

Evaluation of LINC's Caring Communities Sites
21st Century Community Learning Center Programs
Cohort 8, Year 1

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LINC's Caring Communities Sites: 21st Century Community Learning Center Programs
Cohort 8, Year 1

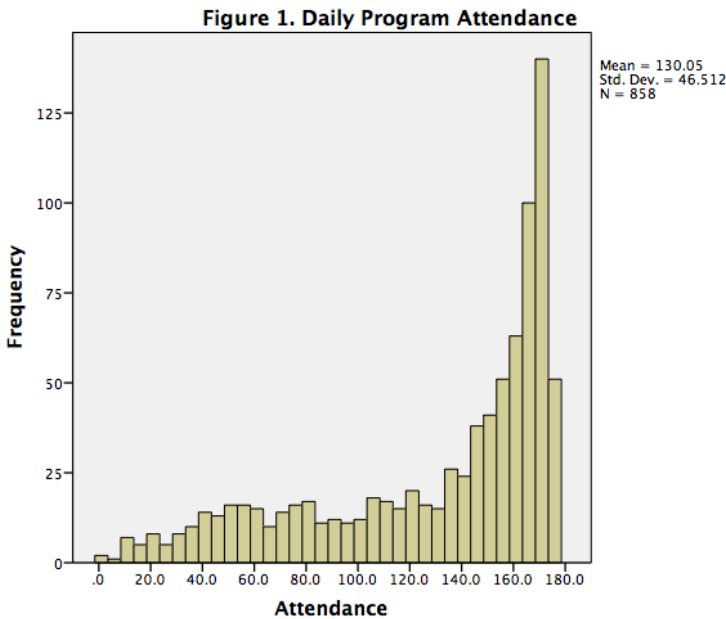
Introduction

This report summarizes the findings from Georgia State University's evaluation of LINC Caring Community sites funded as 21st Century Community Learning Centers (21C). This report includes findings from eight LINC sites in Hickman Mills, Grandview and the Kansas City Public Schools which comprise Cohort 8 and were in their first year of 21C funding during the 2014-2015 school year.

The data sources for the evaluation consist of de-identified data provided by the program. LINC staff rated **student engagement in after-school program activities**. School teachers also rated, **improvements in students' school behavior**. Last, **academic grades in math, reading and science** were examined for students. Outcome analyses tested the **effects of students' participation in the LINC 21C program** on change in school behavior and academic achievement over the school year, using program attendance data and engagement ratings. We use the Harvard Family Research Project's three-part model of program participation, in which **participation consists of program enrollment, program attendance, and engagement in program activities**. In order for after-school programs to have beneficial effects on student achievement, students should not just be enrolled but attend regularly and also be engaged in program activities.

LINC Program Attendance

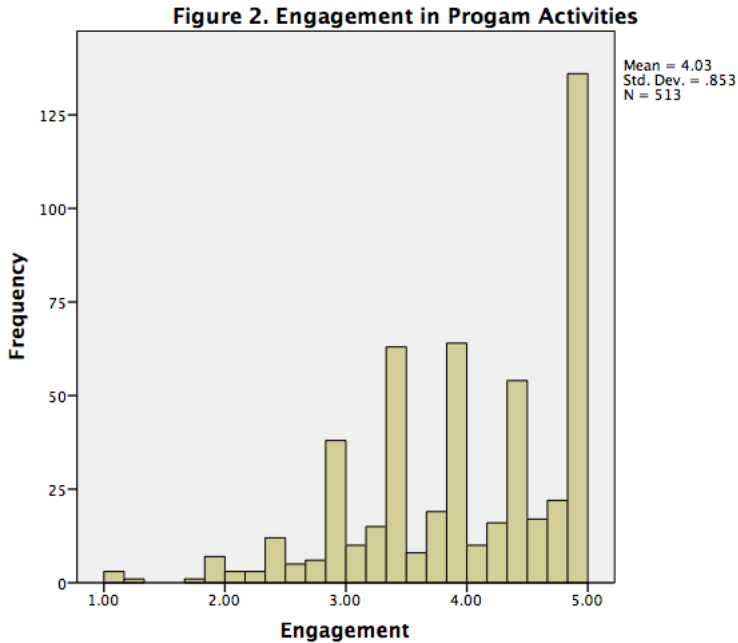
Daily program attendance data were available for 858 students enrolled in the Cohort 8 sites. The average days attended for the 2014-2015 school year was 130 (SD = 47), although there was a wide range from 1 day to 175 days. As indicated in the Figure below, overall program attendance was high.



Student Engagement in Program Activities

During the spring semester LINC staff rated students' engagement during a range of after-school activities. Engagement entails enjoyment of, interest in, and sustained attention and effort focused on an activity. Staff members indicated how often (*never = 1, on occasion = 2, some of the time = 3, most of the time = 4, all of the time = 5*) each student pays attention, seems interested in the subject, on task, and seems to have fun. Student engagement represents each student's average rating during academic and youth development activities. Higher scores indicate a student was more engaged in academic and youth development activities during the LINC after-school program. Engagement data were available for 513 students.

As shown in the figure below, the overall level of student engagement in academic and youth development activities, as rated by program staff, was high. The average engagement score was 4.03 ($SD = 0.85$) out of 5.



Factors Predicting Participation

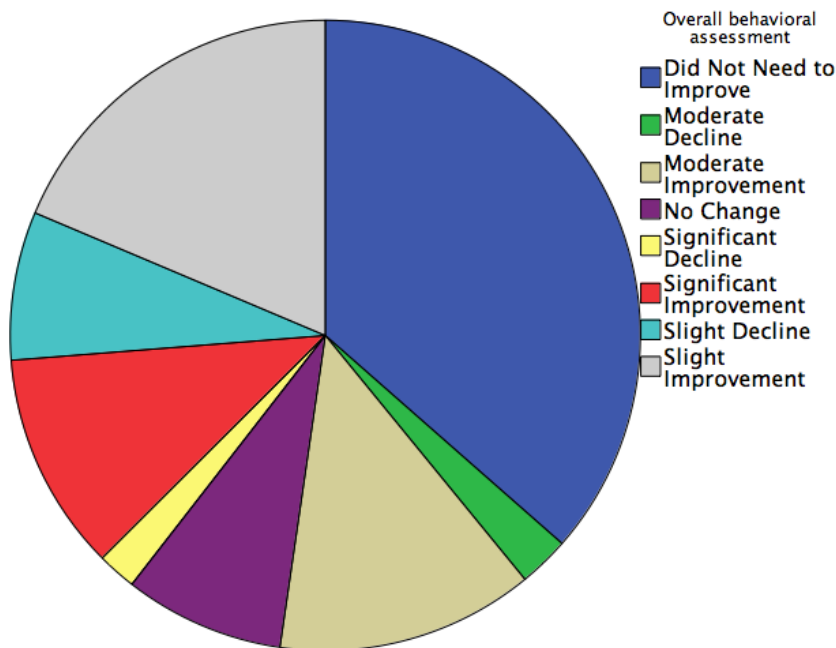
The two facets of participation – program attendance and engagement in program activities – were positively correlated with one another (i.e., students who were more engaged attended more), although the magnitude of the association was small, $r = .10$, $p < .05$. Subsequent analyses tested for factors that may predict students' levels of participation. Separate linear models were run in which program attendance and student engagement were regressed on the following predictor variables: Gender, grade level, first quarter academic grades, and whether or not teachers rated students as needing improvement at the start of the school year as part of their

overall behavioral assessment. Analyses also statistically controlled for program site. Detailed results tables are included in Appendix A.

None of the predictor variables tested was uniquely associated with students' program attendance. Staff ratings of students' engagement in program activities varied by site. Also, boys, older students, and students rated by teachers as needing improvement in behavior were all less engaged in program activities.

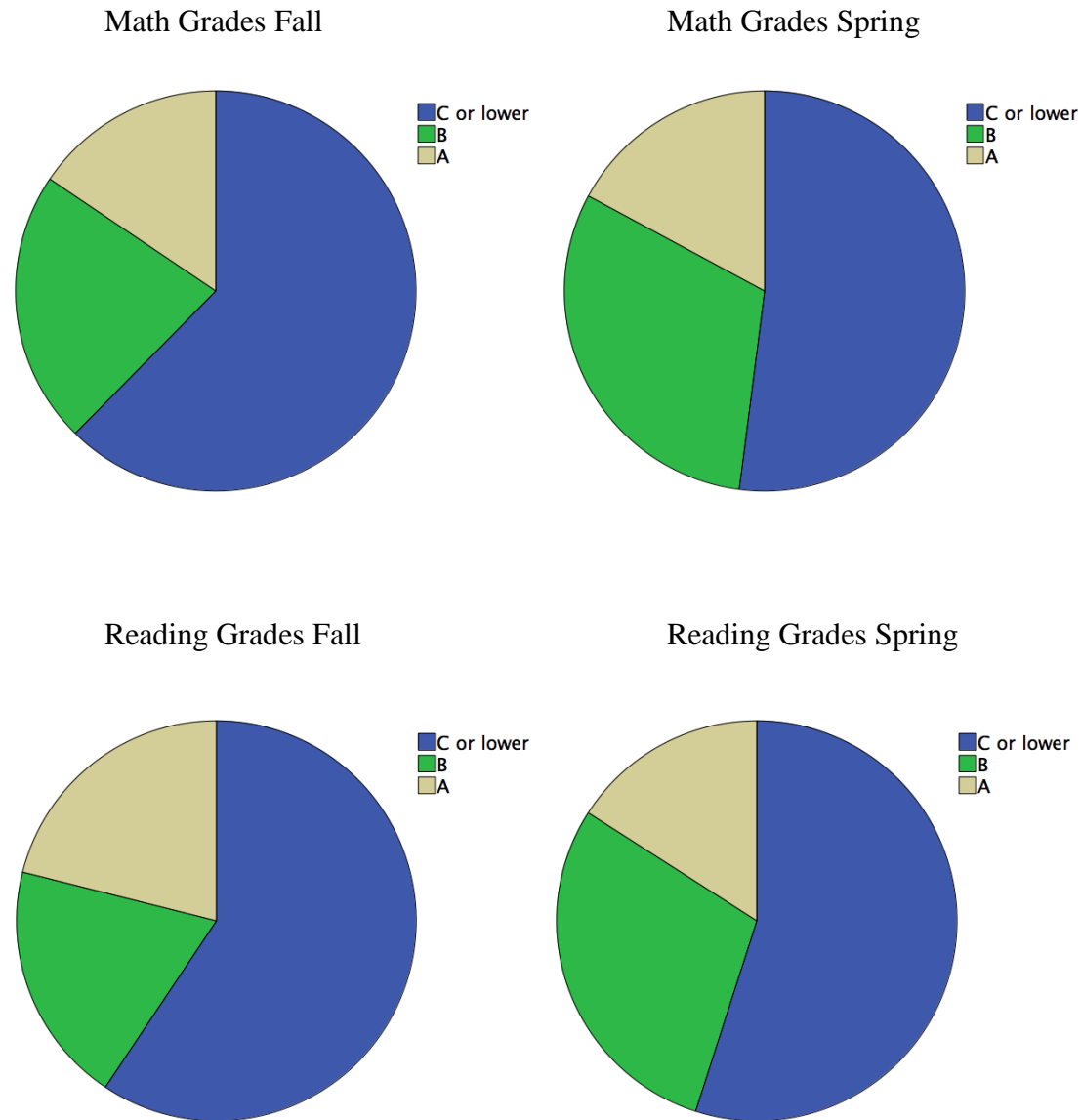
Teacher Ratings of Improvement in School Behavior

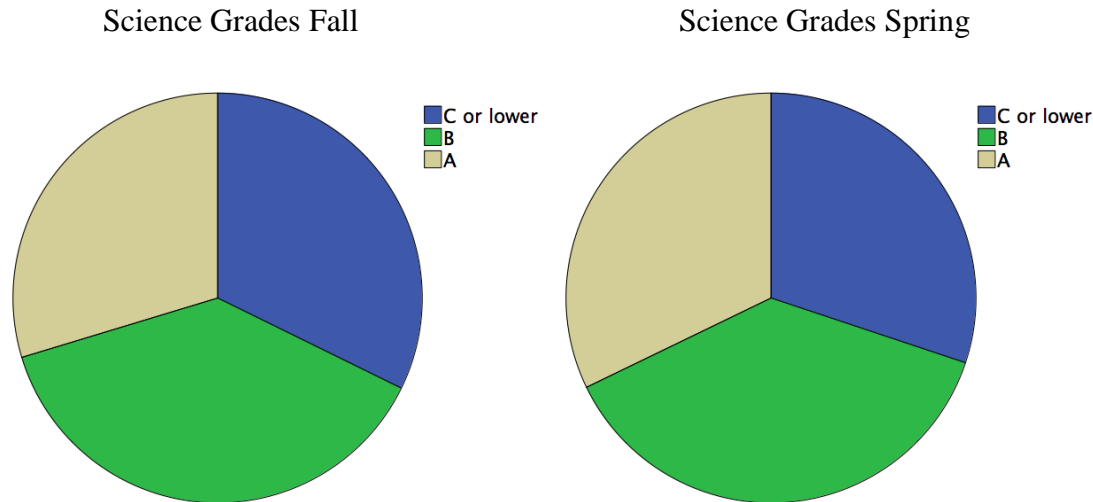
Teacher ratings of changes in student behavior on the DESE Teacher Survey were provided for approximately 499 students who attended the 21CCLC program at least 30 days. For the DESE survey, teachers report on changes over the school year in 10 dimensions of student behavior – academic performance, class attendance, class attentiveness, behaving well in class, gets along with other students, arrives motivated to learn, turns in homework on time, completes homework satisfactorily, participation in class, and volunteering for additional activity – as well as an overall assessment of student behavior. Teachers indicate whether functioning was acceptable at the start of the school year so that the student *did not need to improve*; if level of functioning at the start of the school year was not at an acceptable level, teachers rate change over the school across the following response categories: *significant decline, moderate decline, slight decline, no change, slight improvement, moderate improvement, significant improvement*. The figure below shows the teacher ratings for their overall assessment of student behavior. In terms of overall behavior, 37.3% of students were rated as *did not need to improve*, and 42.4% were rated as having either slight, moderate or significant improvement.



Students' Academic Performance in Math, Reading and Science

Academic grades in math, reading, and science were taken from the first and third quarter marking periods. Because different sites used different grading metrics, they were converted into a standardized three-point ordinal scale in which 3 = A, or E; 2 = B, S or M; 1 = C or lower, W, or U. Data on academic grades were provided students for enrolled in LINC in seven of the Cohort 8 sites. Math grades from both marking periods were available for 263 students; reading grades from both marking periods were available for 316 students, and science grades from both marking periods were available for 238 students. Results of the Wilcoxon signed ranks test indicated that math grades increased from fall to spring, $z = 1.97, p < .05$, whereas reading and science grades stayed roughly the same over the school year, $z = 0.30, p = .76$, and $z = 0.48, p = .64$, respectively. Pie charts in the Figure below show the distribution of Math, Reading grades and from the two marking periods (fall and spring).





Effects of Program Participation on School Behavior and Academic Achievement

A primary goal of the evaluation is to assess the impact of participation in LINC’s 21C before-and-after school program on students’ academic achievement and social competence in school. We used the Harvard Family Project’s three-part model of program participation to inform this part of the evaluation. In this model, participation consists of program enrollment, program attendance, and engagement in program activities. In order for after-school programs to benefit student achievement, students should not just be enrolled but attend regularly and also be engaged in program activities. In addition to being linked directly to student outcomes, engagement in after-school programs may also enhance the effects of program attendance on outcomes. Thus, engagement in after-school activities may operate interactively with attendance to promote students’ school success.

Academic Grades. To examine the effects of daily program attendance and staff-ratings of students’ engagement in program activities on academic achievement, a series of ordinal regression models were conducted in which math, reading and science grades from the 3rd marking period were regressed on the additive and interactive effects of engagement and attendance, controlling for site, gender, grade-level, and grades from the first marking period. Analyses also statistically controlled for program site. Analyses were conducted on a sample of between 284 and 349 students from five of the eight sites who had available data from staff engagement ratings, school records, and program records

Detailed results tables are presented in Appendix B. There were no effects of program attendance, on change in math, reading or science grades over the school year. Effects were detected for engagement. Students who were more engaged in program activities performed better in reading and science over the school year.

Teachers' Overall Assessment of Student Behavior. To examine the effects of daily program attendance and staff-ratings of students' engagement in program activities on teachers' ratings of improvement over the school year, an improvement rating variable was constructed based on the 11 teacher ratings (10 domains plus overall behavioral assessment). For each item, students who were not rated as *did not need to improve* were assigned a score of 1 (*significant decline*) to 7 (*significant improvement*), and their scores were averaged across the 11 items. Thus, scores on the composite improvement rating reflect the average improvement across all domains that a given student was deemed as not functioning at an acceptable level at the start of the school year. Students who received ratings of *did not need to improve* across all 11 domains were excluded from the analyses. Analyses are based on the subsample of 270 students who were assessed by their teachers as needing to improve in at least one domain at the start of the school year.

Detailed results tables are presented in Appendix C. The composite improvement rating was regressed on the additive and interactive effects of engagement and attendance, controlling for site, gender, grade-level, and grades from the first marking period. Analyses also statistically controlled for program site. No main or interactive effects of program attendance or engagement in program activities on teacher ratings of improvement were detected.

Summary and Conclusions

Overall, the sample of students enrolled in the LINC program improved their academic performance in math (but not reading or science) over the school year.

Overall, students attended the LINC program regularly and were rated as being highly engaged in program activities. Students in the lower grades were rated as being more highly engaged.

Tests whether greater participation in the LINC program – in terms of frequency of attendance and engagement in activities – was associated with school performance did not detect any effects of program attendance on academic grades or teachers' ratings of improvement over the school year. Students who were more highly engaged in LINC activities performed better in reading and science over the course of the school year.

Several notable weaknesses limit the conclusions from the evaluation. First, a relatively small proportion of students enrolled in the LINC program had complete data from all sources – program records, school records, staff ratings, and teacher ratings. Thus, it is not clear how generalizable findings are to the larger population of students enrolled in LINC 21C programs. Second, due to the scope of the evaluation and the age range of the students in the program, assessment of students' engagement in after-school activities relied exclusively on staff report. More comprehensive evaluations of engagement would rely on student report and possibly observational ratings. Additionally, given the lack of an experimental design, the direction of effects linking student participation with school outcomes cannot be isolated, limiting causal inferences based on the results.

Appendices

Appendix A.....Predictors of Program Participation

Appendix B.....Program Participation Effects on Grades

Appendix C.....Program Participation Effects on Teacher Ratings

A1. Linear Model Predicting Program Attendance

Sample Descriptives

		Value Label	N
Math, Q1	1	C or lower	142
	2	B	74
	3	A	50
Reading, Q1	1	C or lower	132
	2	B	63
	3	A	71
Science, Q1	1	C or lower	79
	2	B	79
	3	A	108
Needs improvement	.00		100
	1.00		166
Site	African Centered Elementary Academy		63
	Belvidere Elementary		41
	George Melcher Elementary		47
	Johnson Elementary		25
	Santa Fe - Hickman		61
	Satchel Paige		26
	Smith-Hale College Prep		3

A1, continued

Tests of Between-Subjects Effects

Dependent Variable: Program attendance

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	Hypothesis	427742.434	1	427742.434	393.563	.000	.746
	Error	145957.976	134.295	1086.846			
Site	Hypothesis	11657.414	6	1942.902	1.946	.074	.045
	Error	249591.371	250	998.365			
Math, Q1	Hypothesis	1475.822	2	737.911	.739	.479	.006
	Error	249591.371	250	998.365			
Reading, Q1	Hypothesis	371.775	2	185.887	.186	.830	.001
	Error	249591.371	250	998.365			
Science, Q1	Hypothesis	223.282	2	111.641	.112	.894	.001
	Error	249591.371	250	998.365			
Female	Hypothesis	2.440	1	2.440	.002	.961	.000
	Error	249591.371	250	998.365			
Grade level	Hypothesis	640.157	1	640.157	.641	.424	.003
	Error	249591.371	250	998.365			
Needs improvement	Hypothesis	190.396	1	190.396	.191	.663	.001
	Error	249591.371	250	998.365			

A1, continued

Parameter Estimates

Dependent Variable: Program attendance

Parameter	B	Std.	t	Sig.	95% Confidence Interval		Partial Eta Squared
		Error			Lower Bound	Upper Bound	
[Site=African Centered Elementary Academy]	23.326	20.523	1.137	.257	-17.094	63.746	.005
[Site=Belvidere Elementary]	16.370	20.515	.798	.426	-24.035	56.774	.003
[Site=George Melcher Elementary]	5.033	20.771	.242	.809	-35.875	45.941	.000
[Site=Johnson Elementary]	15.011	21.119	.711	.478	-26.582	56.604	.002
[Site=Santa Fe - Hickman]	24.358	21.001	1.160	.247	-17.004	65.719	.005
[Site=Satchel Paige]	20.901	21.330	.980	.328	-21.108	62.910	.004
[Site=Smith-Hale]	0 ^a	.	.	.	.	.	.
[Math, Q1=1]	2.477	7.176	.345	.730	-11.657	16.610	.000
[Math, Q1=2]	-4.251	6.340	-.671	.503	-16.739	8.236	.002
[Math, Q1=3]	0 ^a	.	.	.	.	.	.
[Reading, Q1=1]	-4.215	6.911	-.610	.542	-17.825	9.396	.001
[Reading, Q1=2]	-2.347	6.176	-.380	.704	-14.510	9.816	.001
[Reading, Q1=3]	0 ^a	.	.	.	.	.	.
[Science, Q1=1]	-2.737	5.796	-.472	.637	-14.153	8.679	.001
[Science, Q1=2]	-1.595	5.679	-.281	.779	-12.779	9.589	.000
[Science, Q1=3]	0 ^a	.	.	.	.	.	.
Female	-.199	4.029	-.049	.961	-8.133	7.735	.000
Grade Level	-1.116	1.393	-.801	.424	-3.860	1.628	.003
Needs improvement	1.890	4.327	.437	.663	-6.633	10.412	.001

a. This parameter is set to zero because it is redundant.

A2. Linear Model Predicting Engagement in Program Activities

Sample Descriptives

		Value Label	N
Math, Q1	1	C or lower	92
	2	B	52
	3	A	38
Reading, Q1	1	C or lower	74
	2	B	49
	3	A	59
Science, Q1	1	C or lower	45
	2	B	60
	3	A	77
Needs improvement	.00		64
	1.00		118
Site	African Centered Elementary Academy		61
	Belvidere Elementary		41
	Johnson Elementary		24
	Santa Fe - Hickman		53
	Smith-Hale College Prep		3

A2, continued

Tests of Between-Subjects Effects

Dependent Variable: Engagement in Activities

Source		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	Hypothesis	210.331	1	210.331	242.629	.000	.876
	Error	29.720	34.284	.867			
Site	Hypothesis	11.629	4	2.907	4.489	.002	.097
	Error	108.813	168	.648			
Math, Q1	Hypothesis	1.942	2	.971	1.499	.226	.018
	Error	108.813	168	.648			
Reading, Q1	Hypothesis	.466	2	.233	.359	.699	.004
	Error	108.813	168	.648			
Science, Q1	Hypothesis	.687	2	.343	.530	.590	.006
	Error	108.813	168	.648			
Female	Hypothesis	2.973	1	2.973	4.591	.034	.027
	Error	108.813	168	.648			
Grade level	Hypothesis	3.083	1	3.083	4.760	.031	.028
	Error	108.813	168	.648			
Needs improvement	Hypothesis	6.564	1	6.564	10.135	.002	.057
	Error	108.813	168	.648			

A2, continued

Parameter Estimates

Dependent Variable: Engagement in Activities

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
[Site=African Centered Elementary Academy]	1.122	.544	2.061	.041	.047	2.197	.025
[Site=Belvidere Elementary]	.846	.540	1.565	.119	-.221	1.913	.014
[Site=Johnson Elementary]	1.659	.562	2.952	.004	.550	2.768	.049
[Site=Santa Fe - Hickman]	1.004	.560	1.792	.075	-.102	2.110	.019
[Site=Smith-Hale College]	0 ^a	.	.	.	.	.	.
[Math, Q1=1]	-.359	.216	-1.659	.099	-.786	.068	.016
[Math, Q1=2]	-.119	.189	-.631	.529	-.491	.253	.002
[Math, Q1=3]	0 ^a	.	.	.	.	.	.
[Reading, Q1=1]	-.175	.206	-.847	.398	-.582	.232	.004
[Reading, Q1=2]	-.078	.175	-.443	.658	-.424	.269	.001
[Reading, Q1=3]	0 ^a	.	.	.	.	.	.
[Science, Q1=1]	.155	.190	.816	.416	-.220	.529	.004
[Science, Q1=2]	.172	.175	.983	.327	-.173	.516	.006
[Science, Q1=3]	0 ^a	.	.	.	.	.	.
[Math, Q1=1]	.265	.124	2.143	.034	.021	.509	.027
[Math, Q1=2]	-.093	.043	-2.182	.031	-.177	-.009	.028
Needs improvement	.421	.132	3.183	.002	.160	.683	.057

a. This parameter is set to zero because it is redundant.

B1. Ordinal Regression Predicting Math Grades

Sample Descriptives

		N	Marginal Percentage
Math, Q3	C or lower	150	52.8%
	B	84	29.6%
	A	50	17.6%
Site	African Centered Elementary Academy	63	22.2%
	Belvidere Elementary	55	19.4%
	Johnson Elementary	84	29.6%
	Santa Fe - Hickman	71	25.0%
	Smith-Hale College Prep	11	3.9%
	Math, Q1	C or lower	174	61.3%
	B	58	20.4%
	A	52	18.3%
Valid		284	100.0%

Parameter Estimates

	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[Site=African Centered Elementary Academy]	-2.273	.793	8.210	1	.004	-3.829	-.718
[Site=Belvidere Elementary]	-1.260	.792	2.527	1	.112	-2.812	.293
[Site=Johnson Elementary]	-3.139	.883	12.623	1	.000	-4.870	-1.407
[Site=Santa Fe - Hickman]	-2.032	.848	5.743	1	.017	-3.694	-.370
[Site=Smith-Hale]	0 ^a	.	.	0	.	.	.
Grade level	-.266	.093	8.212	1	.004	-.448	-.084
Female	.230	.269	.729	1	.393	-.298	.757
[Math, Q1=1]	-3.115	.466	44.717	1	.000	-4.028	-2.202
[Math, Q1=2]	-1.450	.416	12.141	1	.000	-2.265	-.634
[Math, Q3=3]	0 ^a	.	.	0	.	.	.
Engagement	.154	.195	.342	1	.431	-.229	.537
Attendance	.001	.004	.029	1	.864	-.007	.009
Engagement * Attendance	-.001	.005	.026	1	.871	-.010	.008

Link function: Logit.

a. This parameter is set to zero because it is redundant.

B2. Ordinal Regression Predicting Reading Grades

Sample Descriptives

		N	Marginal Percentage	
Reading, Q3	C or lower	183	52.4%	
	B	106	30.4%	
	A	60	17.2%	
Site	African Centered Elementary Academy	63	18.1%	
	Belvidere Elementary	75	21.5%	
	Johnson Elementary	96	27.5%	
	Santa Fe - Hickman	88	25.2%	
	Smith-Hale College Prep	27	7.7%	
	Reading, Q1	C or lower	204	58.5%
	B	65	18.6%	
A	80	22.9%		
Valid		349	100.0%	

Parameter Estimates

	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[Site=African Centered Elementary Academy]	-2.279	.584	15.239	1	.000	-3.423	-1.135
[Site=Belvidere Elementary]	-1.537	.570	7.267	1	.007	-2.654	-.419
[Site=Johnson Elementary]	-3.138	.647	23.519	1	.000	-4.406	-1.870
[Site=Santa Fe - Hickman]	-2.755	.616	20.029	1	.000	-3.962	-1.549
[Site=Smith-Hale]	0 ^a	.	.	0	.	.	.
Grade level	-.171	.084	4.151	1	.042	-.336	-.007
Female	.353	.242	2.129	1	.145	-.121	.828
[Reading, Q1=1]	-2.307	.336	47.116	1	.000	-2.966	-1.648
[Reading, Q1=2]	-.712	.339	4.407	1	.036	-1.376	-.047
[Reading, Q1=3]	0 ^a	.	.	0	.	.	.
Engagement	.480	.179	7.213	1	.007	.130	.830
Attendance	.000	.004	.005	1	.946	-.007	.007
Engagement * Attendance	.002	.004	.145	1	.704	-.006	.009

Link function: Logit.

a. This parameter is set to zero because it is redundant.

B3. Ordinal Regression Predicting Science Grades

Sample Descriptives

		N	Marginal Percentage	
Science, Q3	C or lower	89	28.9%	
	B	128	41.6%	
	A	91	29.5%	
Site	African Centered Elementary Academy	58	18.8%	
	Belvidere Elementary	61	19.8%	
	Johnson Elementary	90	29.2%	
	Santa Fe - Hickman	86	27.9%	
	Smith-Hale College Prep	13	4.2%	
	Science, Q1	C or lower	92	29.9%
		B	129	41.9%
A		87	28.2%	
Valid		308	100.0%	

Parameter Estimates

	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[Site=African Centered Elementary Academy]	-2.593	.743	12.181	1	.000	-4.050	-1.137
[Site=Belvidere Elementary]	-2.756	.735	14.072	1	.000	-4.196	-1.316
[Site=Johnson Elementary]	-4.320	.781	30.579	1	.000	-5.851	-2.789
[Site=Santa Fe - Hickman]	-3.424	.740	21.406	1	.000	-4.874	-1.973
[Site=Smith-Hale]	0 ^a	.	.	0	.	.	.
Grade level	-.434	.085	26.084	1	.000	-.600	-.267
Female	.196	.240	.666	1	.414	-.275	.667
[Science, Q1=1]	-1.944	.364	28.526	1	.000	-2.657	-1.231
[Science, Q1=2]	-.737	.344	4.580	1	.032	-1.411	-.062
[Science, Q1=3]	0 ^a	.	.	0	.	.	.
Engagement	.536	.166	10.387	1	.001	.210	.863
Attendance	.004	.004	1.374	1	.241	-.003	.011
Engagement * Attendance	.005	.004	1.481	1	.224	-.003	.012

Link function: Logit.

a. This parameter is set to zero because it is redundant.

C. Linear Model Predicting Composite Teachers' Improvement Ratings
Between-Subjects Factors

		Value Label	N
Math, Q1	1	C or lower	86
	2	B	39
	3	A	24
Reading, Q1	1	C or lower	69
	2	B	37
	3	A	43
Science, Q1	1	C or lower	44
	2	B	49
	3	A	56
Site	African Centered Elementary Academy		50
	Belvidere Elementary		32
	Johnson Elementary		22
	Santa Fe - Hickman		44
	Smith-Hale College Prep		1

C, continued

Tests of Between-Subjects Effects

Dependent Variable: Average improvement rating

Source		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	Hypothesis	128.767	1	128.767	73.766	.000	.626
	Error	76.797	43.994	1.746			
Site	Hypothesis	29.355	4	7.339	5.413	.000	.140
	Error	180.307	133	1.356			
Female	Hypothesis	.046	1	.046	.034	.853	.000
	Error	180.307	133	1.356			
Grade level	Hypothesis	.426	1	.426	.314	.576	.002
	Error	180.307	133	1.356			
Math, Q1	Hypothesis	3.532	2	1.766	1.303	.275	.019
	Error	180.307	133	1.356			
Reading, Q1	Hypothesis	1.903	2	.952	.702	.497	.010
	Error	180.307	133	1.356			
Science, Q1	Hypothesis	7.015	2	3.508	2.587	.079	.037
	Error	180.307	133	1.356			
Engagement	Hypothesis	.407	1	.407	.300	.585	.002
	Error	180.307	133	1.356			
Program attendance	Hypothesis	.548	1	.548	.405	.526	.003
	Error	180.307	133	1.356			
Engagement * Attendance	Hypothesis	4.263	1	4.263	3.145	.078	.023
	Error	180.307	133	1.356			

C, continued

Parameter Estimates

Dependent Variable: Average improvement rating

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
[Site=African Centered Elementary Academy]	2.366	1.473	1.606	.111	-.547	5.279	.019
[Site=Belvidere Elementary]	1.344	1.483	.906	.366	-1.589	4.277	.006
[Site=Johnson Elementary]	1.388	1.503	.924	.357	-1.584	4.360	.006
[Site=Santa Fe - Hickman]	1.309	1.481	.884	.379	-1.621	4.239	.006
[Site=Smith- Hale]	0 ^a	.	.	.	.	.	.
Female	-.038	.203	-.185	.853	-.440	.365	.000
Grade	-.041	.073	-.560	.576	-.186	.104	.002
[Math, Q1=1]	.557	.383	1.453	.148	-.201	1.314	.016
[Math, Q1=2]	.491	.334	1.473	.143	-.169	1.152	.016
[Math, Q1=3]	0 ^a	.	.	.	.	.	.
[Reading, Q1=1]	-.401	.350	-1.147	.253	-1.094	.291	.010
[Reading, Q1=2]	-.114	.295	-.388	.699	-.698	.469	.001
[Reading, Q1=3]	0 ^a	.	.	.	.	.	.
[Science, Q1=1]	-.557	.307	-1.816	.072	-1.163	.050	.024
[Science, Q1=2]	-.021	.295	-.071	.943	-.605	.563	.000
[Science, Q1=3]	0 ^a	.	.	.	.	.	.
Engagement	.123	.150	.825	.411	-.172	.419	.005
Program	.002	.003	.636	.526	-.005	.009	.003
attendance							
Engagement *	.007	.004	1.773	.078	-.001	.015	.023
Attendance							

a. This parameter is set to zero because it is redundant.