



What Matters for College Success? The Relationships between GEAR UP Participation, High School GPA, AP Participation, and ACT scores with College GPA

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As part of our evaluation of the Milwaukee Public School (MPS) Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) grant, we analyze the connection between measures of high school performance, such as AP course participation, participation in GEAR UP programming, ACT scores, and GPA with first-year college GPA. Data were provided by the Milwaukee Public Schools (MPS), the University of Wisconsin in Milwaukee (UWM), and Milwaukee Area Technical College (MATC) for students who graduated MPS GEAR UP schools between 2015 and 2018 and then attended either UWM or MATC.

The MPS GEAR UP initiative provides culturally relevant career and post-secondary focused supports to, mostly, low-income students of color and their families. In addition to evaluating the impact of MPS GEAR UP on college GPA, this study speaks to the current COVID-19 crisis by assessing the importance of ACT scores, which many colleges are considering dropping from the admissions process, for predicting college success. This study weighs the importance of various measures of high school success, some of which may not be available for future graduating classes, to ask the following research questions:

1. Is there evidence participation in GEAR UP helped prepare students to succeed in college, as measured by freshman GPA?
2. What were the most important measures of a student's high school performance for predicting their college success, as measured by their freshman year GPA?
3. Do ACT scores equalize the admissions process for students attending different schools?

4. What is lost by not including ACT scores in the college admissions process?

Key Findings

- Although we did not find a connection between GEAR UP participation and college GPA, nearly all students who graduated high school and attended MATC or UWM had participated in several GEAR UP activities. This complicated our ability to measure impact and suggests GEAR UP programming was valued by nearly all students who ultimately went to college.
- Measures of high school GPA were the only unique predictors of college GPA. Both cumulative and senior year GPA were strong predictors of college GPA.
- Students who participated in AP classes tended to have higher college GPAs. However, this relationship disappeared after accounting for high school GPA.
- Students with higher ACT scores tended to have higher college GPAs. However, this relationship also disappeared after accounting for high school GPA.
- There was no evidence that the ACT equalized the admissions process for students attending different high schools. After accounting for ACT scores and high school GPA, school still predicted student success in college.
- Since ACT scores were unrelated to college GPA, excluding ACT scores in the admissions process would not have subtracted from the ability of college admissions offices to predict the success of students.

Background

What is the MPS GEAR UP initiative?

In 2011, the Milwaukee Public Schools (MPS) was awarded a 7-year, \$14.87 million federal GEAR UP grant to promote college awareness and readiness. The grant provided supports to students from the high school graduating classes of 2017 and 2018. The GEAR UP initiative employed a school-family-community partnership strategy (Epstein et. al, 2002) to bring culturally relevant and effective supports to students, and to empower families and schools to better support students as they progressed through school and into college and careers.

MPS applied for the grant to develop services that could address a historically low on-time/four-year graduation rate. At the time of the grant application in 2011, only 62.8% of students graduated on time. Even fewer economically disadvantaged students (61.5%), African American (61.1%), and Hispanic (58.9%) students graduated MPS on time.¹ After receiving funding, MPS GEAR UP started supporting the 2017 and 2018 graduating classes when students were still in 6th and 7th grade respectively, during the 2011-2012 school year. Each year, the initiative provided these students, their parents, and their schools with a variety of supports designed to meet two objectives:

Objective 1 was to increase educational expectations for participating students and family knowledge of postsecondary education options, preparation, and financing.

Objective 2 was to increase academic performance, high school graduation, and post-secondary readiness and enrollment.

GEAR UP, the college access gap, and COVID-19

The GEAR UP initiative works to address many of the racial and economic inequities inherent in education that lead to racial and economic gaps in both the enrollment and completion of college.² GEAR UP provides students with limited means with opportunities they might not otherwise have. Although access to college visits, ACT preparation, and intensive college counseling and preparation may be expected for most students and families, they are often not available for financial or logistical reasons for low-income students of color attending struggling schools. Although GEAR UP works to help close the college opportunity gap, the events of COVID-19 have likely widened it.

Every aspect of the education system from PreK to 20 has had to adapt to COVID-19 and the social distancing needed to limit its spread. Schools have closed and classes have moved online to limit the spread of the virus. While it has become increasingly understood the move to online learning has exacerbated educational inequities³, less has been discussed about how the disruptions to the college admissions process could further expand the college access gap between races and economic groups.

The college admissions process uses information about students to estimate how likely they are to succeed in their schools. One way this process has been disrupted involves the inability of students to take required standardized tests, a key piece of information about the student. Administrations of the ACT and SAT have been postponed across the US. While an increasing number of colleges, including all UW campuses except Madison, are changing their admissions processes in response to this, by either dropping the standardized test requirement completely or making it optional^{4,5}, most still require students to submit an ACT or SAT score as part of their application.

The increasing number of colleges not requiring students to submit an ACT or SAT score with their application follows a national trend that predates the COVID-19 crisis. A limited number of colleges across the US already made standardized tests optional, with an understanding that requiring them disadvantages certain groups of students. It is also widely understood that higher scores are positively associated to family income and race.⁶ For example, students in more affluent schools with a stronger focus on college and in more affluent families are more likely to participate in activities that tend to boost student scores such as test preparation classes and retaking the exam multiple times.

Much like the college admissions scandal involving Felicity Huffman and Lori Loughlin,⁷ the COVID-19 crisis also shows the inherent unfairness of the current college admissions process. For example, the state in which a person resides might determine the level of access to the tests or any preparation to take it. Some states closed schools before students could take the ACT or SAT assessments. Further, as the College Board considers moving the ACT and SAT online,⁸ inequitable access to reliable internet and a computer would further exacerbate the inequities in the college application process and result in a widening opportunity gap between the haves and the have-nots.

Study questions

In addition to evaluating the impact of MPS GEAR UP on college GPA, this study speaks to the current COVID-19 crisis by measuring the predictive validity of the ACT, along with other measures of school performance, such as high school GPA and participation in advanced placement (AP) classes. The MPS GEAR UP initiative was active in eight high schools with mostly low-income students of color to bring culturally relevant and effective supports to students, and to empower families and schools to better support students as they progressed through school and into college. In this study, we seek to identify the best predictors of college success for students who graduated from these eight GEAR UP MPS schools. This study weighs the importance of the various measures of school success, some of which may not be available for future graduating classes, to ask the following research questions:

1. Is there evidence participation in GEAR UP helped prepare students to succeed in college, as measured by their freshman GPA?
2. What were the most important measures of a student's high school performance for predicting their college success, as measured by their freshman year GPA?
3. Do ACT scores equalize the admissions process for students attending different schools?
4. What is lost by not including ACT scores in the college admissions process?

Students included in the study

This study includes 446 students who graduated between 2015 and 2018 who later enrolled in either MATC or UWM and attempted at least 12 credit hours their freshman year. 220 (49.3%) of these students graduated as part of the 2017 or 2018 class, and thus were part of GEAR UP. 308 (69.1%) students enrolled in MATC and 138 (30.1%) in UWM. 330 (74.0%) students were eligible for free or reduced lunch and 241 (54.0%) were female. 201 (45.1%) were African American and 129 (28.9%) were Latinx.

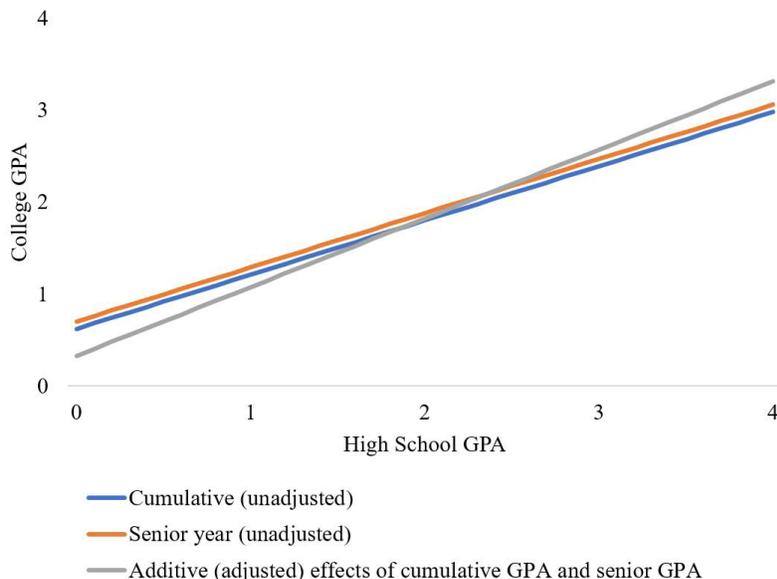
Key Findings

Is there evidence participation in GEAR UP helped prepare students to succeed in college, as measured by their freshman GPA?

The results of this study do not provide evidence that participation in GEAR UP caused students to perform better in college, but some evidence that it successfully supported students on their path toward college. GEAR UP participation was ubiquitous for students in the graduating GEAR UP cohort, which made measuring the impact of participation difficult. Of the 220 students in the GEAR UP cohorts who attended MATC or UWM full-time, all but four participated in GEAR UP programming. 180 (82%) of these students participated in an intensive level of GEAR UP programming (three or more types of activities). As a follow up to a previous study that connected participation in GEAR UP with higher high school graduation rates (Jones & Gilman, 2019), the original goal of this study was to compare the college performance of students engaged in various levels of GEAR UP programming. However, considering nearly all students who graduated high school and attended MATC or UWM had participated in several GEAR UP activities, this was not possible to do. All of this suggests that GEAR UP programming was valued by nearly all students who ultimately went to college. Through their continued participation, students saw value in the activities and supports provided that were designed to help prepare them for success after high school. GEAR UP provided students access to post-secondary opportunities many would not have otherwise had.

What were the most important measures of a student's high school performance for predicting their college success, as measured by their freshman year GPA?

As seen in Figures 1, 2, and 3, statistical adjustment clarified that high school GPA was by far the strongest determinant of college GPA. Interestingly, including both cumulative GPA and senior year GPA improved the predictive power of high school GPA. This finding may provide some direction for how college admissions officers should interpret a student's high school transcript; it is important how well the student did in high school, both overall, and in their most recent courses. Although students with higher ACT scores and those who participated in AP courses tended to earn higher grades in college, after accounting for their high school GPA, they did not. Regarding AP, since nearly three out of every four students took at least one AP course, participation in AP courses seems part of the normative high school experience for students who ultimately attended college. However, the finding that it did not uniquely predict college GPA does not suggest students did not benefit from their participation. They may have gathered value from their participation in ways not assessed in this study, such as having a more positive expectation for college and being more likely to attend college. Regarding ACT scores, this study's findings suggest it did not predict how well students would do in college, and thus, was not beneficial to college admissions offices. Further, unlike AP classes, it is difficult to find some benefit the students in this study received from their participation in the ACT.

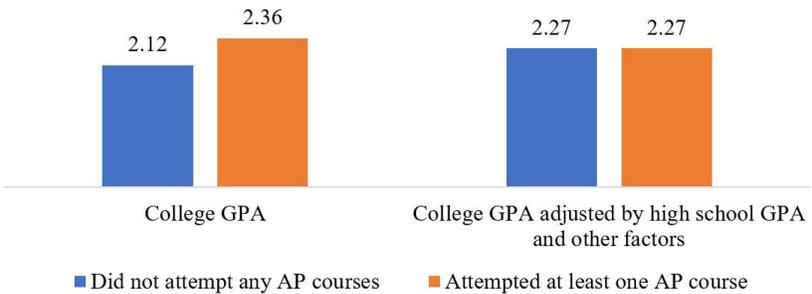
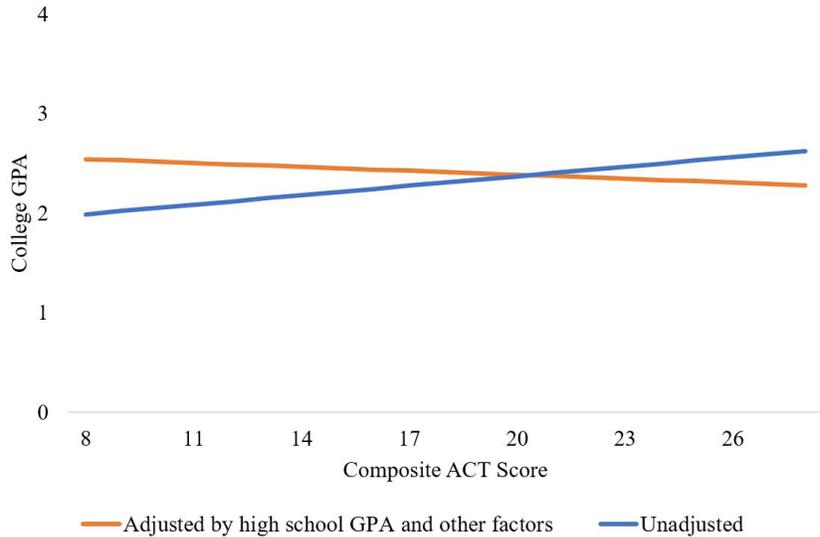


High school GPA was by far the strongest predictor of college GPA.

A 1.0 point increase in both cumulative and senior year GPA was associated with a 0.74 increase in college GPA.

Key Findings

Students with higher ACT scores tended to have higher college GPAs. However, after adjusting for high school GPA, there was no relationship between ACT scores and college GPA.



Students who took AP courses tended to have a higher college GPA. However, after adjusting for high school GPA, there was no difference in the college GPA of students who did or not take AP courses.

Does ACT equalize the admissions process for students attending different schools?

One argument for including ACT in the college admissions process is it provides a standard measure of student ability that is independent of their school or district. With this logic, including ACT scores in the model would theoretically account for school differences in the college performance of students. This was not found in our study. Even after accounting for ACT scores, participation in AP, and high school GPA, the high school a student attended remained a significant predictor of their college success; these factors did not explain any of the differences in college GPA attributable to what high school they attended. This finding is consistent with other recent research out of Chicago (Allensworth & Clark, 2020) where they found the strength of the relationship between which high school you attend and your success in college is much greater than the relationship between ACT scores and success in college.

What is lost by not including ACT scores in the college admissions process?

Since ACT scores were unrelated with college GPA, excluding ACT scores in the admissions process would not have subtracted from the ability of college admissions offices to predict the success of students. As has been discussed, measures of GPA were the only significant factors that predicted college success in this study.

Discussion

At its core, GEAR UP is designed to promote equity in access to college and careers. It does this by providing students, often low-income, college-focused supports and resources they are disproportionately less likely to receive, relative to high-income peers. Our previous studies of MPS GEAR UP have found participation to be associated with increased AP course participation⁹ and improved on-time graduation rates (Jones & Gilman, 2019). While the current study was not able to prove that access to GEAR UP resources impacted student college success, it does show that nearly all MPS students in these eight GEAR UP schools who attended college full-time participated in a number of GEAR UP-sponsored activities on their path to college.

Beyond GEAR UP, the results of this study also inform a larger discussion of whether colleges should continue to require students to submit standardized test scores as part of their applications, especially given how education has changed in response to the COVID-19 crisis. On one side are advocates for equity that argue the ACT and SAT are biased assessments that discriminate against persons of color and those without the means to take the assessments multiple times or to participate in test preparation activities. This was reflected in the experiences of former GEAR UP students who, in a focus group, identified ACT prep as a critical service provided to them by GEAR UP.¹⁰ Without GEAR UP, they did not believe they would have been as prepared to take the ACT and likely would have scored lower. On the other side of the argument are college admissions offices and the College Board who argue that the assessments are necessary for measuring aptitude independent of the local quality of schooling and course grading policies. Yet, the results of this study question whether the ACT should be as important as it generally is for college admissions. Although this study only includes students in MPS, and therefore may not be generalizable to other school district or colleges, its findings are consistent with a growing body of evidence that suggests individual results of the ACT or SAT may be of limited use for identifying students likely to succeed in certain colleges (Allensworth & Clark, 2020; Geiser & Santelices, 2007).



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Endnotes

- ¹ <https://wisedash.dpi.wi.gov/Dashboard/portalHome.jsp>
- ² <https://fivethirtyeight.com/features/race-gap-narrows-in-college-enrollment-but-not-in-graduation/>
- ³ <https://www.washingtonpost.com/education/2020/04/14/how-covid-19-has-laid-bare-vast-inequities-us-public-education/>
- ⁴ <https://www.nytimes.com/2020/04/15/us/sat-act-test-optional-colleges-coronavirus.html>
- ⁵ <https://www.wsj.com/articles/cornell-to-drop-sat-and-act-for-admissions-next-year-due-to-coronavirus-11587578439?mod=searchresults&page=1&pos=1>
- ⁶ <https://www.insidehighered.com/news/2015/09/03/sat-scores-drop-and-racial-gaps-remain-large>
- ⁷ <https://www.nytimes.com/2019/03/12/arts/huffman-loughlin-college-scandal.html>
- ⁸ <https://www.chronicle.com/article/Covid-19-Prompts-College-Board/248537>
- ⁹ The increase in AP course participation was determined as part of required grant reporting to DOE.
- ¹⁰ <https://uwm.edu/sreed/wp-content/uploads/sites/502/2020/05/GEAR-UP-EOP-Focus-Group-Report.pdf>
- ¹¹ Fall-to-Fall data was not available for the 2018 graduating cohort.
- ¹² MATC does not ask all students to submit ACT scores as part of their admissions application while UWM does.
- ¹³ Point-Biserial correlations were used when correlating binary variables.

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Data sharing and organization

We worked closely with the Milwaukee Public Schools (MPS), UW – Milwaukee (UWM), and Milwaukee Area Technical College (MATC) in the design and execution of this study. MPS provided high school transcripts, ACT scores, GEAR UP participation, post-secondary college enrollment, and demographic data for graduating students attending the eight schools engaged in the GEAR UP program during the 2015, 2016, 2017, and 2018 school years. From MPS transcript data, we calculated both an overall high school GPA and a senior year GPA and identified students who had participated in AP classes. Thus, the following data points were derived from MPS data:

- Overall high school GPA
- Senior year GPA
- Participation in AP classes (Yes or No)
- Cumulative ACT score
- College attended after graduating
- Gender
- Race/Ethnicity
- High school enrolled in
- Free/Reduced lunch eligibility
- Whether the student has an IEP (Yes or No)
- Participation in GEAR UP (Yes – graduated in 2018 or 2017; No – graduated in 2016 or 2015). We planned to include a more nuanced measure of participation in GEAR UP but ultimately decided to measure participation as either yes or no. Nearly all students included in the study who were part of a GEAR UP cohort attended a number of GEAR UP activities. As such, the decision was made to simply compare students from the GEAR UP cohorts to students graduating before GEAR UP.

UWM and MATC provided course performance data for freshman who graduated from the eight GEAR UP schools and directly enrolled between the Fall of 2015 and the Fall of 2018. The data included the number of credits attempted and earned, both fall and spring semester GPA, which high school they attended, Fall-to-Spring or Fall-to-Fall¹¹ retention, and whether they took remedial or credit-bearing English and math courses. For the current study, we were interested in the overall GPA of students who attempted at least 12 credit hours their freshman year of college.

MPS data were combined with UWM and MATC data to create the dataset used for the analysis. We used on-time, four-year high school graduates from MPS as a baseline file for MPS records. Matching between MPS records and UWM and MATC records was done by student name, birth date, and school. Afterwards, manual matching was done. We also worked with the three institutions to clarify cases where college enrollment data provided by MPS did not match MATC or UWM data. Ultimately, of the 783 students who directly entered MATC from the 2015 through 2018 graduating cohorts, 23 (2.9%) students were not matched. Of the 193 GEAR UP students directly entering UWM, 14 (7.3%) were not matched.

Analysis procedures

Bivariate correlations identified the simple, unadjusted relationships between study variable. Hierarchical linear modeling (HLM), with students nested within the eight GEAR UP schools, was then used to measure the unique relationships of study variables with first-year college GPA. This model included all study factors to determine which were the most important for predicting college success (first-year college GPA). All model factors were centered around the grand mean, such that the model intercept represents the adjusted average college GPA. The model was written as,

$$Y_{ij} = \gamma_{00} + \gamma_{10}(MATC_{ij}) + \sum_{m=1}^M \beta_{20.m}X_{mij} + \gamma_{30}(ACT_{ij}) + \gamma_{40}(OVRALGPA_{ij}) \\ + \gamma_{50}(SRGPA_{ij}) + \gamma_{60}(AP_{ij}) + \gamma_{70}(GU_{ij}) + u_{0j} + r_{ij}$$

Where γ_{10} represents the difference in college GPA between students attending MATC and UWM;

(MATC) is 1 if the student was enrolled in MATC, 0 if UWM;

$\sum_{m=1}^M \beta_{20.m}X_{mij}$ is a vector of m number of student-level demographic characteristics (gender, race, FRL);

γ_{30} is the relationship of a student's ACT composite score with their college GPA;

γ_{40} is the relationship between a student's overall high school GPA and their college GPA;

γ_{50} is the relationship between a student's senior year GPA and their college GPA;

γ_{60} is the relationship between a student's participation in AP classes and their college GPA;

AP_{ij} is 1 if a student attempted at least one AP course;

γ_{70} is the relationship between whether a student was part of the GEAR UP cohort and their college GPA;

GU_{ij} is 1 if a student was part of a GEAR UP cohort.

Results

Unadjusted results

Table 1 presents the descriptive statistics of school performance results for this sample. About three-fourths of students had participated in at least one AP class. Also, college GPAs were somewhat lower on average (2.30) than overall high school (2.55) and senior year (2.68) GPAs.

Table 1: Student performance results

	Average	Min.	Max.	Std. Dev
College GPA	2.30	0.00	3.96	0.89
ACT Composite score	16.51	8	27	3.20
Overall high school GPA	2.55	1.09	3.98	0.62
Senior year GPA	2.68	0.57	4.00	0.69
Participation in AP	73%	-	-	-

Bivariate correlations are presented in Table 2. From these, high school GPA was the most correlated with college GPA (Overall high school GPA: $r = .437, p < .01$; Senior Year GPA: $r = .441, p < .01$); MPS students with higher high school GPAs tend to have higher college GPAs. ACT scores and participation in AP courses were somewhat related to college GPA, but much less so (ACT: $r = .123, p = .009$; AP: $r = .123, p = .10$). Specifically, high school GPA was 13 times more predictive of college GPA than ACT scores or AP participation. Being part of the GEAR UP cohort was not associated with college GPA ($r = .010, p = .827$). It was somewhat associated with lower ACT though ($r = -.113, p = .017$), which may be an artifact of the finding in a previous study of GEAR UP that high school graduation rates improved for the graduating GEAR UP student cohorts (Jones & Gilman, 2019). As a larger percentage of students graduates from high school, the graduating class includes more students with lower ACT scores. Regarding other measures of high school performance, students with better grades were more likely to take AP classes and score higher on the ACT. Students who participated in AP classes had a higher overall GPA ($r = .350, p < .01$), a higher senior year GPA ($r = .156, p < .01$), and higher ACT scores ($r = .325, p < .01$).

Table 2: Correlations of school performance factors¹³

	College GPA	ACT Composite score	Overall high school GPA	Senior year GPA	Participation in AP	GEAR UP Cohort
College GPA	1					
ACT Composite score	.123**	1				
Overall high school GPA	.437**	.415**	1			
Senior year GPA	.441**	.258**	.775**	1		
Participation in AP	.123**	.325**	.350**	.156**	1	
GEAR UP Cohort	0.01	-.113*	-0.063	-0.045	-0.028	1

Results

Adjusted results

The results of the unconditional model suggest 5.6% of differences in students' college GPA was attributable to which high school they attended ($ICC = .0556, p < .001$), which means the majority of what determined college GPA was attributable to individual student characteristics.

Results of the full model, including all student factors, are presented in Table 3. When including all student factors together, the only uniquely predictive factors were overall high school GPA ($\gamma_{40} = .411, p < .01$) and senior year GPA ($\gamma_{50} = .332, p < .01$). Neither ACT scores nor AP class participation predicted college GPA (ACT: $\gamma_{30} = -.013, p = .353$; AP: $\gamma_{60} = .101, p = .285$). This model did not explain any of the differences between schools but did explain 22.7% of individual differences in college GPA. Being part of GEAR UP was not associated with college GPA ($\gamma_{70} = .067, p = .378$).

Table 4: Model results predicting college GPA

	Effect	Robust Std. Error	p-value
Intercept	2.279	0.092	<0.001
Attended MATC	0.096	0.099	0.335
Female	0.033	0.077	0.673
Eligible for free or reduced lunch	-0.011	0.089	0.901
ACT Composite score	-0.013	0.014	0.353
Overall high school GPA	0.411	0.111	<0.001
Senior year GPA	0.332	0.087	<0.001
Student is African American	0.008	0.126	0.947
Student is Latinx	0.082	0.131	0.530
Student is White	-0.060	0.148	0.686
Participation in AP	0.101	0.094	0.285
GEAR UP Student	0.067	0.076	0.378