Abstract Title Page

Title: Teacher-to-Parent Communication: Experimental Evidence from a Low-Cost Communication Policy

Authors and Affiliations:
Matthew A. Kraft
Brown University

Todd Rogers
Harvard University

Background / Context:

A wide body of literature documents the important role that parents play in supporting children's academic success in school (Houtenville & Conway, 2008; Barnard, 2004; Fan & Chen, 2001). Drawing on this literature, national taskforces and federal legislation consistently identify increased parental involvement as a central goal of educational reform initiatives (e.g. No Child Left Behind, Title I, Part A, Section 1118). Schools attempt to promote greater parental engagement though a variety of efforts centered on teacher-parent communication (Epstein, 2008). Cheung and Pomerantz (2012) found that children whose parents were more likely to be involved with their learning were more likely to be motivated to meet their parents' academic expectations, and received higher grades. Recent experimental research has documented how two-way teacher-parent communication can lead to greater parental involvement, improved student engagement and academic achievement (Authors, 2013; Bergman, 2012).

Purpose / Objective / Research Question / Focus of Study:

In this study, we examine the effect of delivering to parents weekly messages written by teachers about each child's performance in school, and we explore how these effects differ across different message types. We accomplish this by conducting a field experiment during a summer credit recovery program in a large urban school district. We randomly assigned participating students and their parents to one of three experimental conditions. Some parents received information throughout the summer program about what their students were doing well and should continue doing others received information about what their students needed to improve upon, while a third group received no information. We sought to answer two primary questions: 1) What is the effect of teacher-to-parent communication on the probability a student earns course credit in a credit recovery program?; and 2) Are positive or needs-improvement messages more effective at increasing a student's likelihood of earning course credit?

Setting:

We examined the effects of teacher communication with parents of high-school students during a traditional summer school program offered by a large urban school district in the Northeastern United States. The program offered high school students the opportunity to make up credits in up to two different courses across four core content areas. High school students from across the district enrolled in the program operated out of one large high school campus. Course content drew largely from district curricula with teachers focused on reviewing content taught during the academic year. Classes met for two hours each morning during the five week program with an average size of 33 students. The program employed twenty-nine teachers, each of whom taught two courses. The majority of these teachers were certified full-time teachers in the district, while several were finishing teacher residency programs or were substitute teachers during the academic year.

Population / Participants / Subjects:

The 1,321 students enrolled in the summer credit recovery program came from over 30 high schools in the district. African-American and Hispanic student comprised the vast majority of enrolled students, 65% and 28% respectively. Over 80% of students were eligible for free or reduced price lunch, approximately 30% were English language learners and almost 25% had Independent Education Plans. Students who had just completed 9th grade made up the largest proportion of students, 39%, while 30% were in 10th grade, 25% were in 11th grade, and 6% were

in 12th grade. We successfully recruited 435 students and their parents to participate in our study. Among participants, 141 or 32% were enrolled in two courses. As part of the consent process, we gather information about the current contact information and preferred method of contact for each parent/guardian of participating students.

Intervention & Research Design:

In order to test both the overall effect of teacher-to-parent communication and the differential effect of message type, we conducted a blocked randomized field trial with multiple treatment arms. We randomly assigned students and their parents to one of three conditions: positive information (n=146), improvement information (n=136), or control (n=153) blocking on the first class taken by each student. All participating parents were assigned to receive an introductory phone call from their child's teacher. Those in the positive information condition were assigned to receive weekly communications highlighting what the student was doing well behaviorally or academically. Those in the improvement information condition were assigned to receive weekly communications that highlighted what the student needed to improve.

After making introductory calls, summer academy teachers wrote both positive and improvement messages for the parents of every student in the study. At the beginning of the study we provided instructions and example messages to teachers and explained how our research team would insert these messages within a standardized script that we would email, read to text to parents. Research assistants collected these sentences from teachers at the end of each week and communicated the relevant message to parents in each of the two treatment groups via email, phone or text depending on a parent's reported preference. We hired translators to communicate messages in Spanish, Hatiain Creole, Cantonese and Vietnamese for parents who did not speak English. Importantly, this process of teachers writing both sentences for all students and our research team communicating the appropriate message to parents in each of the two treatment arms allowed us to keep teachers blind to the treatment status of students.

Data Collection and Analysis:

Our primary outcome of interest is a binary indicator for whether a student earned credit for a course they were enrolled in during the summer program. Attendance records during the first four weeks of the summer program provide us with a second outcome of interest. Teachers also completed a brief survey about each of their students who participated in our study. These surveys consisted of three Likert-scale questions asking teachers to assess the effort and behavior of each individual student, as well as their relationship with each student during the summer program. We collected teacher surveys for 534 of the 576 total student-class combinations in our study, a 92.7% response rate.

We first analyze our data by estimating the pooled treatment effect of being assigned to receive additional teacher-to-parent communication in either treatment arm of the study, *TREAT*.

$$(1) \qquad Y_{ijc} = \alpha + \beta_1 TREAT_i + \sum_k \delta_k d_{ik} + \varepsilon_{ijs}$$

where Y_{ijc} represents a given outcome of interest for student *i* with teacher *j* in class *c*. The set of indicator variables d_{ik} controls for the first course taken by each student, indexed by *k*. These indicator variables account for the blocked randomized design where the assignment to treatment

is only random within blocks. The coefficient on *TREAT*, β_1, captures our estimate of the Intent-To-Treat (ITT) effect of teacher-to-parent communication.

In our second set of analyses, we estimate ITT effects for each of our two distinct treatment arms, the positive information condition, *POSITIVE,* and the improvement information condition, $IMPROVE$.

$$(2) \qquad Y_{ijc} = \alpha + \beta_1 POSITIVE_i + \beta_2 IMPROVE_i + \sum_k \delta_k d_{ik} + \varepsilon_{ijs}$$

Here, the coefficients β_1 and β_2 provide estimates of the positive and improvement information ITT effects relative to students in the control group. In both models, we account for the multiple observations per-student for students who took two courses by clustering our standard errors at the student-level.

Findings / Results:

Detailed communication records allow us to evaluate the degree to which the assigned teacher-to-parent communication was implemented in practice. Introductory phone calls home to all students in our study were implemented by teachers with limited success due, in part, to scheduling challenges in the first week of the program that lead to frequently changing class rosters. Overall, 54.0% of all assigned calls were made by teachers; there were no statistically significant differences in introductory phone call completion rates across the three experimental groups. Teachers' sentences were delivered with much higher rates of success throughout the summer program. Overall, 91.2% of all assigned sentences were written by teachers and sent to parents via phone calls, texts, or emails. Of those sentences delivered via phone calls, 54.1% resulted in a live conversation with a parent or guardian.

Analyses from model (1) of the pooled treatment effect of being assigned to receive additional teacher-to-parent communication show that additional communication reduced the probability a student would either drop out, fail, or be dismissed from the summer program by half. The vast majority of students in our *control* condition earned credits in the courses in which they were originally enrolled (87.2%). As shown in Table 1, students whose parents were assigned to receive either form of additional information were 6.5 percentage points (p=.048) more likely to earn a course credit for classes they enrolled in compared to the *control* group. Substituting indicators for whether a student dropped out, failed or was dismissed as outcomes reveals that students in the pooled treatment group were 6.0 percentage points (p=0.046) less likely to dropped out of a class.

Results from model (2) of that estimates separate treatment effects for the positive and improvement information treatment conditions suggests that the content of messages also matters. We find that the large positive effect of communication is driven by students in the improvement information condition who experienced an 8.8 percentage point (p=0.016) increase in their probability of earning course credit (Table 1, column 3). In contrast, the estimated treatment effect for students in the positive information condition was positive but not statistically significant (4.5 percentage points, p=0.236). Although we do not have the statistical power to distinguish between these two estimates, these results are consistent with an interpretation that teacher-to-parent needs-improvement information was more effective at inducing students to complete the summer program, relative to teacher-to-parent positive information.

We examine several potential mechanisms through which teacher-to-parent messages could have affected student completion of the summer program. Reduced student absenteeism appears to be a primary student behavior affected by the messages. As shown in Table 2, increased teacher-to-parent communication decreased the probability a student was absent from a class by 2.4 percentage points (p=0.011). Students in the improvement information condition were 3.2 percentage points less likely to be absent from a class than control groups students (p=0.003), while students in the positive information condition were slightly less likely to be absent than control group students, though not statistically significantly so (-1.7%, p=.125). Other measures of student behavior that might have been affected by the teacher-to-parent information include teachers' assessments of their students' effort or in-class behavior. We find no compelling evidence that the treatment affected either of these measures.

We also explored whether specific qualities of teachers' sentences moderated the effect of teacher-to-parent communication. First, we coded sentences as "actionable" or "not-actionable" to capture whether each sentence provided a clear prescription for something a student should stop doing, start doing, or continue doing. Second, we coded sentences as referencing issues that pertained to "in class," "out of class," both or neither and created two non-mutually exclusive indicator variables for "in class" and "out of class" sentences. As shown in Table 3, just over 84% of all needs-improvement sentences were actionable while only 8.5% of positive sentences referenced specific actions ($p<0.001$). Needs-improvement sentences were also 18 percentage points more likely to be about an out-of-class issue compared to positive sentences although there was no difference in the frequency of references to in-class issues across treatment arms ($p<0.001$). Needs-improvement sentences were also two words longer on average than positive sentences ($p<0.001$).

Conclusions:

Our research contributes to a growing body of evidence on the beneficial impact that teachers providing parents with individualized messages and information about their children's schoolwork can have on student achievement and advancement in school. The low-cost of implementing weekly teacher-to-parent communication relative to typical education interventions and reform initiatives highlights the potential for communications policies to be adopted at scale. A simple back-of-the envelope calculation of the cost and benefits of such a policy reveals that implementing our communication policy cost just over $13 per student-course treated. The return to these investments was an additional 24 course credits earned at a cost of $200 per credit. These costs could also easily be reduced by integrating time to write messages into teachers' regular workday, and by not having a third party research team collect and deliver the messages to parents. The district, in comparison, spends approximately $13,350 per student annually or $2,225 per student-course during the academic year.

This study also points to the importance of further examining how teachers and schools can improve the content and quality of their communication with parents. We find suggestive evidence that providing information to parents about what their child needs to improve in school induces parents to discuss these suggestions with their children. There is still much to learn about the types and sequences of messages that elicit meaningful parental involvement in their child's academic work. Better understanding the mechanisms behind the effects of teacher-to-parent communication will also serve to inform how communication is best used to support students and their parents. This knowledge base can support improved teacher education on how best to harness the influence of parents on student achievement.

Appendices

Appendix A. References

Authors. (2013). The effect of teacher-family communication on student engagement: Evidence from a randomized field experiment. *Journal of Research on Educational Effectiveness*. *6*(3), 199-222.

Barnard, W. M. (2004). Parent involvement in elementary school and educational attainment. *Children and Youth Services Review*, *26*(1), 39-62.

Bergman, P. (2012). The More You Know: Evidence from a Field Experiment on Parent-Child Information Frictions and Human Capital Investment. *UCLA Working Paper*.

Cheung & Pomerantz. (2012). Why does parents' involvement enhance children's achievement? The role of parent-oriented motivation. *Journal of Educational Psychology, 104*(3), 820-832.

Epstein, J. (2009). *School, Family, and Community Partnerships: Your Handbook for Action*, Third Edition. Corwin Press

Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational psychology review*, *13*(1), 1-22.

Houtenville, A. J., & Conway, K. S. (2008). Parental effort, school resources, and student achievement. *Journal of Human Resources*, *43*(2), 437-453.

Rosenberg, M., Schooler, C., Schoenbach, C, & Rosenberg, F. (1995). Global self-esteem and specific self-esteem: Different concepts, different outcomes. *American Sociological Review, 60*(1), 1995.

Appendix B. Tables and Figures

Table 1: Intent to Treat Effects of Teacher-to-Parent Communication on the Probability of Earning Course Credit

	Pooled Treatment	Positive	Improvement
Pass	0.065*	0.045	0.088*
	(0.033)	(0.038)	(0.036)
Dropout	-0.061*	-0.042	-0.081*
	(0.030)	(0.035)	(0.033)
Fail	-0.003	-0.003	-0.002
	(0.009)	(0.010)	(0.011)
Dismiss	-0.002	0.000	-0.005
	(0.010)	(0.012)	(0.011)

Notes: ***p<0.001, **p<0.01, *p<0.05. N=576. Each cell represents results from a separate regression. Standard error represented in parentheses are clustered at the student-level.

Table 2: Intent to Treat Effects of Teacher-to-Parent Communication on Absenteeism, Students' Actions, and Communication with Parents

	Pooled Treatment	Positive	Improvement	n
		Attendance		
Absent	-0.024*	-0.017	-0.032**	10849
	(0.009)	(0.011)	(0.010)	
		Teachers' Perceptions of Students		
Effort in School	0.072	0.038	0.112	534
	(0.116)	(0.130)	(0.141)	
Bevavior in Class	-0.012	0.004	-0.031	534
	(0.105)	(0.117)	(0.129)	
Relationship with Teacher	-0.145	-0.180*	-0.104	533
	(0.079)	(0.089)	(0.097)	
		Students' Perceptions of their Communication with Parents		
Parent spoke with student about school work	0.119	0.201	0.034	350
	(0.145)	(0.167)	(0.169)	
Parent congratulated student about success in summer sch	0.095	0.199	-0.008	351
	(0.150)	(0.172)	(0.173)	
Parent rewarded student for success in summer school	0.046	-0.025	0.119	351
	(0.138)	(0.159)	(0.160)	
Parent assisted student with academic work in summer sch	0.036	0.002	0.069	347
	(0.142)	(0.165)	(0.164)	
Parent spoke to student about what to improve	0.188	0.000	0.376*	351
	(0.163)	(0.187)	(0.187)	

Notes: ***p<0.001, **p<0.01, *p<0.05. Each cell represents results from a separate regression. Standard error represented in parentheses are clustered at the student-level for absences and for outcomes based on Teachers' Perceptions of Students.

Table 3: Sentence Descriptive Statistics				
	Positive	Improvement	Difference	P-value of t-test
Actionable	0.0855	0.844	-0.759	0.000
In-class	0.532	0.507	0.0251	0.345
Out-of-class	0.134	0.314	-0.18	0.000
Number of words	7.81	9.80	-1.96	0.00
n	727	691		