

# Predicting the Effects of School Lunch Programs on Measures of Academic Success

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## Abstract

The Community Eligibility Provision (CEP) is a North Carolina program that brings free or reduced cost lunches to elementary, middle, and high schools across the state. This program helps families from economically disadvantaged circumstances. Using data from the 2017 to 2018 school year, this report uses a regression to understand the predicted effect that CEP has on measures of academic performance. There is evidence to suggest that CEP does improve certain performance measures, though it is predicted to have more of an impact on schools that have a student population that is over 50% white, schools at the elementary level, and schools that have between 70% to 75% Economically Disadvantaged Students.

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## Introduction

School lunches are an important part of the American education system. In North Carolina, these lunches are provided at free or reduced cost to students through a program called the Community Eligibility Provision (CEP). Schools may choose whether to opt into this program or not, and the decision is frequently made based on the percent of Economically Disadvantaged Students (EDS). Typically, if a school has less than 70% EDS, then it does not enroll in CEP. If a school has greater than 90% EDS, then it usually does enroll in CEP. However, for schools ranging between 70% and 90% EDS, the decision is less certain.

The purpose of this report is to investigate the effect of CEP on several measures of academic performance. Sponsored by the North Carolina Alliance for Health, this report will use data collected on North Carolina schools during the 2017-2018 school year. Notably, this project was designed to answer the question, “How would schools without CEP during the 2017-2018 school year have performed if they had been enrolled in CEP?” This will be accomplished through investigation of the data, use of a statistical technique called Linear Regression, and analysis of the predictions made from those mathematical models. By the end of this report, it will be shown that CEP is suggested to have a positive impact on measures of academic performance, as well as improving the performance measures of those schools that were not enrolled in CEP.

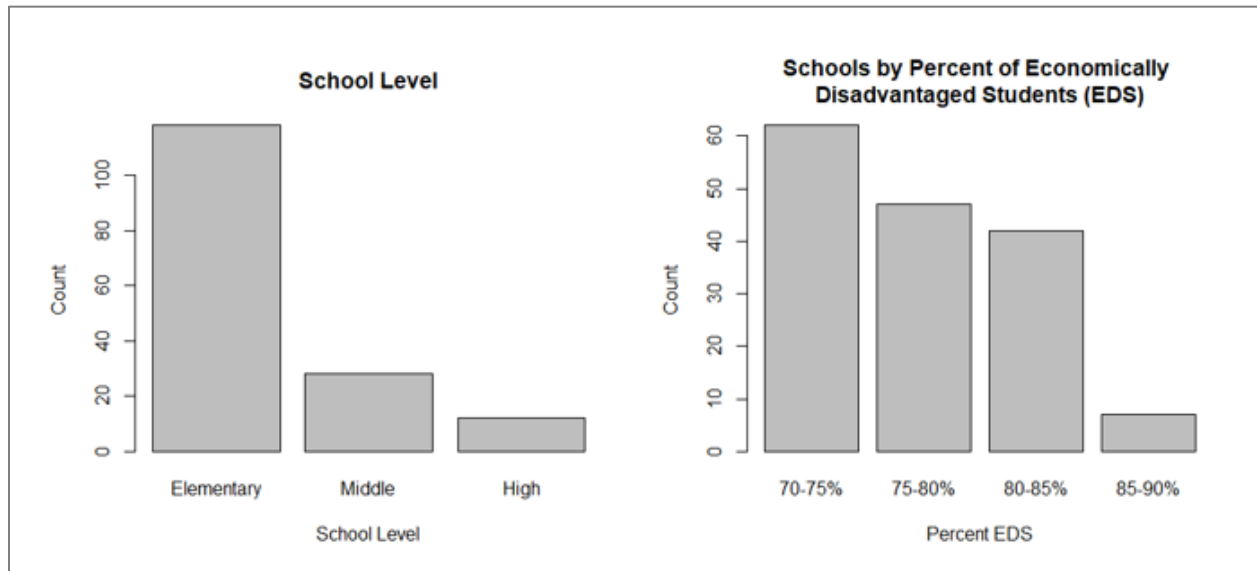
## Previous Work

Previous work on this subject was completed in November 2020 by Jack Prothero. Working with the NC Alliance for Health and using a similar dataset, this work was focused on whether a school’s CEP enrollment status could be predicted by other variables. It further addressed whether the CEP enrollment status had an impact on the academic performance of schools. The report concluded that schools with higher utilization of free lunches were more likely to be enrolled in CEP and that CEP enrollment status was related to the academic performance.

This report will expand upon the second goal; that is, it will investigate how CEP is related to 6 measures of academic performance and will give predictions for those measures.

## Data Overview

The dataset included information concerning 159 North Carolina schools. One school was removed from this set because of incomplete data. This school was White Oak Elementary School, which is a new school and thus did not have any data about its Academic Growth, one of the important performance measures for this report. So, the models were determined from the remaining 158 schools. It included 118 elementary schools, 28 middle schools, and 12 high schools. The schools can also be classified by their percentage of Economically Disadvantaged Students (EDS), with 62 schools being between 70% and 75% EDS, 47 schools between 75% and 80% EDS, 42 schools between 80% and 85% EDS, and 7 schools between 85% and 90%. These are visually demonstrated in the figure below.



*Figure 1. Schools by Level and by Percent of Economically Disadvantaged Students (EDS). There are many more Elementary schools than Middle or High schools. There are the fewest schools in the 85-90% EDS category.*

The data were collected to summarize the CEP enrollment status, performance measures, demographics, and other variables for the 2017-2018 school year. Collected at the individual school level, these variables will be stated and explored in the following section of this report.

The response variables measured several aspects of a school's performance. These variables, also referred to as performance measures, may be impacted by a school's CEP enrollment status. For the remainder of this report, the word "improvement" will designate when the association between CEP enrollment status and these measures are beneficial. However, the direction of the improvement may not be the same for each performance measure. For example, an improvement in the academic performance would mean that the academic performance went up while an improvement in suspension rate would mean that the suspension rate went down. The performance measures, a brief description of them, and their improvement directions are shown in the table below.

Performance Measure	Description	Improvement Direction
Academic Performance	A number between 0 and 100 indicating the school's performance.	Up
Suspension Rate	The rate of short-term suspensions per 1,000 students.	Down
Attendance	A number between 0 and 100 representing the attendance of the school.	Up
Grade	An indicator of the school's performance. The options are "A", "B", "C", "D", and "F".	Up
Academic Growth	A number between 0 and 100 indicating the school's growth.	Up
Growth Level	An indicator of the school's growth. Directly related to the Academic Growth. The options are "Not Met", "Met", or "Exceeded"	Up

*Table 1. Performance Measures, Descriptions, and Improvement Directions*

The predictor variables were the remaining variables in the dataset. These variables were considered by the client to be informative for predicting the performance measures. They are listed and described in the table below. Notably absent from this list is the percent of EDS. While this is an important dimension for the results of the analysis, at the request of the client, it was not included as a predictor for the model.

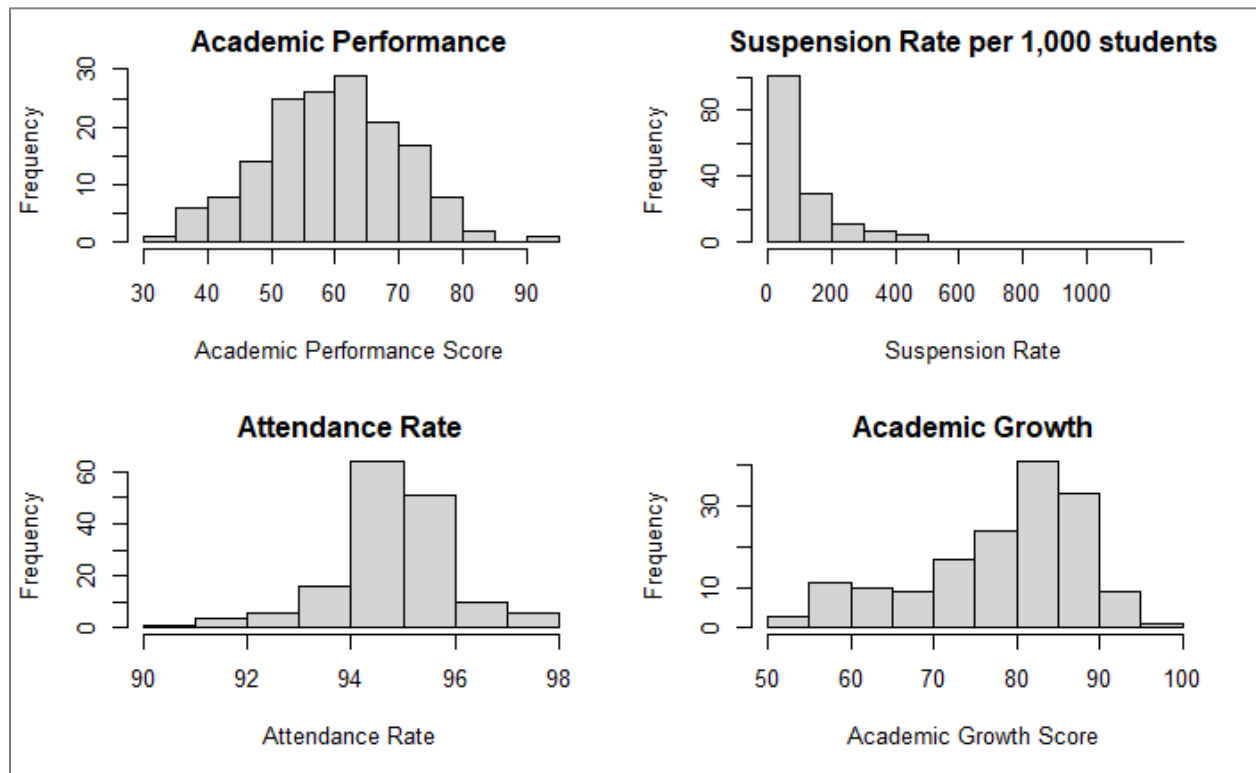
Predictor variable	Description
School Level	An indicator of the school's level. The options are "Elementary", "Middle", and "High".
Proportion of White Students	A number between 0 and 1 representing the proportion of students at a school who identify as white.
Proportion of Black Students	A number between 0 and 1 representing the proportion of students at a school who identify as black.
Proportion of Hispanic Students	A number between 0 and 1 representing the proportion of students at a school who identify as Hispanic.
Proportion of Other Students	A number between 0 and 1 representing the proportion of students at a school who identify as neither white, black, nor Hispanic.
Average Daily Attendance	A number that counts the average daily attendance of the school. Reflective of the school's enrollment size.
CEP Enrollment Status	An indicator the school's CEP enrollment status. The options are "CEP" and "NON", where "NON" indicates that the school is not enrolled in CEP.

*Table 2. Predictor Variables and Descriptions*

This dataset was suitable for analysis because it contained a relatively large number of schools. More importantly, each school contained information on all of the variables described above. This is important for statistical analysis because it allows for effective comparison, analysis, and predictions on the data.

## Response Variable Overview

There are six response variables of interest for this report, listed and described in Table 1. Histograms and barplots of these variables were made to learn about how the data is distributed. A histogram is used to visualize numeric data while a barplot is used for categorical data. If a variable is numeric, its histogram would ideally be in the form of a bell-shaped curve. Bell-shaped curves are symmetric, being tall in the center and shorter towards the outside. This shape is best for statistical models. If a variable is distributed in a shape other than a bell-shaped curve, it is standard statistical practice to transform the data with a mathematical function so that it becomes bell-shaped. The barplots for categorical variables do not have an ideal shape, but it is important to observe their shape and look for outliers. The histograms and barplots for each variable are shown below.



*Figure 2. Histograms of Numeric Response Variables. The histograms for Academic Performance, Attendance Rate, and Academic Growth all appear roughly bell-shaped. The Suspension Rate histogram is quite far from being bell-shaped. It will need to be transformed.*

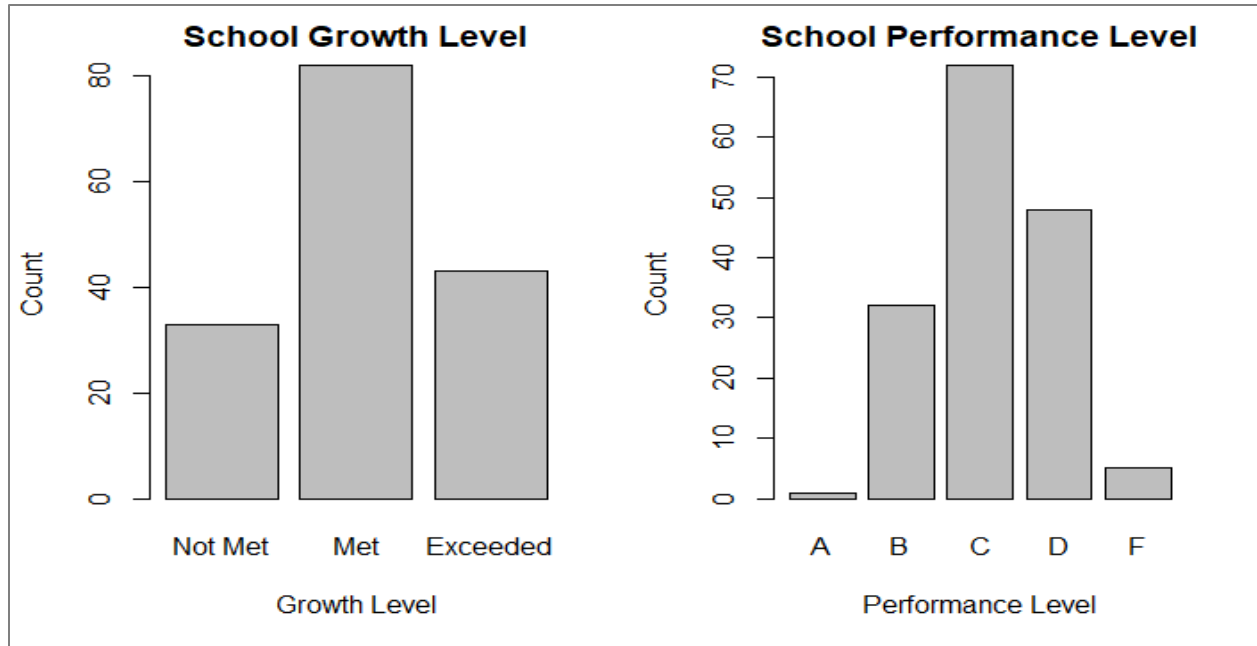


Figure 3. Barplots of Categorical Response Variables. There are no apparent outliers.

As seen in Figure 1, three of the four numeric response variables are bell-shaped and do not need to be transformed. The Suspension Rate, however, does need to be transformed. Per standard statistical practice, a logarithm function of base 10 was used to transform this variable. After applying this function to the variable and making its histogram, it is now seen to be bell-shaped. This is shown in the following figure. This Logged Suspension Rate, as it will be called, was used in the models.

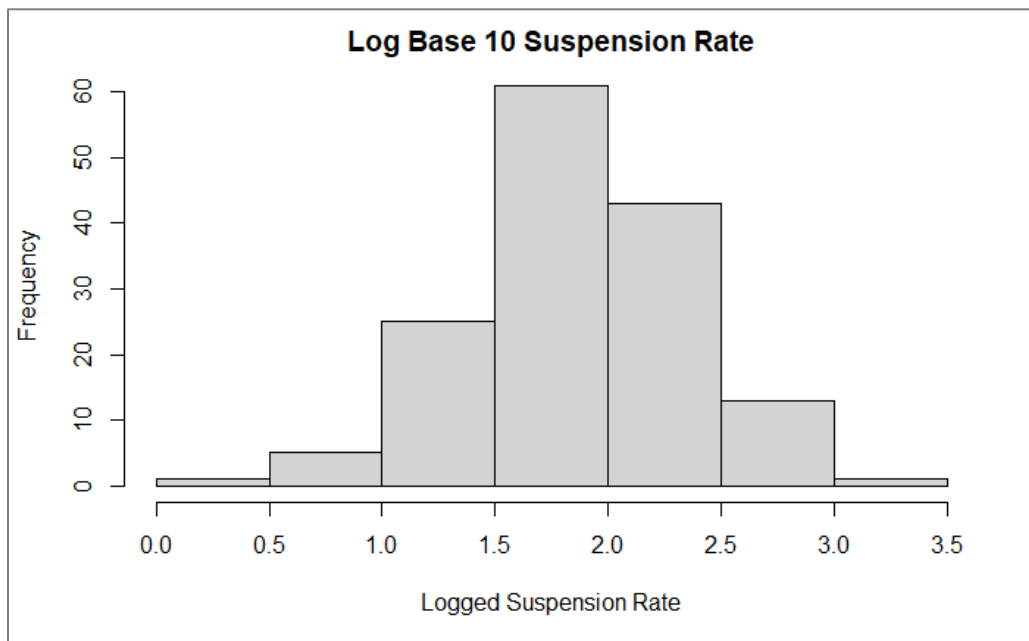


Figure 4. Histogram of Logged Suspension Rate variable. Using the log base 10 function, this transformation is now bell-shaped.

The statistical tools used in this analysis perform well when the response variables are numeric and not categorical. As seen earlier, the Growth Score and Grade variables are categorical. In order to address this, ordered values were given to each variable's categories. The following tables show these conversions. These values were used in the model.

Growth Score Category	Value
"Not Met"	-1
"Met"	0
"Exceeded"	1

*Table 3. Growth Score Category Values*

Grade Category	Value
"A"	2
"B"	1
"C"	0
"D"	-1
"F"	-2

*Table 4. Grade Category Values*

## Predictor Variable Overview

Just as the response variables were investigated, so were the predictor variables. These variables were listed and described in Table 2. Using histograms and barplots accordingly, these variables were also visualized. While many of the numeric variables are not bell-shaped, transformations of the variables were not used. These transformations would have made the models much harder to interpret, and so the variables remained untransformed.



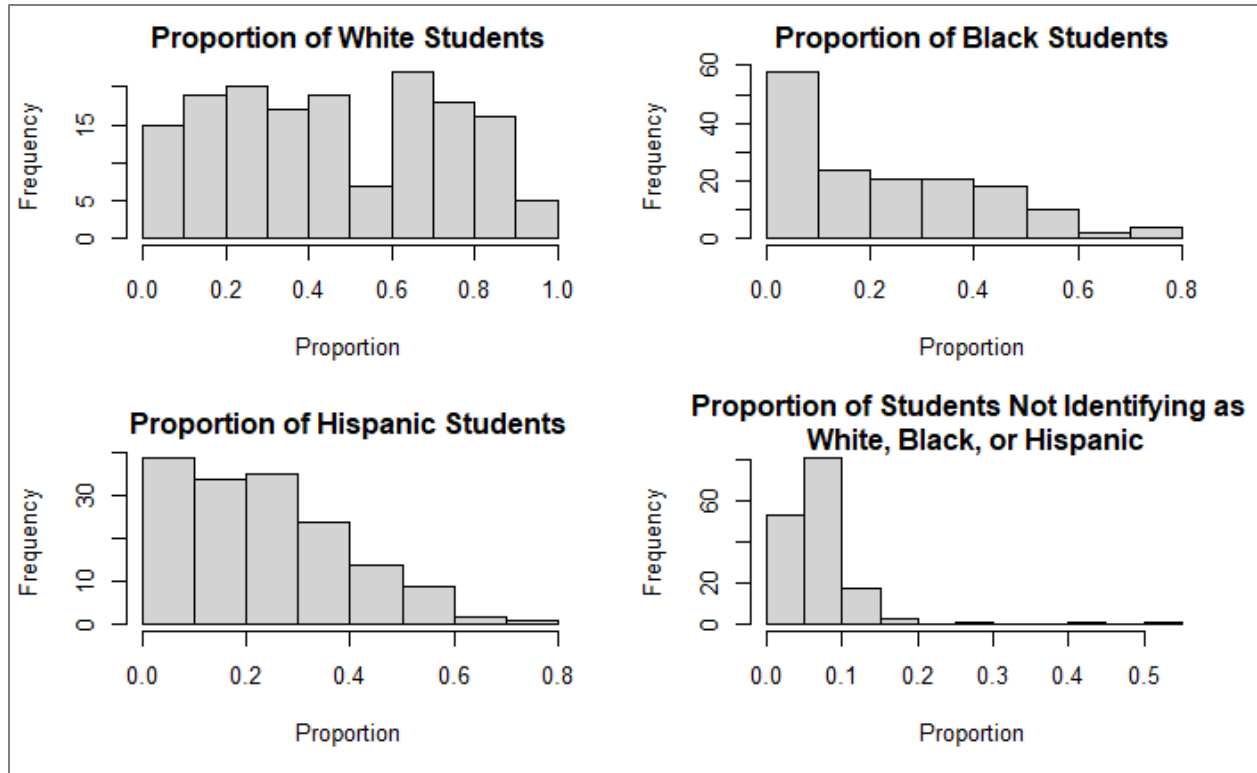


Figure 5. Histograms of Demographic Predictor Variables. None are bell-shaped. Transformations of the variables were not taken because it would have lessened the interpretability of the models.

Notably, the histogram for the proportion of other students is very non-symmetric. Under different circumstances, this would be concerning, but this variable was not used in the models. It was not used because the proportion of other students is mathematically related to the larger three demographic variables, a property which the statistical models used in this report cannot handle well.

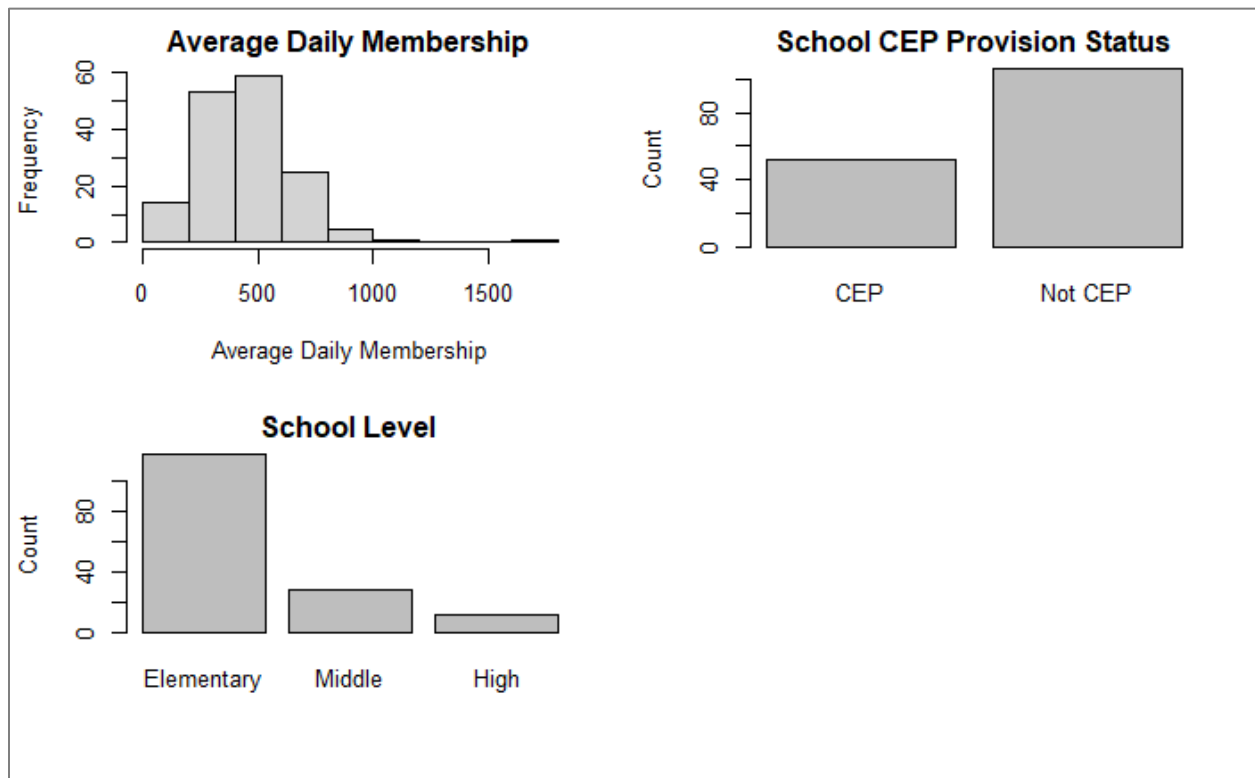


Figure 6. Histograms and Barplots for Predictor Variables. Apart from one very large value, the Average Daily Membership is roughly bell-shaped. There are more schools not enrolled in CEP than enrolled in it. There are many more Elementary schools than Middle and High schools.

For the statistical method used, the categorical variables of CEP Status and School Level do not need to be switched to numerical values. This is because these variables are predictors and not responses. So, because the response variables have been appropriately transformed, and because the predictors do not need to be transformed, the analysis can be continued.

## Method

At this point in the report, it becomes necessary to begin the modeling process. The following method was applied to each of the response variables.

### CEP Effect Only

First, the effect of CEP status itself on the response variables was investigated as a initial, simple look at the relationship. For this section, it was of interest to see whether the average response variable was different in the schools with CEP than those without CEP. For the response variables, this was done using a Welch's T-test for difference of means. This test is used to compare the average value of two groups when there is different variation in each group. The statistical test returns what is called a p-value. P-values range between 0 and 1, and the closer they are to 0, the more evidence there is that the two groups have a different average response. When the p-value is less than 0.05, then CEP is said to have a significant effect on the predictor.

The table below shows the p-values for response variables based on CEP enrollment status alone. Because the p-values for Academic Performance and Grade Score are less than 0.05, there is evidence to suggest that CEP alone effects the response. The notation “< 0.005” should be read as “less than 0.005” and indicates that the p-value for that variable was very close to 0. Any p-values less than 0.05 suggest that variable is a statistically significant predictor in the model.

Response Variable	P-value	Significant?
Academic Performance	< 0.005	Yes
Logged Suspension Rate	0.35	No
Attendance	0.32	No
Grade Score	< 0.005	Yes
Academic Growth	0.94	No
Growth Level Score	0.50	No

*Table 5. T-test results for difference in means between CEP and Non-CEP schools. CEP status has a statistically significant effect on Academic Performance and Grade Score but not on the other responses.*

### Linear Models – CEP and all other Predictor Variables

Regardless of whether CEP was determined to have a significant effect on the response in the simple analysis, the next, more sophisticated, step was to predict the response variable based on all of the predictor variables, including the CEP status. Known as Linear Regression, this statistical modeling technique takes all of the predictor variables and one of the response variables and produces estimates for the relationship between the variables.

There are two measures that indicate the strength of the relationship between the predictor and response variables. One of these measures is given to each predictor variable. This measure is also called a p-value, and like the t-test, the p-value is between 0 and 1. When the p-value for a variable is below 0.05, then the relationship between that variable, the model, and the response variable is said to be statistically significant. The smaller the p-value is, the more evidence there is to suggest that the predictor does belong in the model.

The other measure is used for assessing the goodness of the model fit as a whole. Called an R-squared value, this measure is between 0 and 1. If the R-squared is close to 0, then it is said that the model has weak goodness of fit for the data. If it is closer to 1, then it is said that the model has strong goodness of fit. While there are other measures used to assess model fit, these two were used heavily in this report.

In order to find a linear model with suitable p-values and R-squared values, variable selection was implemented. In linear models, not every variable is necessarily needed for the final model, and variable selection determines which ones to use, with the size of the model being the number of included variables. The type of variable selection used in this report looked at all combinations of variables and reported the best model for each size. A measure called the Akaike Information Criterion (AIC) was used to determine the best model of each size, as well as the best overall model. Usually, the model with the lowest AIC is selected as the overall best model. However, in this case, the model with the lowest AIC that still contained the CEP enrollment status predictor was selected as the best.

The aforementioned procedure of Linear Regression was implemented once per response variable. The implementation allowed for relationships between the predictor variables, using interactions between the CEP enrollment status and the other predictor variables. These models can be harder to interpret but are more adept at capturing the nuanced relationships between variables.

After the best model was found, its modeling strength was assessed via the R-squared values and the p-values of the CEP variable and its interaction terms. In the case of the Academic Growth and Growth Level Score responses, the models had low R-squared values and high p-values for the coefficients. These indicate that the models are unreliable. As such, predictions were not made for these two response variables, and their model summaries are not included in this report. The outputs from these models would be more misleading than insightful.

The Model Summary Table for Academic Performance is included below. It features a mid-range R-squared value, indicating a decent goodness of fit for the model. In this particular model, all of the p-values are statistically significant<sup>1</sup>. Only this Summary Table is included in this section of the report. The remaining tables are in Appendix I.

Academic Performance		R-squared: 0.53
	Coefficient	P-value
Intercept: CEP and Elementary	41.83	< 0.005
Not enrolled in CEP	8.64	0.021
Proportion of White Students	37.04	< 0.005
Level: Middle	-5.65	< 0.005
Level: High	5.87	0.012
Not enrolled in CEP and Proportion of White Students	-16.56	0.006

*Table 6. Academic Performance Model Summary. With a middle-level R-squared and statistically significant predictors, this is a decently reliable model.*

As seen through the model summary tables found in Appendix I, the models for Academic Growth, Logged Suspension Rate, Attendance, and Grade Score are all reliable models with mid-range R-squared values and statistically significant predictors. Predictions can comfortably be made with these models.

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<sup>1</sup> As noted above, the notation "< 0.005" should be read as "less than 0.005" and indicates that the p-value for that variable was very close to 0. As before, any p-values less than 0.05 suggest that variable is a statistically significant predictor in the model. The smaller the p-value is, the more evidence there is to suggest that the predictor does belong in the model.

## Predictions

Finally, predictions based on the final model were calculated. Because the intention of the project was to investigate how the performance measures of schools without CEP would have changed had they been enrolled in CEP, predictions were only made on the schools without CEP. The actual school performance measures from 2017-2018 and the CEP model predictions<sup>2</sup> were compared. The model prediction was used to approximate how the schools would have performed if they had had CEP.

In the dataset, there were 106 schools that were not enrolled in CEP during the 2017-2018 school year. The following tables give a summary of the improvement for each performance measure. Through exploration, it was found that the proportion of schools that would have seen improvement varied by the type of school and by the demographic composition. As such, the model predictions were summarized on these different types of groups. For example, Elementary Schools comprised one group while High Schools were another. Similarly, schools with White students comprising over 50% of the student population were in one group while schools with White students comprising less than 50% of the student population were in another.

The table below gives a quick overview of whether or not CEP improved the performance measures. As a device for summarizing these diverse metrics, the groups are ordered by a ranked Overall Improvement Score based on the percentage of schools where the model with CEP was better than the actual data. A score was determined for each measure and then added together, to get the group's Overall Improvement Score. If the percentage of schools that improved was between 0% and 25%, the model was said to not improve the performance measure and was given 0 points. If the percentage of schools that improved was between 25% and 50%, then the model was said to improve slightly and was given 2 points. Similarly, if the percentage was between 50% and 75%, the model was said to moderately improve and was given 4 points. Lastly, if the percentage was between 75% and 100%, it was said to certainly improve the measure and was given 6 points. The percentage of schools that improved are reported in the following table.

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<sup>2</sup> The phrase "CEP model predictions" means the model prediction under the assumption that the schools had had CEP.

		Percentage of Schools where the model prediction with CEP was larger than the actual performance measure				Overall improvement score
Group Type	Number in Group	Academic Performance	Suspension Rate	Attendance	Grade Score	Yes = 6 points, Moderately = 4 points, Slightly = 2 points, No = 0 points
Prop. White > 50%	32	78.1%	65.6%	53.1%	75.0%	20
Prop. Hispanic < 20%	33	63.6%	51.5%	57.6%	54.6%	16
Level - Elementary	81	40.7%	54.2%	45.7%	53.1%	12
EDS 70-75%	52	38.5%	46.2%	53.9%	53.9%	12
Prop. Black < 25%	53	49.1%	62.3%	41.5%	49.1%	10
All Schools	106	35.9%	44.3%	44.3%	45.3%	8
EDS 75-80%	31	29.0%	38.7%	41.9%	32.3%	8
EDS 85-90%	2	0.0%	50.0%	50.0%	0.0%	8
Prop. White < 50%	74	17.6%	35.1%	40.5%	32.4%	6
Prop. Black > 25%	53	22.6%	26.4%	47.2%	41.5%	6
Prop. Hispanic > 20%	73	23.3%	41.1%	38.4%	41.1%	6
Level - High	5	20.0%	40.0%	60.0%	20.0%	6
EDS 80-85%	21	42.9%	47.6%	23.8%	47.6%	6
Level - Middle	20	20.0%	5.0%	35.0%	20.0%	2

*Table 7. Summary of CEP Improvements on Performance Measures. The rows are ordered by their Overall Improvement Score. The blue highlight shows the row that corresponds to all the schools. Green highlight shows where the model improved the measure in over 75% of schools; dark yellow where the model improved it in 50% to 75% of schools; light yellow where the model improved it in 25% to 50% of schools; and white where the model did not improve the measure on more than 25% of schools.*

Finally, looking at the subset of each group where the model improved the measure, the average improvement was calculated. The table below reports the number of schools in the improvement group for that measure, indicated by the symbol “n”. This number was calculated by multiplying the number in the Group Type by the percent of schools where the performance measure improved.

Group Type	Average measure improvement of schools where CEP prediction was larger than the actual value							
	Academic Performance		Suspension Rate		Attendance		Grade Score	
	n	Average Improvement	n	Average Improvement	n	Average Improvement	N	Average Improvement
Prop. White > 50%	25	6.72	21	-36.9	17	0.67	24	0.53
Prop. Hispanic < 20%	21	7.05	17	-63.5	19	0.78	18	0.63
Level – Elementary	33	5.64	44	-45.9	37	0.56	43	0.46
EDS 70-75%	20	6.43	24	-47.0	28	0.66	28	0.45
Prop. Black < 25%	26	6.40	33	-37.4	22	0.62	26	0.54
All Schools	38	6.21	47	-52.3	47	0.64	48	0.49
EDS 75-80%	9	6.79	12	-58.7	13	0.64	10	0.46
EDS 85-90%	0	-	1	-42.7	1	0.34	0	-
Prop. White < 50%	13	5.22	26	-64.8	30	0.63	24	0.44
Prop. Black > 25%	12	5.79	14	-87.4	25	0.66	22	0.42
Prop. Hispanic > 20%	17	5.16	30	-46.0	28	0.55	30	0.4
Level – High	1	18.87	2	-194.2	3	0.86	1	1.09
EDS 80-85%	9	5.13	10	-58.5	5	0.65	10	0.61
Level – Middle	4	5.64	1	-51.4	7	0.96	4	0.65

*Table 8. Average Improvements between Model and Actual Performance Measures. The rows are ordered by their Overall Improvement Score. The highlighted colors have the same meaning as in Table 7.*

When the model prediction with CEP is compared to the actual performance measures, as reported in the previous two tables, implementation of CEP is expected to create a slight improvement for all of the performance measures across all types of schools. The models suggest a potential average increase in Academic Performance of 6.21 points in 35.9% of schools; a potential average decrease in the Short-Term Suspension Rate by 52.3 suspensions per 1,000 students in 44.3% of schools; a potential average increase in Attendance by 0.64 points in 44.3% of schools; and a potential average increase in the Grade Score by 0.49 points in 45.3% of schools.

## Discussion

Because the Grade Score measure is somewhat artificial, it is hard to interpret a Grade Score increasing by a half. This is equivalent to saying a grade increased from “C” to halfway in between “C” and “B”, which is not a viable category. However, an average increase of 0.49 points seems more significant than an average increase close to 0.

However, there are certain types of schools where the performance measures make a difference in a higher percentage of that group. As seen through the upper rows of the tables, CEP is predicted to have an impact in more schools with a majority-white student body, followed by schools with less than 20% Hispanic students, followed by Elementary schools, and finally by schools with 70% to 75% Economically Disadvantaged Students. A satisfactory explanation for this could not be found by the

author. Part of this effect may be due to the variables used in the models, and part of it may be due to the relationship between CEP enrollment status and demographics found in the original dataset (see Appendix II for more information). However, it seems unlikely that this is the sole driver. More work would be needed to explore this, and it would need to be completed by an interdisciplinary team of experts.

## Further Work

The results reported are observational predictions only.. While grounded in rigorous statistical methodology, the above averages are approximations. In order to fully understand how the implementation of CEP affects performance measures, a carefully designed experiment would need to be conducted. Data would need to be collected on the performance measures before and after the implementation. If done on a large scale, the data collected from that project would give much more evidence of the relationship between CEP and performance measures. That being said, the work done and reported here does suggest that CEP may be associated with improved performance measures.

## Conclusion

After building several linear models to determine the effects of the school lunch program CEP on various measures of academic performance, the results and predictions show that CEP has potential for a positive impact. The models were not informative for the Academic Growth and Academic Growth Scores, but they were informative for the Academic Performance, the Suspension Rate, the Attendance, and the Grade Score. However, the models do not suggest that it would have the same impact on each school. The models imply that CEP would make a difference in more Elementary schools, in schools with a student population that is over 50% white, and that has between 70% to 75% Economically Disadvantaged Students.

This report will help inform the work of the North Carolina Alliance for Health as they seek to explain to policymakers why the CEP program would be helpful for education. With these early findings suggesting that CEP may improve measures of performance, hopefully further research can be conducted on the intersection of food equity, education, and policy.



## Appendix I: Model Coefficients

The model coefficients and p-values are included below. The tables for the Academic Growth and for the Growth Score are not reported because these models had very high p-values for their coefficients and a very low R-squared. These properties, among others make the models more misleading than informative.

Academic Performance		R-squared: 0.53
	Coefficient	P-value
Intercept: CEP and Elementary	41.83	< 0.005
Not enrolled in CEP	8.64	0.021
Proportion of White Students	37.04	< 0.005
Level: Middle	-5.65	< 0.005
Level: High	5.87	0.012
Not enrolled in CEP and Proportion of White Students	-16.56	0.006

*Table 9. Academic Performance Model Summary. With a middle-level R-squared and statistically significant predictors, this is a decently reliable model.*

Logged Suspension Rate		R-squared: 0.45
	Coefficient	P-value
Intercept: CEP and Elementary	3.17	< 0.005
Not enrolled in CEP	0.18	0.196
Proportion of White Students	-2.17	< 0.005
Proportion of Black Students	-0.05	0.953
Proportion of Hispanic Students	-1.99	< 0.005
Level: Middle	0.70	< 0.005
Level: High	0.69	< 0.005
Not enrolled in CEP and Proportion of Black Students	-1.15	0.030

*Table 10. Logged Suspension Rate Model Summary. This model also has a middle-range R-squared value and statistically significant predictors, indicating it is a decently reliable model. While CEP itself is not statistically significant, the interaction with the proportion of black students is statistically significant.*

Attendance		R-squared: 0.43
	Coefficient	P-value
Intercept: CEP and Elementary	95.20	< 0.005
Not enrolled in CEP	-0.68	0.022
Proportion of Hispanic Students	-0.68	0.615
Level: Middle	-0.92	< 0.005
Level: High	-2.57	< 0.005
Not enrolled in CEP and Proportion of Hispanic Students	3.13	0.034

*Table 11. Attendance Model Summary. This model has a middle-range R-squared value and statistically significant predictors, so it is a decently reliable model.*

Grade Score		R-squared: 0.49
	Coefficient	P-value
Intercept: CEP and Elementary	-1.22	< 0.005
Not enrolled in CEP	0.35	0.227
Proportion of White Students	2.36	< 0.005
Level: Middle	-0.43	0.062
Level: High	0.27	0.261
Not enrolled in CEP and Proportion of White Students	-0.89	0.054
Not enrolled in CEP and Middle School	0.04	0.879
Not enrolled in CEP and High School	0.43	0.230

*Table 12. Grade Score Model Summary. This model also has a middle-range R-squared value and statistically significant predictors. It is a decently reliable model.*

## Appendix II: CEP Characterizations

It could be useful to gain a deeper understanding of our most relevant variable, the CEP enrollment status. The table below gives a characterization of the schools that enrolled in CEP for the 2017-2018 school year and of the schools that did not. Further, in order to see whether the characterizations were significantly different, a Welch 2-sample T-test was completed for each variable. Their significance probability values (p-values) are given below as well. Generally, if a p-value is below 0.05, then the difference in the average values of the two groups is considered significant. The t-test does not apply to the first four rows because these rows are simply counts, and not averages.

	Schools with CEP	Schools without CEP	
	Measure	Measure	Significant difference?
Number of schools	52	106	-
Number of Elementary Schools	37	81	-
Number of Middle Schools	8	20	-
Number of High Schools	7	5	-
Average Proportion of White Students	0.64	0.38	Yes P < 0.001
Average Proportion of Black Students	0.15	0.26	Yes P < 0.001
Average Proportion of Hispanic Students	0.14	0.29	Yes P < 0.001
Average Proportion of Other Students	0.07	0.07	No P = 0.87
Average Daily Attendance	444	458	No P = 0.73

*Table 13. Characterizations of schools with and without CEP*

From this table, we see that the racial demographics between the two groups are significantly different. The average school with CEP has a higher proportion of white students than the average school without CEP. Further, the average school with CEP has a lower proportion of black and Hispanic students than the average school without CEP. This underlying structure may be important to consider.