Article

NASSP Bulletin
2014, Vol. 98(4) 261–279

DOI: 10.1177/0192636514565171
bul.sagepub.com
SAGE

Comparing Weighted and Unweighted Grade Point Averages in Predicting College Success of Diverse and Low-Income College Students

Russell T. Warne[1], Chanel Nagaishi[1], Michael K. Slade[1], Paul Hermesmeyer[2], and Elizabeth Kimberli Peck[3]

Abstract

While research has shown the statistical significance of high school grade point averages (HSGPAs) in predicting future academic outcomes, the systems with which HSGPAs are calculated vary drastically across schools. Some schools employ unweighted grades that carry the same point value regardless of the course in which they are earned; other schools use weighting systems that assign greater value to grades earned in honors courses. Due to these inconsistencies, comparison of HSGPAs from different schools is difficult or impossible. We coded 710 transcripts from undergraduate students involved in the Joint Admissions Medical Program in Texas. All grades were standardized on an unweighted 4.0 scale in order to compare the effectiveness of weighted and unweighted HSGPAs. Using multiple regression and multiple logistic regression models, we were able to determine the predictive power of HSGPAs on four outcomes: college grade point average (CGPA), Medical College Admissions Test (MCAT) scores, the likelihood of students taking the MCAT, and the likelihood of students graduating from medical school. Our results demonstrated that unweighted HSGPAs were better predictors of CGPA, but that neither type of HSGPA was a useful predictor for the other outcomes. We recommend

[1]Utah Valley University, Orem, UT, USA
[2]Joint Admission Medical Program, Austin, TX, USA
[3]Texas Tech Health Sciences Center, Lubbock, TX, USA

Corresponding Author:
Russell T. Warne, Department of Behavioral Science, Utah Valley University, 800 W. University Parkway MC 115, Orem, UT 84058, USA.
Email: rwarne@uvu.edu

discontinuation of the use of weighted HSGPAs in assessing the likelihood of student success in higher education.

Keywords
high school, grade point averages, multiple regression, academic achievement, diverse students

At most 4-year universities, admissions personnel use similar criteria when selecting future students from a pool of applicants. Standardized test scores—such as the SAT—and high school grade point average (HSGPA) are among the most widely used data for determining admission into college (Zwick, 2006). According to Sadler and Tai (2007), HSGPA carries more weight than any other factor in the college admissions process. Similarly, Zwick (2006) reported that GPA and class rank are two of the four most important criteria (along with standardized test scores and evidence of advanced coursework) to consider when deciding whether a student will be admitted to college. Furthermore, a recent survey showed that the only criteria that a majority of college admissions officers deemed to be of "considerable importance" were grades in college preparation courses (84.3%), the strength of a student's curriculum (67.7%), standardized college admission tests scores (59.2%), and overall HSGPA (51.9%; Clinedinst, Hurley, & Hawkins, 2012, p. 34).

HSGPA and standardized test scores are probably frequently used by college admissions personnel because they are some of the best available predictors of college success (Zheng, Saunders, Shelley, & Whalen, 2002). Geiser and Santelices (2007) concluded that college performance (as measured by freshman CGPA, sophomore CGPA, and persistence) was best predicted by HSGPA, and both HSGPA and SAT scores have been shown to have predictive power ($R^2 = .43$) in a student's future collegiate success (see also Kirby, White, & Arguete, 2007). Often high SAT scores, coupled with a high HSGPA, correlate with a high college grade point average (CGPA) and increased retention (Camara & Echternacht, 2000). Other research has documented the success of these variables in predicting college outcomes (e.g., Cohn, Cohn, Balch, & Bradley, 2004; Hoffman & Lowitzski, 2005; Mattson, 2007; Waugh & Micceri, 1994; Wolfe & Johnson, 1995; Zheng et al., 2002).

While measures such as an SAT score are standardized across the nation, HSGPA calculations vary from state to state, and even within the same institutions at different times (Vickers, 2000). Currently, there is no uniform system for calculating and reporting HSGPAs (Downs, 2000; Mays, Mortimer, Roller, & Washington, 2007), and some states give complete discretion to district and school personnel in deciding how to calculate HSGPAs (Lang, 2007). This poses a major problem for college admissions officers, who may be unfamiliar with a school's method of calculating GPA, or who may need to compare weighted and unweighted grades recorded in high school transcripts. In these cases, comparison may be impossible (Lang, 2007). Often college admissions officers will not assign extra points to an unweighted HSGPA even if a student's transcript displays honors or Advanced Placement (AP) classes, placing students with weighted grades at an advantage because of the additional points awarded to them by their high school for grades earned in advanced courses (Cognard, 1996; Downs, 2000; Mays et al., 2007). Because students in challenging courses in settings where weighting is not used may not receive benefits on their transcripts for taking difficult courses, unweighted grading systems may disincentivize students to enroll in more academically rigorous classes (Lang, 2007; Norton, 2008). In other words, if the goal of a student is to maintain the highest GPA for college admissions, there is little reward in challenging oneself if the student's high school uses an unweighted GPA system.

In his 2007 article, Lang described different methodologies for weighting GPAs and showed how each is inherently flawed. Lang surveyed 198 of the largest school districts in the United States to gather their methods for weighting GPAs. The results of his survey showed that 80% of the respondents added additional weight to AP and/or honors classes in order to determine class rank. Additionally, almost two-thirds of the total surveyed reported weighting in their determination of valedictorian. Norton (2008, p. 19) found similar results in a survey of American high school counselors in which 75.7% of respondents indicated that their school used weighted GPAs. AP courses (91.6%) and honors courses (75.3%) were the only course types that were weighted by more than half of high schools where weighting occurred.

Of the methods used to weight grades, the Bonus Point procedure, which involves augmenting grade points in specific courses before calculating the total GPA, was most common in Lang's (2007) and Norton's (2008) studies. There are four variations of this procedure that Lang identified: GPA(+), GPA(x), Percentage(+), and Percentage(x). GPA(+), the most prevalent method, involves adding a full grade point to an unweighted grade. As a result, an A is worth five points, a B worth four points, a C worth three points, and so on. In the GPA(x) weighting system, the bonus point is multiplied by the unweighted grade point; frequently a factor of 1.25 is used, making an A worth five points, but a B worth 3.75. Percentage(+) and Percentage(x) involve methodologies similar to their GPA counterparts, but these methods are used in districts that keep a running average of students' percentages in courses.

Researchers have demonstrated the disadvantages of weighting GPAs in both additive and multiplicative methods. For example, in the GPA(+) method if one student earns an A, their grade would be worth five points rather than the standard four, which would be a 25% inflation (Lang, 2007; Nemecek, 1978). However, a student who earns a B (and subsequently earns four points instead of three points) has a grade that is inflated 33%. This means that students who do not do as well in the class get rewarded more than do students who earn As. Lang (2007) explained that students are receiving "different incentives for enrolling in the same course" (p. 44; see also Nemecek, 1978). While some schools try to address flaws in weighting procedures by developing different methods, this may create additional problems by implementing a system that is difficult to interpret and makes comparisons across campuses impossible.

Another problem inherent in weighting GPAs is that weighted GPAs provide an incomplete or inaccurate portrait of a student's high school career because school policies may place a limit on how many courses can be counted toward a student's GPA (Lang, 2007; Norton, 2008). These policies are often made to compensate for situations where students may be penalized by a weighted GPA system for taking additional elective courses—even if they earn high grades in those elective courses (which are rarely weighted). Thus, in an attempt to level the playing field with other students, these additional courses are not counted toward GPA calculation. However, by placing constraints on how many courses are counted toward a student's overall GPA, schools are not rewarding students for classes they have completed in addition to the school's required course load (Guskey, 2014; Lang, 2007).

Downs (2000) criticized weighting GPAs, claiming that while weighted grades encourage students to take academically rigorous courses, they subsequently discourage enrollment in "courses of interest that would enrich [students'] lives" (p. 8). Mays et al. (2007) also noticed this decreased enrollment in elective courses in schools with weighted GPA grading systems. As a result, high schools are limiting their offerings of noncore courses as enrollment numbers for them dwindle.

Some researchers (e.g., Downs, 2000; Norton, 2008) have expressed concerns about the implications weighting GPAs has on college admissions, claiming that students with weighted GPAs possess an advantage over students with unweighted GPAs. This is because admissions officers often do not take the time to recalculate weighted GPAs for students whose high schools use an unweighted GPA system. The students from schools with unweighted GPAs are then placed at a disadvantage as "a difference in a few points in GPA may mean the difference between acceptance and rejection" (Vickers, 2000, p. 141). In a college admissions system where HSGPA carries more weight than many other factors (Sadler & Tai, 2007), the inequality that results from inconsistently weighted GPAs is problematic.

Nonetheless, there is a place for weighted GPAs. According to Sadler and Tai (2007, p. 11), "If large differences in college performance exist based on taking advanced courses, then weighted HSGPAs make sense. If the differences are small, unweighted HSGPAs will do." In this regard, weighted GPAs are useful when they consistently predict college outcomes. Sadler and Tai found this to be true, as students in the study who enrolled in more advanced high school courses—for example, honors and AP—performed better in their college science courses than students who did not take advanced courses. One drawback of this study is that the authors built their own weighting scheme from the data they collected rather than using the weighting schemes employed by the students' high schools. Therefore, they maximized the predictive power of weighted HSGPAs in their data set. In the current system where weighting methods remain unstandardized among schools, Sadler and Tai's findings of the benefits of weighted GPAs may not apply.

The purpose of this study is to compare the effectiveness of unweighted and school-produced weighted HSGPAs in predicting four college outcomes: (a) the student's College Grade Point Average (CGPA), (b) undergraduate premedical program attrition, (c) the score students achieved on the Medical College Admission Test (MCAT), and (d) whether students completed medical school. In this study, we coded 710 transcripts of Joint Admissions Medical Program (JAMP) applicants in order to determine the effectiveness of weighted and unweighted GPAs in predicting four academic outcomes. Weighted GPAs were calculated and recorded by high school staff on students' transcripts. Because of the inconsistency among high schools in weighting methods and the problems of weighting that we discovered in our literature review, we hypothesized that unweighted HSGPAs would be a consistently stronger predictor of JAMP student outcomes than weighted HSGPAs.

Method

Sample

This article is an update to a preliminary version of this study (Nagaishi, Slade, Warne, Wright, & Hermesmeyer, 2012). The sample reported in that study was amplified by new data. The current sample consisted of all 710 students from the first seven annually admitted cohorts of JAMP participants, all of whom were following a premedical course of study in their undergraduate education. JAMP was created in 2001 in order to "enhance opportunities for economically disadvantaged students from across [Texas]" (Dalley et al., 2009, p. 1373), as well as to increase the number of physicians in underserved rural and inner city areas of Texas (Thomson, Ferry, King, Martinez-Wedig, & Michael, 2003).

Students interested in JAMP apply for the admission in their sophomore year of college and are selected based on quantitative data (e.g., SAT scores, high school rank, and GPA) and qualitative data (e.g., evidence of a strong work ethic, a desire to serve others, communication skills, motivation to serve one's home community in the medical profession). JAMP applicants are required to demonstrate their low-income status in order to be considered for the program (Dalley et al., 2009; Podawiltz et al., 2012). After acceptance, JAMP participants are involved in enrichment activities to prepare them for medical school, and they are guaranteed acceptance into a Texas medical school if they maintain a 3.25 CGPA and score at least a 23 (changed to 25 for entering cohort in 2014) on the MCAT (Dalley et al., 2009). Because of the rigorous nature of the program, students who apply to JAMP are typically high academic achievers (Dalley et al., 2009).

Of the students admitted to JAMP, 166 (23.4%) were White, 83 (11.7%) were African American, 248 (34.9%) were Hispanic, 186 (26.2%) were Asian/Pacific Islander, and 27 (3.8%) were members of other or unknown racial/ethnic groups. Two thirds of the students (476, or 67.0%) were female and 234 (33.0%) were male. One of the students who had attended high school overseas did not have a transcript that we could code. We used listwise deletion to eliminate any students who were missing data on any variables, which produced an n ranging from 172 to 516.

Variables

Grade Point Average. We collected all high school data for this study from high school transcripts submitted as part of students' JAMP applications. It was from

Table 1. Coding System for Calculating Unweighted Grade Point Averages.

Percentage	Letter	Grade points
93-100	A	4.000
90-92	A−	3.667
87-89	B+	3.333
83-86	B	3.000
80-82	B−	2.667
77-79	C+	2.333
73-76	C	2.000
70-72	C−	1.667
67-69	D+	1.333
63-66	D	1.000
60-62	D−	0.667
0-59	F	0.000

these transcripts that we collected all of the high school data for this study. GPAs were often calculated based on a weighted system and reported as such. Because Texas has no restrictions concerning weighting, maximum GPAs at a high school ranged from 4.0 to over 100. This is because some high schools used a point system (usually a 4-15 point scale), while others used a percentage.[1] The HSGPAs that were reported on students' transcripts (calculated by high school personnel) were recorded as the weighted HSGPA. We decided to use the weighted GPA created by the students' high schools because we believed that this would likely be the information that university personnel would use when making an admissions decision about a candidate. We believed that this operationalization of weighted HSGPA was more realistic than Sadler and Tai's (2007) approach of constructing their own weighting system from the data.

To produce unweighted GPAs, we used the scale displayed in Table 1. When both a letter grade and a percentage were reported for a particular course—as was the case on some transcripts—the letter grade was given precedence. All graded courses were included in our overall unweighted HSGPA calculation unless a class grade was P (passing). Additionally, work release, release time, and other ungraded courses were not counted toward GPA calculation, even if the student attended the class during school hours. Any courses the student enrolled in before their freshman year of high school were not included. Graded extracurricular activities (e.g., band, athletics) and electives were included in the overall GPA calculation.

After HSGPAs were recorded, we verified the reliability of our data by recoding a randomly selected 20% of the transcripts. The percentage of agreement between the first and second codings for different cohorts of admitted students ranged from 97.8% to 99.3%, with transcripts coded later showing higher agreement, likely because we became more adept at transcript coding. This rate of agreement was sufficiently high to conclude that it was not necessary to recode every transcript.

Standardized High School Rank. Students' high school ranks and the graduating class sizes were reported on most students' high school transcripts. To control for varying graduating class sizes (which ranged from 5 to 1,277), we calculated the percentage of students in the graduating high school class who were ranked lower than the JAMP student.

SAT Scores. JAMP applicants were also required to report a standardized college admissions test score, either the SAT or ACT. SAT Verbal and Math scores were summed for analysis; ACT scores were converted to SAT scores using a concordance table produced from a study performed by personnel at the University of Texas (Lavergne & Walker, 2001). This concordance table was used instead of the similar table produced from a nationwide study performed by ACT, Inc. and the College Board (ACT, Inc., 2008), because we believed that the former table was more applicable to JAMP students than the latter due to similar sample characteristics. The University of Texas concordance table was created with a sample consisting mostly of Texas high school students, which better resembles the population of JAMP students than a nationwide sample of examinees in the ACT/College Board concordance study. The two concordance tables produce similar estimates of SAT scores—within 30 points on the SAT's 1,600-point scale (see Lavergne & Walker, 2001, p. 22, for a comparison), except in the extremely low ACT composite scores (below 15). However, no JAMP students had ACT scores in that range. For students who took both tests, we used their SAT scores for all analyses. Only 70 students (9.9%) had an ACT but no SAT score.

Demographic Variables. JAMP collects demographic data for each applicant to the program as part of the application process. We dummy coded gender and ethnicity in order to make White students and male students the reference groups. We believed that it was important to include these demographic variables as covariates in our study because it would control for the persistent gaps in academic achievement among racial and gender groups (College Board, 2013) and prevent these demographic variables from becoming confounding variables as we examined the predictive power of weighted and unweighted HSGPAs.

Outcome Variables. At the end of each semester, JAMP personnel collected the latest CGPA (on an unweighted 0 to 4.0 scale) for each student, as well as attrition data. Because students who completed the undergraduate portion of JAMP took the MCAT, all students who did not take the MCAT were labeled as having left JAMP. It is important to note that data on medical school completion is available only for the first three cohorts of JAMP students because members of the later cohorts are all still in medical school. Data on CPGA, MCAT scores, and whether students finished the program are available for all JAMP students.

Analyses

Descriptive statistics were used to examine demographic variables (i.e., race/ethnicity, gender) and outcome variables. Multiple regression was used to examine the relationship between the independent variables (i.e., race/ethnicity, gender, SAT score, standardized high school rank, weighted HSGPA, unweighted HSGPA) and the dependent variables of CGPA and MCAT scores. Multiple logistic regression was used to ascertain the relationship between the independent variables and the other two dependent variables (i.e., whether the student took the MCAT and whether the student finished medical school) because these dependent variables were dichotomous. Readers should note that we coded students who left JAMP and did not take the MCAT as 0 and students who took the MCAT as 1. We did this so that positive β values for all analyses would indicate more favorable academic outcomes.

For each dependent variable, we created two sets of regression models, one set with weighted HSGPA as an independent variable and another set with unweighted HSGPA as an independent variable. Each set of models consisted of three regression models: (a) one using the entire sample of JAMP students, (b) a model including only students with weighted HSGPA values less than 16, and (c) a model including only students with weighted HSGPA values higher than 75. We then compared pairs of regression models that were equal in all respects (i.e., using the same subjects, dependent variable, and covariates), except the type of HSGPA used as a predictor. Afterwards we determined that the model with the highest R^2 value included the best HSGPA measure for predicting a particular outcome. In total we created 24 regression models, which we used to make 12 comparisons for four dependent variables.

Results

Descriptive Statistics

Table 2 displays means and standard deviations for interval and ratio scale variables. As mentioned above, weighted HSGPAs formed a bimodal distribution with no students having a weighted HSGPA between 16 and 75. To compensate for this bimodal distribution, Table 2 shows weighted HSGPA descriptive statistics for all students combined, for students with weighted HSGPAs less than 16, and students with weighted HSGPAs greater than 75. Similarly, all analyses were performed three times to ensure that the bimodal distribution did not distort the statistical analyses.

According to the data in Table 2, the students admitted to JAMP obtained higher academic achievement than the average college applicant in the United States. For example, the average SAT examinee in the United States in 2013 earned a combined SAT score of 1,010 (College Board, 2013, p. 1), which is considerably lower than this study's mean of 1154.82 points. Likewise, the JAMP students' unweighted HSGPAs averaged 3.72 ($SD = 0.27$), which is the equivalent of an A− on our grading scale, and somewhat higher than the median B+ of the typical SAT examinee (College Board, 2013, p. 5). Also, the average JAMP student outperformed 89% of his or her high school graduating class, showing that JAMP students have a long history of academic excellence before applying to the program. JAMP students' scores are slightly lower than the average MCAT examinee's score in the United States. According to Table 2, the average JAMP student who took the MCAT earned a score of 24.45 ($SD = 4.88$).

Table 2. Descriptive Statistics for the Variables.

Variable	Mean (*SD*)	*n*
Weighted HSGPA		
All students	35.73 (43.37)	676
Values <16	4.80 (2.00)	447
Values >75	96.09 (5.18)	229
Unweighted HSGPA		
All students	3.72 (0.27)	694
Weighted GPA values <16	3.72 (0.26)	447[a]
Weighted GPA values >75	3.72 (0.28)	229[a]
SAT V + M	1154.82 (135.57)	709
Standardized HS rank	0.89 (0.24)	690
CGPA	3.62 (0.29)	710
Total MCAT score	24.45 (4.88)	542

Note. HSGPA = high school grade point average; HS = high school; CGPA = college grade point average; MCAT = Medical College Admissions Test. The correlation between weighted and unweighted HSGPAs was $r = .028$ ($p = .464$, $n = 673$) for all students, $r = .268$ ($p < .001$, $n = 444$) for students with weighted HSGPAs less than 16, and $r = .781$ ($p < .001$, $n = 229$) for students with HSGPAs greater than 75.
[a]These subgroups do not add up to the total number of students with unweighted HSGPAs because some students were missing weighted HSGPAs.

However, the average MCAT in 2013 in the United States was 25.3 ($SD = 6.5$; Association of American Medical Colleges, 2013).

Predicting CGPA

As displayed in Table 3, when predicting CGPA we found that unweighted HSGPA was a better predictor than weighted GPA for all three pairs of multiple regression models. Indeed, weighted HSGPA was only a statistically significant independent variables of CGPA in one model (for students with weighted HSGPAs higher than 75). R^2 values for the unweighted HSGPA models were between 1.6% and 5.3% higher than the R^2 values for the weighted HSGPA models.

The only independent variables that were consistently predictive of CGPA were unweighted HSGPA and gender. Indeed, unweighted HSGPA was always the strongest predictor in any model from Table 3 in which it appeared, with β values between .345 and .435. The β values for gender—although usually the second strongest predictor of CGPA—were much weaker (between −.127 and −.193). High school rank, SAT scores, weighted HSGPA, and Asian/Pacific Islander ethnicity were less consistent statistically significant variables.

Predicting Whether Students Took the MCAT

Table 4 demonstrates that neither type of HSGPA is a statistically significant predictor of whether students took the MCAT in any of the six models we created. Only gender

Table 3. Multiple Regression Models for Predicting CGPA.

	Model using weighted HSGPA								
	All students			Students with weighted HSGPA <16			Students with weighted HSGPA >75		
Variable	*b*	β	*p*	*b*	β	*p*	*b*	β	*p*
Weighted HSGPA	.000	.051	.237	.005	.033	.536	**.019**	**.327**	**.002**
Standardized HS rank	**.480**	**.212**	**<.001**	**.582**	**.250**	**<.001**	−.072	−.033	.737
SAT V + M	**.000**	**.171**	**<.001**	**.000**	**.212**	**<.001**	.000	.030	.727
Female	**−.080**	**−.127**	**.003**	**−.084**	**−.132**	**.010**	**−.118**	**−.193**	**.015**
African American	.031	.034	.491	.019	.022	.711	.089	.077	.369
Hispanic	−.024	−.039	.469	−.038	−.059	.370	−.026	−.044	.638
Asian/Pacific Islander	**.078**	**.114**	**.028**	.076	.118	.065	.001	.002	.986
Other race/ethnicity	.058	.033	.448	–.021	–.012	.811	.222	.113	.140
	R^2 = .132 (*n* = 516)			R^2 = .192 (*n* = 344)			R^2 = .115 (*n* = 172)		
	Model using unweighted HSGPA								
	All students			Students with weighted HSGPA <16			Students with weighted HSGPA >75		
Variable	*b*	β	*p*	*b*	β	*p*	*b*	β	*p*
Unweighted HSGPA	**.411**	**.373**	**<.001**	**.390**	**.345**	**<.001**	**.458**	**.435**	**<.001**
Standardized HS rank	−.123	−.054	.380	.021	.009	.903	−.303	−.140	.218
SAT V + M	**.000**	**.135**	**.004**	**.000**	**.180**	**.001**	.000	.047	.580
Female	**−.093**	**−.149**	**<.001**	**−.090**	**−.141**	**.005**	**−.099**	**−.162**	**.034**
African American	.079	.087	.076	.062	.074	.216	.154	.133	.130
Hispanic	.009	.015	.772	−.012	−.018	.776	.020	.033	.729
Asian/Pacific Islander	**.099**	**.144**	**.004**	**.106**	**.165**	**.008**	.033	.038	.645
Other race/ethnicity	.078	.045	.287	.017	.010	.836	.203	.103	.173
	R^2 = .185 (*n* = 516)			R^2 = .239 (*n* = 344)			R^2 = .131 (*n* = 172)		

Note. HSGPA = high school grade point average; HS = high school; CGPA = college grade point average. Bold values indicate statistically significant independent variables.

and Asian/Pacific Islander ethnicity were statistically significant predictors of the outcome variable on a consistent basis. The ethnicity dummy variable was usually a stronger predictor, though for students with weighted HSGPAs higher than 75 gender was the stronger independent variable. Effect size values ranged from R^2 = .087 to .212. The only exception to this general trend is the high school rank, which was statistically significant in one model.

Predicting MCAT Score

The highest effect sizes in our study (R^2 values between .425 and .441) were observed for the MCAT score dependent variable. However, as Table 5 shows, HSGPA was a statistically significant predictor of MCAT scores in only one model. In fact, almost all of the predictive power of the models in Table 5 is due to the very strong β values (between .584 and .625) for the SAT scores. A student's SAT score was by far the most

Table 4. Multiple Logistic Regression Models for Predicting Whether Students Took the MCAT.

	Model using weighted HSGPA								
	All students			Students with weighted HSGPA <16			Students with weighted HSGPA >75		
Variable	β	e^{β}	*p*	β	e^{β}	*p*	β	e^{β}	*p*
Weighted HSGPA	.001	1.001	.734	.239	1.270	.068	.063	1.065	.211
Standardized HS rank	2.300	9.976	.006	**2.707**	**14.984**	**.020**	−.562	.570	.760
SAT V + M	.000	1.000	.865	.000	1.000	.764	−.001	.999	.534
Female	**−1.041**	**.353**	**<.001**	**−1.288**	**.276**	**.001**	**−.947**	**.388**	**.025**
African American	.597	1.816	.129	.581	1.787	.204	.760	2.139	.401
Hispanic	−.265	.767	.338	−.322	.381	.725	−.258	.773	.563
Asian/Pacific Islander	**1.298**	**3.664**	**.001**	**1.402**	**4.602**	**.003**	.589	1.802	.364
Other race/ethnicity	−.577	.561	.640	1.171	3.224	.291		—[a]	
	R^2 = .138 (*n* = 516)			R^2 = .212 (*n* = 344)			R^2 = .090 (*n* = 172)		
	Model using unweighted HSGPA								
	All students			Students with weighted HSGPA <16			Students with weighted HSGPA >75		
Variable	β	e^{β}	*p*	β	e^{β}	*p*	β	e^{β}	*p*
Unweighted HSGPA	.768	2.155	.213	.610	1.841	.431	1.166	3.210	.270
Standardized HS rank	1.205	3.337	.332	2.661	14.309	.085	−.850	.427	.691
SAT V + M	.000	1.000	.975	.000	1.000	.713	.000	.999	.610
Female	**−1.078**	**.340**	**<.001**	**−1.295**	**.274**	**.001**	**−.868**	**.420**	**.034**
African American	.674	1.961	.090	.660	1.964	.150	.909	2.481	.336
Hispanic	−.205	.815	.466	−.354	.702	.338	−.146	.864	.751
Asian/Pacific Islander	**1.341**	**3.822**	**<.001**	**1.507**	**4.511**	**.001**	.676	1.965	.296
Other race/ethnicity	1.729	5.637	.104	1.197	3.310	.275		—[a]	
	R^2 = .142 (*n* = 516)			R^2 = .196 (*n* = 344)			R^2 = .087 (*n* = 172)		

Note. HSGPA = high school grade point average; HS = high school; MCAT = Medical College Admissions Test. R^2 values are Nagelkerke R^2 values.
[a]There were only 4 students in the "Other" race/ethnicity group, all of whom took the MCAT. For these students b = 20.311 (SE = 19,919.473), β = 662,392,036.121, and p = .999, for the model using the weighted HSGPA and b = 20.254 (SE = 19,909.630), β = 625,366,290.409, and p = .999, for the model using the unweighted HSGPA. Bold values indicate statistically significant independent variables.

statistically and practically significant variable in this regard. The only other independent variable that was statistically significant was Hispanic ethnicity, which (like unweighted HSGPA) was statistically significant in a single model. However, gender did approach the α value of .05 in three models, and with a larger sample size it would have almost surely been statistically significant.

Predicting Medical School Graduation

Like the results for the other dichotomous dependent variable in the study (i.e., whether a student took the MCAT), HSGPAs were not useful for predict whether students

Table 5. Multiple Regression Models for Predicting MCAT Scores.

	Model using weighted HSGPA								
	All students			Students with weighted HSGPA <16			Students with weighted HSGPA >75		
Variable	*b*	β	*p*	*b*	β	*p*	*b*	β	*p*
Weighted HSGPA	.002	.017	.674	.128	.058	.244	−.009	−.010	.918
Standardized HS rank	1.103	.029	.484	2.544	.062	.230	−2.749	−.081	.389
SAT V + M	**.022**	**.625**	**<.001**	**.022**	**.624**	**<.001**	**.022**	**.583**	**<.001**
Female	−.700	.069	.088	−.848	−.082	.095	−.566	−.058	.445
African American	−.291	−.019	.682	.196	.014	.813	−2.066	−.114	−.172
Hispanic	−.716	−.068	.182	−.235	−.027	.739	−1.691	−.173	.052
Asian/Pacific Islander	−.284	−.026	.599	−.018	−.002	−.978	−.878	−.066	.417
Other race/ethnicity	−1.297	−.049	.232	−.732	−.028	−.573	3.186	−1.570	.119
	R^2 = .427 (*n* = 395)			R^2 = .434 (*n* = 267)			R^2 = .425 (*n* = 128)		

	Model using unweighted HSGPA								
	All students			Students with weighted HSGPA <16			Students with weighted HSGPA >75		
Variable	*b*	β	*p*	*b*	β	*p*	*b*	β	*p*
Unweighted HSGPA	1.592	.086	.163	**3.152**	**.160**	**.031**	−1.625	−.098	.401
Standardized HS rank	−1.251	−.033	.583	−1.588	−.039	.597	−.780	−.023	.831
SAT V + M	**.022**	**.616**	**<.001**	**.022**	**.611**	**<.001**	**.022**	**.584**	**<.001**
Female	−.735	.072	.073	−.819	−.079	.103	−.527	−.054	.464
African American	−.075	−.005	.918	.638	.045	.446	−2.532	−.140	.113
Hispanic	−.565	−.054	.300	−.046	−.004	.948	**−1.905**	**−.195**	**.035**
Asian/Pacific Islander	−.190	−.018	.725	−.296	.029	.648	−.944	−.071	.381
Other race/ethnicity	−1.202	−.045	.268	−.338	−.013	−.794	−3.202	−.115	.116
	R^2 = .430 (*n* = 395)			R^2 = .441 (*n* = 267)			R^2 = .429 (*n* = 128)		

Note. HSGPA = high school grade point average; HS = high school; MCAT = Medical College Admissions Test. Bold values indicate statistically significant independent variables.

graduated from medical school. Table 6 shows that the best variables for this prediction were SAT scores and gender. Also, like the results in Table 4, the effect sizes in Table 6 are weak (R^2 values between .116 and .134), showing that the models were generally poor at predicting who would actually become a physician. High school rank was the only other statistically significant variable, but only for a single model for students with weighted HSGPAs higher than 75. However, the small number of medical school graduates in the subgroup and the restriction of range of their high school ranks make this result very unstable.

Discussion

From the results of our study, we were able to determine the effectiveness of employing weighted versus unweighted HSGPAs in predicting four future outcomes: (a) a

Table 6. Multiple Logistic Regression Models for Predicting Medical School Graduation.

	Model using weighted HSGPA								
	All students			Students with weighted HSGPA <16			Students with weighted HSGPA >75		
Variable	β	e^{β}	*p*	β	e^{β}	*p*	β	e^{β}	*p*
Weighted HSGPA	−.002	.998	.422	−.011	.989	.878	−.049	.952	.400
Standardized HS rank	2.195	8.977	.072	.968	2.632	.468	**8.145**	**3445.117**	**.033**
SAT V + M	**.003**	**1.003**	**.003**	**.004**	**1.004**	**.001**	.001	1.001	.571
Female	**−.815**	**.443**	**.001**	**−.832**	**.434**	**.005**	−.727	.483	.139
African American	−.245	.783	.611	−1.58	.854	.771	−.741	.477	.537
Hispanic	−.432	.649	.185	−.352	.703	.394	−.588	.55	.295
Asian/Pacific Islander	**−.092**	**.912**	**.772**	−.085	.919	.821	−.135	.874	.842
Other race/ethnicity	−.168	.846	.812	−.358	.699	.674	.495	.006	.334
	R^2 = .116 (*n* = 516)			R^2 = .125 (*n* = 344)			R^2 = .134 (*n* = 172)		

	Model using unweighted HSGPA								
	All students			Students with weighted HSGPA <16			Students with weighted HSGPA >75		
Variable	β	e^{β}	*p*	β	e^{β}	*p*	β	e^{β}	*p*
Unweighted HSGPA	.672	1.957	.384	1.118	3.060	.234	−.448	.639	.759
Standardized HS rank	1.165	3.206	.486	−.813	.443	.666	7.587	1971.970	.084
SAT V + M	**.003**	**1.003**	**.002**	**.004**	**1.004**	**.002**	.001	1.001	.648
Female	**−.822**	**.440**	**.001**	**−.857**	**.424**	**.004**	−.839	.432	.074
African American	−.101	.904	.837	−.052	.949	.925	−.690	.501	.585
Hispanic	−.385	−.241	.680	−.296	.744	.475	−.652	.521	.262
Asian/Pacific Islander	−.016	.984	.959	−.016	.985	.967	−.232	.793	.729
Other race/ethnicity	−.078	.925	.912	−.260	.771	.761	.507	1.660	.703
	R^2 = .116 (*n* = 516)			R^2 = .132 (*n* = 344)			R^2 = .128 (*n* = 172)		

Note. HSGPA = high school grade point average; HS = high school. R^2 values are Nagelkerke R^2 values. Bold values indicate statistically significant independent variables.

student's CGPA, (b) the likelihood of taking the MCAT, (c) the score the student attained on the MCAT exam, and (d) the likelihood of medical school graduation. We were also able to measure the strength that other independent variables, including SAT scores, standardized high school rank, gender, and ethnicity, had in predicting these same results.

The most surprising result for us was that for the two dichotomous outcome variables—(b) and (d)—neither type of HSGPA was ever a statistically significant predictor. Rather, the most consistent predictors of these dependent variables were SAT scores (for the medical school graduation outcome) and gender (for both outcomes). Previous JAMP results have also found that SAT scores were the strongest predictor of success in the undergraduate stage of JAMP. These results are consistent with internal analysis of JAMP data that a higher likelihood for female attrition is present at each stage of medical education.

For the CGPA outcome, we hypothesized that the unweighted HSGPA would be a better predictor than the weighted HSGPA. The results in Table 3 supported this hypothesis uniformly. Weighted HSGPAs are clearly an inferior predictor of CGPA compared with unweighted HSGPAs for the diverse and low-income students in our study. These results show that the criticism of weighted HSGPAs by researchers like Downs (2000) and Lang (2007) are justified.

Finally, when predicting MCAT scores, SAT scores were the only consistent independent variable that achieved statistical significance (see Table 5). Unweighted HSGPA was a stronger predictor of MCAT scores than weighted HSGPA—but only in one of three models did unweighted HSGPA achieve statistical significance. We believe that this provides weak support for our original hypothesis. However, the much stronger β values for the SAT variable precludes any widespread use of HSGPA when predicting of MCAT scores because of the low incremental validity for using HSGPA data for this purpose.

Based on these results, we believe that HSGPA values are best for predicting CGPA, but as JAMP students advance through their medical education HSGPA becomes increasingly irrelevant. A similar finding occurs when using CGPA to predict medical school GPA (Julian, 2005). One possibility for this result may be a reduced variance in HSGPAs for remaining students as they progress through their medical education. However, the variance in unweighted HSGPA for medical school matriculants was only 11.2% smaller than for the variance for the total sample, while the variance in weighted HSGPA for medical school matriculants was just 4.9% smaller than for the total sample. (When examining the two subgroups of students with weighted HSGPAs below 16 or above 75, the variance reductions were even lower.) Therefore, we believe that a restriction in range is an unlikely explanation for the reduced predictive validity of HSGPA in later medical school outcomes.

Also, as the outcomes increasingly differed in nature from HSGPA, the predictive power of HSGPA lessened. This explains why HSPGA strongly predicts CGPA (a very similar variable), weakly predicts MCAT scores (much less similar), and does not predict whether a student takes the MCAT or graduates from medical school (which are outcomes that require much more than just academic skills to achieve). The higher correlation among similarly measured variables is a common finding that has been observed in the testing literature for decades (Campbell & Fiske, 1959).

Our results agree with outcomes found by Kirby et al. (2007) that HSGPA and SAT scores strongly predict a student's future undergraduate success. We were also able to demonstrate that SAT scores hold slightly more predictive ability for CGPA than HSGPA or any other variable that admissions counselors would have access to, a finding Geiser and Santelices (2007) also recognized. As a result, we encourage the continued use of HSGPAs and SAT scores in the college admissions process. But along with Sadler and Tai (2007), we urge caution when considering using HSGPA while making admissions decisions, due to the inconsistency of HSGPA calculation. If students happen to come from a school where his or her HSGPA was weighted, our study shows that their HSGPA would likely provide a less accurate prediction of how they will perform in college than would the HSGPA for students from high schools where

GPA weighting was not used. Thus, it is important that college admissions personnel maintain the standard practice of making admission decisions based on multiple sources of data.

Despite the fact that our study demonstrated more favorable outcomes—as measured by CGPA, MCAT score, and medical school graduation—for males as well as Asian/Pacific Islanders, by no means do we suggest that females and other ethnic minorities are incapable of achieving the same success (indeed, a majority of JAMP medical school graduates are female). Rather, we believe the reasons surrounding these populations' lower likelihood of taking the MCAT, achieving high MCAT scores, and graduating medical school are attributable to factors not measured in this study, such as familial responsibilities, lack of opportunity, and education experiences prior to high school (see Warne, Yoon, & Price, 2014). We advise college personnel and administrators of programs like JAMP to provide support to these students who may be at higher risk of not achieving their educational goals. We encourage readers to consult previous articles about JAMP to learn about efforts that have been made in Texas to support economically disadvantaged students who are interested in careers in medicine (Dalley et al., 2009; Podawiltz et al., 2012; Thomson et al., 2003).

Limitations

The demographics of our sample limit the generalizability of our results. Because JAMP is a program designed for economically disadvantaged students who are also high academic achievers, we can only apply our findings to similar populations. However, given the persistent argument that standardized tests are discriminatory or harmful for diverse and low-income students (e.g., Ford, 2003; Gould, 1981; Richert, 2003), we believe these findings are useful because they show that the SAT is a better predictor for some measures of college success than are other variables examined through our study, including HSGPA.

In terms of internal validity, it is possible that differences in grading systems employed—for example, GPA(+), GPA(x), Percentage(+), and Percentage(x)—by Texas schools have an immeasurable impact on student behavior in high school. The use of a certain system of weighting may affect the courses students enroll in, which in turn may affect their weighted and unweighted HSGPAs. For instance, a student may enroll in an honors biology course because he or she knows that a C in that course would be equivalent to a B in a non–honors class because they can enroll in the more difficult course without damaging their GPA. This behavior in selecting courses would affect both types of HSGPA and may distort our findings. The varying methods of weighting employed by Texas high schools could also confound this study. If one weighting method produces HSGPAs that are more effective for predicting success in JAMP than unweighted HSGPAs, then that may be difficult to detect because those effectively weighted HSGPAs would be mingled in our analyses with HSGPAs created by other, less effective weighting methods. Unfortunately, we did not have access to most high schools' weighting methods, which forced us to treat all weighting systems as being roughly equivalent.

Finally, it is important to recognize that our findings do not unambiguously support unweighted GPA grading systems, especially in light of Sadler and Tai's (2007) results that showed that weighted GPAs were better predictors of college academic performance. One interpretation of these contradictory findings is that it is not the grading system per se that makes high school grades more or less effective predictors of college education outcomes, but rather the presence of a uniform method of calculating GPAs. Although Sadler and Tai (2007) used exploratory methods to derive a weighting system and we used an a priori scheme for calculating unweighted GPAs, the consistency of the methods within each study may be more important than which grading system officials choose to use.

Implications

For this study, we examined whether unweighted or weighted HSGPAs possessed more predictive power in determining college outcomes as measured by four independent variables: (a) the student's CGPA, (b) whether the student took the MCAT, (c), the score obtained on the MCAT, and (d) medical school completion status. Our findings indicate that unweighted HSGPA were more useful for predicting CGPA than weighted HSGPAs, but that neither type of HSGPA consistently performs well in predicting the other three outcomes. However, SAT scores were better at predicting MCAT scores and whether a JAMP student would graduate from medical school better than other available variables.

Our study presents only one piece of the research needed in order to evaluate effectively the potency of weighted HSGPAs, and it is our hope that future researchers will focus on whether weighting has a place in school systems. Due to our findings, we believe that educational officials should critically analyze weighted GPAs and attempt to determine the methods for calculation rather than take the GPA reported on a high school transcript at face value. Because we have demonstrated that the current system of weighting grades has little—if any—predictive power of future academic outcomes, we strongly recommend discontinuing the use of weighted HSGPAs until a uniform and fair weighting system can be instituted in all high schools where administrators choose to weight GPAs.

Acknowledgment

The authors wish to acknowledge the support and feedback of William A. Thomson, Quentin W. Smith, and the JAMP staff.

Authors' Note

Chanel Nagaishi is now at the Department of Social Work, Brigham Young University.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Note

1. Unweighted HSGPAs for some students exceeded 100 if they earned a high grade on a percentage scale in advanced class at a school that used a Percentage(x) weighting system.

References

ACT, Inc. (2008). *ACT-SAT concordance: A tool for comparing scores*. Retrieved from http://www.act.org/aap/concordance/pdf/reference.pdf

Association of American Medical Colleges. (2013). *Percentile ranks for MCAT total and section scores for tests administered in 2013*. Retrieved from https://www.aamc.org/students/download/361080/data/combined13.pdf.pdf

Camara, W. J., & Echternacht, G. (2000). *The SAT I and high school grades: Utility in predicting success in college*. Retrieved from http://research.collegeboard.org/publications/content/2012/05/sat-i-and-high-school-grades-utility-predicting-success-college

Campbell, D. T., & Fiske, D. W. (1959). Convergent and divergent validation by the multitrait-multimethod matrix. *Psychological Bulletin*, *56*, 81-105. doi:10.1037/h0046016

Clinedinst, M. E., Hurley, S. F., & Hawkins, D. A. (2012). *State of college admission 2012*. Arlington, VA: National Association for College Admission Counseling. Retrieved from http://www.nacacnet.org/research/PublicationsResources/Marketplace/research/Pages/StateofCollegeAdmission.aspx

College Board. (2013). *2013 College-bound seniors: Total group profile report*. Retrieved from http://media.collegeboard.com/digitalServices/pdf/research/2013/TotalGroup-2013.pdf

Cohn, E., Cohn, S., Balch, D. C., & Bradley, J., Jr. (2004). Determinants of undergraduate GPAs: SAT scores, high-school GPA and high-school rank. *Economics of Education Review*, *23*, 577-586. doi:10.1016/j.econedurev.2004.01.001

Cognard, A. M. (1996, May). *The case for weighting grades and waiving classes for gifted and talented high school students* (NRCG/T Report No. RM96226). Retrieved from http://www.gifted.uconn.edu/nrcgt/reports/rm96226/rm96226.pdf

Dalley, B., Podawiltz, A., Castro, R., Fallon, K., Kott, M., Rabek, J., & Smith, Q. (2009). The joint admission medical program: A statewide approach to expanding medical education and career opportunities for disadvantaged students. *Academic Medicine*, *84*, 1373-1382. doi:10.1097/ACM.0b013e3181b6c76b

Downs, G. C. (2000). *Weighted grades: A conundrum for secondary schools* (Occasional Paper No. 35). Retrieved from http://libraries.maine.edu/cre/35/No35.pdf

Ford, D. Y. (2003). Equity and excellence: Culturally diverse students in gifted education. In N. Colangelo & G. A. Davis (Eds.), *Handbook of gifted education* (pp. 506-520). Boston, MA: Allyn & Bacon.

Geiser, S., & Santelices, M. V. (2007). *Validity of high-school grades in predicting student success beyond the freshman year: High-school record vs. standardized tests as indicators of four-year outcomes* (CSHE.6.07). Retrieved from http://www.cshe.berkeley.edu/sites/default/files/shared/publications/docs/ROPS.GEISER._SAT_6.13.07.pdf

Gould, S. J. (1981). *The mismeasure of man*. New York, NY: Norton.

Guskey, T. R. (2014). Class rank weighs down true learning. *Phi Delta Kappan*, *95*(6), 15-19. doi:10.1177/003172171409500604

Hoffman, J. E., & Lowitzski, K. E. (2005). Predicting college success with high schools grades and test scores: Limitations for minority students. *Review of Higher Education*, *28*, 455-474. doi:10.1353/rhe.2005.0042

Julian, E. R. (2005). Validity of the Medical College Admission Test for predicting medical school performance. *Academic Medicine*, *80*, 910-917. doi:10.1097/00001888-200510000-00010

Kirby, E., White, S., & Arguete, M. (2007). Predictors of white and minority student success at a private women's college. *College Student Journal*, *41*, 460-465.

Lang, D. M. (2007). Class rank, GPA, and valedictorians: How high schools rank students. *American Secondary Education*, *35*(2), 36-48.

Lavergne, G. M., & Walker, B. (2001). *Developing a concordance between the ACT assessment and the SAT I: Reasoning Test for the University of Texas at Austin*. Retrieved from http://www.utexas.edu/student/admissions/research/ACT-SATconcordance.html

Mattson, C. E. (2007). Beyond admission: Understanding pre-college variables and the success of at-risk students. *Journal of College Admission*, (196), 8-13.

Mays, A., Mortimer, W., Roller, W., & Washington, S. (2007, May). *Review of literature related to weighted grade point average and rank in class*. Paper presented at the meeting of the Portland School Committee Policy Subcommittee, Portland, OR. Retrieved from www.portlandschools.org/News/PolicyCommittee/Weighted%20grades%20Lit%20Review.doc

Nagaishi, C., Slade, M. K., Warne, R. T., Wright, J. S., & Hermesmeyer, B. P. (2012). *Are weighted or unweighted high school grade point averages better indicators of college success?* 2012 Proceedings of the National Conference of Undergraduate Research. Retrieved from http://www.ncurproceedings.org/ojs/index.php/NCUR2012/article/view/160/106

Nemecek, P. M. (1978). Constructing weighted grading systems. *The Clearing House*, *51*, 373-375. doi:10.1080/00098655.1978.9957077

Norton, C. W. (2008). *Weighted grading in practice: Perceptions of the effect by high school counselors* (Unpublished master's thesis). University of Wisconsin-Stout, Menomonie.

Podawiltz, D. O., Richardson, J., Gleason, W., Fallon, K., Jones, D., Peck, E. K., & Smith, Q. W. (2012). What the Joint Admission Medical Program (JAMP) can do for Texas physicians; what Texas physicians can do for JAMP. *Texas Medicine*, *108*(8):e1. Retrieved from http://www.texmed.org/Aug12Journal/

Richert, E. S. (2003). Excellence with justice in identification and programming. In N. Colangelo & G. A. Davis (Eds.), *Handbook of gifted education* (3rd ed., pp. 146-158). Boston, MA: Allyn & Bacon.

Sadler, P. M., & Tai, R. H. (2007). Weighting for recognition: Accounting for advanced placement and honors courses when calculating high school grade point average. *NASSP Bulletin*, *91*, 5-32. doi:10.1177/0192636506298726

Thomson, W. A., Ferry, P., King, J., Wedig, C. M., & Villarreal, G. B. (2010). A baccalaureate-MD program for students from medically underserved communities: 15-year outcomes. *Academic Medicine*, *85*, 668-674. doi:10.1097/ACM.0b013e3181d27914

Vickers, J. M. (2000). Justice and truth in grades and their averages. *Research in Higher Education*, *41*, 141-164.

Waugh, G., & Micceri, T. (1994, March). *Using ethnicity, ACT/SAT scores, and high school GPA to predict retention and graduation rates*. Paper presented at the meeting of the Florida Association for Institutional Research, Florida. Retrieved from http://usfweb2.usf.edu/surveys/RePDF/199403_2.pdf

Warne, R. T., Yoon, M., & Price, C. J. (2014). Exploring the various interpretations of "test bias." *Cultural Diversity and Ethnic Minority Psychology*, *20*, 570-582. doi:10.1037/a0036503

Wolfe, R. N., & Johnson, S. D. (1995). Personality as a predictor of college performance. *Educational & Psychological Measurement*, *55*, 177-185. doi:10.1177/0013164495055002002

Zheng, J. L., Saunders, K. P., Shelley, M.C., II, & Whalen, D. F. (2002). Predictors of academic success for freshmen residence hall students. *Journal of College Student Development*, *43*, 267-283.

Zwick, R. (2006). Higher education admissions testing. In R. L. Brennan (Ed.), *Educational measurement* (4th ed., pp. 647-679). Westport, CT: Praeger.

Author Biographies

Dr. Russell T. Warne has been an Assistant Professor of Psychology at Utah Valley University since 2011. He earned his doctoral degree in educational psychology from Texas A&M University and is interested in giftedness, advanced academics, and standardized testing. He attended a high school that used unweighted GPAs.

Chanel Nagaishi is currently finishing her last year in her Master of Social Work program at Brigham Young University. After she graduates she hopes to practice as a clinical social worker with children and youth.

Michael K. Slade is a senior at Utah Valley Univeristy. He hopes to attend a PhD program in clinical psychology with a specialty in child psychotherapy. He has conducted a meta-analysis on the effectiveness of cognitive-behavioral therapy and play therapy in child victims of abuse.

Paul Hermesmeyer is the Assistant Director of the Joint Admission Medical Program. He received his B.S. and M.S. from Tarleton State University. After completion of his degrees he has worked in higher education for more than 30 years in Student Services, College Admissions, Scholarship, and Program Development.

Dr. Kim Peck is the Associate Dean for Admissions and Diversity at Texas Tech University Health Sciences Center School of Medicine. She is also an Associate Professor in the Departments of Medical Education and Family and Community Medicine where she provides patient care as well as teaching both resident physicians and medical dtudents.