and toward decisions having more immediate impacts, such as those involving immediate financial needs.

Tendency to Discount the Value of Future Benefits

Education provides benefits in the long run but requires continual investment.³³ There is evidence that a temporary negative shock to people's finances increases how much they discount or devalue their assessment of benefits that might come in the future.³⁴ This discounting may cause low-income families to underinvest

in their child's education, despite the value of education for later earnings. Compounding this issue, many parenting practices, such as reading and discipline, often require continuous attention, but the benefits of these practices on performance and self-management take a long time to manifest. Parents may tend to delay activities that do not pay off quickly in favor of activities offering immediate rewards.

Costs of Monitoring Student Progress

An additional cognitive challenge of parenting is the difficulty of monitoring children's progress. Schools contribute to this difficulty. They may provide information that is not in parents' native language, issue confusing report cards, and send information to families infrequently. In a study conducted in the largest school district in West Virginia, for instance, Eric W. Chan and I found that 45% of parents were contacted less than once every three months about their child's schoolwork or grades (whether by report cards, phone calls, or e-mails).⁹

Studies from outside the United States raise similar concerns. In Brazil, school landlines are blocked from calling cell phone numbers.³⁵ This impedes school-to-parent communication, because few families in Brazil—as is true in many low-income countries—have landlines. Cell phone penetration, however, is above 90%. In Malawi, 64% of parents do not know their child's current academic standing; among the most commonly cited reasons for this lack of knowledge are not receiving a report card and not being able to understand the report card when it comes.¹³

Low-Cost Interventions That Leverage Behavioral Insights

The evidence above suggests that the provision of timely, actionable information to families about their children's academic progress could address many of these behavioral and informational barriers. *Timely* implies that the information is top of mind right at the point a decision must be made. *Actionable* means that the information is simple and clear and that it suggests a response that can directly improve educational outcomes. The timing of

information delivery and the recommended actions must be specific to the age of the child.

Next, I describe interventions targeted according to children's age ranges. Many of these interventions address multiple behavioral biases or structural barriers simultaneously. All the studies cited are randomized controlled trials, and all the findings reported below refer to differences between the treatment groups and controls.

Preschool Through Primary School

Fostering learning in preschoolers and kindergarteners can be a complicated task with steps that are difficult to discern. What might successful parental involvement look like at these ages?

Benjamin York and his coauthors designed a literacy intervention that delivered timely, actionable advice to families.²³ Their intervention consisted of short, simple text messages sent to parents three times a week over eight months. The first message of the week was a child-development fact that highlighted the importance of a particular literacy skill. The second message of the week described a simple activity parents could do to improve this skill. The third message informed parents about how to build on this activity. The brevity of the messages reduced the cognitive burden on families while making actionable content salient.

To test the intervention, the authors recruited roughly 1,000 families with preschool-aged children and surveyed teachers to discern how the parents of each child responded to the messages. Treatment-group parents asked teachers more frequently about what their child was doing in school, requested tips for teaching their child to read, and asked whether their child got along with others. These impacts coincided with increased literacy scores equivalent to three months of learning (0.10–0.15 standard deviations).

Susan E. Mayer and her coauthors also studied how behavioral interventions targeted to parents could improve preschool-aged children's literacy.³⁶ They gave tablets loaded with 500 books to 169 parents. Parents were then

“parents in the treatment group read to their child more than twice as much as did parents in the control group”

randomly assigned to a control group or a three-component intervention. In the intervention's first component, parents made a “soft” commitment, informing a research assistant of how much time they intended to spend reading to their child the following week. (Research shows that making a public commitment increases the likelihood the commitment will be honored.) At the end of each week, parents received an assessment of how much they actually read to their child compared with their goal, based on data collected by the tablet. The second component consisted of sending parents a text message each weekday reminding them about their reading goal and the importance of reading. The third component was a social reward: parents received a congratulatory message for achieving their reading goal or for doing the most reading, compared with the other families within their preschool center. Over the course of six weeks, parents in the treatment group read to their child more than twice as much as did parents in the control group (for 152 minutes versus 63 minutes).

In a study similar to one I conducted in 2014 with middle school and high school students (described below),⁸ Stanley Siebert and several of his colleagues tested an intervention intended to make it easier for parents in China to monitor grade school students.³⁷ In a trial involving 10 schools and approximately 4,000 students, the authors provided students and their parents with weekly information, primarily about the students' behaviors in school. Teachers met with students every two weeks to review a progress report card that was sent to parents using WeChat, a popular messaging platform in China. Providing this information to both parents and students proved particularly effective at enhancing the academic achievement of lower performing students (who showed an

average of 0.25 standard deviations of improvement in math and language), but looping in parents added no benefit over direct feedback for higher performing students.

Felipe Barrera-Osorio and his collaborators and, independently, Rebecca Dizon-Ross also conducted studies focused on enhancing scholastic performance information delivery while looking specifically at effects on parental bias.^{13,38} They randomized the provision of test score information to parents in Colombia and Malawi, respectively. In both settings, parents' beliefs became more accurate as a result of receiving the scores. In Colombia, student performance gradually improved (particularly for children who started with low grades), although these effects faded five months after the intervention. In Malawi, Dizon-Ross offered leveled workbooks to parents and found that those who received their children's scores were more likely to accurately match workbook levels to their child's reading ability. But another result was mixed: children whose parents initially underestimated their performance were more likely to persist in school, but those whose parents overestimated performance were less likely to persist. The reduced persistence might have resulted from parents deciding that investing in schooling was no longer worthwhile for children who were not doing as well as the parents had thought.

In the United States, Todd Rogers and Avi Feller also tested an intervention targeting parents' inaccurate beliefs, this time about their child's school attendance.¹¹ They sent one of three types of mailers to the parents of students in kindergarten through 12th grade: one displayed the child's total number of absences, another displayed this information along with a comparison to the number of absences for the average child, and the third informed families about the importance of attendance and offered encouragement. The authors randomized these mailers to 30,000 households. The first two mailers reduced absences by one day, and the third mailer reduced absences by half a day. No mailer affected students' test scores, however, raising the question of whether

large improvements in attendance or complementary interventions are needed to improve learning.

Middle School Through High School

As children get older, parents may be less likely to directly help with assignments and more likely to shift to monitoring and incentivizing their child's effort in school. Low grades, missed assignments, and absences become more pertinent to academic performance, but various interventions with parents can help mitigate these problems.

The study I conducted in Los Angeles at a public combined middle and high school, mentioned earlier, provided information on grades and missed assignments to parents in the treatment group via text messages sent every two weeks.⁸ Missed assignments were defined as incomplete assigned tasks, which included in-class work, projects, essays, exams, and homework. This measure was easy for parents to interpret: their child had been assigned a task, and the child had not completed it. On average, students were missing 20% of all their assignments.

The messages affected parental behaviors in several ways. First, parents in the treatment group were significantly more likely to take away privileges from their child. As a result of the intervention, parents in the treatment group also formed more accurate beliefs about the number of assignments their child had turned in. This combination of changed beliefs and increased incentives resulted in greater student effort: assignment completion increased by 25%, grade point average went up by roughly 0.20 standard deviations, and math scores improved.⁸

Since this study was reported, variations of this intervention have been conducted in different contexts across the United States and around the world. In the United States, Matthew A. Kraft and Todd Rogers sent parents messages written by teachers during a summer credit recovery program.³⁹ Parents were randomly assigned to one of two treatment conditions: one group received weekly messages that highlighted behaviors their child could improve, and the

<1/3

Words a child in a low-income family hears relative to one from a professional-class family



The standard deviation in achievement gaps across races and incomes in the US is 0.75-1.25.

60%

Discrepancy between what conciliatory messages acknowledge and the scope of the problem

other group received weekly messages about good behaviors their child was demonstrating and should continue doing. Averaging across both treatments, the intervention increased credit completion by 6.5 percentage points relative to the control group. The data suggested that the improvement-oriented messages were more effective, probably because they provided more actionable information.

In Chile, Samuel Berlinski and his collaborators sent text messages to parents about their children's attendance, grades, and behavior.¹² The sample included nearly 1,500 children in Grades 4–8 across eight schools. After four months, students in the treatment group improved their math grades by 0.09 standard deviations, the share of children with attendance rates of 85% or greater increased by 6.6 percentage points, and poor behavior fell by 20%. Parents in the treatment group more accurately reported their child's performance as well.

In the United Kingdom, a study called the Parent Engagement Project tested the effects of sending text messages to parents about the dates of upcoming tests and whether assignments had been completed.⁴⁰ The study encompassed 36 secondary schools serving 15,697 students. The intervention increased math scores by 0.07 standard deviations (representing roughly one month of learning) and decreased absenteeism by one half day.

In Brazil, Nina Cunha and others conducted a trial with 19,300 ninth-grade students.³⁵ The intervention had multiple treatment arms, including one that informed families via text message about their child's missed assignments and attendance in math class and another that reminded families that it is important for their child to attend class and complete assignments. The impacts were large and similar in size across arms: attendance increased by five days over the year, math grades and math test scores increased by 0.09 standard deviations, and the number of children who were promoted to the next grade at the end of the year increased by 3 percentage points. Although the messages related only to math, achievement did not

decrease (and sometimes increased) in other subjects. The effects coincided with parents talking to their children more often about school, providing their children with greater incentives, and showing increased college aspirations for their children.

At first glance, it might seem surprising that both treatment arms yielded similar outcomes despite one of the arms providing no student-specific information. The authors argued that, in Brazil, just making education top of mind may be enough to prod parents to engage in behaviors that support their children's schooling. In Brazil, it costs money to contact families via their cell phones, which contributes to poor baseline school-to-parent communication. From a policy standpoint, the finding that a generic reminder can be effective is important, because generating such messages is less costly than having to gather information from teachers and push out tailored messages for each family.

In Mozambique, Damien de Walque and Christine Valente studied how to improve school attendance of girls aged 11–15 years.⁴¹ In one arm, parents were provided a cash transfer conditional on their child's attendance. In a second arm, parents were sent information about their child's attendance without incentives. The information-only arm increased attendance by 7%, which was 75% as large as the effect of the cash incentive. Moreover, the information arm increased test scores, whereas incentives to parents did not.

Francisco Gallego and his collaborators assessed whether sending text messages to parents about their child's Internet usage (measured in megabytes) would alter that usage.⁴² They randomly assigned 7,707 parents of middle school students in Chile to one of several groups, including one in which parents received usage information weekly and one in which parents received messages reminding them that it is important their child use his or her computer productively but with no information on usage. Although the authors could not study the effects of these messages on academic outcomes, the usage

treatment reduced Internet usage by 6%–10% relative to baseline.

College Transition & Beyond

Much less research evaluates interventions targeted at parents during their child's transition to college and later. This lack is perhaps natural (students have significant agency once they reach college age), but it is also practical: After children turn 18 years old in the United States, they control access to their student records. Information from these records can be provided to parents only with students' permission.

As a result, research has focused on the college matriculation process instead of on academic progress. In 2012, Eric Bettinger and his collaborators showed how severely the complexity of the college financial aid application process can impede enrollment.⁴³ They randomized parents into two groups: One group received personal assistance filling out the Free Application for Federal Student Aid (FAFSA), and a second group received information about financial aid and a tuition-cost estimate but no assistance filling out the FAFSA. Compared with the second group, the assistance group was 16 percentage points more likely to complete the FAFSA and 8 percentage points more likely to enroll in college for at least two years.

Ben Castleman and Lindsay C. Page tested a low-cost intervention aimed at reducing the complexity and increasing the salience of key college-enrollment steps.⁴⁴ They sent text messages about the actions high school seniors must complete to matriculate; these messages included reminders and information about orientation, housing forms, and FAFSA completion. The authors conducted a multiarm trial to evaluate their intervention. One arm provided prompts only to students, and another arm provided prompts to both students and their parents. They found that including parents added no additional efficacy to the students-only messaging, which increased on-time enrollment by 3 percentage points. The value of involving parents and using low-cost interventions while students enroll in and continue attending college is an open area for further research.

Discussion

Table 1 summarizes a number of the studies described above as well as related ones, noting details about the interventions, barriers addressed, sample, primary outcomes, and findings. The evidence is notable for its rigor—every study is a randomized controlled trial. These are not replications: The exact design of each intervention varies within and across student age groups. Even while restricting attention to randomized controlled trials, I found that engaging parents with timely, actionable information consistently improved student effort and achievement and did so in disparate regions, such as Brazil, Chile, China, England, Malawi, Mozambique, and the United States.

The evidence also supports a few of the mechanisms that have been hypothesized to explain why different interventions help to change parental behavior related to education. The findings sometimes conflict, however, so further research is needed to distinguish the importance of one mechanism over another.

The model of parent–child interactions that I developed in 2015, mentioned earlier, was meant to distinguish between two of these mechanisms: The effects of reducing monitoring costs and the effects of altering beliefs. In the United States, I found that about 40% of the effect stemmed from lowering monitoring costs and 50% came from belief changes. Yet, the multiarm trial conducted by Nina Cunha's team in Brazil suggests that tailored information and lowered monitoring costs are not necessarily key drivers of impacts in that country: their reminder treatment, which increased the salience of the importance of schoolwork, had effects as large as those of individualized information.³⁵ Meanwhile, in research not described above, Christopher Doss and his collaborators found that personalized messages have a substantially greater impact than generic text messages do.⁴⁵ Understanding whether personalization matters is important for policy because gathering individualized data can be costly. If generic messages can improve outcomes, they have the benefit of being easier to implement and cheaper to scale.

Table 1. Interventions, primary barriers they addressed, & their effects

Study	Intervention	Primary barriers addressed	Sample	Primary outcome	Findings
Preschool through primary school					
Barrera-Osorio et al. (2018) ^A	Information to parents on school and student performance; suggestions for parents on how to support their children; information for both provided via home visits	Biased beliefs about performance in school; understanding of productive parent engagement strategies	Primary school children in Manizales, Colombia	Composite reading and math test score	Composite score dropped by 0.02 standard deviations three years after the intervention.
Dizon-Ross (in press) ^B	In-person explanation to parents about their child's absolute and relative test score performance	Biased beliefs about performance in school	Parents of primary-school children in Machinga and Balaka, Malawi	Primary school enrollment persistence	Dropout rate for above-median performing students fell by 2 percentage points; for below-median performing students, the rate increased by 2 percentage points.
Mayer et al. (2018) ^C	To encourage parents to read more to their children over six weeks, parents were (a) provided a "soft commitment device," (b) texted two reminders about their weekly reading goals, and (c) sent a congratulatory message for reading more than their peers.	Procrastination/ present bias; limited attention; inaccurate beliefs about benefits to reading	Parents enrolled in a subsidized preschool program in Chicago, Illinois. Parents were provided tablets with preloaded books.	Recorded time parents spent reading to their child.	Reading time increased by 79 minutes over six weeks.
Rogers and Feller (2018) ^D	Up to five mailers sent to households graphically showing their child's total absences.	Biased beliefs about absolute and relative school attendance	Kindergarten through Grade 12 children in a Philadelphia, Pennsylvania, school district	Full-day absences	Full-day absences were reduced by one day.
Siebert et al. (2018) ^E	Weekly feedback provided to students and parents about their academic performance and behavior.	Monitoring costs; poor school-parent communication	Students in primary schools and their parents in Shaoyang County of rural China	Math and reading test scores	Math and reading scores increased by 0.25 standard deviations, but parent-provided feedback was beneficial only for low-performing students.
York et al. (2018) ^F	Literacy curriculum for parents delivered via text messages over eight months.	Complexity; cognitive load; limited attention	Parents of preschool children in San Francisco, California	District-administered reading test scores	Scores increased by 0.10–0.15 standard deviations. The effects were particularly strong for letter recognition and sound awareness.
Middle school through high school					
Avvisati et al., 2014 ^G	School meetings instructing parents how to help their child with their schoolwork	Complexity; low valuation of schooling	Middle school students in low-income areas of Paris	Test scores, behavior, attendance	25% reduction in truancy; 21% reduction in disciplinary sanctions; 0.02 drop and 0.04 rise in standard deviations on French and math test scores, respectively.
Bergman (2015) ^H	Biweekly text messages sent every two weeks to parents in English and Spanish describing their child's missed assignments and grades	Biased beliefs about assignment completion; monitoring costs	Middle and high school students in Los Angeles, California	GPA, missed assignments, test scores	GPA increased by 0.20 standard deviations; assignment completion increased by 25%; evidence of math score improvements of 0.20 standard deviations; no increase in English scores.
Bergman et al. (2018) ^I	Weekly text messages to parents about their child's absences, grades, and missed assignments	Biased beliefs about assignment completion; monitoring costs	Three lowest performing middle and high schools in an urban, Midwestern school district	GPA, student retention in the district, math and English test scores	GPA increased by 0.13 standard deviations; district retention increased by 3 percentage points; no improvements in math or English scores.

(continued)

Table 1. Interventions, primary barriers they addressed, & their effects (continued)

Study	Intervention	Primary barriers addressed	Sample	Primary outcome	Findings
Berlinski et al. (2017) ^J	Text messages sent to parents of children about their attendance, grades, and behavior in math class	Biased beliefs about test score performance; monitoring costs	Parents of children in Grades 4–8 in two low-income municipalities of Santiago, Chile	Math grades, behavior, attendance	Math grades improved by 0.09 standard deviations; share of students with >85% attendance increased by 7 percentage points; poor behavior decreased by 20%.
Cunha et al. (2017) ^K	Text message to parents about their child’s missed assignments and attendance in math class; reminders about the importance of assignment completion and attendance	Limited attention, biased beliefs, monitoring costs	Grade 9 students in Sao Paulo, Brazil	Math grades and test scores, grade promotion	Math grades and test scores increased by 0.09 standard deviations; grade promotion increased by 3 percentage points.
de Walque and Valente (2018) ^L	Information intervention arm was a weekly report card showing students’ attendance as marked by teachers. The system was explained to parents by a nongovernmental organization. Report cards were sent home with the children.	Monitoring costs	Parents of female students in Grades 6 and 7 in Manica Province, Mozambique	Attendance and test scores	7% increase in attendance; math scores increased by 9%.
Gallego et al. (2017) ^M	Text messages to parents about their child’s Internet usage	Monitoring costs	Low-income Grade 7 students’ parents across Chile	Internet download (measured in megabytes).	6%–10% reduction in Internet usage (megabytes downloaded)
Kraft and Rogers (2015) ^N	Four messages to parents written by teachers about their child’s performance. Messages were framed as either positive messages or “needs improvement” messages and sent in parents’ native language via e-mail, text, or phone call.	Monitoring costs	Large, urban district’s summer credit recovery program (city unspecified)	Course credit	6.5 percentage point increase in the likelihood a student received credit at the end of the program
Miller et al. (2017) ^O	Text messages to parents about the dates of upcoming tests, assignment completion, and what their child was doing in school	Monitoring costs	Geographically dispersed secondary schools in England	English, math, and science test scores; absences	Math scores increased by 0.07 standard deviations and absenteeism decreased by a half day. No effects on English or science scores.
College transition and beyond					
Bettinger et al. (2012) ^P	Two intervention arms: (a) personalized help by a tax assistant at H&R Block, who helped families fill out their Free Application for Federal Student Aid (FAFSA) using their tax information; and (b) information about how to fill out the FAFSA and a tuition-cost estimate	Complexity, salience	Tax preparation offices across Ohio and Charlotte, North Carolina; low-income households with one member between 17 and 30 years of age without an undergraduate degree	College enrollment and persistence	No effect on FAFSA completion or college enrollment for the information-only group; the assistance group was 16 percentage points more likely to complete the FAFSA and 8 percentage points more likely to enroll in college for at least two years.
Castleman & Page (2018) ^Q	Text messages sent to parents and their children about the steps high school seniors must take to matriculate to college.	Complexity, limited attention	Parents of high school graduates enrolled in uAspire sites in Boston, Lawrence, and Springfield, Massachusetts (uAspire is a nonprofit focused on college financial aid advising)	College enrollment	On-time college enrollment increased by 3 percentage points.

Table 1 notes

Note. All studies in this table were randomized controlled trials, and all results refer to differences between treatment groups and controls. GPA = grade point average.

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Research by Gallego and his coauthors has provided further support for the importance of salience and reminders.⁴² Children's Internet usage drops most the day immediately after parents receive a text message informing them about the extent of their child's Internet usage. The authors also randomized the timing of the messages each week for one group of parents. This random timing led to a sizeable additional reduction in Internet usage, which is consistent with the importance of salience.

Several other papers not mentioned above show how the framing and frequency of messaging can affect a program's success. In an early literacy program, Frans Fricke and coauthors demonstrated that more is not always better:

high-frequency messaging (five versus three messages per week) more than doubled the dropout rate from their intervention program.⁴⁶ Similarly, Nina Cunha's group found that increasing messaging frequency beyond twice a week did not improve their intervention's effectiveness.³⁵ Complex message wording also increases the dropout rate.⁴⁷ Simplicity and message frequency matter for efficacy.

The effect sizes of all the interventions described above imply they are no panacea. Achievement gaps across races and incomes in the United States are on the order of 0.75–1.25 standard deviations.⁴⁸ The effects of using behavioral interventions are not nearly enough to close these gaps by themselves. Nevertheless, they

“Simplicity and message frequency matter for efficacy”

offer an opportunity for educational policymakers to enhance student performance in a way that is low cost and easy to implement.

Scalability & New Challenges

This low cost and ease of use offers the promise of scale. In a study that Eric Chan and I conducted in 2018,⁹ we used Twilio, a tool known as an *application programming interface*, to automate the gathering and delivery of information to parents. As part of a study involving 22 middle and high schools in West Virginia, the application gathered data about student attendance and performance and automatically sent out text message alerts to parents. It delivered weekly alerts about missed assignments and class absences and monthly alerts about low grades. The intervention reduced course failures by nearly 30% and increased class attendance by 12% relative to the control group. Twilio sent more than 32,000 text messages over the course of the school year, which cost \$64. Teachers were not required to fill in any additional information because the intervention drew from existing data in the learning management system (such as from teachers’ digital grade books).

However, efficacy in a controlled trial—even across many schools and students—does not imply sustained efficacy at scale. Typically, school districts ask parents to opt in to the type of automated-alert intervention described above, which is likely to yield fewer signups than would an opt-out program, which includes parents unless they explicitly choose to be excluded. In 2017, I, Jessica Lasky-Fink, and Todd Rogers showed that the opt-in approach leads policymakers to understate the efficacy of text messaging, which in turn lowers their willingness to pay for it.⁴⁹ We randomized nearly 7,000 parents to one of three treatment groups:

a standard opt-in group, in which parents enrolled in the automated-alert intervention by signing up via a district website; a simplified opt-in group in which parents could enroll by responding “start” to a text message prompt; and an automatic-enrollment, or opt-out, group, in which parents were enrolled in the intervention but could stop the messages at any time by replying “stop.”

The results were stark: The take-up rate in the standard opt-in group was less than 1%. Take-up in the simplified opt-in group was only 11%. In contrast, only 5% of families in the automatic-enrollment group ever opted out. Unsurprisingly, treatment effects appeared only in this last group.

Why would policymakers ever implement an opt-in program? We surveyed more than 100 district leaders serving more than 3 million students and asked them to guess parents’ take-up rates under each of the experimental conditions. They found that leaders overestimated take-up in the opt-in groups by roughly 30 percentage points and underestimated it in the automatic-enrollment group by approximately 30 percentage points. When presented with the take-up rates under each condition, leaders’ willingness to pay for the intervention increased by more than 150% if enrollment shifted from opt in to opt out.

Will these messaging interventions remain effective as time goes on? Arguably, families receive more information from various sources today than ever before. Although text messages work now, they may not continue to be as effective if more organizations start using them, overwhelming families with information, or if people begin to favor other modes of communication. Ideally, researchers will clarify which features of messages are most likely to elicit parental action and why text messages command more attention than other modes of communication do. Such insights will help policymakers and schools figure out how to hold parents’ attention even as communication technologies continue to change over time.

endnote

A. Programs such as the Nurse–Family Partnership, which provides low-income first-time mothers with home visits from registered nurses, have demonstrated lasting health effects but are often costly: The Nurse–Family Partnership, for example, costs approximately \$7,600 per child. The program is intensive, and similar but easier-to-implement programs have not been shown to have the same positive effects.⁵⁰ A second frequently cited example is the Perry Preschool Program, which has a component that aims to involve mothers in their child’s development. The Perry Preschool Program improves long-run socioemotional outcomes and earnings but costs \$17,759 per child.⁵¹

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