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Student and Classroom Predictors of Early Childhood Literacy: An Analysis of Year 1 CHOICE Program Data

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Executive Summary

The CHOICE program (Children Have Opportunities in Centers of Excellence) seeks to improve the literacy services for preschool-age children and increase student preparation for kindergarten literacy. Saint Paul Public Schools is implementing the CHOICE program in four preschool sites, two district sites and two local Head Start preschool sites. As part of the evaluation component of the CHOICE program, repeated measures of student academic performance, family support for children's literacy, and classroom support of literacy were taken from those sites in spring and summer 2004 – prior to full implementation of the program at each of the sites.

A series of multiple regression models were constructed to explain changes in student performance in TROLL and TERA scores collected during spring 2004. The sample was limited to 293 students ages four and older enrolled in three CHOICE sites: Battle Creek, Highwood Hills, and John A. Johnson. Each model looked at the independent impact of the following on post-test scores: initial test scores, gender, free or reduced price lunch status, special education status, attendance, Hmong as a first language, Spanish as a first language, and classroom / teacher support for literacy. After controlling for the initial test score, the other factors explain the difference between pre and post-test scores or change in the scores. The models were repeated using three different measures of classroom and teacher support for literacy from the ELLCO.

The multiple regression models revealed strong continuity between pre and post-test scores. Not surprisingly where a student began on the TROLL or TERA strongly predicted how they would do on the post-test. Once that was taken into account, four factors predicted change in the TROLL or TERA:

- classroom / teacher support for literacy (as measured by the ELLCO) had the strongest positive impact on gains in the TROLL or TERA.
- Hmong language status had a negative impact on changes in the TROLL or TERA.
- Spanish language status had a negative impact on changes in the TROLL or TERA.
- special education status had a negative impact on changes in the TROLL or TERA..

A negative impact means that factors was inversely related to change in the TROLL or TERA. In other words, as a factor increased or was present, gains in the TROLL or TERA were lower. For example, a student with special education status did not make gains as strong as a student without special education status. In contrast to the above

effects, gender, free or reduced lunch price eligibility, and attendance did not have a statistically significant impact on the TROLL or TERA.

A secondary analysis was conducted to explore whether any of the student characteristics interacted with classroom / teacher support for literacy to affect student performance on the TROLL or TERA. Only one pattern was consistently strong enough to suggest an interaction effect. Classroom / teacher support for literacy appeared to have a stronger impact on the TERA for students eligible for free or reduced price lunches than students who were not eligible.

The results highlight the importance of classroom and teacher practices on pre-school student literacy. Although their role appears to be slightly more consequential than many student demographic factors, other factors like first language still exert an independent influence on gains made in student literacy.

Introduction

The CHOICE program (Children Have Opportunities in Centers of Excellence) seeks to improve the literacy services for preschool-age children and increase student preparation for kindergarten literacy. Saint Paul Public Schools is implementing the CHOICE program in four preschool sites, two district sites and two local Head Start preschool sites. As part of the evaluation component of the CHOICE program, repeated measures of student academic performance, family support for children's literacy, and classroom support of literacy were taken from those sites in spring and summer 2004 – prior to full implementation of the program at each of the sites.

A recent CAREI report (October 22, 2004) described these measures and reported on any between-school and over-time differences in these measures. The present analyses adds to that earlier report by building statistical models to reveal the strongest contributors to growth in early childhood literacy. Two tasks are undertaken here. First, the independent impact of individual student characteristics and classroom and teacher support of literacy on early childhood literacy acquisition are modeled with CHOICE data. Second, additional interactions between student and classroom factors are explored through extensions of those models.

Sample

The sample was limited to 293 students ages four and five enrolled in one of three CHOICE sites during Spring 2004. This was a smaller sample than the 322 students used in the previous CAREI report on the CHOICE program (October 22, 2004). The reduction in the sample is due to removing East YMCA students from the present analysis. East YMCA students were omitted for three reasons. First, this was the smallest school sample of the four schools and thus presented concerns whether it would even be representative of that site. Second, missing student data was a problem at this site. Although the remaining sites differ in number of students at each, their demographic profiles are similar. (See Table 1 below.) This will help alleviate concerns that statistical effects of specific demographic characteristics are actually effects for a specific school

Table 1. Characteristics of Sample

School	N	% English Language Learners	% Special Education	% Free or Reduced Price Lunch Eligible	% Boys
Battle Creek	180	48	14	30	50
Highwood Hills	39	46	49	64	62
John A. Johnson	74	51	20	70	50

Statistical Models of Change in Student Performance

Method

The following analyses examine the statistical predictors of change in student literacy performance as measured on the TROLL and the TERA. The basic technique used to model what factors predict gains or losses in student performance is called multiple regression. This technique seeks to predict changes in a dependent variable (student literacy performance in the present case) from the levels of several independent variables (e.g. gender, attendance, special education status). Multiple regression examines the contribution of each independent variable to the dependent variable controlling for the effects of other independent variables. For example, it can be used to assess how students who have Spanish as their first language differ in gains made on the TROLL from students who have English as their first language, controlling for differences caused by other factors like free or reduced price lunch status. The product of multiple regression is a statistical model which explicates the relationship (or lack of one) between each independent variable and the dependent variable in the analysis.

The key concept to be modeled or explained in the present analyses is student literacy performance. This is measured in five ways:

(1) TROLL Total Score (raw score)
(2) TERA Alphabet Sub-Scale Score (standard score)
(3) TERA Conventions Sub-Scale Score (standard score)
(4) TERA Meaning Sub-Scale Score (standard score)
(5) Sum of TERA Sub-Scale Scores (raw score)

Although data from the work sampling system was collected during this period, it is not used here as an outcome measure. Only one dimension of this data addressed literacy and there was considerable difficulty with missing data during one period of collection.

The following analysis posits that there are eight independent variables that contribute to changes in student performance. The independent variables and how they are measured are:

(1) Initial measure or pre-test of student performance
(2) Gender (0=male, 1=female)
(3) Special Education Status (0=not enrolled, 1=enrolled)
(4) Free or Reduced Priced Lunch Eligibility (0=not eligible, 1=eligible)
(5) Attendance (percentage of total number of days possible)
(6) First Language Hmong (0=no, 1=yes)
(7) First Language Spanish (0=no, 1=yes)
(8) Classroom Support for Literacy (as measured by ELLCO)

Three measures of classroom and teacher support for literacy from the ELLCO are used here. They include a literacy environment checklist, a classroom observation and teacher interview score, and a literacy activities rating scale. Each analysis is repeated using a different ELLCO measure. Since each one was measured twice in spring 2004, both measures are averaged together for use here. In other words, the pre and post-measures of the literacy environment checklist are added together and divided by two for an average literacy environment checklist score.

There are several ways to use multiple regression to model change in the dependent variable. The method chosen here uses a pre-test score as an independent predictor of the post-test score or dependent variable. After controlling for the effects of the pre-test score, what the other independent variables explain is the difference or change between the pre-test and post-test scores. This method helps take into account student performance differences that exist before the performance tests were taken.

Results

Table 2 shows the results of the multiple regression models predicting student performance. The results are divided into three main blocks – each using a different ELLCO measure as an independent variable. The blocks are further divided into five columns – each using a different measure of student performance. The numbers listed below are standardized regression coefficients. They transform each measure used in the analysis into a "standard" unit of analysis having a mean of 0 and standard deviation of 1. This allows us to compare the effects of independent variables with different scales. In the table below, the statistically significant coefficients ($p < .05$) are in bold. Statistical significance means that it is unlikely that these results are due to chance.

The interpretation of a standardized regression coefficient is that each increase of one standard deviation in the independent variable, say a student's initial test score on the TROLL, leads to an increase of one standard deviation in the dependent variable, say a student's post-test score on the TROLL, multiplied by the regression coefficient. The first cell in the first column of Table 2 shows a standardized regression coefficient of .744. This means that each increase of one standard deviation in the initial test score leads to a .744 increase of the standard deviation in the post-test score. In other words, the impact of the initial TROLL test score on the TROLL post-test score is .744. Standardized regression coefficients are intuitively useful because they can only range between -1 (a perfect negative relationship) and 1 (a perfect positive relationship). A coefficient close to 0 would indicate the absence of any relationship between the independent and dependent variable. In this example, the initial TROLL test score has a strong positive relationship with the TROLL post-test score. The higher a student's score on the initial test, the higher there score is likely to be on the post-test.

In predicting how a student will do on the post-test, the most important predictor appears to be how they did on pre-test. This is true no matter what the measure of student performance or the particular ELLCO measure employed as an independent predictor.

After controlling for the pre-test measure, the effect of the other independent variables is considered their impact on change in student performance. These results are also similar across measures of student performance and ELLCO measures:

- Each ELLCO measure is a statistically significant predictor of change in student performance. Each has a positive coefficient – the higher the ELLCO score, the more students tend to gain in the student performance measure.

- English language learner status, as measured by either having Hmong or Spanish as a first language, operates in the opposite way. If a student has either language as their first language, they will show smaller gains on the measure of student performance than students who have English as their first language.

- The same statistically significant relationship is found for special education status. Students who have special education status make smaller gains on the measure of student performance than students who do not have special education status.

There are no obvious differences in the effects of each independent predictor depending on what measure of student performance is used (TROLL or TERA) or what ELLCO measure is used. For example, the ELLCO has roughly the same impact on student performance whether the ELLCO is measured as a literacy environment checklist or literacy activities rating scale and whether students' performance is measured by the TROLL or the TERA conventions sub-scale. Overall, language status, classroom support for literacy, and special education status are the independent variables that have an effect on changes in student performance. Classroom support for literacy appears to have a slightly greater impact than either language status or special education status.

Table 2. Standardized Regression Coefficients Predicting Student Test Performance

Independent Variables	Using Literacy Environment Checklist as ELLCO Measure					Using Classroom Observation & Teacher Interview as ELLCO Measure					Using Literacy Activity Rating Scale as ELLCO Measure				
	Measure of Student Performance					*Measure of Student Performance*					*Measure of Student Performance*				
	TROLL	TERA Alpha Sub-Scale	TERA Conv. Sub-Scale	TERA Mean. Sub-Scale	TERA Sum of Sub-Scales	TROLL	TERA Alpha Sub-Scale	TERA Conv. Sub-Scale	TERA Mean. Sub-Scale	TERA Sum of Sub-Scales	TROLL	TERA Alpha Sub-Scale	TERA Conv. Sub-Scale	TERA Mean. Sub-Scale	TERA Sum of Sub-Scales
Initial Test Score	**.744**	**.808**	**.475**	**.585**	**.777**	**.756**	**.808**	**.476**	**.582**	**.774**	**.746**	**.809**	**.472**	**.574**	**.773**
Female	.026	.044	.078	.031	.043	.025	.044	.081	.028	.043	.021	.034	.067	.015	.030
Enrolled in Special Education	**-.115**	**-.098**	**-.174**	**-.110**	**-.079**	**-.126**	**-.102**	**-.178**	**-.117**	**-.085**	**-.125**	**-.100**	**-.178**	**-.117**	**-.084**
Free / Reduced Price Lunch Eligible	.025	.056	-.037	-.063	.020	.027	.061	-.044	-.043	.028	.040	.066	-.030	-.050	.035
Attendance	.026	-.027	.031	**-.075**	-.030	.019	-.029	.027	**-.076**	-.032	.027	-.029	.028	**-.078**	-.032
First Language Hmong	**-.058**	-.001	**-.129**	**-.103**	-.020	**-.058**	-.006	**-.127**	**-.118**	-.028	**-.073**	-.013	**-.141**	**-.124**	-.037
First Language Spanish	-.008	**-.106**	**-.174**	**-.162**	**-.137**	-.004	**-.110**	**-.173**	**-.173**	**-.143**	-.015	**-.114**	**-.182**	**-.174**	**-.149**
ELLCO Measure	**.185**	**.132**	**.168**	**.210**	**.187**	**.172**	**.130**	**.202**	**.174**	**.182**	**.141**	**.121**	**.170**	**.198**	**.170**

Bold coefficients indicate a statistically significant impact on the dependent measure ($p < .05$).

Interactions Among Predictors of Student Performance

Method

The previous analysis examined the impact of each independent variable separately from the other independent variables. In other words, it examined how one independent variable affects the dependent variable, if everything else remains the same. This approach to modeling may oversimplify some relationships, however. Some contributors to student performance may have a greater or lesser impact depending on the levels of other independent variables. For example, a teacher that engages in practices that are supportive of literacy may have a stronger impact on students from a low-income background (free or reduced price lunch eligible) than on students who are not from a low-income background. In other words, the increases in ELLCO measures may have a disproportionate impact on the performance on some students. It is precisely this issue that was explored with the addition of interaction terms to the multiple regression models described above.

An interaction term is a mathematical combination of two or more independent variables. The interaction terms used here are limited to the multiplication of each student characteristic (gender, special education status, free or reduced price eligibility, attendance, Hmong as a first language, Spanish as a first language) by one of the three ELLCO measures. Each interaction term is added to each multiple regression model described above. No two interaction terms were considered in the same model for statistical reasons. For example, an interaction term between Hmong and the ELLCO is not considered with an interaction term between special education status and the ELLCO. The main reason for this was to assess the impact on the multiple regression model of each interaction term by itself – rather than the cumulative effect of multiple interaction terms which may not be as helpful in drawing conclusions about specific factors influencing student literacy.

Because interaction terms are tricky to interpret, it is helpful to look at how much adding a particular interaction term contributed to the overall ability of the model to explain or predict variance in student performance. This variance is simply how much students differ from each other on student performance. If there was no variance – every student would have the same average score. If students' scores were all determined by rolling dice for students, there would be lots of individual variance in test scores but nothing systematic that could explain why students differ since all scores would be random. The amount of variance in the dependent variable – or student performance in this case – that can be explained is measured by the adjusted R square. The R square is simply the proportion of variance in the dependent variable that can be explained by the independent variables. An adjusted R square of .722 means that approximately 72 percent of the variance in the dependent variable can be explained by the independent variables. In the

present case, perhaps the initial score predicts most of the variance on the post-score, while special education status predicts a little more, and English language learner status predicts a little more. In the analysis of interaction terms here, we essentially look to see how much predictive or explanatory power adding an interaction terms provides to explain variance in individual student performance. "Adjusted" R square is used to adjust for the fact that simply adding independent variables (whether they are statistically significant or not) tends to increase the R square measure.

Results

Table 3 presents the adjusted R square for each of the multiple regression models considered earlier and an indication of how adding each interaction term would increase the adjusted R square or predictive power of that model. Those terms that are in bold represent a statistically significant increase in the adjusted R square if that interaction term were added. The most striking aspect of the table is that the multiple regression models without interaction terms have relatively high adjusted R squares. This is primarily due to the inclusion of the pre-test score in each model – which is a powerful predictor of how students did on the post-test score. In contrast, the increases in adjusted R squares attributed to adding an interaction term are quite small and often statistically insignificant. Of those that are statistically significant, many increase the adjusted R square by less than .01 or contribute less than 1 percent of additional explanatory power. By way of comparison, if the ELLCO measure was removed from the earlier model predicting performance on the TROLL, adding it would raise the adjusted R square from .692 to .722 or contribute an additional three percent of explanatory power.

One pattern of interactions does appear consistently stronger. Although free or reduced price lunch status is not a statistically significant predictor of student performance in models without interaction terms, its interaction term with each ELLCO measure adds from .010 to .022 to the adjusted R square predicting student performance on each TERA measure. This indicates that classroom environment or teacher literacy practices have a greater impact on TERA test scores for students eligible for free or reduced price lunches than for students who are not eligible.

Table 3. Impact of Interaction Terms on Multiple Regression Models

		TROLL Total Raw Score (Time 2)	TERA Alphabet Standard Score (Time 2)	TERA Conven. Standard Score (Time 2)	TERA Meaning Standard Score (Time 2)	TERA Sum of Sub-Scale Scores (Time 2)
Using ELLCO Literacy Environment						
	Adjusted R Square Without Interaction Terms	.722	.693	.386	.509	.681
Impact on Adjusted R Square by Adding Each Interaction Term	Female * ELLCO	.000	(+) **.004**	(+) **.010**	.000	.002
	Special Education * ELLCO	.000	(-) **.004**	(-) **.010**	.002	.001
	Free / Reduced Lunch * ELLCO	(-) **.003**	(+) **.010**	(+) **.016**	(+) **.015**	(+).**022**
	Attendance * ELLCO	.001	.000	.000	.003	.000
	Hmong * ELLCO	(-) **.005**	(+) **.004**	.004	.003	(+) .005
	Spanish * ELLCO	.000	.000	.005	.003	(+) .004
ELLCO Observation						
	Adjusted R Square Without Interaction Terms	.718	.693	.398	.497	.680
Impact on Adjusted R Square by Adding Each Interaction Term	Female * ELLCO	.000	.002	.003	.000	.001
	Special Education * ELLCO	.000	.002	(-) **.007**	.002	.000
	Free or Reduced Lunch * ELLCO	(-) **.006**	.007	(+) **.018**	(+) **.015**	(+) **.019**
	Attendance * ELLCO	.000	.000	.001	.002	.001
	Hmong * ELLCO	(-) **.004**	.003	.002	.002	.002
	Spanish * ELLCO	.000	.000	.003	.001	.002
Using ELLCO Literacy Activities						
	Adjusted R Square Without Interaction Terms	.709	.692	.388	.506	.676
Impact on Adjusted R Square by Adding Each Interaction Term	Female * ELLCO	.000	.001	.002	.002	.000
	Special Education * ELLCO	(+) **.005**	.002	.002	.004	.000
	Free or Reduced Lunch * ELLCO	(-) **.004**	(+).**001**	(+) **.021**	(+) **.010**	(+) **.021**
	Attendance * ELLCO	.000	.000	.000	(+) **.008**	.000
	Hmong * ELLCO	(-) **.009**	.003	.002	.003	.003
	Spanish * ELLCO	.000	.001	(+) **.010**	.004	(+) **.006**

Numbers in bold represent statistically significant increases in the adjusted R square to the multiple regression model after adding the interaction term. Plus or minus signs indicate the direction of the interaction effect.

Discussion

The preceding analyses provide information about the most important contributors to pre-school student literacy levels as measured by the TERA and TROLL. While there is strong continuity between pre and post-test performance on the TERA and TROLL, several factors appeared to influence the magnitude of gains made over time. Classroom and teacher support for literacy measured in multiple ways using the ELLCO appeared to be positively related to student gains in performance. Those students who spoke Hmong or Spanish as a first language did not make as strong of gains as those with English as a first language. Those students with special education status did not make as strong of gains as those who were not in special education. Although, free and reduced price lunch eligibility (as a measure of socioeconomic background) did not have an independent impact on student performance on the TROLL or TERA, classroom and teacher support for literacy was more closely related to gains in student performance among eligible students than those not eligible for free or reduced price lunch.

These results confirm the centrality of the CHOICE program's focus on training teachers to support pre-school literacy in their classrooms. No other factor did quite so well in predicting gains in student literacy as what the teachers did in their classrooms. There is even evidence that students from low-income families may particularly benefit from teachers who engage in practices which support early childhood literacy. The results also point to an area that may not necessarily be strongly influenced by the CHOICE program – that of the literacy acquisition of non-native English speakers. Hmong and Spanish speakers tended not to gain as much literacy as English speakers during the period of data collection here.

This analysis has three main limitations. First, elapsed time between repeated data collections was short. It is possible that more nuanced effects could be seen (e.g. effects for gender) if the period between pre and post-test was longer, presumably allowing for greater learning to occur. Second, the measure of classroom and teacher support for literacy was static. The CHOICE program was not fully implemented at the time of data collection and as a result the relationship between changes in teacher practice and student performance could not be fully explored. Third, missing data eliminated some measures (e.g. work sampling system data) and sub-samples from the present analysis. The second year of program implementation will likely address each of these limitations and allow for a fuller exploration of the causes of pre-school literacy.

Appendix A: Unstandardized Multiple Regression Coefficients for Models Predicting Student Performance

Table A. 1. Multiple Regression Models of Changes in TROLL and TERA Scores By Student Characteristics and ELLCO Literacy Environment Average

	TROLL Total Raw Score (Time 2)	TERA Alphabet Standard Score (Time 2)	TERA Conven. Standard Score (Time 2)	TERA Meaning Standard Score (Time 2)	TERA Sum of Sub-Scale Scores (Time 2)
Constant	2.450 (2.752)	.428 (.697)	*** 2.940 (.762)	*** 4.144 (.648)	2.514 (1.649)
Initial Test Score (Time 1)	*** .803 (.031)	*** .827 (.031)	*** .509 (.051)	*** .477 (.034)	*** .790 (.034)
Female	.836 (.785)	.281 (.193)	.358 (.199)	.135 (.166)	.584 (.417)
Enrolled in Special Education	*** -4.138 (1.134)	** -.743 (.244)	*** -.938 (.256)	** -.569 (.215)	* -1.268 (.543)
Free or Reduced Price Lunch Eligible	.784 (.902)	.364 (.232)	-.171 (.235)	-.279 (.203)	.281 (.503)
Attendance (Proportion of Possible Days)	2.207 (2.200)	-.455 (.500)	.365 (.504)	* -.854 (.430)	-1.040 (1.076)
First Language Hmong	* -2.228 (1.101)	-.011 (.267)	* -.704 (.273)	* -.540 (.237)	-.324 (.589)
First Language Spanish	-.356 (1.213)	** -.861 (.285)	** -1.005 (.290)	*** -.894 (.245)	*** -2.352 (.616)
ELLCO Literacy Environment Average (5 – 41)	*** .399 (.056)	*** .059 (.014)	*** .054 (.015)	*** .065 (.012)	*** .178 (.031)
Adj. R Square	.722	.693	.386	.509	.681
Weighted N	485	354	354	354	354
Average Gain (P2 – P1)	3.940	.726	.838	.373	1.937

* p < .05, ** p < .01, *** p < .001

Table A. 2. Multiple Regression Models Predicting Changes in TROLL and TERA Scores By Student Characteristics and ELLCO Observation Average

	TROLL Total Raw Score (Time 2)	TERA Alphabet Standard Score (Time 2)	TERA Conven. Standard Score (Time 2)	TERA Meaning Standard Score (Time 2)	TERA Sum of Sub-Scale Scores (Time 2)
Constant	-.725 (3.061)	.015 (.763)	** 2.147 (.814)	*** 4.085 (.699)	1.437 (1.774)
Initial Test Score (Time 1)	*** .815 (.031)	*** .827 (.032)	*** .510 (.050)	*** .474 (.034)	*** .788 (.034)
Female	.793 (.790)	.283 (.193)	.375 (.197)	.123 (.168)	.590 (.418)
Enrolled in Special Education	*** -4.551 (1.136)	** -.772 (.244)	*** -.964 (.253)	** -.602 (.217)	* -1.367 (.544)
Free or Reduced Price Lunch Eligible	.870 (.909)	.395 (.230)	-.204 (.230)	-.191 (.203)	.384 (.498)
Attendance (Proportion of Possible Days)	1.622 (2.222)	-.482 (.500)	.321 (.499)	* -.865 (.436)	-1.110 (1.078)
First Language Hmong	* -2.227 (1.110)	-.047 (.265)	* -.696 (.269)	* -.618 (.239)	-.451 (.586)
First Language Spanish	-.170 (1.223)	** -.890 (.284)	** -.999 (.286)	*** -.956 (.247)	*** -2.453 (.615)
ELLCO Observation Average (1-5)	*** 4.501 (.670)	*** .673 (.164)	*** .745 (.163)	***.615 (.143)	*** 1.986 (.353)
Adj. R Square	.718	.693	.398	.497	.680
Weighted N	485	354	354	354	354
Average Gain (P2 – P1)	3.940	.726	.838	.373	1.937

* p < .05, ** p < .01, *** p < .001

Table A. 3. Multiple Regression Models Predicting Changes in TROLL and TERA Scores By Student Characteristics and ELLCO Literacy Activities Average

	TROLL Total Raw Score (Time 2)	TERA Alphabet Standard Score (Time 2)	TERA Conven. Standard Score (Time 2)	TERA Meaning Standard Score (Time 2)	TERA Sum of Sub-Scale Scores (Time 2)
Constant	2.400	.146	** 2.540	*** 3.891	1.869
	(3.028)	(.764)	(.814)	(.686)	(1.772)
Initial Test Score (Time 1)	*** .805	*** .828	*** .506	*** .468	*** .786
	(.031)	(.032)	(.051)	(.034)	(.034)
Female	.683	.220	.307	.068	.406
	(.803)	(.193)	(.198)	(.166)	(.418)
Enrolled in Special Education	*** -4.504	** -.760	*** -.961	** -.605	* -1.345
	(1.158)	(.245)	(.255)	(.215)	(.546)
Free or Reduced Price Lunch Eligible	1.286	.431	-.138	-.219	.483
	(.922)	(.229)	(.231)	(.200)	(.498)
Attendance (Proportion of Possible Days)	2.331	-.484	.333	* -.886	-1.111
	(2.252)	(.502)	(.504)	(.432)	(1.084)
First Language Hmong	* -2.836	-.096	** -.773	** -.648	-.605
	(1.120)	(.264)	(.269)	(.235)	(.585)
First Language Spanish	-.659	** -.920	*** -1.051	*** -.962	*** -2.548
	(1.240)	(.284)	(.288)	(.244)	(.616)
ELLCO Literacy Activities Average (2-13)	*** 1.201	*** .219	*** .219	*** .244	*** .648
	(.225)	(.057)	(.057)	(.049)	(.122)
Adj. R Square	.709	.692	.388	.506	.676
Weighted N	485	354	354	354	354
Average Gain (P2 – P1)	3.940	.726	.838	.373	1.937

* p < .05, ** p < .01, *** p < .001