CB DREAMS PROGRAM EVALUATION DATA ANALYSIS

Prepared for Council Bluffs Community School District

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In the following report, Hanover Research uses regression analysis to evaluate Council Bluffs Community School District's before and after school program.

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INTRODUCTION

As a recipient of the 21st Century Community Learning Centers grant in 2014, Council Bluffs Community School District (Council Bluffs) implemented the Developing Relationships Engaging All Middle Schoolers (CB DREAMS) program for middle school students. The program represents a collaborative effort between the District, area businesses, and community partners to provide these students with high-quality before- and after-school activities. This report evaluates the correlation between program participation and student academic outcomes, namely, assessment scores, disciplinary incidents, and attendance. We find that after controlling for student observable characteristics, the program effect on assessment outcomes is likely negligible, while there is some evidence that program participation corresponds to slightly better behavioral outcomes in students.

This report is organized as follows:

- **Section I: Data and Methodology:** This section outlines the data provided by Council Bluffs, the data processing conducted by Hanover Research, and the Heckman correction and regression methods employed in the analyses presented in the following sections.
- **Section II: Program Participation and Assessment Outcomes:** This section presents an analysis of the potential effect of the CB DREAMS program on the Iowa Assessment and the Scholastic Reading Inventory. For these assessments, we examine both scaled scores and proficiency levels as outcomes of interest.
- **Section III Program Participation and Behavioral Outcomes:** This section presents an analysis of the potential effect of the CB DREAMS program on two behavioral outcomes, school attendance and disciplinary incidents.

KEY FINDINGS

- **Any effect of program participation on assessment outcomes is very weak.**
  - After accounting for the effects of control variables, the effect of 10 additional days of program participation does not exceed two scaled score points (positive or negative) for students in any grade for any of the assessments.
  - After accounting for the effects of control variables, the effect of 10 additional days of program participation does not exceed 1.4 percentage points (positive or negative) for students in any grade for any of the assessments.
- **Additional program participation is somewhat correlated with improved behavioral outcomes.**
  - An additional 10 days of program participation correlates with a 0.2 percentage point increase in attendance rates, after accounting for the effects of the control variables.

- An additional 10 days of program participation correlates with 0.08 fewer disciplinary incidents, after accounting for the effects of control variables.

- **Although some of these results are statistically significant, Hanover cautions against claims of program effects on assessment outcomes due to the small magnitudes and inconsistency of the effects.**

SECTION I: DATA AND METHODOLOGY

In this section, Hanover Research explains the data we analyze in this report and the methodology we use to conduct our analysis.

DATA

Council Bluffs provided Hanover Research with assessment data from the Iowa Assessment (IA) and the Scholastic Reading Inventory (SRI) for the school years 2013-2014 and 2014-2015. The district also provided student demographic information and data on disciplinary incidents, attendance, and CB DREAMS program participation. In order to understand the correlation between program participation and the academic outcomes, Hanover compiled these data into a dataset in which each observation represents a student; we observed data for 1,804 students.

OUTCOME VARIABLES

This report uses standardized assessment data and data on student attendance and disciplinary incidents to create the outcome variables of interest. Council Bluffs provided Hanover with student-level assessment data from the Iowa Assessment and SRI assessment.

IOWA ASSESSMENTS

Math and Reading Iowa assessment data are available for the 2013-2014 and the 2014-2015 academic years. Hanover analyzes the correlation between program participation and two types of outcomes: scaled scores and proficiency levels. Scaled scores are provided by the district, and Hanover consolidates proficiency levels, originally on a four-level scale, to a binary outcome, either proficient or not proficient. To be coded as proficient, the student must attain either the "proficient" or "advanced" level in the initial coding scheme. We use the previous year's score as a control for each student, meaning that the result of the analysis is an estimate of the correlation between program participation and the change in scaled score or proficiency level in the previous year.

SCHOLASTIC READING INVENTORY

The SRI data includes both the formative "entry" assessment data and the summative "third trimester" assessment data. Since the program began during the 2014-2015 academic year, we use the 2014[1] summative assessment as a control and the 2015 summative assessment as the outcome variable of interest. As with the Iowa Assessment analysis, Hanover measures the correlation between levels of program participation and the change in outcome from the previous year.

[1] Singular dates, such as 2014 and 2015 refer to the spring test scores. In other words, 2014 refers to the 2013-2014 test scores, and 2015 refers to the 2014-2015 test scores.

Behavioral Outcomes

Finally, Hanover analyzes the correlations between program participation and two student behavioral outcomes: attendance and disciplinary incidents during the program period. Attendance is measured as the percentage of class periods attended, while disciplinary incidents are measured as a count of disciplinary incidents for the student during the school year.

As is seen in Figure 1.1, the students who participate in the program tend to have assessment scores that are slightly higher than those of other students. Program participants also have slightly better attendance records and slightly fewer disciplinary incidents than non-program students.

Figure 1.1: Academic Outcome Summary Statistics

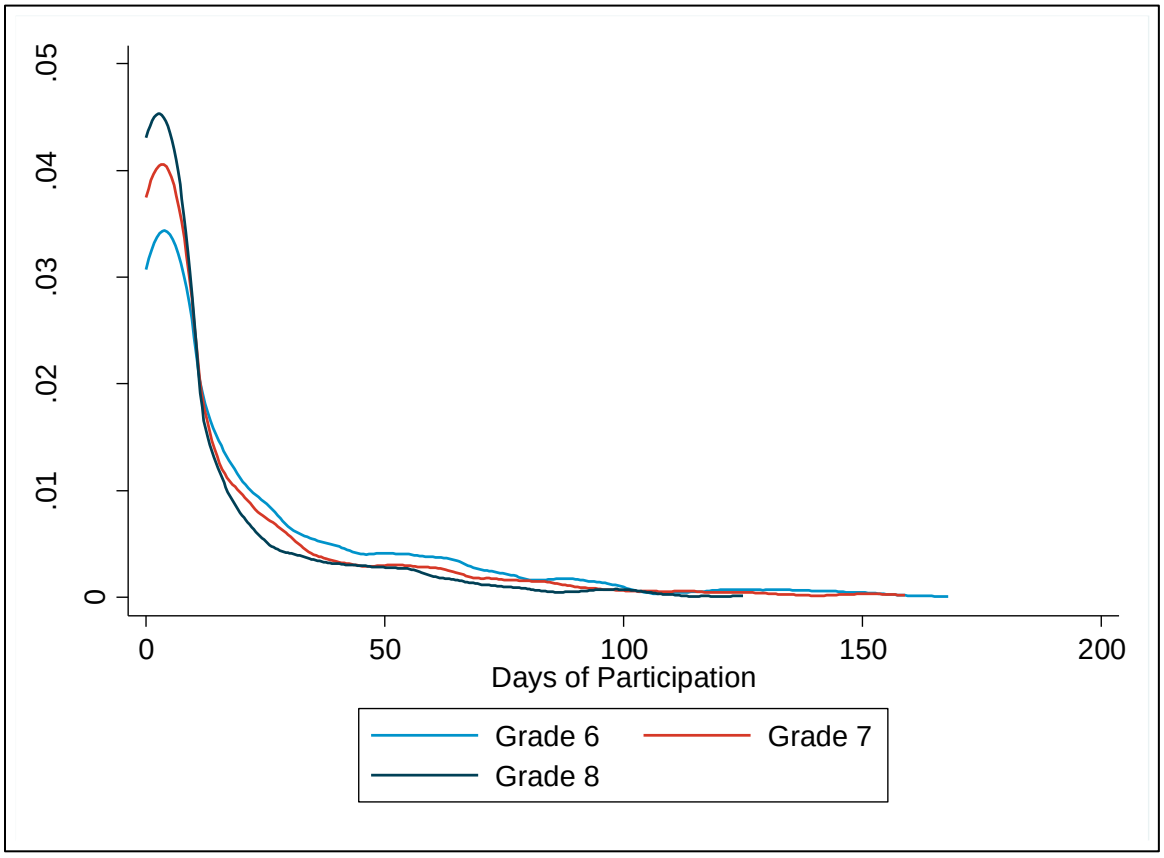
Variable	Program		Non-Program		Difference	
	Mean	N	Mean	N	Program - Non-Program	T Statistic
Assessment Outcomes						
Iowa Mathematics Assessment Scaled Score 2014-15	240.6	1363	235.1	403	5.5***	-3.09
Iowa Reading Assessment Scaled Score 2014-15	246.0	1362	241.9	404	4.1*	-1.79
Scholastic Reading Inventory End of Year Scaled Scores 2014-15	974.6	1338	932.6	373	42.0***	-2.64
Iowa Mathematics Assessment Proficient 2014-15	72.1%	1363	62.5%	403	9.6%***	-3.70
Iowa Reading Assessment Proficient 2014-15	69.8%	1362	64.4%	404	5.5%**	-2.08
Scholastic Reading Inventory End of Year Proficient 2014-2015	57.2%	1338	54.2%	373	3.1%	-1.07
Behavioral Outcomes						
Attendance Rate	96.3%	1393	95.2%	411	1.0%***	-3.73
Discipline Incidents	1.8	1393	2.4	411	-0.6**	2.07

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

PROGRAM VARIABLES

The data provided contained information on program participation for students at Kirn Middle School and Wilson Middle School. These data indicate the number of days a student participated in the CB DREAMS program during the year. We transform this variable into a binary measure for whether a student participates in CB DREAMS for at least one day, in addition to transforming this variable into a continuous variable indicating the number of days the student participated, measured in 10-day increments.

Figure 1.2: Participating Students' Days of Participation, Kernel Density Plot



N=1,804

CONTROL VARIABLES

In order to ensure that correlations between program participation and academic outcomes are not a result of differences in other observable characteristics of the students, we employ linear and logistic regression analyses that allow the introduction of control variables. For control variables, Hanover uses student-level demographic data as well as pre-program test scores. Student-level data include gender, date of birth, ethnicity, English language learner (ELL) status, free or reduced price lunch status, whether the student has an individualized education plan (IEP), and a gifted designation. These data also include the 2014 end of year scaled scores for the Iowa Assessment (Math and Reading) and the SRI.

Hanover transforms the date of birth variable into an age variable representing the age of the student on September 1, 2014, which is the approximate beginning of the program. Hanover also transforms the ELL data into two binary indicators representing whether a student is currently ELL and whether the student is formerly ELL. Figure 1.3 presents the means and number of observations for all of these variables, broken out by whether or not the student participates in the program. It also shows the difference between the groups and whether this difference is statistically significant.

Figure 1.3: Control Variable Summary Statistics

Variable	Program		Non-Program		Difference	
	Mean/ Pct. in Group	N	Mean/ Pct. in Group	N	Program - Non-Program	T Statistic
Demographic						
Age	12.4	1393	12.7	411	-0.3***	5.70
Female	49.3%	1393	51.1%	411	-1.8%	0.63
Male	50.7%	1393	48.9%	411	1.8%	-0.63
Asian	1.3%	1393	2.2%	411	-0.9%	1.32
Black	4.8%	1393	3.9%	411	0.9%	-0.78
Hispanic	14.1%	1393	14.8%	411	-0.8%	0.39
American Indian	0.7%	1393	1.9%	411	-1.2%**	2.20
White	79.1%	1393	77.1%	411	2.0%	-0.86
Academic						
English Language Learner	6.9%	1393	6.8%	411	0.1%	-0.06
Former English Language Learner	2.9%	1393	2.4%	411	0.4%	-0.48
Gifted Status	20.2%	1393	13.9%	411	6.4%***	-2.91
Individualized Education Program	16.2%	1393	24.6%	411	-8.4%***	3.91
Qualifies for Free or Reduced-Price Lunch	60.9%	1393	67.9%	411	-6.9%**	2.56
Iowa Mathematics Assessment Scaled Score 2013-14	225.9	1305	222.5	383	3.4**	-2.01
Iowa Reading Assessment Scaled Score 2013-14	231.9	1305	227.5	383	4.4**	-2.06
Scholastic Reading Inventory End of Year Scaled Scores 2013-14	908.5	1278	896.8	356	11.7	-0.76

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

METHODOLOGY

Given the differences between program and non-program students observed in Figures 1.1 and 1.3, Hanover takes two main measures in order to evaluate the differences in outcomes between groups that may be attributable to the CB DREAMS program. We use the Heckman correction to account for differences between program and non-program students. Then, we use linear and logistic regression analysis to identify correlations between increased program participation and academic outcomes, while controlling for student observable characteristics such as previous year's assessment scores and demographic characteristics. We conduct statistical tests in order to identify potential differences in assessment and behavioral outcomes for students who participate with varying degrees in the program.

HECKMAN CORRECTION

The core of this analysis is to evaluate the extent of the correlations between program participation and academic outcomes. Because the students who participate in the program are not randomly selected, Hanover employs a method known as the Heckman correction to correct for this selection effect.

Consider Figure 1.3, which shows that students who participate in the program are more likely to have gifted status, less likely to have an IEP, less likely to qualify for free or reduced-price lunch, and have slightly better Iowa Assessment scores in the period before the program. These differences in the students' observable characteristics indicate that the students who elect to participate in the program are different from those who do not. As such, making comparisons between the program and non-program group, even with the use of control variables, may thus lead to biased results. The Heckman correction is meant to account for the fact that students who elect to participate are different from those who do not. In turn, this allows us to isolate the effect of the program for the students who participated.

The method is carried out in two stages. First, Hanover analyzes the correlates to program participation, yielding a new variable that estimates the probability of program participation for each student. In the second stage, we correct for the selection effect by including the variable generated in the first stage as an additional explanatory variable. This model estimates the effect of additional amounts of participation (measured in 10-day units) on the dependent variable, after accounting for the difference between program and non-program groups.

LINEAR REGRESSION METHOD

After completing the Heckman correction process, we compare program students who participated more and less in the program. In Section II, we estimate program effects on assessment outcomes, and in Section III we estimate program effects on behavioral outcomes. **The program effects statistics in Section II and Section III represent the change in the outcome of interest, given an increase of 10 days of program participation.**

Although there may be differences in outcomes for students with different levels of participation in the program, these differences could be due to different types of students using the program at different rates. For example, if program participants with gifted status tend to use the program more than other program students, this difference could drive a correlation between program participation and assessment outcomes that is unrelated to the program itself. Regression analysis controls for these observable differences and isolates the program effect.

We note, however, that regression analysis cannot control for factors that are unobserved and therefore not included in the models. In other words, the CB DREAMS program is likely to involve students who are different from other students in important ways *we do not observe*. For example, if program participation is an indication of faculty interest in the student, this unobserved factor could represent a confounding factor which drives the correlation between academic outcomes and program participation. As such, we suggest that any program effects found through this analysis be interpreted with caution.

REGRESSION EQUATION

Each regression model has a single outcome variable and a set of predictor variables, which include a program participation variable and control variables. These control variables include those discussed above. We estimate regression equations similar to (1) separately for each outcome.

$$\mathrm{Y_i} = \alpha + \beta_1 * \text{Program Participation}_i + \mathrm{X}_i\beta_2 + \mu_s + \epsilon_\mathrm{i} \qquad (1)$$

$\mathrm{Y_i}$ denotes the outcome variable which is the mean score for student *i.* Program $\text{Participation}_\mathrm{i}$ is an indicator that represents the number of days student *i* participated in the program.[2] X_i denotes a matrix of student-level characteristics, including ethnicity, gender, English language learning status, gifted status, and others described in Figure 1.3. μ_s represents school-level fixed effects, accounting for different mean scores in the two different middle schools. Finally, ϵ_i is the idiosyncratic error term.

The parameter of interest to the evaluation is β_1, which signifies the increase in the outcome variable that is associated with a 10-day increase the number of days the student participated in the program. A positive and statistically significant estimate for this coefficient in the models using assessment scores or attendance rate as outcomes indicates that the students in the program have better outcomes (i.e., higher scores) than similar students who had lower levels of participation in the program. In the models with disciplinary incidents as an outcome, a negative value indicates a better outcome, which corresponds to fewer reported disciplinary incidents. For the analysis of proficiency level outcomes in Section II, which are based on logistic regression analysis, we report marginal effects with control variables held at their means.

[2] Hanover transforms the raw data by dividing this measure by 10, resulting in an indicator that represents the number of 10-day units of student participation in the program.

SECTION II: PROGRAM PARTICIPATION AND ASSESSMENT OUTCOMES

SUMMARY

This section presents the results from regression analyses of CB DREAMS program participation and academic assessment outcomes. After controlling for observable factors, the correlations between program participation and assessment outcomes are very weak.

POOLED RESULTS

Figure 2.1 presents linear regression analysis results showing the relationship between assessment outcomes and program participation. In these regressions, students from all grades are included in each analysis, and a fixed effect for each grade is estimated (see the Appendix for full regression results).

An additional 10 days of program participation is associated with an additional 0.3 scaled points on the IA Math assessment. Recall that the mean score for this assessment is 240.6 points for program students (Figure 1.1), indicating that the program effect is negligible. The largest program effect is in SRI scores (1.0 scaled points for every additional 10 days of program participation), but this is not statistically significant and is very small considering that the mean score for program participants is 974.6 points.

Figure 2.1: Scaled Scores, Pooled

Statistic	IA Math	IA Read	SRI
Additional 10 Days of Program	0.285*	-0.106	1.004
Standard Error	(0.151)	(0.205)	(1.231)
Observations	1,299	1,299	1,242

*** p<0.01, ** p<0.05, * p<0.1, Robust standard errors in parentheses

Figure 2.2 presents the results of logistic regression analysis of the relationship between program participation and proficiency outcomes. As with the scaled scores, the correlation between program participation and the likelihood of scoring at the proficient level is very weak when control variables are present in the models. An additional 10 days of the program participation correlates with only a 0.5 percentage point increase in the likelihood of attaining proficiency on the IA Math assessment. This result is not statistically significant. We also find that an additional 10 days of program participation correlates with an increased likelihood of attaining proficiency on the IA Reading assessment of 0.3 percentage points, although this result is also not statistically significant. We find a statistically significant difference in SRI proficiency level for students who spend an additional 10 days in the program; however, this difference of 0.8 percentage points is very small.

Figure 2.2: Proficiency Levels, Pooled (Marginal Effects)

Statistic	IA Math	IA Read	SRI
Additional 10 Days of Program	0.005	0.003	0.008**
Standard Error	(0.003)	(0.003)	(0.003)
Observations	1,299	1,299	1,242

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

RESULTS BY GRADE

Hanover also conducted these analyses separately for each grade in order to determine whether students from different grades might respond differently to the program. Although there are some statistically significant results that vary by grade, none of the differences for a 10-day increase in program participation is greater than two scaled points. After accounting for the control variables, there are no substantial differences between students who take an additional 10 days of the program and those who do not, regardless of grade.

Figure 2.3: Scaled Scores by Grade

Statistic	Grade 6			Grade 7			Grade 8		
	IA Math	IA Read	SRI	IA Math	IA Read	SRI	IA Math	IA Read	SRI
Additional 10 Days of Program	0.554***	0.239	1.703	0.047	0.313	1.223	-0.081	-0.933**	-1.269
Standard Error	(0.200)	(0.306)	(1.540)	(0.281)	(0.340)	(2.452)	(0.373)	(0.465)	(2.445)
Observations	487	487	476	448	448	421	364	364	345

*** p<0.01, ** p<0.05, * p<0.1, Robust standard errors in parentheses

As with the scaled score outcomes by grade, the differences in proficiency outcomes between students who participate in the program for an additional 10 days and those who do not are very small.

Figure 2.4: Proficiency Levels by Grade

Statistic	Grade 6			Grade 7			Grade 8		
	IA Math	IA Read	SRI	IA Math	IA Read	SRI	IA Math	IA Read	SRI
Additional 10 Days of Program	0.009**	0.006	0.008**	-0.004	0.006	0.010*	0.001	-0.014*	-0.005
Standard Error	(0.004)	(0.005)	(0.004)	(0.005)	(0.006)	(0.006)	(0.008)	(0.008)	(0.009)
Observations	481	481	470	440	440	414	361	361	342

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

SECTION III: PROGRAM PARTICIPATION AND BEHAVIORAL OUTCOMES

SUMMARY

In this section, Hanover Research analyzes the difference in behavioral outcomes depending on the level of participation in the CB DREAMS program. We find that in general, program participation correlates with slightly higher attendance and somewhat lower numbers of disciplinary incidents for students. Although the effects are small, the findings in this section constitute evidence that program participation is associated with slightly better student behavioral outcomes.

POOLED RESULTS

Figure 3.1 presents the results of linear regression analysis of the relationship between program participation and two behavioral outcomes, attendance and disciplinary incidents. An additional 10 days of program participation is associated with a 0.2 percentage point increase in attendance rate. If this attendance is based on a typical 180 day school year, this corresponds to less than half of one day of attendance. An additional 10 days of program participation correlates with 0.08 fewer disciplinary incidents. Although neither of these findings is very large, they are both statistically significant. These findings may point to the conclusion that program participation is correlated with slightly better student behavior.

Figure 3.1: Behavioral Outcomes, Pooled

Statistic	Attendance	Discipline
Additional 10 Days of Program	0.002***	-0.080**
Standard Error	(0.000)	(0.036)
Observations	1,304	1,304

*** p<0.01, ** p<0.05, * p<0.1, Robust standard errors in parentheses

RESULTS BY GRADE

As with the assessment outcomes, Hanover also conducted these analyses separately for each grade in order to determine whether students from different grades might respond differently to the program.

In every grade, additional program participation correlates somewhat positively with attendance and somewhat negatively with disciplinary incidents. Most of the results are statistically significant, but all the effects are small. For attendance, the greatest program effect is for Grade 8 students, for whom an additional 10 days of program participation correlates with a 0.3 percentage point higher in attendance rates. A student who participates for an additional 20 days might therefore be expected to increase his/her attendance by one school day over the year, a small difference. For Grade 7 students, the effect is only 0.1 percentage points, but this result remains statistically significant.

For discipline outcomes, the program effect is strongest for Grade 7 students, for whom an additional 10 days of program participation correlates with 0.11 fewer disciplinary incidents. For the Grade 6 and Grade 8 students, the results are somewhat smaller and not statistically significant, but program participation continues to exhibit a negative correlation with disciplinary incidents for students in these grades.

Figure 3.2: Behavioral Outcomes by Grade

Statistic	Grade 6		Grade 7		Grade 8	
	Attendance	Discipline	Attendance	Discipline	Attendance	Discipline
Additional 10 Days of Program	0.002***	-0.071	0.001*	-0.109**	0.003***	-0.034
Standard Error	(0.000)	(0.047)	(0.000)	(0.055)	(0.001)	(0.124)
Observations	487	487	448	448	364	364

*** p<0.01, ** p<0.05, * p<0.1, Robust standard errors in parentheses

Although the effects are not large, the findings in this section constitute some evidence that program participation is associated with slightly better student behavioral outcomes. However, the absence of outcome data in the pre-program period results in Hanover not controlling for pre-program student behavioral outcomes. As such, we caution that these behavioral differences may not be direct effects of the program. Additionally, because school attendance may be necessary for program attendance for some students, the correlation between days of program participation and the attendance rate may simply reflect the similarity of these two measures.

APPENDIX: REGRESSION TABLES

This appendix presents the full regression tables from the regression analysis in Section II and Section III.

Figure A.1: Scaled Scores, Pooled

VARIABLES	IA MATH	IA READ	SRI
Number of Program Days Divided by 10	0.285*	-0.106	1.004
	(0.151)	(0.205)	(1.231)
Age as of September 1, 2014	1.894	25.238***	13.114
	(3.166)	(2.544)	(14.563)
Female	1.221	5.435***	-2.217
	(0.901)	(1.217)	(6.516)
Asian	-0.248	14.635***	75.723***
	(4.314)	(4.513)	(26.183)
Black	-2.680	-17.187***	-20.926
	(2.262)	(2.835)	(15.398)
Hispanic	-1.391	18.345***	9.519
	(3.165)	(3.552)	(17.955)
American Indian	1.883	70.294***	50.451
	(10.945)	(10.851)	(58.108)
English Language Learner	-0.406	-24.189***	9.599
	(4.260)	(4.449)	(23.950)
Former English Language Learner	6.328*	-16.386***	12.286
	(3.720)	(4.906)	(23.044)
Gifted Status	7.683***	-4.251	4.453
	(2.399)	(2.942)	(15.284)
Individualized Education Program	-3.968	17.266***	-52.719**
	(3.470)	(3.605)	(21.807)
Qualifies for Free or Reduced-Price Lunch	-0.084	3.501**	-7.200
	(1.264)	(1.506)	(8.730)
Iowa Mathematics Assessment Scaled Score 2013-14	0.817***		
	(0.034)		
Iowa Reading Assessment Scaled Score 2013-14		0.707***	
		(0.024)	
Scholastic Reading Inventory End of Year Scaled Scores 2013-14			0.830***
			(0.021)
Constant	34.907	-162.107***	99.011
	(23.432)	(22.090)	(128.234)
School Fixed Effects	Yes	Yes	Yes
Nonselection Hazard	Yes	Yes	Yes
Observations	1,299	1,299	1,242
R-squared	0.799	0.742	0.800

Robust Standard Errors. *** p<0.01, ** p<0.05, * p<0.1

Figure A.2: Scaled Scores, Grade 6

VARIABLES	IA MATH	IA READ	SRI
Number of Program Days Divided by 10	0.554***	0.239	1.703
	-0.2	-0.306	-1.54
Age as of September 1, 2014	5.650**	-8.268**	11.425
	-2.666	-3.694	-19.842
Female	7.011**	-4.599	8.225
	-2.753	-3.655	-17.532
Asian	7.8	-13.804	93.388**
	-6.668	-8.987	-47.384
Black	-2.726	-17.047***	-0.466
	-2.979	-5.006	-30.607
Hispanic	10.062*	-18.552**	-1.033
	-5.58	-8.656	-39.845
American Indian	-44.684**	65.134***	-39.611
	-17.891	-24.357	-110.203
English Language Learner	-7.422*	16.317**	23.142
	-4.479	-7.163	-36.032
Former English Language Learner	-44.042**	81.823***	3.466
	-20.338	-28.167	-130.326
Gifted Status	12.698***	0.921	10.387
	-3.396	-6.206	-27.136
Individualized Education Program	-8.803***	-1.634	-114.705***
	-2.206	-3.755	-24.672
Qualifies for Free or Reduced-Price Lunch	-5.708**	2.992	-24.286
	-2.316	-3.61	-16.258
Iowa Mathematics Assessment Scaled Score 2013-14	0.880***		
	-0.042		
School Name (Encoded) = 2, Wilson Middle School	1.281	6.677***	66.097***
	-1.261	-1.84	-10.285
Iowa Reading Assessment Scaled Score 2013-14		0.725***	
		-0.04	
Scholastic Reading Inventory End of Year Scaled Scores 2013-14			0.916***
			-0.034
School Fixed Effects	Yes	Yes	Yes
Nonselection Hazard	Yes	Yes	Yes
Constant	-51.866	200.477***	-26.064
	-44.062	-51.016	-265.404
Observations	487	487	476
R-squared	0.788	0.713	0.819

Robust Standard Errors. *** p<0.01, ** p<0.05, * p<0.1

Figure A.3: Scaled Scores, Grade 7

VARIABLES	IA MATH	IA READ	SRI
Number of Program Days Divided by 10	0.047	0.313	1.223
	-0.281	-0.34	-2.452
Age as of September 1, 2014	6.825*	-1.013	92.656***
	-4.017	-5.009	-24.756
Female	-0.819	-3.881**	7.616
	-1.263	-1.966	-10.671
Asian	10.865	-10.903	145.750***
	-9.246	-9.082	-51.268
Black	-10.127*	-6.419	-111.798***
	-5.811	-7.114	-36.035
Hispanic	-2.622	-0.503	31.532
	-2.631	-4.933	-19.482
American Indian			
English Language Learner	-4.331	0.769	12.579
	-3.874	-6.51	-37.298
Former English Language Learner	-14.493	2.124	-206.639**
	-11.79	-14.726	-82.233
Gifted Status	-0.334	15.142**	-100.888***
	-5.506	-5.865	-32.981
Individualized Education Program	5.553	-11.705*	49.689
	-5.597	-5.996	-40.543
Qualifies for Free or Reduced-Price Lunch	-2.916**	-4.890**	-12.065
	-1.481	-2.275	-12.087
Iowa Mathematics Assessment Scaled Score 2013-14	0.750***		
	-0.038		
School Name (Encoded) = 2, Wilson Middle School	0.358	-6.364***	-27.224**
	-1.254	-1.958	-10.743
Iowa Reading Assessment Scaled Score 2013-14		0.736***	
		-0.042	
Scholastic Reading Inventory End of Year Scaled Scores 2013-14			0.827***
			-0.036
School Fixed Effects	Yes	Yes	Yes
Nonselection Hazard	Yes	Yes	Yes
Constant	14.215	97.804*	-675.558***
	-37.464	-50.181	-248.909
Observations	448	448	421
R-squared	0.781	0.717	0.823

Robust Standard Errors. *** p<0.01, ** p<0.05, * p<0.1

Figure A.4: Scaled Scores, Grade 8

VARIABLES	IA MATH	IA READ	SRI
Number of Program Days Divided by 10	-0.081	-0.933**	-1.269
	-0.373	-0.465	-2.445
Age as of September 1, 2014	-6.03	10.108*	11.033
	-5.84	-5.26	-24.51
Female	0.35	9.438***	-23.502
	-3.154	-3.226	-14.317
Asian	-12.482***	-0.254	72.430***
	-4.532	-5.772	-25.28
Black	-2.983	-4.695	-12.854
	-5.169	-5.61	-22.825
Hispanic	-7.489	16.730*	-38.191
	-9.69	-8.781	-33.987
American Indian	3.102	-1.326	45.382
	-13.384	-10.391	-28.854
English Language Learner	9.172	-23.295***	-1.156
	-10.241	-8.717	-47.498
Former English Language Learner	14.174	-23.030**	6.625
	-10.815	-11.496	-39.536
Gifted Status	8.413***	12.371***	51.757***
	-2.912	-3.368	-13.366
Individualized Education Program	-8.603	4.077	-19.162
	-5.417	-4.979	-29.55
Qualifies for Free or Reduced-Price Lunch	-0.092	3.935	-16.556
	-2.442	-2.747	-14.016
Iowa Mathematics Assessment Scaled Score 2013-14	0.953***		
	-0.088		
School Name (Encoded) = 2, Wilson Middle School	-1.354	7.866***	35.417***
	-1.719	-2.346	-12.122
Iowa Reading Assessment Scaled Score 2013-14		0.807***	
		-0.045	
Scholastic Reading Inventory End of Year Scaled Scores 2013-14			0.740***
			-0.033
School Fixed Effects	Yes	Yes	Yes
Nonselection Hazard	Yes	Yes	Yes
Constant	95.354*	-61.222	135.012
	-55.09	-65.541	-305.942
Observations	364	364	345
R-squared	0.779	0.744	0.774

Robust Standard Errors. *** p<0.01, ** p<0.05, * p<0.1

Figure A.5: Proficiency Levels, Pooled Marginal Effects

VARIABLES	IA MATH	IA READ	SRI
Number of Program Days Divided by 10	0.005	0.003	0.008**
	(0.003)	(0.003)	(0.003)
Age as of September 1, 2014	-0.193**	0.135***	-0.053
	(0.081)	(0.041)	(0.044)
Female	-0.015	0.044**	-0.010
	(0.020)	(0.019)	(0.021)
Asian	-0.211*	0.225***	0.146*
	(0.114)	(0.051)	(0.080)
Black	-0.016	-0.150***	-0.019
	(0.049)	(0.048)	(0.050)
Hispanic	-0.059	0.164***	0.042
	(0.077)	(0.038)	(0.053)
American Indian	-0.278	0.297***	0.064
	(0.255)	(0.009)	(0.174)
English Language Learner	0.057	-0.273***	-0.016
	(0.092)	(0.068)	(0.070)
Former English Language Learner	0.109	-0.085	-0.006
	(0.075)	(0.125)	(0.077)
Gifted Status	0.206***	-0.041	0.095*
	(0.053)	(0.075)	(0.055)
Individualized Education Program	-0.128	0.142***	-0.039
	(0.097)	(0.031)	(0.067)
Qualifies for Free or Reduced-Price Lunch	-0.032	0.046*	-0.026
	(0.031)	(0.023)	(0.025)
Iowa Mathematics Assessment Scaled Score 2013-14	0.010***		
	(0.001)		
Iowa Reading Assessment Scaled Score 2013-14		0.007***	
		(0.000)	
Scholastic Reading Inventory End of Year Scaled Scores 2013-14			0.001***
			(0.000)
School Fixed Effects	Yes	Yes	Yes
Nonselection Hazard	Yes	Yes	Yes
Observations	1,299	1,299	1,242

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

Figure A.6: Proficiency Levels Grade 6, Marginal Effects

VARIABLES	IA MATH	IA READ	SRI
Number of Program Days Divided by 10	0.009**	0.006	0.008**
	(0.004)	(0.005)	(0.004)
Age as of September 1, 2014	0.021	-0.075	0.039
	(0.042)	(0.049)	(0.044)
Female	0.006	0.018	0.030
	(0.034)	(0.036)	(0.032)
Black	-0.144*	-0.154*	0.066
	(0.074)	(0.084)	(0.088)
Hispanic	-0.044	-0.034	0.042
	(0.040)	(0.045)	(0.041)
American Indian	-0.300*	0.260***	0.063
	(0.170)	(0.062)	(0.175)
Individualized Education Program = 1	-0.094**	-0.041	-0.138**
	(0.042)	(0.048)	(0.062)
Qualifies for Free or Reduced-Price Lunch = 1	-0.019	-0.032	-0.078**
	(0.033)	(0.039)	(0.033)
School Name (Encoded) = 2, Wilson Middle School	-0.011	0.039	0.099***
	(0.026)	(0.031)	(0.028)
Iowa Mathematics Assessment Scaled Score 2013-14	0.011***		
	(0.000)		
Iowa Reading Assessment Scaled Score 2013-14		0.008***	
		(0.000)	
Scholastic Reading Inventory End of Year Scaled Scores 2013-14			0.002***
			(0.000)
School Fixed Effects	Yes	Yes	Yes
Nonselection Hazard	Yes	Yes	Yes
Observations	481	481	470

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

Figure A.7: Proficiency Levels Grade 7, Marginal Effects

VARIABLES	IA MATH	IA READ	SRI
Number of Program Days Divided by 10	-0.004	0.006	0.010*
	(0.005)	(0.006)	(0.006)
Age as of September 1, 2014	0.184**	0.093	0.005
	(0.079)	(0.071)	(0.061)
Female	-0.028	-0.036	-0.014
	(0.028)	(0.031)	(0.034)
Black	-0.210*	-0.110	-0.051
	(0.118)	(0.107)	(0.083)
Hispanic	-0.063	0.022	0.079
	(0.048)	(0.048)	(0.050)
American Indian			
Individualized Education Program = 1	0.120***	-0.042	0.079
	(0.035)	(0.088)	(0.069)
Qualifies for Free or Reduced-Price Lunch = 1	-0.084***	-0.040	0.013
	(0.030)	(0.034)	(0.039)
School Name (Encoded) = 2, Wilson Middle School	0.032	-0.009	-0.039
	(0.027)	(0.030)	(0.034)
Iowa Mathematics Assessment Scaled Score 2013-14	0.008***		
	(0.001)		
Iowa Reading Assessment Scaled Score 2013-14		0.006***	
		(0.001)	
Scholastic Reading Inventory End of Year Scaled Scores 2013-14			0.002***
			(0.000)
School Fixed Effects	Yes	Yes	Yes
Nonselection Hazard	Yes	Yes	Yes
Observations	440	440	414

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

Figure A.8: Proficiency Levels Grade 8, Marginal Effects

VARIABLES	IA MATH	IA READ	SRI
Number of Program Days Divided by 10	0.001	-0.014*	-0.005
	(0.008)	(0.008)	(0.009)
Age as of September 1, 2014	-0.130**	-0.027	0.046
	(0.065)	(0.063)	(0.073)
Female	0.031	0.051	-0.065
	(0.040)	(0.038)	(0.044)
Black	-0.161*	-0.115	-0.025
	(0.092)	(0.099)	(0.100)
Hispanic	0.008	-0.006	-0.095
	(0.049)	(0.053)	(0.067)
American Indian	0.082	-0.109	-0.026
	(0.116)	(0.139)	(0.170)
Individualized Education Program = 1	-0.036	-0.002	-0.041
	(0.056)	(0.058)	(0.074)
Qualifies for Free or Reduced-Price Lunch = 1	-0.009	-0.008	-0.061
	(0.037)	(0.037)	(0.044)
School Name (Encoded) = 2, Wilson Middle School	-0.026	0.021	0.042
	(0.033)	(0.034)	(0.040)
Iowa Mathematics Assessment Scaled Score 2013-14	0.012***		
	(0.001)		
Iowa Reading Assessment Scaled Score 2013-14		0.009***	
		(0.001)	
Scholastic Reading Inventory End of Year Scaled Scores 2013-14			0.001***
			(0.000)
School Fixed Effects	Yes	Yes	Yes
Nonselection Hazard	Yes	Yes	Yes
Observations	361	361	342

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

Figure A.9: Behavioral Outcomes, Pooled

VARIABLES	ATTENDANCE	DISCIPLINE
Number of Program Days Divided by 10	0.002***	-0.080**
	(0.000)	(0.036)
Age as of September 1, 2014	0.007	-0.954
	(0.008)	(1.146)
Female	0.004*	-1.959***
	(0.002)	(0.298)
Asian	0.021**	-2.105*
	(0.010)	(1.225)
Black	-0.009	1.591**
	(0.008)	(0.741)
Hispanic	0.012	-1.633
	(0.008)	(1.002)
American Indian	0.049*	-6.987*
	(0.029)	(4.011)
English Language Learner	-0.006	1.098
	(0.010)	(1.371)
Former English Language Learner	-0.001	0.314
	(0.009)	(1.038)
Gifted Status	-0.011*	0.743
	(0.006)	(0.885)
Individualized Education Program	0.009	-0.799
	(0.010)	(1.392)
Qualifies for Free or Reduced-Price Lunch	-0.002	-0.050
	(0.003)	(0.428)
Iowa Mathematics Assessment Scaled Score 2013-14	-0.000	0.002
	(0.000)	(0.013)
Iowa Reading Assessment Scaled Score 2013-14	0.000***	-0.011*
	(0.000)	(0.006)
Constant	0.890***	11.025
	(0.063)	(8.333)
School Fixed Effects	Yes	Yes
Nonselection Hazard	Yes	Yes
Observations	1,304	1,304
R-squared	0.063	0.106

Robust Standard Errors. *** p<0.01, ** p<0.05, * p<0.1

Figure A.10: Behavioral Outcomes by Grade

Variables	Grade 6		Grade 7		Grade 8	
	Attendance	Discipline	Attendance	Attendance	Discipline	Attendance
Number of Program Days Divided by 10	0.002***	-0.071	0.001*	-0.109**	0.003***	-0.034
	(0.000)	(0.047)	(0.000)	(0.055)	(0.001)	(0.124)
Age as of September 1, 2014	0.009	0.169	-0.005	0.940	-0.009	-1.626
	(0.008)	(0.875)	(0.006)	(0.665)	(0.013)	(2.320)
Female	0.016**	-1.828*	-0.002	-2.165***	-0.002	-3.237**
	(0.008)	(0.938)	(0.003)	(0.384)	(0.007)	(1.302)
Asian	0.028***	0.175	-0.008	0.303	-0.002	-2.695
	(0.011)	(1.266)	(0.012)	(1.082)	(0.020)	(1.804)
Black	-0.002	0.651	0.002	0.550	-0.004	-0.608
	(0.015)	(0.864)	(0.009)	(0.935)	(0.011)	(2.032)
Hispanic	0.018	-0.313	-0.006	-0.453	0.002	-5.267
	(0.014)	(1.690)	(0.006)	(0.417)	(0.019)	(3.607)
American Indian	-0.032	-0.983			0.010	-0.205
	(0.053)	(5.625)			(0.012)	(1.663)
English Language Learner	0.004	-0.626	0.015	-1.442**	-0.000	4.211
	(0.011)	(1.290)	(0.010)	(0.707)	(0.020)	(3.660)
Former English Language Learner	-0.062	-0.740	0.031*	-2.909	0.021	4.461
	(0.061)	(6.235)	(0.018)	(1.768)	(0.020)	(4.185)
Gifted Status	0.000	0.021	0.005	-1.185*	-0.004	-1.500*
	(0.010)	(1.137)	(0.007)	(0.719)	(0.007)	(0.882)
Individualized Education Program	-0.002	2.244***	-0.015	2.442**	-0.007	-4.414**
	(0.006)	(0.762)	(0.010)	(1.115)	(0.015)	(1.929)
Qualifies for Free or Reduced-Price Lunch	-0.015**	0.666	-0.002	1.152***	-0.006	-1.422*
	(0.007)	(0.813)	(0.003)	(0.354)	(0.006)	(0.843)
Iowa Reading Assessment Scaled Score 2013-14	-0.000	0.006	0.000	0.008	0.000*	-0.047***
	(0.000)	(0.013)	(0.000)	(0.007)	(0.000)	(0.013)
Iowa Mathematics Assessment Scaled Score 2013-14	0.000*	-0.018	0.000	-0.023**	0.000	0.050
	(0.000)	(0.018)	(0.000)	(0.009)	(0.000)	(0.041)
Constant	0.768***	2.407	0.978***	-4.199	0.999***	19.951
	(0.135)	(13.076)	(0.062)	(7.233)	(0.127)	(21.379)
School Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Nonselection Hazard	Yes	Yes	Yes	Yes	Yes	Yes
Observations	487	487	448	448	364	364
R-squared	0.102	0.098	0.068	0.173	0.064	0.127

Robust Standard Errors. *** p<0.01, ** p<0.05, * p<0.1

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