

# UNDERSTANDING STUDENT GPA

## INTRODUCTION

As a student of Stephen F. Austin State University have you ever wondered about the efficacy of your weekly habits as it relates towards your cumulative college GPA? Have you ever been curious of students with a higher GPA (grade point average) spent their free time than those with a lower GPAs? We decided to test various weekly habits of the everyday college student to discover if their actions are in fact a determinant of college GPA.

We find this topic to be pertinent, because our main goal is to make students more aware of that there is a clear relationship between the way they spend their free time and their current cumulative college GPA. By assaying this, we hope to incite students to take advantage of the time they have and apply it to more constructive opportunities so they may have a reflective positive return on their GPA. Furthermore, we predicted that students with a higher GPA better utilize their time and avoid too many distractions than those with a lower GPA. We are very excited to see the results of our work and be able to put it to use for the benefit of the students on the SFA campus.

Statistics Summary						
	Current GPA	Female	HS GPA	Partying per Week	Exercise per Week	White
Mean	2.88929731	0.61385136	3.39074257	1.51483448	5.41891089	0.44544534
Standard Error	0.00481973	0.0468863	0.00170461	0.34979209	0.32089951	0.04979236
Median	2.87	1	3.43	1	4	0
Mode	2.5	1	3.5	1	4	0
Standard Deviation	0.58622944	0.48929264	0.41949872	1.44447061	5.28317856	0.89950195
Sample Variance	0.343782182	0.23949594	0.17592687	2.09227728	27.9118602	0.809081
Minimum	1.4	0	2.5	0	0	0
Maximum	4	1	4.5	7	28	1

Correlation Matrix						
	Current GPA	Female	HS GPA	Partying per Week	Exercise per Week	White
Current GPA	1					
Female	0.208715152	1				
HS GPA	0.371797558	0.189454031	1			
Partying per Week	-0.176231845	-0.030357085	-0.00229134	1		
Exercise per Week	0.104663244	-0.164313457	0.024802679	0.343018749	1	
White	0.352435596	0.097226091	0.212502927	-0.08372397	0.098560703	1

## DATA

**Current GPA:** The average current GPA is 2.889, the minimum GPA was 1.4, and the maximum GPA was 4.0. This average of current GPA was relatively close to other averages estimated by previous projects.

**Female:** The average mean of females is 0.614, which means that females are on average 61% of the population here at Stephen F. Austin State University. The female variable was a dummy variable in our regression equation.

**HS GPA:** The average high school GPA was 3.391 on a 4.0 scale. The minimum high school GPA was 2.5 and the maximum was 4.5. We believe that this range is an accurate sample of the

**Partying Nights per Week:** The average number of nights a student parties per week is 1.515, according to our summary statistics. The minimum number of night a student parties is 0 while the maximum number of nights is 7. This maximum number seems unlikely because it is highly unlikely that someone parties every day of the week for every week of the year.

**Exercise Hours per Week:** The average number of exercise hours per week is 5.411 hours. The minimum exercise hour is 0 and the maximum is 28 hours.

**White:** This variable is a dummy variable in our regression and it was chosen because White had the greatest percentage of all ethnicities we sampled. It had a mean of 0.446.

## EVALUATING THE REGRESSION

### Goodness of Fit

Our Adjusted R<sup>2</sup> was .23 which means that 23% of the variation in Current GPA is explained by our model. Our Adjusted R<sup>2</sup> of .23 was fairly good considering that human behavior is known to be difficult to model, as expected.

### Significant Variables

The significant variables in our regression are HS GPA and White because both of their p-values fall under our alpha of 0.05. HS GPA has a p-value of 0.003 and White has a p-value of 0.007. The next closest significant variables in our regression that was deemed relevant was Partying Nights per Week, with a p-value of 0.06, and Exercise per Week, with a p-value of .098, because their p-value fell under an alpha of 0.1. The other variables in our regression had p-values greater than or equal to alpha 0.1 so they were not significant variables.

### Signs and Magnitudes

When looking at the signs and magnitudes of our variables in our regression we agree that the coefficients of our variables correctly state the relationship we expected with our dependent variable, Current GPA. We expected the variables of Female, HS GPA, Exercise Hours per Week, and White to have positive coefficients because these variables are expected to increase Current GPA. Partying Nights per Week was expected to have negative coefficients as an increase in these variables would decrease Current GPA.

### Sample Size

Large samples always lead to more accurate predictions. For our project we sampled over 100 people on campus. While sampling people we assured them that their information would be kept private and anonymous by having a box for their results and in return we hoped for their honest results. If we had every student on campus take this survey our prediction of a student's Current GPA should be closer to their actual Current GPA than the prediction we have obtained with only 100 samples.

### Potential Variables Left Out

Potential variables left out that would have contributed to our project would be if they're in a relationship or not, if they are a part of the university Greek system, and a rating of their test taking abilities from 1 – 10.

### Irrelevant Variables

The variable with the highest p-value in our regression was Female. This indicated that whether or not the student was Female had a minimal effect on their current GPA. Although, with an alpha just over .1 we deemed it as minimal because we were mainly concerned with variables with alphas below .1 or .05 as these variables impacted GPA much more greatly.

SUMMARY OUTPUT							
<b>Regression Statistics</b>							
Multiple R		0.518					
R Square		0.269					
Adjusted R Square		0.230					
Standard Error		0.514					
Observations		101					
<b>ANOVA</b>							
	df	SS	MS	F	Significance F		
Regression	5	9.239	1.848	6.983	1.35368E-05		
Residual	95	25.139	0.265				
Total	100	34.378					
		<b>Coefficients</b>	<b>Standard Error</b>	<b>t Stat</b>	<b>P-value</b>	<b>Lower 95%</b>	<b>Upper 95%</b>
Intercept		1.366	0.430	3.175	0.002	0.512	2.220
Female		0.176	0.109	1.613	0.110	-0.040	0.392
HS GPA		0.383	0.128	3.000	0.003	0.130	0.636
Partying per Week		-0.072	0.038	-1.875	0.064	-0.148	0.004
Exercise per Week		0.018	0.011	1.672	0.098	-0.003	0.039
White		0.292	0.107	2.736	0.007	0.080	0.504

## EXECUTIVE SUMMARY

As a student of Stephen F. Austin State University, I was intrigued to find a relationship between student living habits and cumulative college GPA (grade point average). The manner in which we conducted our project was to randomly distribute and collect surveys from the student body. Our survey was comprised of many variables but the ones held statistical significance in our model were: current GPA, female, High school GPA, partying nights per week, exercise hours per week, and ethnicity.

With these statistically significant variables we were able to generate our own predicted GPA's and compare them with our actual GPA's, to interpret how accurate our model is. For group member Malcolm Recinos, his predicted GPA was 2.579 and his actual GPA was 2.9. Lastly, for group member Carla Torres, her predicted GPA was 2.855 and while her actual GPA was 2.6. After running the regression equation against our actual GPA's, we have inferred that our statistical model is on average a reasonable estimate of actual GPA's.

My overall goal of this project is to make these results accessible to all SFA students because I want to make students more aware of their everyday habits and how it corresponds positively or negatively in relation to their current college GPA. I would set up a simple generator, based on my results, and make it available to various resources on campus such as the AARC (Academic Assistance and Resource Center), the student help desk, and even the campus recreational center in hopes that students will utilize what I've learned and apply it towards better understanding where their time could be more effective in areas that would boost their GPA.

## CONCLUSION

The purpose of our project was to effectively prove that certain aspects of a student's weekly activities have a positive or negative relationship when comparing it to cumulative college GPA. We have come to the conclusion that having a high High School GPA, the ethnicity of the student, if the student is male or female, and the amount of hours a student exercises per week are clear positive affective factors in adequately predicting changes to Current GPA.

In the future our research can be furthered by increasing the sample size and including omitted variables in the survey to get a more accurate regression equation for more efficient predictions of student's Current GPA. With our research we hope to be able to persuade more students on campus to take advantage of their time and utilize resources on campus such as the recreation center or even the Academic Assistance and Resource Center (AARC). By having people put in their information into our regression equation at one of the accessible locations on campus we hope our project results will make students more aware of how they could increase their Current GPA if they took advantage of the resources SFA has to offer.

## GPA PREDICTION

$$\hat{y} = 1.365 + .176(\text{Female}) + .389(\text{High School GPA}) - .72(\text{Partying per Week}) + .012(\text{Exercising per Week}) + .292(\text{White})$$



\* Submitted by: Justin Rodriguez  
 \* Prepared by: Justin Rodriguez, Malcolm Recinos, and Carla Torres  
 \* Faculty Sponsor: Ryan Phelps (Economics and Finance)  
 \* Nelson Rusche College of Business at Stephen F. Austin State University

