Parent Skills and Information Asymmetries: Experimental Evidence from Home Visits and Text Messages in Middle and High Schools

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This paper studies the ability to foster parent skills and resolve information problems as a means to improving student achievement. We conducted a three-arm randomized control trial in which community-based organizations provided regular information to families about their child's academic progress in one arm and supplemented this with home visits on skills-based information in a separate arm. Math and English test scores improved for the treatment arm with home visits. There are large effects on retention for both groups during the year, though learning gains tend to accrue for students with average-and-above baseline performance and students at the lower-end of the distribution appear marginally retained.

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I Introduction

While family environments are one of the strongest determinants of achievement disparities, the optimal parent strategy to foster human capital may change as children get older (Coleman, 1966; Todd and Wolpin, 2003; Heckman, 2006; Cunha and Heckman, 2007). The process of skill acquisition can become increasingly complex as parents may no longer have the knowhow to directly assist with their child's schoolwork and must help their child navigate a complex set of graduation requirements and post-secondary options. These changes may leave families ill-informed about the most immediately relevant inputs and outputs to the education production function (Cunha et al., 2013; Fryer, 2011), which ultimately could impede parents' investments in their child's human capital.

However, there is a dearth of rigorous evidence on improving parental inputs, and in turn academic achievement, for children in secondary schools (Desforges and Abouchaar, 2003; Furstenberg, 2011; Cullen et al., 2013). Recent experimental evidence focuses on information asymmetries between parents, their children and schools. Reducing these information problems can improve student outcomes, often at low cost (Kraft and Dougherty, 2013; Kraft and Rogers, 2014; Bergman, 2015). Fewer interventions focus on parent skills in later years of child development, though one exception to this is an experiment conducted in Paris middle schools by Avvisati et al. (2013), which provided at-school sessions about how parents can support their children. They found no impacts on test scores but did find impacts on student attendance and discipline. A key issue with school-based parent meetings in low-test score, urban schools in the United States is the inability to bring parents to schools for these types of workshops. For instance, Bergman (2015) found that only 15% of parents attended the parent teacher conference night at the study school in Los Angeles. Fryer et al. (2015) study the effects of an early childhood parent academy, to which they offered $100 incentives and free child care to attend, but parents attended less than half of the sessions, on average.

This paper contributes to the existing literature by leveraging text messages and home

visits to address both parent-skill deficiencies as well as parent-child information asymmetries for families with children in middle and high school. Our first intervention addresses parent-child information problems (hereon the "information" or "Info" intervention) by sending information to parents about their child's academic performance in their native language via twice-monthly text messages. These messages, based on work by Bergman (2015), contain detailed information about students' assignments, grades and attendance. Our second intervention innovates on this by addressing potential parent-skill deficiencies (hereon the "parent-skills" or "Info+Skills" intervention) via home visits that aim to enhance parents' knowhow about using school resources to track student progress, understanding graduation requirements and college readiness, and setting up home-learning environments. While early-childhood home visits that aim to affect parent skills and home environments have shown success at improving child outcomes (Olds et al., 1997; Olds et al., 2004; Duncan and Magnuson, 2004; Heckman et al., 2010; Heckman et al., 2013), to our knowledge home visits for parents of children in middle and high school have not been experimentally evaluated. The ability to reach parents in the home can be key to delivering information when there is inability to bring parents to schools for this type of information.

We evaluate these interventions using a multi-armed randomized controlled trial across three schools in a low-income, urban-area school district in the Midwest. During the 2014-2015 school year, 1,120 families with children in three of the lowest-performing middle and high schools in a state were randomly assigned to the information-asymmetries intervention, the information asymmetries plus home-visit intervention, or the control group.

In an effort to maintain sustainability, we worked with community-based organizations to deliver these interventions across multiple schools. We trained members of five local community organizations to interpret student data, to transmit data to parents via text messages, phone calls or emails, and to visit parents or guardians in their homes. Students were followed across schools within the district. Nearly all families in the intervention groups received academic progress text messages and 54% of families assigned to receive a home

visit actually received one or more visits.

Both interventions significantly increased district retention during the year. Compared to the control group, students were four to five percentage points less likely to leave the district (40% to 50% of the control mean).GPA increased by 0.13 standard deviations for the information asymmetries intervention and 0.08 standard deviations for the information and parent skills intervention, respectively, however the latter is not statistically significant. Student percent grades improve by three percentage points on average (6 percent of the control mean). Math and reading standardized test scores improved by 0.13 and 0.12 standard deviations when asymmetries are addressed in conjunction with the parent skills intervention via home visits, but do not improve as a result of addressing information asymmetries alone. The test score effects are equivalent to three percentile-point gains on a national scale for math and reading scores. Because only 54% of the home visit group actually received a visit, effects are nearly twice as large (0.26 standard deviations in math and 0.19 standard deviations in reading) for those who received both a home visit and the information-asymmetries intervention.

Overall, the retention effects are large but learning gains appear to accrue to students with average-and-above GPA at baseline. Retention effects are qualitatively larger for students with below-average GPA but achievement and behavior impacts are larger for those with higher GPA at baseline. For instance in the latter subgroup, students in the information plus parent skills intervention were present an additional 5.6 full days of school compared to the control group while those with low GPAs saw increase in the days enrolled and the days absent, suggesting the latter were only marginally retained. In general there was little other heterogeneity though there were several subgroups of interest and randomization was stratified according to all subgroups of interest.

The rest of this paper proceeds as follows. Section II describes the participating schools and experimental design. Section III reviews the data and empirical strategies. Section IV shows the impacts of the interventions and Section V concludes with a discussion of

limitations and potential future work.

II Context and Experimental Design

Background

The experiment took place during the 2014-2015 school year. The three participating schools are in an urban school district serving roughly 20,000 students in a low-income area; 81% of students in the district receive free or reduced-price lunch. According to state education data, the four-year and five-year district graduation rates were roughly 50% during the 2013-2014 school year. That year the district student population was one third Black, one third Hispanic, and 20% white.

All three participating schools overwhelmingly serve low-income students, with 80% to 90% of students at each school receiving free or reduced-price lunch, and each school is in the bottom 5% of Title I schools in the state according to test scores and graduation rates.[1] The schools were chosen specifically because of their low performance. Table 1 shows the summary statistics of study participants by school. The majority of students in Middle School I and High School I are Black, while students in High School II are predominantly Hispanic. The average GPA for each school is below a 2.00. Percentile scores on the district's standardized tests, which are nationally normed, range between the 20th and 29th percentile for reading and between the 16th to 23rd percentile for math. Students have missed, on average, 10 school days (8%) across the three schools. Strikingly, 40% of participating students in the middle school have been suspended or expelled at some point during the *last year*. Roughly 30% were suspended or expelled in the two high schools in the last year.

[1]The exact criteria can be found here: https://www.ed.gov/sites/default/files/demonstrating-meet-flex-definitions.pdf.

Research Design

The information intervention consists of text messages sent once every two weeks to parents detailing their child's grades, absences and missed assignments. We used a web-based text messaging platform to deliver information to parents. An example of the information provided via text message is shown in Figure 1. The information shows missed assignments by class as well as by-class daily attendance. Text messages were translated into Spanish at the request of parents during study intake. Though 21% of the sample listed their primary language at home as Spanish, 16% of all families required this information communicated to them in Spanish.

An important innovation is the delivery of home visits to parents with children in middle or high schools. This intervention intends to improve parent skills through up to three informational home visits. These visits focused on teaching parents how to check and interpret their child's grades, test scores and attendance; setting up home learning environments; reviewing high-school graduation requirements; and ensuring parents are informed about how make their child college ready. Visits were scheduled on an individual basis between members of the community-based organizations and the participating parents to find an available time. The latter was challenging however, which mean many fewer families received a home visit than intended, as discussed further below.

Rather than using dedicated research staff, we aimed for scalability and sustainability by leveraging community-based organizations to gather and deliver information rather than dedicated research staff. The interventions were implemented by five such organizations. Paid staff from these groups spent roughly 2.5 days per week providing information to 150 parents per staff member. Staff attempted to make 30-40 home visits per month and spent one day per week gathering and organizing student data for the project.

The control group received the default amount of information and services provided by the schools. This primarily consists of an online gradebook that parents can use to check their

child's grades, robo-calls for absences, report cards mailed home four times per semester, and parent-teacher conferences. While gradebook information could be accessed by parents online, Bergman (2015) finds that many parents never log on to parent portals that display this information and this is particularly true in low-income area schools with low test scores.

To test the impact of the information-asymmetries intervention (Info treatment) and the information plus parent-skills (Info+Skills) interventions, we randomized 1,120 students at the three participating schools into one of three groups: the information-asymmetries group, the information-asymmetries plus parent-skills group and a control group. Students whose parents consented to participate were randomly assigned to these groups in equal proportion. Randomization was stratified by indicators for student gender, chronic absentee status, and below-average GPA at baseline. Students, teachers and school staff were blinded to study-arm assignment. Randomization implies that each group should be similar along baseline observable and unobservable factors in expectation. This similarity across groups at baseline helps ensure that any difference in subsequent outcomes at the end of the study can likely be attributed to the interventions and not to other factors, such as parents in one group being more involved in their child's education at the outset.

III Data and Analysis

Data

This study uses administrative from the district and program data from our implementing partners. Administrative data includes math and reading test scores and grade point average (GPA), which are standardized according to the control group to have mean zero and standard deviation one by grade level. Grades are measured by grade point average across a student's classes throughout the school year, using the district weights for honors classes versus non-honors classes. Grades are also measured using a finer continuous measure: average percent score across a student's classes, though the analysis of this outcome should be

considered exploratory as we did not know we would have this measure at the outset of the study. Students with no outcome GPA or course grades are assigned a GPA of zero (prior to standardization) and an average percent grade of zero as they have taken no courses. This imputation is a limitation that stems from the substantial non-random effects on attrition, as shown below. Attendance is measured as the number of days present, and we explore changes in the possible number of days and number of days absent since the interventions may affect both of these variables.[2] We also generate an indicator variable for whether a student was suspended or expelled during the school year.

Lastly, we define a student as retained if they enrolled in classes and received course grades after the intervention began. Students are not retained otherwise as they have not taken classes in the district. The latter is a significant predictor of performance: those who are not retained had baseline GPAs 0.70 points lower than students who were retained.

Program data include indicators for whether a family received an alert about their child's missed assignments and grades and when these alerts first began. 98% of families in the information-asymmetry treatment arm received at least one alert and 95% of families received at least one alert in the information plus parent skills treatment arm. Similarly for the parent-skills intervention, program data shows whether a family received a home visit and when visits occurred. Compared to the alerts, many fewer families who were assigned to receive a home visit actually received at least one. Of those families assigned to receive a visit, 54% received at least one home visit. This low-visit rate was due to difficulties coordinating schedules between program providers and families.

Randomization

We can examine empirically whether our randomization created balanced, or similar, groups at baseline according to observable characteristics. Table 2 presents evidence that this is the case. Column (1) shows the control group mean. Column (2) shows the difference between

[2]This measures the total days present in the district as opposed to the number of days absent. The latter is affected by the total days a student remains in the district; if a student is retained they have more days they potentially miss.

the information-only treatment group's mean and the control group's mean. Column (3) shows the p-value for this difference. Column (4) shows the difference between the additional parent-skills group's mean and the control group's mean. Column (5) shows the p-value for this difference. Column (6) shows the number of observations available for the baseline variable. Observation counts are lower for baseline test scores because the district does not have these scores for all students. None of the differences across groups is statistically significant across groups. Though not shown, there are no significant differences between the control group and the pooled treatment group of receiving any intervention. A joint test of the significance of covariates regressed on an indicator for receiving any treatment does not reject the null (p-value equals 0.49 and 0.88 for the Info and Info+Skills treatments, respectively).

Despite randomization, attrition that correlates with treatment status may bias impact estimates. Attrition from the district is an outcome as well, but the latter could bias estimated effects on test scores if the intervention affects the likelihood that students take standardized tests in a way that correlates with test scores. Appendix Table A.1 shows the share of students missing test scores and the treatment effects on an indicator for missing math scores and an indicator for missing reading scores. Students in the 12th grade, 8% of the sample, do not take the standardized tests. At baseline, 21% of eligible students were missing test scores, and, in line with the student-retention data shown below, Column (1) shows that 31% and 32% of students in grades six through eleven were missing math and English test scores at endline, respectively. Among those who remained enrolled in the district, test taking rates at endline are similar to the rates at baseline: 19% of retained students have at least one test score compared with 17% at baseline. This is all to say that the test-taking rates in the previous year and during the study year were similar. Neither the Information-only treatment nor the Information-plus-skills treatment has a significant impact on the likelihood of missing math scores (p-values are 0.46 and 0.93, respectively). Both coefficients are insignificant for missing reading scores as well (p-values equal to 0.97

and 0.44, respectively). This, as shown below, is likely because any students retained were unlikely to take the exams regardless.

While students who take the exams are comparable across treatment groups, students who take the tests tend to be higher-performing than those students who do not take the tests. Table A.2 shows the correlates of missing test score data by regressing an indicator for missing a test score on baseline measures of absences, GPA, test scores, and an indicator for ever being suspended using the sample of eligible test takers. Students who missed an exam have significantly higher absence rates, lower baseline GPAs, and were much more likely to have been suspended at some point during the previous year. Conditional on these variables, baseline test scores do not significantly correlate with missing post-treatment test scores. Nonetheless, more than three fourths of students have a test score and it is important to keep in mind the overall level of achievement in these schools: students who *did* take the exams still have baseline GPAs below 2.00 and a 30% rate of suspension in the last year.

Empirical Strategy

We assess the effects of the information-asymmetries and parent-skills home visit interventions using an intent-to-treat (ITT) framework to compare outcomes across program groups. The ITT analysis compares the outcomes of those assigned to a particular group to the outcomes of the control group irrespective of whether they actually received the intervention or not. For instance, we assign someone to the Info+Skills group if that was their original assignment even if they did not ultimately receive a home visit.

To estimate ITT effects, we use the following estimating equation:

$$Y_i = \alpha + \beta_I * T_i^I + \beta_S * T_i^S + X_i\gamma_1 + \varepsilon_{i1}$$

Where Y_i is an outcome for student i, T^I and T^S are indicators for receiving the information asymmetries treatment and the Info+Skills treatment, respectively, and X_i is a vector of

baseline characteristics described below.[3] Heteroskedasticity-robust standard errors are used in all estimations. In addition to reporting statistical significance for β_I and β_S, for completeness we also report the p-value for a test of their equivalence and a test of significance of the pooled treatments as well.

We use several control variables in these regressions. Strata were selected based on subgroups of particular interest: chronically absent students as defined by the district, student gender, and an indicator for below-average GPA. All regressions control for these strata indicators to control for the design of the experiment (Bruhn and McKenzie, 2009). We also include several baseline measures: standardized math and reading scores, indicators for race, IEP and English Language Learner categorization, and parents' education levels. For missing baseline variables we generate indicator variables for missingness and impute values. Robustness checks show the potential sensitivity to controls.

Lastly, we explore heterogeneous effects by interacting treatment indicators with indicators for each of the subgroups of interest. As mentioned above, these subgroups are defined by the strata for gender, above average and below average GPA, and chronically absent students.

IV Results

Retention and Behavior Outcomes

Figure 2 shows the effect of the interventions on retention. The first bar shows the impact on attrition, as measured by the student not taking any course and receiving a grade in the district post intervention. The control mean shows that 10% of the control group left the district in this fashion. The Info and Info+Skills interventions improved retention by approximately four percentage points, or 40% of the control mean. Each individual treatment

[3]This specification in which both treatment indicators are included in a single regression is slightly restrictive in that it constrains the coefficients γ_1 to be the same across treatment groups. However the results tend to be slightly larger if each intervention group is analyzed in a separate regressions (available upon request).

effect is significant at the 5% level and the p-value for the pooled treatment effect indicates the combined effect of the information-asymmetries treatment and the information plus parent skills treatment is significant at the 1% level. Unsurprisingly given their similar magnitudes, the p-value for whether the two interventions are statistically different from each other indicates the two produce similar effects on retention.

This impact on retention is large and significant. To give an idea of its significance, students who attrit from the district had GPAs 0.70 points lower than other students, on average, which implies the intervention is helping to retain some of the most at-risk students.

District retention is important both in terms of student performance and district funding. In terms of the former, student mobility is associated with lower student performance (Rumberger and Larson, 1998). In terms of student funding, student retention generates just over $7,000 in per-pupil funding according to district administrators.

Table 4 presents the impacts on measures of student behaviors. There are no statistically significant effects on student attendance, suspensions or status as chronically absent. These results should be interpreted in light of the retention findings described above. Student behaviors are tracked conditional on enrollment. This means enrolled students have more opportunity to be recorded for suspensions while attriting students do not. Given that the intervention retains students who are more at risk than the average student, the treatment effects may be negatively biased. Alternatively, the intervention may retain students but have no impact on the their in-class behaviors. We examine the latter by studying impacts on test scores and grades. We examine the former explanation, selection into measurement that is correlated with behaviors and performance, by exploring heterogeneity in effects for those who would be less likely to be missing outcome data, such as those who were higher-performing at baseline.

Achievement Outcomes

While retention is an important outcome, we also examine several continuous measures of academic performance. Table 3 shows the impacts on students' GPA, percent grades and test scores. Column (1) shows GPA increases of 0.13 and 0.08 standard deviations for the Info and Info+Skills treatments, respectively, with the former statistically significant at the 5% level while the latter is not statistically significant. GPA has a standard deviation roughly equal to one, so the raw effects on GPA are similar to the standardized effects.[4] Effects on course percent grades, shown in Column (2), are four and three percentage points for the Info and Info+Skills treatment, respectively. These results are statistically significant at the 5% level. Overall, the results suggest both interventions had a *joint* effect on course performance and retention, though the impact on course performance is not as definitive as the impacts on retention.

Columns (4) and (5) show effects on math and reading test scores. The Info+Skills intervention impacts test scores but the information intervention alone does not. The Info+Skills intervention has a 0.13 impact on math scores, which is significant at the 5% level, though a series of specification checks in Table A.3 show significance levels vary slightly by specification. The addition of the parent skills intervention also impacts reading scores, which is significant at the 10% level. These effects are statistically different from the information-asymmetries intervention alone, given the latter had no impact. Appendix Table A.3 shows that these results are robust to the set of controls, and whether the raw scale scores are used instead of z scores, though the results are not significant if there zero controls in the model.

Table A.3 also shows that test-score impacts are equivalent to a 2.5-percentile point increase in nationally-normed math and reading scores. Using treatment assignment as an instrumental variable for receipt of the Info+Skills intervention, the treatment impact is 0.26 standard deviations for math, or 5 percentile points (p-value 0.02). This effect is 0.19

[4]The pooled treatment effect is significant at the 5% level (p-value equals 0.048) and the test of equivalence between the two treatments does not reject the null hypothesis that both treatment effects are equal.

standard deviations for reading, or 5 percentile points (p-value 0.06).

The ITT impacts on test scores are roughly one half to one third the size of impacts found from the more effective charter schools over the course of a school year. For comparison, the Harlem Children's Zone charter school in New York increased math scores and English scores by 0.23 and 0.05 standard deviations. KIPP Lynn charter school in Massachusetts increased these scores 0.35 and 0.12 standard deviations (Dobbie and Fryer, 2010; Angrist et al., 2010).

Differential Effects

We stratified treatment assignment according to several subgroups of interest: above and below average GPA, gender and chronically absent students.

There is suggestive evidence that there are greater effects on retention for those with below-average baseline GPAs while learning and behavior gains accrue to those with higher baseline GPAs. Table 5 examines this heterogeneity with respect to baseline GPA. Though students with low GPAs are retained, it appears this does not yield much in terms of learning gains. GPA effects tend to be smaller for this group, as do impacts on attendance. Reading and math scores are smaller but not significantly so, perhaps because students with below-average GPAs are less likely to take the tests.

In contrast, the interventions yield larger gains for students with GPAs above average. GPA increases by 0.20 standard deviations and there are behavioral improvements in the parent-skills group: they attend 5.6 more days of school and there is evidence they are less likely to be suspended. The result on attendance is because both groups exhibit an increase in the number of days enrolled in school but only those with above-average GPAs actually experience a reduction in absences during those additional days. Thus low-performing students may be retained but only marginally in school.

Tables 6 and 7 show whether there is heterogeneity by chronic absentee status or gender. The number of observations change across columns because the interaction term has missing

data. There is little evidence of differential effects as few subgroup effects are significantly different from the effects on other groups.

V Conclusion, Limitations and Future Work

Overall, providing information to parents on their child's academic progress and skill-based information on how to help their child progress academically produced positive impacts on academic outcomes. A key innovation in these interventions is the use of home visits to reach families with children in middle and high school. We leveraged community-based organizations to schedule and deliver information and meet with families. We did encounter difficulties in reaching the intended number of parents, but we found impacts nonetheless, which suggests home visits for parents of older children are a promising avenue to affect parent behaviors and to improve student outcomes that is worthy of further research.

While both interventions have large effects on retention, the additional skills intervention via home visits caused increases in math standardized test scores and marginally significant increases in reading scores. Results appear stronger for those with average-to-above-average GPAs, though in this context these students still have baseline math and reading scores at the 30th percentile and under, nationally. A simple accounting exercise provides a rough estimate of the potential revenue changes from reducing information problems and improving parent skills. With an increase in retention of just over four percentage points and 744 students treated by either the information-asymmetries intervention or the information-plus-parent-skills intervention, this implies a $218,736 increase in per-pupil revenue for the district.

There are several caveats and limitations to the results however. First, while there are budget implications for retained students, an important caveat is that those who are most likely to be retained are marginally engaged in school and in turn reap few benefits academically. Second, these are three of lowest-performing schools in the state and they were chosen for the study for this reason. This is an important study population given the need

for successful interventions in such a setting, but the results of home visitations may differ in other, less disadvantaged settings. Lastly, and perhaps most significantly, we unfortunately were not able to survey participants to parse the mechanisms in each treatment arm. Bergman (2015) was able to survey participants and estimate a structural model to disentangle several mechanisms in the context of the information-asymmetries treatment, however the mechanisms in the home visit arm are much more skills oriented. The latter focuses on information about graduation requirements, navigating the school system and setting up home learning environments. Future work could assess what content changes parent behaviors and knowhow and how these changes map into student outcomes. Parents' information sets can vary widely within and across school districts, and understanding these mechanisms would have important implications for external validity and the ability to bring this intervention to scale.

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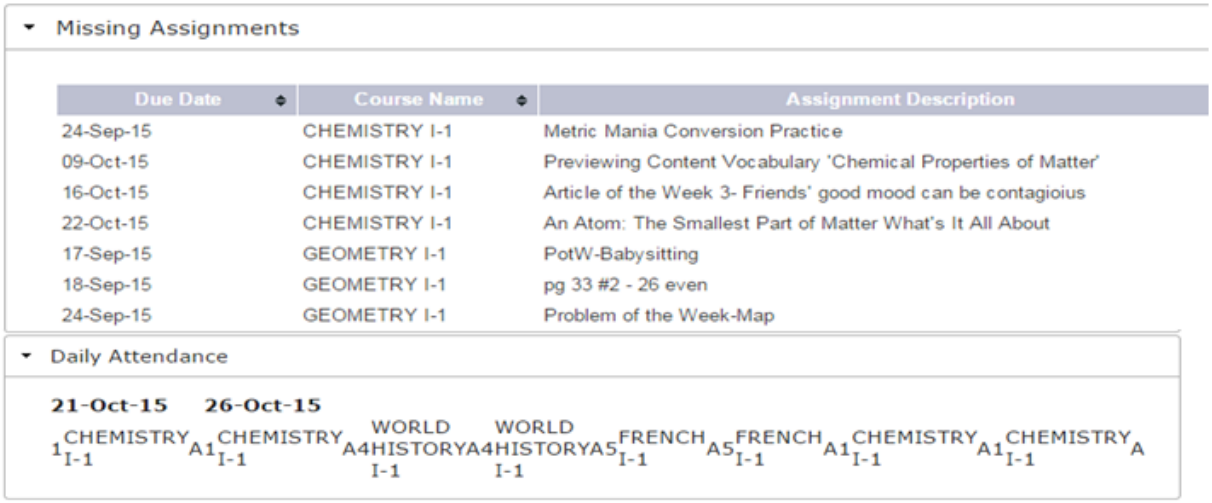
Figure 1: Example Report



Missing Assignments

Due Date	Course Name	Assignment Description
24-Sep-15	CHEMISTRY I-1	Metric Mania Conversion Practice
09-Oct-15	CHEMISTRY I-1	Previewing Content Vocabulary 'Chemical Properties of Matter'
16-Oct-15	CHEMISTRY I-1	Article of the Week 3- Friends' good mood can be contagioius
22-Oct-15	CHEMISTRY I-1	An Atom: The Smallest Part of Matter What's It All About
17-Sep-15	GEOMETRY I-1	PotW-Babysitting
18-Sep-15	GEOMETRY I-1	pg 33 #2 - 26 even
24-Sep-15	GEOMETRY I-1	Problem of the Week-Map

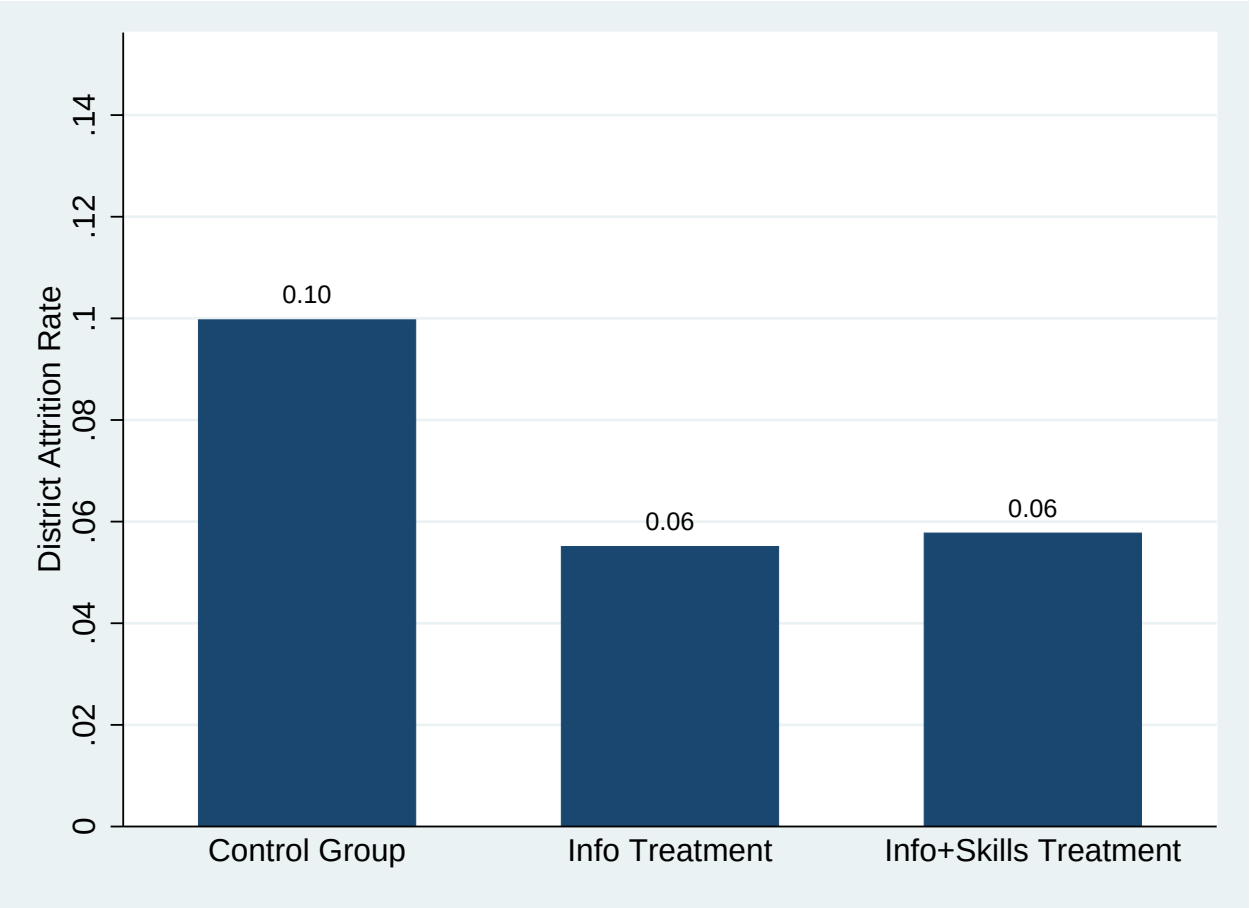
Daily Attendance

21-Oct-15 **26-Oct-15**

1 CHEMISTRY I-1 A1 CHEMISTRY I-1 A4 WORLD HISTORY I-1 A4 WORLD HISTORY I-1 A5 FRENCH I-1 A5 FRENCH I-1 A1 CHEMISTRY I-1 A1 CHEMISTRY I-1 A

This figure shows an example of the type of data collected and transmitted to parents bimonthly.

Figure 2: Student Attrition from the District by Intervention Group



This bar chart shows group means for student retention in the district. Both the Info Treatment and the Info+Skills treatment are statistically different from the control-group mean at the 5% level and, when both treatment groups are pooled together, this difference is significant at the 1% level. The latter two groups are not statistically different from each other.

Table 1: Baseline Summary Statistics by School

Baseline Variable	(1) Middle School 1	(2) High School 1	(3) High School 2
Share Black	0.75	0.82	0.26
Share Hispanic	0.17	0.09	0.49
Share White	0.04	0.04	0.13
Baseline GPA	1.78	1.71	1.90
Reading Nat'l Percentile	20.49	25.15	29.19
Math Nat'l Percentile	16.48	17.13	22.52
Days Absent	10.52	9.39	9.64
Ever Suspended	0.40	0.33	0.27
Participants	284	333	485

This table shows baseline summary statistics from the district's administrative data. Column (1) shows the Middle School means. Column (2) shows the High School 1 means. Column (3) shows the High School 2 means.

Table 2: Baseline Summary Statistics

Baseline Variable	(1) Control Mean	(2) Info Diff.	(3) P-value	(4) Info+Skills Diff.	(5) P-Value	(6) N
Black	0.56	-0.05	0.13	0.02	0.55	1121
Hispanic	0.28	0.01	0.74	0.02	0.61	1121
White	0.08	0.01	0.72	-0.02	0.38	1121
Baseline GPA	1.79	-0.05	0.28	0.03	0.56	1121
Reading Nat'l Percentile	25.03	1.32	0.46	0.06	0.97	887
Math Nat'l Percentile	19.36	1.05	0.51	-1.02	0.49	898
Days Absent	9.55	0.44	0.46	-0.30	0.61	1121
Suspended Last Year	0.31	0.00	0.97	0.02	0.44	1121
Parent Graduated HS	0.59	-0.03	0.54	-0.05	0.26	720
English Language Learner	0.18	-0.02	0.58	-0.03	0.20	1120

This table shows baseline summary statistics from the district's administrative data. Column (1) shows the control group mean. Column (2) shows the difference between the Info-only treatment group mean and the control group mean. Column (3) shows the p-value for this difference. Column (4) shows the difference between the Info+Skills group mean and the control group mean. Column (5) shows the p-value for this difference. Column (6) shows the number of observations available for the baseline variable.

Table 3: Academic Results

	(1) Standardized GPA	(2) Percent Grade	(3) Math Scores	(4) Reading Scores
Info	0.13**	3.68**	0.01	-0.06
	(0.07)	(1.58)	(0.06)	(0.07)
Info+Skills	0.08	3.36**	0.13**	0.12*
	(0.06)	(1.54)	(0.06)	(0.07)
Observations	1,120	1,120	701	705
Mean for Control	0.00	64.30	0.00	0.00
P-Value Pooled Treatment=0	0.06	0.01	0.17	0.60
P-Value Info=Info+Skills	0.44	0.82	0.06	0.01

Regressions include controls for parents' education, baseline test scores and GPA, IEP status, indicators for race and ELL categorization. All regressions include strata indicators. The sample is all students for whom the outcome variable is not missing. Missing values for covariates are imputed and indicators for missingness are included in the regression. The p-value for pooled treatment is derived from a test whether the coefficient on an indicator for being either in the Info or Info+Skills treatment equals zero. The p-value for the equality of the Info and Info+Skills treatments is derived from a test of whether the impacts of these interventions is equal. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Behaviors Results

	(1) Days Attended	(2) Ever Suspended	(3) Chronically Absent
Info	1.21	0.01	0.01
	(2.85)	(0.03)	(0.03)
Info+Skills	2.82	-0.02	0.00
	(2.69)	(0.03)	(0.03)
Observations	1,120	1,120	1,111
Mean for Control	138.10	0.43	0.60
P-Value Pooled Treatment=0	0.41	0.89	0.87
P-Value Info=Info+Skills	0.54	0.30	0.92

Regressions include controls for parents' education, baseline test scores and GPA, IEP status, indicators for race and ELL categorization. All regressions include strata indicators. The sample is all students for whom the outcome variable is not missing. Missing values for covariates are imputed and indicators for missingness are included in the regression. The p-value for pooled treatment is derived from a test whether the coefficient on an indicator for being either in the Info or Info+Skills treatment equals zero. The p-value for the equality of the Info and Info+Skills treatments is derived from a test of whether the impacts of these interventions is equal. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Heterogeneity by Baseline GPA

	(1) Attrition	(2) GPA	(3) Math Scores	(4) Reading Scores	(5) Ever Suspended	(6) Days Attended	(7) Chronically Absent
Info	-0.03*	0.20**	0.04	-0.00	-0.00	1.98	-0.01
	(0.02)	(0.08)	(0.07)	(0.08)	(0.05)	(3.23)	(0.04)
Info×Low GPA	-0.03	-0.13	-0.09	-0.14	0.04	-1.50	0.02
	(0.04)	(0.13)	(0.12)	(0.14)	(0.07)	(5.96)	(0.06)
Info+Skills	-0.02	0.19**	0.15**	0.13*	-0.08*	5.60**	-0.07*
	(0.02)	(0.08)	(0.07)	(0.08)	(0.04)	(2.82)	(0.04)
Info+Skills×Low GPA	-0.05	-0.23*	-0.05	-0.05	0.12*	-6.26	0.15**
	(0.04)	(0.13)	(0.14)	(0.15)	(0.07)	(5.61)	(0.06)
Observations	1,120	1,120	701	705	1,120	1,120	1,111

Regressions include controls for parents' education, baseline test scores and GPA, IEP status, indicators for race and ELL categorization. All regressions include strata indicators. The sample is all students for whom the outcome variable is not missing. Missing values for covariates are imputed and indicators for missingness are included in the regression. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Heterogeneity by Chronic Absentee Status

	(1) Attrition	(2) GPA	(3) Math Scores	(4) Reading Scores	(5) Ever Suspended	(6) Days Attended	(7) Chronically Absent
Info	-0.04**	0.15**	-0.00	-0.07	-0.01	1.93	-0.03
	(0.02)	(0.07)	(0.05)	(0.07)	(0.04)	(2.91)	(0.04)
Info×Chronic	-0.05	0.10	-0.04	0.36*	0.00	-0.20	0.11
	(0.06)	(0.16)	(0.18)	(0.19)	(0.09)	(8.60)	(0.07)
Info+Skills	-0.03	0.09	0.11*	0.07	-0.04	3.88	-0.03
	(0.02)	(0.07)	(0.06)	(0.07)	(0.04)	(2.63)	(0.04)
Info+Skills×Chronic	-0.06	0.11	-0.16	0.45**	-0.04	-1.85	0.08
	(0.06)	(0.16)	(0.16)	(0.19)	(0.08)	(8.26)	(0.07)
Observations	920	920	590	592	920	920	915

Regressions include controls for parents' education, baseline test scores and GPA, IEP status, indicators for race and ELL categorization. All regressions include strata indicators. The sample is all students for whom the outcome variable is not missing. Missing values for covariates are imputed and indicators for missingness are included in the regression. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Heterogeneity by Gender

	(1) Attrition	(2) GPA	(3) Math Scores	(4) Reading Scores	(5) Ever Suspended	(6) Days Attended	(7) Chronically Absent
Info	-0.02	0.12	0.04	-0.07	-0.06	0.19	0.01
	(0.03)	(0.09)	(0.09)	(0.10)	(0.05)	(4.02)	(0.04)
Info×Female	-0.06	0.05	-0.09	0.03	0.15**	2.23	-0.02
	(0.04)	(0.13)	(0.11)	(0.13)	(0.07)	(5.73)	(0.06)
Info+Skills	-0.04	0.05	0.14	0.14	-0.04	0.18	0.05
	(0.03)	(0.09)	(0.10)	(0.10)	(0.05)	(3.67)	(0.04)
Info+Skills×Female	-0.00	0.07	-0.03	-0.05	0.03	5.07	-0.11*
	(0.04)	(0.12)	(0.12)	(0.14)	(0.07)	(5.36)	(0.06)
Observations	1,120	1,120	701	705	1,120	1,120	1,111

Regressions include controls for parents' education, baseline test scores and GPA, IEP status, indicators for race and ELL categorization. All regressions include strata indicators. The sample is all students for whom the outcome variable is not missing. Missing values for covariates are imputed and indicators for missingness are included in the regression. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Appendix Tables

Table A.1: Missing Test Scores

	(1) Missing Math Scores	(2) Missing Reading Scores
Info	0.025	0.01
	(0.03)	(0.03)
Info+Skills	-0.01	-0.03
	(0.03)	(0.03)
Observations	1,029	1,029
Mean for Control	31%	32%

This table shows the share of students missing math and reading standardized test scores and the effects of the Information-only (Info) treatment and the Information-plus-skills (Info+Skills) treatment on the likelihood a student is missing scores. Sample is the set of students eligible to take the standardized tests; 12th grade students do not take these exams. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table A.2: Missing Test Scores

	(1) Missing Math Scores	(2) Missing Reading Scores
Percent Absent	0.658***	0.713***
	(0.117)	(0.100)
Baseline Math Score	0.020	0.001
	(0.021)	(0.018)
Baseline Reading Score	-0.010	-0.024
	(0.019)	(0.019)
Baseline GPA	-0.072***	-0.078***
	(0.018)	(0.017)
Ever Suspended	0.130***	0.133***
	(0.032)	(0.031)
Observations	1,029	1,029

This table shows the results of a regression of an indicator for a missing standardized test score regressed on baseline covariates. Baseline GPA and baseline math and reading scores are standardized according to control-group mean by grade level. Sample is the set of students eligible to take the standardized tests; 12th grade students do not take these exams. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table A.3: Robustness: Test Score Results

Panel A.	(1) Math Z Score	(2) Reading Z Score	(3) Math Scale Score	(4) Reading Scale Score	(5) Math Z Score	(6) Reading Z Score
Info	-0.01	-0.06	0.05	-1.49	-0.01	-0.06
	(0.06)	(0.07)	(1.23)	(1.50)	(0.06)	(0.07)
Info+Skills	0.12*	0.11	2.44**	2.83*	0.13**	0.11
	(0.06)	(0.07)	(1.24)	(1.60)	(0.06)	(0.07)
Observations	701	705	701	705	701	705

	(7) Math Scale Score	(8) Reading Scale Score	(9) Math Z Score	(10) Reading Z Score	(11) Math Scale Score	(12) Reading Scale Score
Info	0.18	-1.47	-0.00	-0.06	0.32	-1.38
	(1.21)	(1.49)	(0.06)	(0.07)	(1.21)	(1.49)
Info+Skills	2.47**	2.85*	0.13**	0.11	2.55**	2.85*
	(1.24)	(1.60)	(0.06)	(0.07)	(1.24)	(1.58)
Observations	701	705	701	705	701	705

The regressions in Column (1)-(4) includes controls for parents' education, baseline test scores and indicators for race. The regressions in columns (5)-(8) add indicators for the English Language Learner test-score categorization. Columns (9)-(12) add controls for baseline GPA, standardized, IEP status, an indicator for being ever suspended, and baseline number of absences and days enrolled. All regressions include strata indicators. The sample is all students for whom the outcome variable is not missing. Missing values for covariates are imputed and indicators for missingness are included in the regression. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1