

Prediction Error for UC Freshman GPA Using High School GPA and SAT Scores

Overview

As demonstrated in Geiser with Studley¹ and other research, high school GPA (HSGPA) and admissions test scores are among the best available predictors of UC freshman GPA (UCGPA). There is a measurable relationship, *on average*, between a student's high school grades and test scores and his or her college performance. However, the predictions these factors yield for *individual students* are not very precise.

Details

The accompanying chart shows prediction intervals for a student with HSGPA = 3.84, SAT I = 1213, and SAT II = 1789.² Using a student's HSGPA alone to predict his or her UCGPA yields an expected UCGPA of 2.9219, and this estimate has an 80 percent confidence interval of 2.194 to 3.650. This means that if 100 UC applicants have an HSGPA of 3.84, 80 of them can be expected to earn a UCGPA between 2.194 and 3.650; the remaining 20 would be expected to achieve a UCGPA outside this interval. Note that the width of the interval is fairly large, 1.457 grade points.

Adding SAT II to the model improves the prediction, but not by much: the 80 percent prediction interval narrows to the range 2.223 to 3.621. This interval has a width of 1.398 grade points, 0.059 grade points less than the prediction interval based on HSGPA alone.

Adding SAT I to a model that already contains HSGPA and SAT II produces almost no further improvement to the prediction. The interval narrows slightly to 2.224 to 3.620, which has a width of 1.396 and is only 0.002 grade points smaller than the prediction interval based only on HSGPA and SAT II.

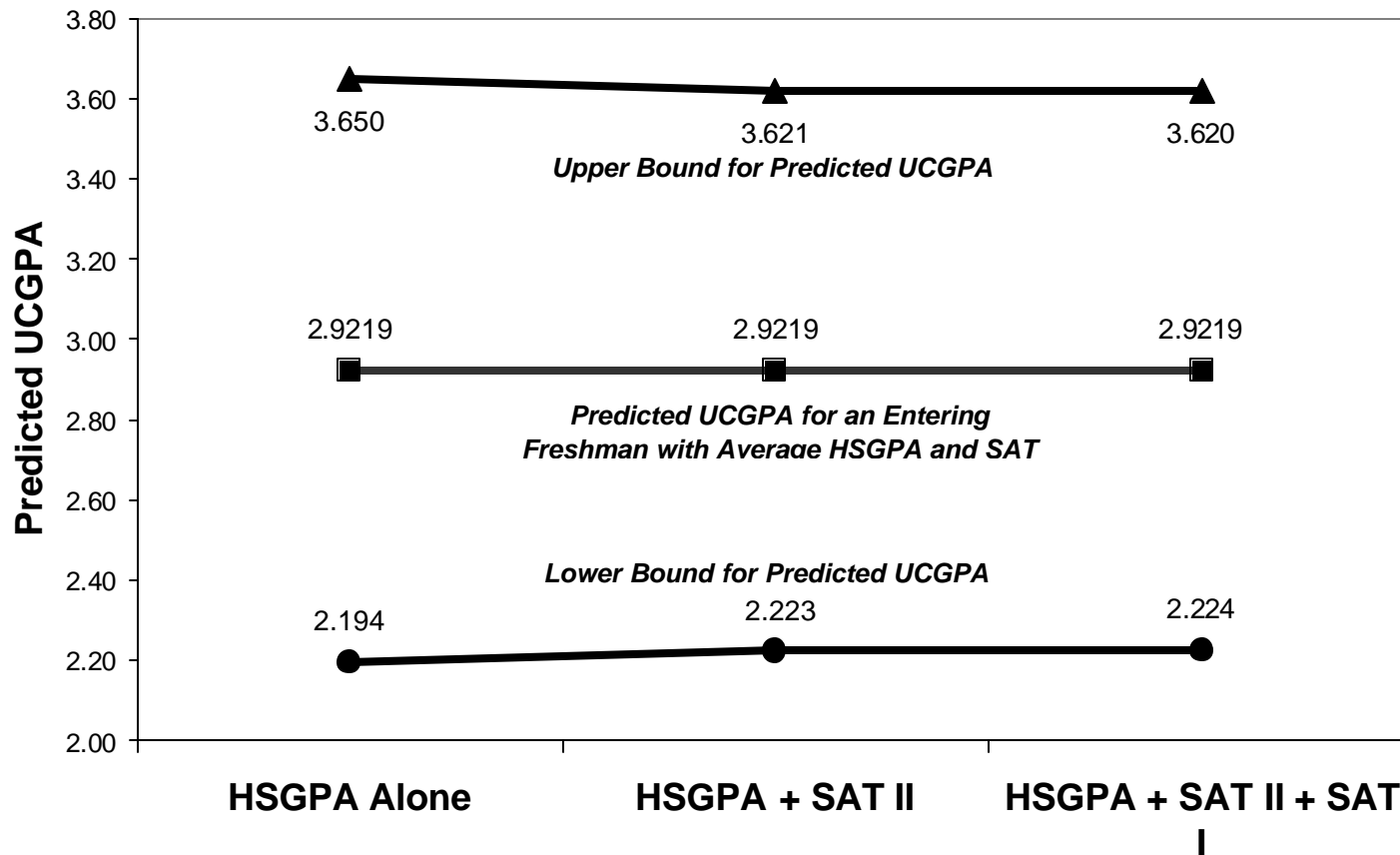
If SAT I had been added to the model before SAT II, the pattern of results would be similar, although the SAT I improvement would likely be smaller than 0.059 and the SAT II improvement (on top of HSGPA + SAT I) would be corresponding larger. This is due to the fact that, individually and in combination, the SAT II has been demonstrated, in general, to be a slightly better predictor of UCGPA than the SAT I.³

¹ Geiser, Saul with Roger Studley, 2003. UC and the SAT: Predictive Validity and Differential Impact of the SAT I and SAT II at the University Of California. *Educational Assessment*, 8(1) 1-26.

² Since prediction intervals differ for students with different characteristics, it is necessary to display them for a student with a specific set of characteristics. The numbers we have chosen represent the average HSGPA, SAT I, and SAT II in the sample data.

³ See Geiser and Studley (2003) for details.

Predictions Bands for UC Freshman GPA Using HSGPA and SAT Scores as Predictors (@ 80% Confidence Level)



Source: Based on regression analysis of 77,893 freshmen entering UC between 1996 and 1999. Predictions are based on sample averages for entering freshmen: HSGPA = 3.84, SAT I = 1213, and SAT II = 1789. SAT II is a composite of the three subject exams required by UC: SAT II Writing, SAT II Math, and a third SAT II examination in a subject of the student's choice.