Results

Results tables for the four models are shown below. We highlight the terms that are significant with a p-value threshold of 0.05, with red being familial predictors and blue being educational predictors.

Standardized Test Composite Score

Table 1: Results: OLS Model for Test Composite Score

	Coef	Std. Error	P-value
Intercept	29.108	0.591	<0.001
Race=API	-1.131	0.296	<0.001
Race=Black	-3.394	0.28	<0.001
Race=Hispanic	-2.370	0.277	<0.001
Race=White	1.325	0.246	<0.001
Has Two Parents	0.130	0.138	0.347
SES	1.906	0.145	<0.001
# Years Parents Education	-0.089	0.036	0.014
# Years Education Parents Push	0.475	0.029	<0.001
Has Computer and Internet	1.130	0.15	<0.001
Is Public School	0.217	0.162	0.180
# Years Education Math Teacher Pushes	1.358	0.036	<0.001
# Years Education English Teacher Pushes	1.137	0.034	<0.001
% Sophomores in College Prep	0.005	0.002	<0.001
Lowest Teacher Salary (thousands)	-0.013	0.012	0.300
Majority Students Have Free Lunch	-1.007	0.237	<0.001
LH by Lack of Space	-0.020	0.154	0.895
LH by Poor Building Conditions	-0.917	0.165	<0.001
LH by Poor Heating/Air/Light	0.350	0.16	0.029
LH by Lack of Text/Supplies	-0.000	0.143	0.998
LH by Poor Facilities	-0.432	0.155	0.005
LH by Poor Technology	-0.065	0.154	0.671
Majority Free Lunch:LH by Lack of Space	-0.714	0.298	0.017

The student's family's socioeconomic status has a positive relationship with test composite score: controlling for other variables, when SES increases by one unit, the student's test composite score increases by an average of 2 points. On the other hand, we can look at variables that serve as proxies of the finances of the school. The type of school a student attends is not significantly associated with the student's test composite score. However, whether or not a student went to a school where the majority of students received free lunch is significantly correlated with test composite score. If a student went to a school where the majority of students received free lunch, test scores decreased by 1 point on average, with all else held constant. The interaction between learning hindrance due to a lack of space and whether a majority of the students have free lunch is significantly associated with the odds of dropping out. Therefore, the association between whether a majority of students have free lunch and test score depends on learning hindrance due to a lack of space. When looking at schools where the majority of students receive free lunch, students at these schools where learning is hindered by a lack of space have, on average, a 0.714 decrease in test scores, holding all else constant. However, if there is a learning hindrance due to lack of space, without the majority of students with free lunch, average test score is not changed. Therefore, as we found a negative association for poorer schools that also face space limitations, this tangentially supports the findings in previous literature that showed a

larger positive effect when funding poorer schools that also had a lack of space for students. Therefore, in terms of financial factors, it seems that finances of the student's home has a higher magnitude of correlation with test composite; however, when the student's school has space constraints, the two groups of predictors are leveled in size of determining test score.

External motivational factors from both home and school are significantly associated with test composite. For each additional year that the student's parent(s) push him/her to go in school, his/her test composite score increases by 0.475 points, all else held constant. On the other hand, it seems that with each extra year the student's math or English teacher pushes him/her to achieve in school, his/her test composite increases by more than a point on average, while adjusting for other factors. In addition, the percentage of sophomores in a college prep program at the time of the base year survey is also significantly correlated with student test composite score. However, with every one percent increase of sophomores who were in a college prep program at school, the average test score increases by only 0.005, adjusting for other variables. Taking all of these factors into account, the student's school environment through external motivation seems to be more strongly correlated with the outcome.

Comparing home and school factors, the student's access to technology at home is significant, while learning hindrance due to lack of technology at school is not. In terms of the student's access to technology at home, students who have a computer and internet at home score, on average, 1.13 points higher on the standardized test than students who do not have access to either at home, with all other variables controlled. In addition, race is a significant predictor as well, with indicators of the student being Black, Hispanic, or API negatively associated with the test composite score when compared to American Indian/Alaska Native/Mixed students, on average. Test composite score is negatively associated with learning hindrances at school, namely by poor facilities (arts, science labs, libraries) and by poor building conditions, on average. However, the outcome is actually positively correlated with learning hindrances due to poor heating/air/light. This could be a source of future investigation, since it may be affected by other confounding variables. Due to the effect sizes of a student's technology access at home and their race, we conclude that home conditions are more strongly correlated with test composite.

Taking into account all of the variables that are significantly associated with test composite, it seems that the home factors are more strongly correlated with test composite in terms of environmental conditions and finances. However, if the school is on the poorer side, with more than half of students that receive free lunch, and also faces a lack of space, then educational factors may overweigh familial factors on the financial axes. Influence from adults seem to be more strongly correlated with the outcome at school than at home.

Education Attainment

Odds of Dropping Out of High School

The SES of a student's family is not significantly associated with the odds of dropping out of high school. However, if the student attends a public school, their odds of dropping out increases by a factor of 1.565, on average, with all else held constant. Therefore, it seems that educational factors are more correlated with the odds of dropping out.

In addition, the external urges from teachers are significantly associated with the outcome, while the urges from the student's parents are not significant. For every additional year a math or English teacher pushes the student to reach in school, the odds of him/her dropping out decreases by a factor of 0.7, on average, with all else held constant. Therefore, this axis also shows that school factors are more strongly correlated with the odds of dropping out.

When investigating general conditions at home and at school, it seems that the home factors are the only significant main effects using a p-value of 0.05. If a student has two parents, the odds of him/her dropping out of high school decreases by a factor of 0.77, on average, in comparison to a student who lives in a single parent or absent parent home, all else held constant. In addition, access to technology at home and whether or not a student is white is also negatively correlated with the odds of dropping out, on average, when controlling for other factors.

Table 2: Results: Logistic Regression for Odds of Dropping Out of HS

	Coef	Exp(Coef)	Std. Error	P-value
Intercept	2.658	14.274	0.286	<0.001
Race=API	0.007	1.007	0.14	0.963
Race=Black	-0.221	0.802	0.119	0.063
Race=Hispanic	-0.133	0.876	0.118	0.261
Race=White	-0.481	0.618	0.109	<0.001
Has Two Parents	-0.264	0.768	0.061	<0.001
SES	-0.061	0.941	0.068	0.367
# Years Parents Education	-0.031	0.970	0.017	0.064
# Years Education Parents Push	-0.022	0.978	0.013	0.087
Has Computer and Internet	-0.186	0.830	0.061	0.002
Is Public School	0.448	1.565	0.109	<0.001
# Years Education Math Teacher Pushes	-0.296	0.743	0.017	<0.001
# Years Education English Teacher Pushes	-0.309	0.734	0.017	<0.001
% Sophomores in College Prep	-0.002	0.998	0.001	0.015
Lowest Teacher Salary (thousands)	-0.009	0.991	0.006	0.124
Majority Students Have Free Lunch	-0.146	0.864	0.108	0.174
LH by Lack of Space	0.062	1.064	0.078	0.428
LH by Poor Building Conditions	0.058	1.059	0.079	0.466
LH by Poor Heating/Air/Light	-0.022	0.979	0.078	0.78
LH by Lack of Text/Supplies	0.011	1.011	0.067	0.87
LH by Poor Facilities	-0.102	0.903	0.077	0.184
LH by Poor Technology	0.046	1.047	0.077	0.552
Majority Free Lunch:LH by Lack of Space	0.222	1.249	0.132	0.093

When modeling odds of dropping out of high school, educational factors are more strongly associated over home factors when looking at finances and external motivation. However, the opposite is true when looking at environmental conditions.

Odds of Attaining Bachelor's Degree

When looking at wealth factors, a student's family's SES status composite is significantly positively associated with the odds of attaining a Bachelor's degree. For every one increase in SES composite, the odds of the student attaining a Bachelor's degree increases by a factor of 1.6, on average, adjusting for other variables. On the school level, whether or not the high school attended was a public school is significantly negative correlated with the outcome, at a factor of 0.7, on average, when controlling for other factors. In addition, the lowest teacher salary is also significantly positively associated with the outcome, albeit with a small effect size. Since SES is a continuous variable, the effect size can be larger than just 1.5 with more than a singular unit difference in SES. Therefore, it seems that familial factors are larger determinant of the odds of attaining a Bachelor's degree.

When investigating external desires from adult figures, all of the predictors are significant, but we see that the effect sizes of the variables representing the number of years of education the student's teachers hope for him/her are greater than that for the student's parents. However, the effect size of the parent predictor is only a little above 1, so it is very minimal when explaining the odds of attaining a Bachelor's. Therefore, it seems that external motivation from school is more strongly associated with the outcome.

In terms of conditions at home and at school, the coefficient for the student's access to technology home is significantly positively associated with the odds of attaining a Bachelor's degree, while that for tech access at

Table 3: Results: Logistic Regression for Odds of Attaining Bachelor's

	Coef	Exp(Coef)	Std. Error	P-value
Intercept	-6.975	0.001	0.236	<0.001
Race=API	0.310	1.363	0.107	0.004
Race=Black	0.078	1.081	0.106	0.462
Race=Hispanic	-0.040	0.961	0.106	0.707
Race=White	0.298	1.347	0.091	0.001
Has Two Parents	0.027	1.028	0.052	0.597
SES	0.461	1.586	0.053	<0.001
# Years Parents Education	0.014	1.014	0.013	0.288
# Years Education Parents Push	0.082	1.085	0.011	<0.001
Has Computer and Internet	0.372	1.450	0.062	<0.001
Is Public School	-0.322	0.725	0.054	<0.001
# Years Education Math Teacher Pushes	0.342	1.408	0.014	<0.001
# Years Education English Teacher Pushes	0.325	1.384	0.014	<0.001
% Sophomores in College Prep	0.002	1.002	0.001	<0.001
Lowest Teacher Salary (thousands)	0.009	1.009	0.004	0.036
Majority Students Have Free Lunch	-0.170	0.844	0.093	0.067
LH by Lack of Space	-0.038	0.963	0.055	0.493
LH by Poor Building Conditions	-0.187	0.830	0.061	0.002
LH by Poor Heating/Air/Light	0.078	1.081	0.058	0.181
LH by Lack of Text/Supplies	0.116	1.123	0.053	0.03
LH by Poor Facilities	-0.015	0.985	0.056	0.783
LH by Poor Technology	-0.099	0.905	0.055	0.073
Majority Free Lunch:LH by Lack of Space	-0.034	0.966	0.118	0.773

school is not. In addition, whether or not a student is Asian or White is significantly positively correlated with the outcome as well. Finally, the number of years of education that a student's parents have completed is also significantly associated with the outcome; however, the effect size is marginal. Overall, conditions at home are larger determinants of the odds of attaining a Bachelor's degree.

In explaining the odds of attaining a Bachelor's degree, it seems that familial factors are larger determinants along the financial and condition factors. However, educational predictors are once again more strongly associated with the outcome along the external motivation axis.

Socioeconomic Status Quantile

The student's family's SES status is significantly associated with the odds of being in a lower SES quantile. The odds a student is in an SES quantile lower than 1, 2 or 3, as an adult, decreases by a factor of 0.717 for every one increase in his/her family's SES status composite, on average, all else held constant. On the school side, if the student attended a public school or went to a school where a majority of students received free lunch, the odds of being in a lower SES quantile as an adult increases. In addition, for students who attend schools where a majority of students receive free lunch, the odds increases by a factor of 1.234. Looking at effect sizes, it seems that these home and school financial factors are relatively similar in this model.

In terms of motivation stemming from home or school, the push from teachers is a larger determinant of the outcome than the push from parents. For every additional year that the parents push their student to achieve in school, the average odds of being in a lower SES quantile only decreases by a factor of only 0.95, very close to 1, with all else adjusted for. The percentage of sophomores in a college preparation program is

Table 4: Results: Ordinal Logistic Regression for SES Status

	Coef	Exp(-Coef)	Std. Error	P-value
Race=API	0.070	0.933	0.079	0.377
Race=Black	0.063	0.939	0.074	0.397
Race=Hispanic	-0.041	1.042	0.074	0.574
Race=White	0.200	0.819	0.066	0.002
Has Two Parents	0.104	0.901	0.037	0.005
SES	0.333	0.717	0.038	<0.001
# Years Parents Education	-0.016	1.016	0.010	0.097
# Years Education Parents Push	0.049	0.952	0.008	<0.001
Has Computer and Internet	0.296	0.744	0.040	<0.001
Is Public School	-0.213	1.237	0.043	<0.001
# Years Education Math Teacher Pushes	0.249	0.779	0.010	<0.001
# Years Education English Teacher Pushes	0.208	0.813	0.009	<0.001
% Sophomores in College Prep	0.002	0.998	0.000	<0.001
Lowest Teacher Salary (thousands)	0.005	0.995	0.003	0.088
Majority Students Have Free Lunch	-0.210	1.234	0.063	0.001
LH by Lack of Space	-0.111	1.118	0.041	0.006
LH by Poor Building Conditions	-0.175	1.192	0.044	<0.001
LH by Poor Heating/Air/Light	0.150	0.861	0.043	<0.001
LH by Lack of Text/Supplies	0.033	0.968	0.038	0.389
LH by Poor Facilities	-0.119	1.126	0.041	0.004
LH by Poor Technology	0.019	0.981	0.041	0.638
Majority Free Lunch:LH by Lack of Space	0.058	0.943	0.079	0.463
Intercept (SES Quartile <= 1)	2.459	0.085	0.158	<0.001
Intercept (SES Quartile <= 2)	3.829	0.022	0.160	<0.001
Intercept (SES Quartile <= 3)	5.212	0.005	0.162	<0.001

also significant; however, the effect size is very minimal as well. Therefore, it seems that the number of years that teachers push a student, an educational motivational factor, is the most correlated with student SES outcome 9 years after their sophomore year.

Once again, whether a student has access to a computer and internet at home is significantly correlated with the outcome. Students who have this technology access are, on average, 0.74 times less likely to be in the lower SES quantiles, all else held constant. On the other hand, learning hindrance at school due to technology is not significant in the model. In terms of other conditions at school, a student is more likely to be in a lower SES quantile if their learning was hindered by a lack of space, poor building conditions, and poor facilities. An interesting result is the negative association of the outcome with whether student learning is hindered by a poor heating/air/light. Overall, the familial and educational factors seem similar in effect sizes for determining the odds of being a lower SES quantile.

Therefore, when predicting the odds of being below a particular SES quantile when the student is an adult, the effect sizes of school factors are pretty leveled in magnitude compared with the effect sizes of home factors when looking at the financial and condition axes. However, educational factors are larger determinants along the external motivation axis, and familial factors are larger determinants along the environmental condition axis.

Model Comparisons

Looking at familial predictors, environmental conditions at home are large determinants of for all facets of student success that we investigated. In addition, financial familial predictors are large determinants of test composite score and the odds of attaining a Bachelor's degree.

For educational predictors, financial predictors in this group were large determinants of SES quantile and odds of dropping out. They were only large determinants of test composite score for poorer schools with a majority of students that receive free lunch. Notably, external motivation from school is a large determinant of student success across all models.

Sensitivity Analysis

Results from the sensitivity analysis done using non-imputed data is included in the Appendix. In comparison to the main models, the effect sizes of the predictors are similar. Although not all of the predictors that are significant in the main models are significant in the sensitivity analysis models, this is expected due to the lack of observations for certain levels in the original data set. In addition, the predictors of the number of years of education that a student's math and English teacher push had the highest number of missing observations. Even so, they were still both significant in all of the sensitivity analysis models. Therefore, the sensitivity analysis supports our results.