

## Report 1: TAKS Results and PSAT Math Scores

March 15, 2008

Prepared by W. H. Howland ([howland@stthom.edu](mailto:howland@stthom.edu).)

Data from "Tracking Math Course.xls" were copied to a working file, then all middle school data was eliminated as were all cases which did not have TAKS or PSAT math scores. Linear correlation and regression was used in an attempt to predict PSAT math scores from TAKS scores. SPSS 14.0 did the calculations for the entire dataset and for subsets defined by school, grade, and subject.

For each regression the linear correlation coefficient and coefficient of determination were recorded as were the coefficients  $A$  and  $B$  for the regression equation:  $PSAT_{mathscore} = A(TAKS_{score}) + B$ .

Results are given in the tables.

The sample size is  $n$ ,  $R$  is the linear correlation coefficient, and  $R^2$  is the coefficient of determination.

## Results by school

School	n	R	R <sup>2</sup>	A	B
All	8451	0.829	0.687	0.053	-72.47
Katy High	1318	0.811	0.657	0.050	-65.35
Taylor High	1490	0.820	0.672	0.053	-71.43
OAC	72	0.691	0.477	0.044	-52.98
Mayde Creek	1457	0.788	0.621	0.050	-67.97
Cinco Ranch	1523	0.805	0.647	0.049	-62.31
Morton Ranch	1581	0.802	0.643	0.052	-72.55
Seven Lakes	1004	0.798	0.638	0.050	-64.67

## Results by grade

Grade	n	R	R <sup>2</sup>	A	B
9	4	not	done		
10	4140	0.830	0.689	0.048	-61.64
11	4049	0.825	0.681	0.057	-80.74
12	286	0.334	0.112	0.036	-42.4

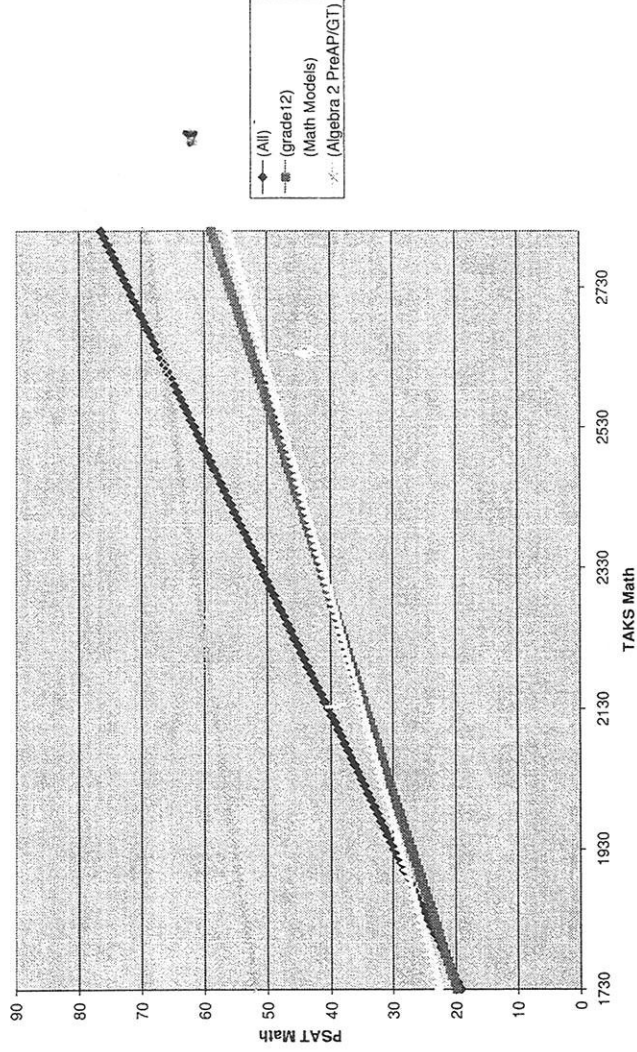
The atypical result for grade 12 is interesting and might prove to be meaningful. The sample size is large enough to find a correlation if one exists, but the result (and sample size) might be due to missing data for most of the 12<sup>th</sup> grade students.

## Results by class

class	n	R	R <sup>2</sup>	A	B <sub>1</sub>
Algebra 1	195	0.692	0.479	0.042	-49.65
Geometry	2864	0.701	0.491	0.043	-52.73
Geometry (PreAP)	229	0.632	0.399	0.036	-33.13
Math Models	276	0.375	0.141	0.031	-30.81
Algebra 2	2720	0.691	0.478	0.047	-59.85
Algebra 2 (PreAP)	674	0.505	0.255	0.025	-4.39
Algebra 2 (PreAP/GT)	245	0.358	0.128	0.016	24.13
PreCalculus	477	0.660	0.435	0.040	-38.51
PreCalculus (PreAP)	414	0.562	0.316	0.032	-17.36

It is interesting that we get lower correlations and differing regression equations for students at both ends of the math spectrum. Both the Math Models students and The PreAP Algebra 2 students have regressions that are different from and not nearly as accurate as those for the majority of the students, most of whom are in Geometry and regular Algebra 2.

Predicting PSAT Math from TAKS



The chart shows just how different the regressions are. What may be a good pattern for most students would overpredict for some and underpredict for others.

## Report 2: Predicting College Readiness from PSAT Scores

March 21, 2008

Prepared by W. H. Howland ([howland@stthom.edu](mailto:howland@stthom.edu).)

Data from "Tracking Math Course.xls" were copied to a working file, then all middle school data was eliminated. Existing PSAT Reading and Math scores were added to form a PSAT Combined Score for each student. A Projected SAT score for each student was calculated by multiplying the PSAT Combined Score by ten. A five number summary of the Projected SAT scores consisting of the minimum, 25<sup>th</sup> percentile, median, 75<sup>th</sup> percentile, and maximum was calculated for each dataset. Means and standard deviations were also recorded. SPSS 14.0 did the calculations for the entire dataset and for subsets defined by school, grade, and subject.

The 25<sup>th</sup> and 75<sup>th</sup> percentile numbers are particularly useful because they define a range of values which delimit the middle 50 percent of the students in the group. These students represent what is "typical" of the group. For example, from data given elsewhere in this report, a typical student at UT Austin has an SAT score between 1120 and 1370. A typical Cinco Ranch HS student has an SAT score between 900 and 1190. A typical KISD 12<sup>th</sup> grader has an SAT score between 850 and 1160.

The middle 50 percent of each group is illustrated by the colored rectangles in the accompanying illustrations. The bold line in the center represents the median for the group and the top and bottom of the rectangle are the 75<sup>th</sup> and 25<sup>th</sup> percentiles respectively. The vertical lines outside the rectangle illustrate the top 25% and the bottom 25%. The colored circles represent statistical outliers.

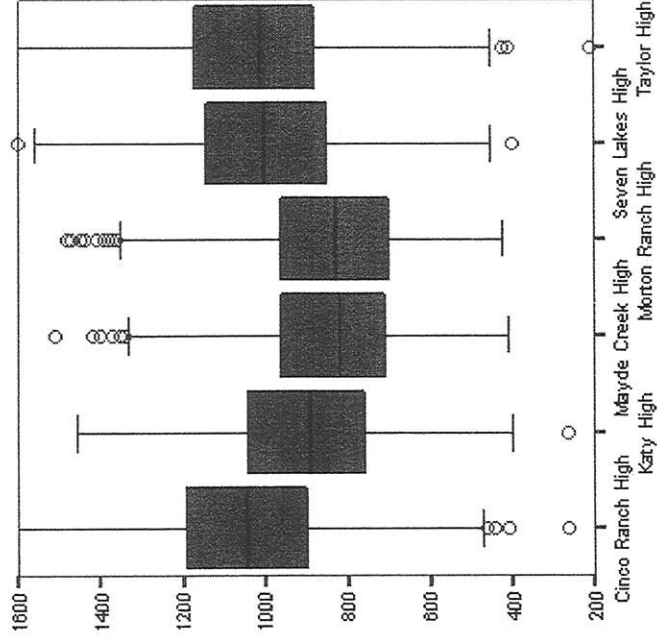
**Results by School:**

High School	Minimum	25th Percentile	Median	75th Percentile	Maximum
All	210	780	930	1090	1600
Cinco Ranch	260	900	1040	1190	1600
Taylor	210	880	1010	1170	1600
Seven Lakes	400	850	1000	1140	1600
Katy	260	760	890	1040	1460
Morton Ranch	420	700	830	960	1480
Mayde Creek	280	710	820	960	1510

**High School Mean Standard Deviation**

All	938	219
Cinco Ranch	1041	206
Taylor	1018	214
Seven Lakes	994	212
Katy	902	196
Morton Ranch	836	185
Mayde Creek	840	189

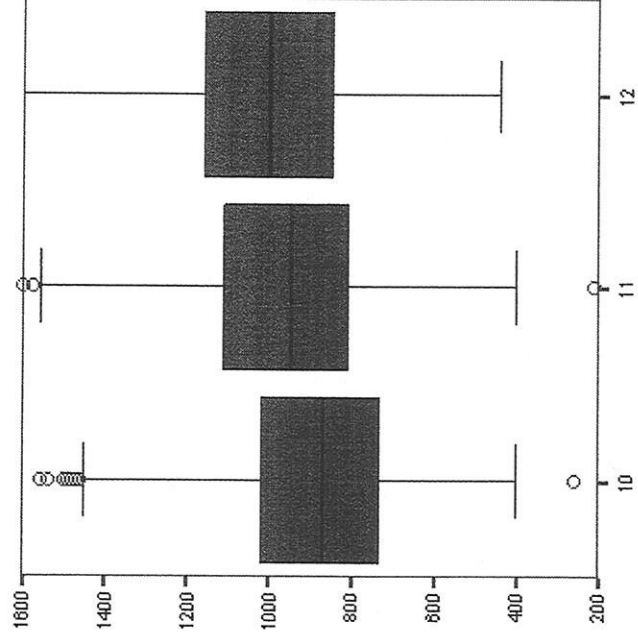
**Projected SAT Scores by School**



**Results by Grade:**

Grade	Minimum	25th Percentile	Median	75th Percentile	Maximum
10	260	720	860	1020	1560
11	210	810	950	1110	1600
12	440	850	990	1160	1600

Grade	Mean	Standard Deviation
10	876	204
11	962	217
12	1001	219

**Projected SAT Scores by Grade**

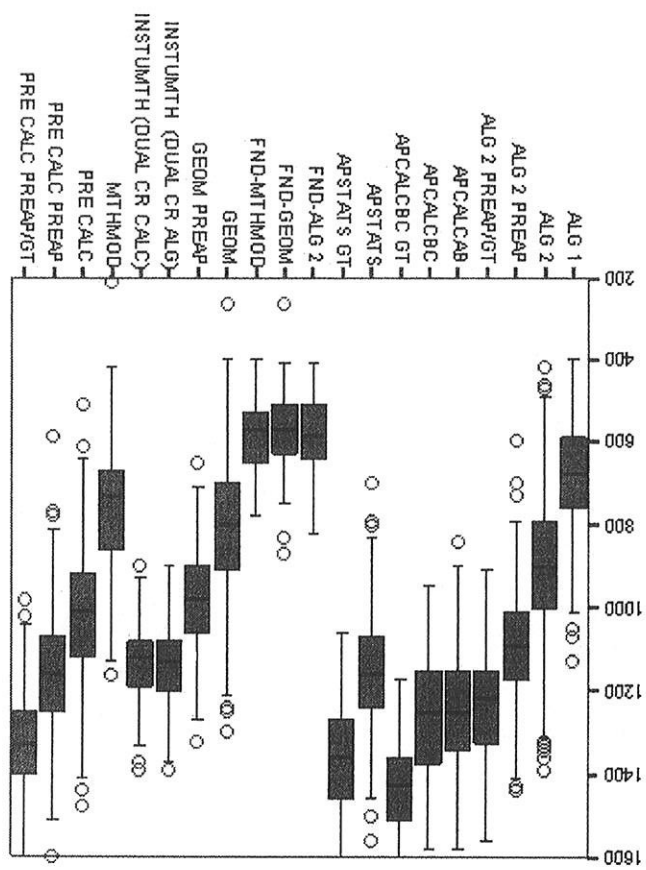
## Results by Math Subject:

Math Course	Minimum	25th Percentile	Median	75th Percentile	Maximum
AP Calculus BC/GT	1170	1360	1425	1510	1600
AP Statistics/GT	1060	1270	1360	1460	1600
PreCalculus PAP/GT	980	1250	1330	1400	1600
AP Calculus AB	840	1150	1250	1340	1580
AP Calculus BC	950	1150	1250	1378	1580
Algebra 2 PAP/GT	910	1150	1220	1330	1560
AP Statistics	700	1070	1160	1245	1560
PreCalculus PAP	590	1070	1160	1250	1600
Dual Credit Algebra	900	1080	1130	1205	1390
Dual Credit Calculus	900	1078	1120	1193	1390
Algebra 2 PAP	600	1010	1090	1170	1440
PreCalculus	510	920	1010	1120	1480
Geometry PAP	650	900	980	1060	1320
Algebra 2	420	790	900	1000	1390
Geometry	260	700	800	910	1300
Math Models	210	670	730	860	1160
Algebra 1	400	590	680	760	1130
Fund. Algebra 2	410	510	585	640	820
Fund. Geometry	260	510	570	630	870
Fund Math Models	400	530	570	650	780

## Mean Standard Deviation

Math Course	Mean	Standard Deviation
AP Calculus BC/GT	1432	106
AP Statistics/GT	1355	136
PreCalculus PAP/GT	1322	120
AP Calculus AB	1240	137
AP Calculus BC	1256	150
Algebra 2 PAP/GT	1228	122
AP Statistics	1155	136
PreCalculus PAP	1151	141
Dual Credit Algebra	1144	100
Dual Credit Calculus	1133	101
Algebra 2 PAP	1088	123
PreCalculus	1017	140
Geometry PAP	975	120
Algebra 2	896	155
Geometry	805	147
Math Models	760	139
Algebra 1	696	142
Fund. Algebra 2	581	97
Fund. Geometry	573	90
Fund Math Models	578	90

Projected SAT Scores by Math Subject



4

4

## SAT Profiles of Selected Colleges and Universities:

School Name	25th Percentile	75th Percentile	School Name	25th Percentile	75th Percentile
Harvard	1390	1590	Univ of Dallas	1100	1340
Yale	1390	1580	Baylor	1100	1310
MIT	1380	1560	A&M College Station	1080	1290
Princeton	1370	1590	TCU	1060	1260
Washington (St. Louis)	1370	1530	LeTourneau	1030	1320
Dartmouth	1350	1550	LSU Baton Rouge	1030	1220
Duke	1350	1540	Univ. of St. Thomas	1020	1250
Stanford	1340	1540	Purdue	1020	1250
Rice	1330	1540	St. Edwards	1020	1230
Columbia	1330	1540	Texas Tech	1020	1210
Univ of Chicago	1320	1530	Univ. of N. Texas	1010	1230
Noire Dame	1290	1500	TSU San Marcos	980	1160
Georgetown	1290	1490	UT Arlington	960	1190
Johns Hopkins	1290	1490	Houston Baptist	950	1200
Cornell	1280	1490	Univ. of Houston	950	1190
Vanderbilt	1280	1470	Dallas Baptist	950	1170
Univ of Virginia	1220	1430	UT San Antonio	910	1140
Tulane	1220	1425	Concordia, Austin	910	1130
Michigan	1220	1380	UT Permian Basin	900	1070
UC Berkeley	1200	1450	Stephen F Austin	890	1090
Trinity, San Antonio	1190	1370	Sam Houston	850	1050
UCLA	1180	1410	Texas Women's Univ.	840	1040
Wisconsin	1180	1340	A&M Corpus Christi	830	1030
West Point	1170	1370	Angelo State	830	1030
Air Force	1160	1420	A&M Commerce	810	1070
Annapolis	1160	1370	Lamar University	810	950
UT Dallas	1140	1360	A&M Kingsville	780	1030
Austin College, Sherman	1140	1340	UT Pan AM	780	990
SMU	1140	1320	UT El Paso	770	1040
Colorado School of Mines	1140	1300	A&M Laredo	770	990
Pepperdine	1130	1350	Huston-Tillotson	700	920
UT Austin	1120	1370			
Southwestern	1115	1335			

All data from the 2008 edition of "America's Best Colleges"  
by U.S. News & World Report, ISBN# 78-1-931469-31-9



## Report 3: Limitations in Predicting PSAT Math Scores from TAKS Results

March 25, 2008

Prepared by W. H. Howland ([howland@stthom.edu](mailto:howland@stthom.edu).)

Data from "Tracking Math Course.xls" were copied to a working file, then all middle school data was eliminated as were all cases which did not have TAKS or PSAT math scores. Linear correlation and regression was used in an attempt to predict PSAT math scores from TAKS scores. SPSS 14.0 did the calculations for the entire dataset and for subsets defined by school, grade, and TAKS Mastery.

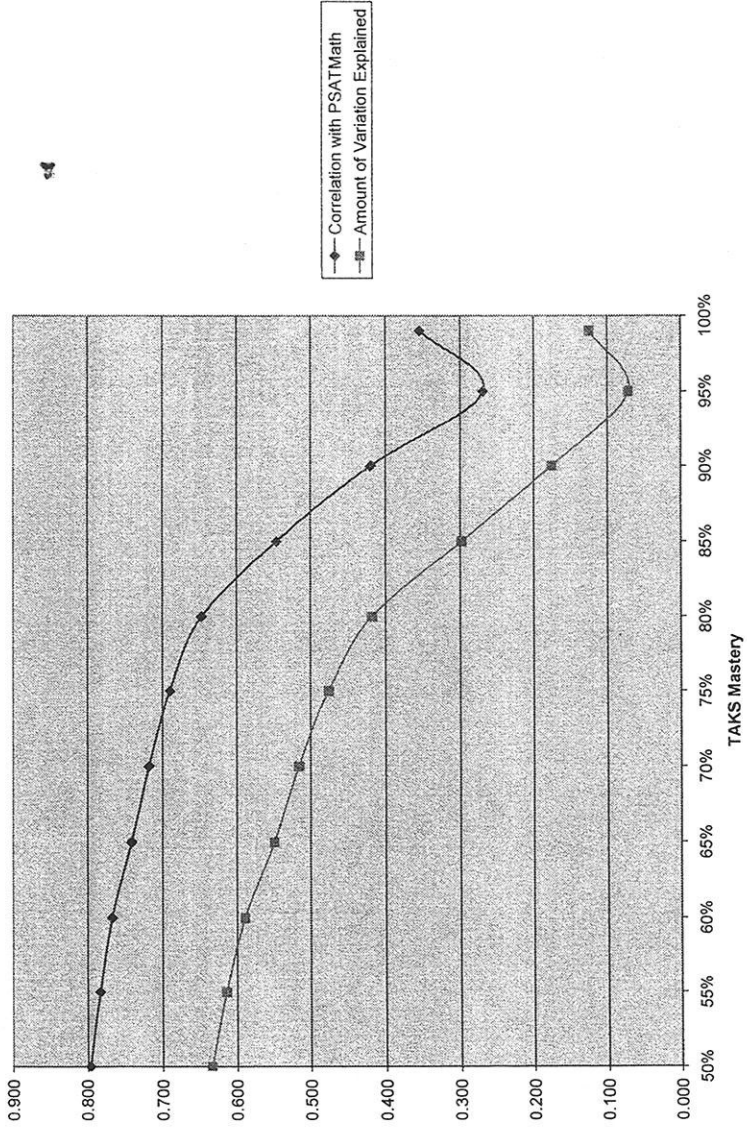
As reported earlier, the TAKS correlates reasonably well with the PSAT Math score overall, but the correlation diminishes rapidly as the Mastery level increases.

A series of regressions were calculated for all the students above a minimum mastery level. As the minimum mastery level rose the correlations got worse. For students above a mastery level of about 90%, the TAKS has almost nothing to do with the PSATmath score.

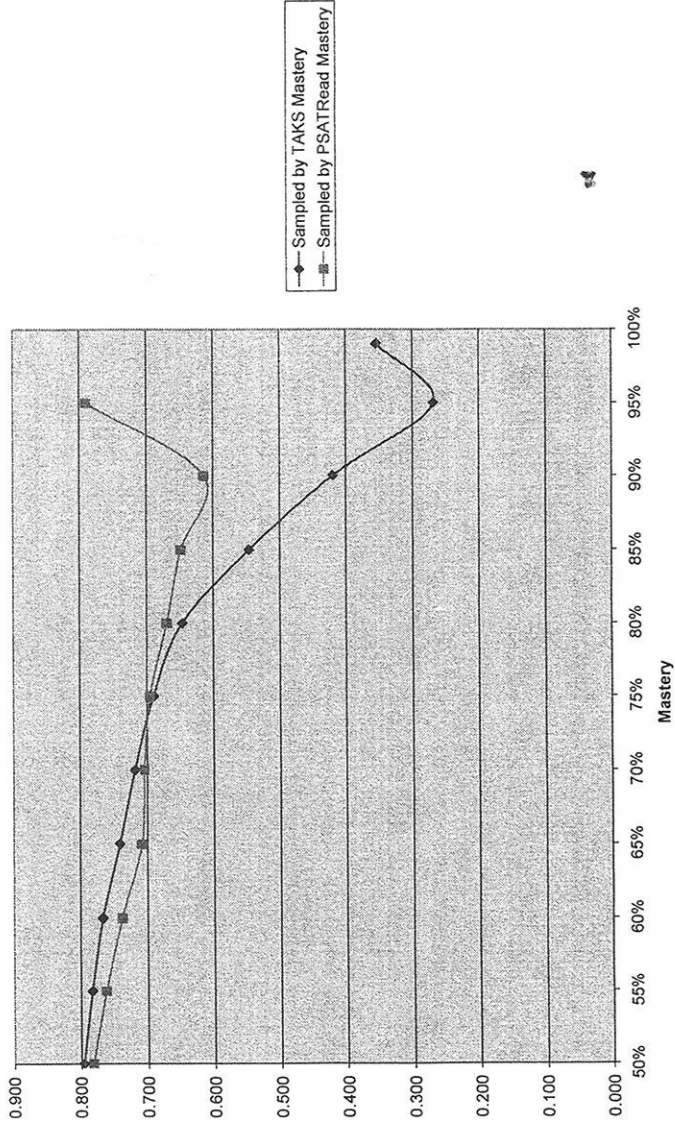
TAKS Mastery	Correlation with PSATMath	Amount of Variation Explained
50%	0.796	0.634
55%	0.783	0.614
60%	0.767	0.589
65%	0.741	0.549
70%	0.718	0.516
75%	0.690	0.476
80%	0.647	0.418
85%	0.546	0.298
90%	0.420	0.176
95%	0.269	0.072
99%	0.354	0.125

While doing poorly on the TAKS quite accurately predicts doing poorly on the PSAT, doing well on the TAKS predicts nothing. This might be because the TAKS and the PSATMath tests are measuring different collections of knowledge and skills or because they are measuring the same collections at different levels of competence.

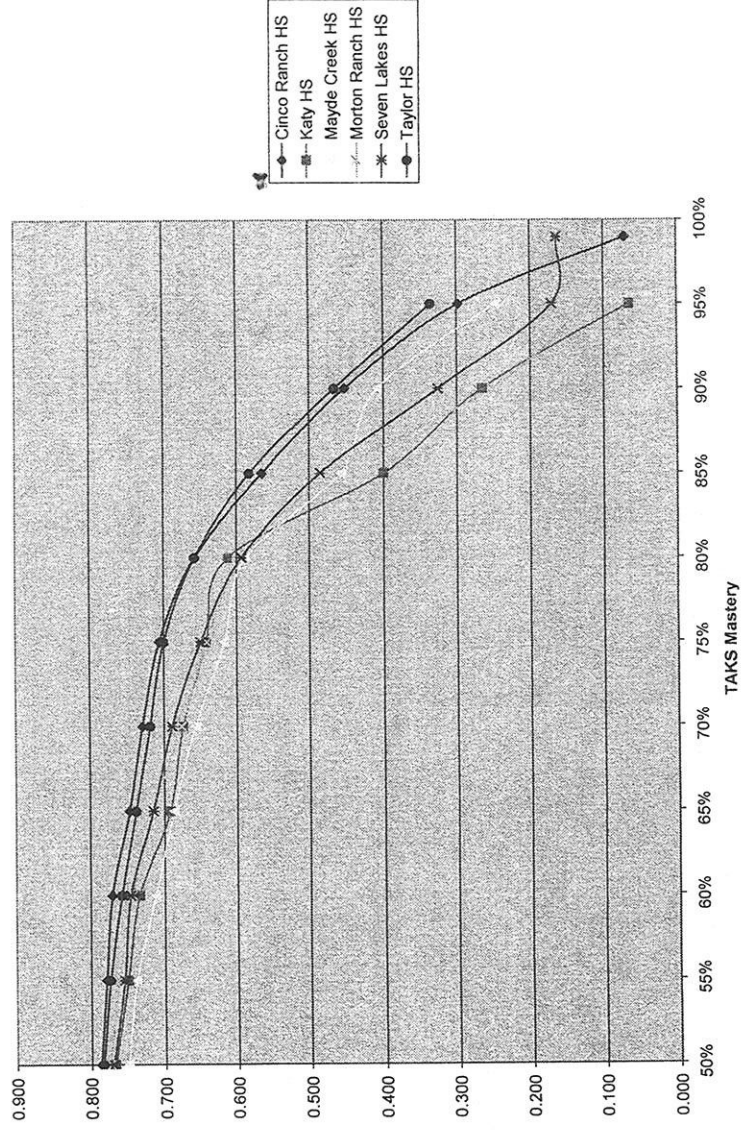
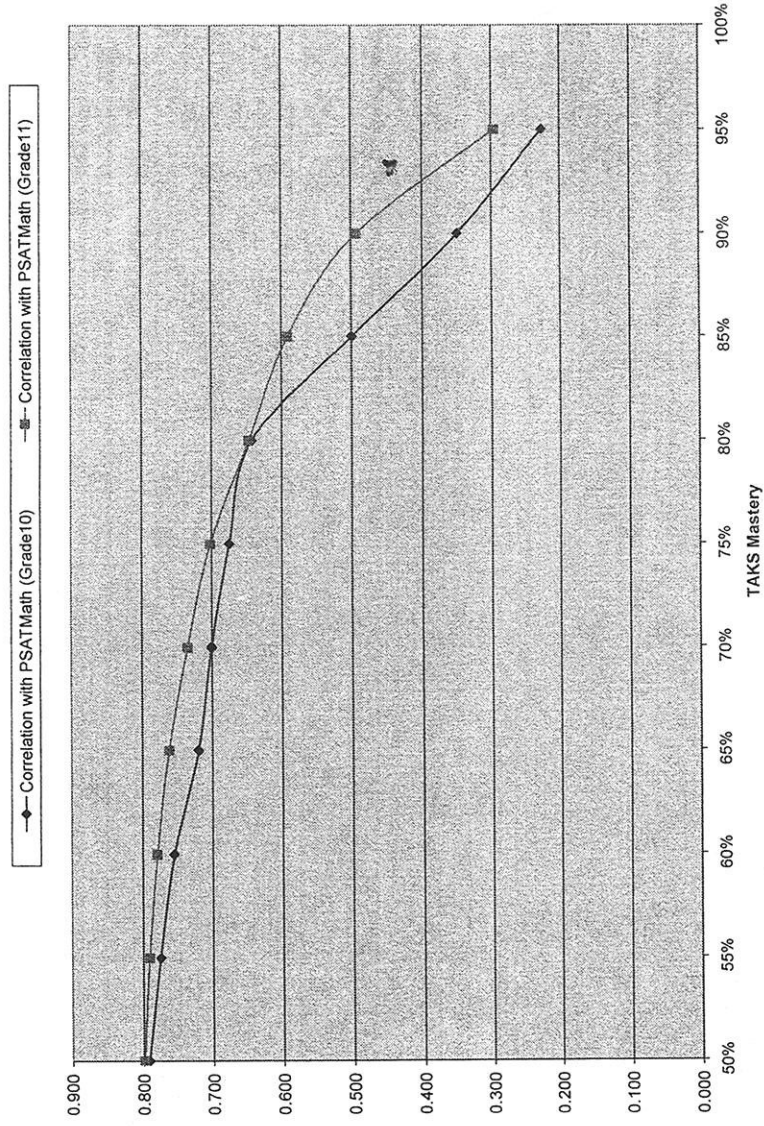
The observed reduction in predictive value might also be an artifact of the methodical way in which the samples were chosen, but it is not. After replicating the results for subsets by grade and school, we visited the entire dataset again, but this time we sampled by mastery level for the PSATReading test. The correlations dipped slightly, as might be expected from the reduction in sample size, but nowhere nearly as dramatically.



Linear Correlation TAKS & PSAT Math



Results were consistent when each grade and each school were sampled in the same way.



## Report 4: The Limited Predictive Value of Classroom Grades in Algebra 2

14

May 9, 2008

Prepared by W. H. Howland ([howland@stthom.edu](mailto:howland@stthom.edu).)

Data from "Tracking Math Course.xls" were copied to a working file, then all middle school data was eliminated as were all cases which did not have TAKS or PSAT math scores. Linear correlation and regression was used in an attempt to predict PSAT math scores and TAKS scores from classroom grades for students in Algebra 2. Results are expected to differ for PreAP and PreAP/GT classrooms, so those will be analyzed and reported separately. SPSS 14.0 was used to calculate linear correlations between classroom grades, TAKS percent mastery, and PSAT Math Score.

As reported earlier, the TAKS correlates reasonably well with the PSAT Math score overall, but the correlation diminishes rapidly as the Mastery level increases. It seems reasonable to expect a positive, statistically significant correlation between classroom grades and these two measures of performance. It is difficult to know if the TAKS and the PSAT Math tests are measuring different collections of knowledge and skills or if they are measuring the same collections at different levels of competence, but in either case we would expect classroom grades to be measuring at least some of the same things. But the evidence indicates a significant correlation between grades and test scores only in a minority of classrooms. Many of the correlations which do occur are for one test only and not the other. Details are given in the table below.

	N (classrooms)	Grades correlate		Grades correlate	
		w/ PSATMath	Grades correlate w/ TAKS PM	w/ both	Grades correlate w/ both
all KISD	122	33.6%	45.1%	23.0%	
Cinco Ranch HS	24	20.8%	25.0%	8.3%	
Katy HS	24	41.7%	50.0%	29.2%	
Mayde Creek HS	19	26.3%	21.1%	5.3%	
Morton Ranch HS	20	35.0%	75.0%	35.0%	
Seven Lakes HS	9	55.6%	77.8%	44.4%	
Taylor HS	26	34.6%	42.3%	26.9%	

For the district and for each school taken as a whole, there are low positive correlations between classroom grades and both PSAT Math scores and TAKS Percent Mastery. These are reported here with a warning – The observed result is not caused by a uniformly low correlation but by combining the data from a few classrooms with good correlations with many having little or no correlations. Correlations with the TAKS appear to be somewhat higher than with the PSAT Math test.

	N (students	Grade Correlation with PSAT Math	Grade Correlation with TAKS PM
all KISD	3204	0.297	0.408
Cinco Ranch HS	644	0.294	0.369
Katy HS	483	0.384	0.497
Mayde Creek HS	410	0.284	0.390
Morton Ranch HS	559	0.255	0.465
Seven Lakes HS	245	0.354	0.439
Taylor HS	616	0.305	0.357

Taken together, these results indicate that classroom grades in Algebra 2 may not be a reliable indicator of either TAKS preparation or college readiness.

## Report 6: The Relation of SAT Scores to Performance at The University of Texas

Prepared by W.H. Howland ([howland@stthom.edu](mailto:howland@stthom.edu).)

The data concerns all students admitted to the University of Texas at Austin in the fall of years 1999 through 2003. Data from "Scott Request 3" were copied to a working file and sorted by year of entry and composite SAT score (verbal + quantitative). Quartile scores were calculated and the data from each year of entry were sorted into three groups.

The "High" group consists of those students with SAT composite scores in the highest 25%. The "Mid" group consists of those students with scores between the 25<sup>th</sup> and 75<sup>th</sup> percentiles. The "Low" group consists of those students with scores in the lowest 25%. Descriptive statistics were used to compare the performance of students in the Low group to that of students in the High group. The data manipulations and calculations were done with Excel 2003 and SPSS 14.0.

Experts differ in their assessment of the actual skills measured by the SAT and about the predictive value of these measurements in relation to college performance. We express no opinion in those matters here. We do relate the actual scores of students admitted to the University of Texas at Austin to their actual performance at the university.

In general, students in the High group were more likely to graduate and less likely to drop out than those in the Low group. Of those students who graduated, students in the High group graduated in less time and with higher average grades than students in the Low group.

Comparison of cumulative graduation rates:

Year Admitted	4 year graduation rate		5 year graduation rate		6 year graduation rate	
	High	Low	High	Low	High	Low
1999	49.9%	33.1%	75.6%	61.4%	80.6%	67.9%
2000	53.4%	37.2%	77.0%	65.1%	82.2%	72.0%
2001	53.5%	38.6%	79.1%	64.0%	84.2%	69.6%
2002	57.1%	36.8%	80.2%	63.1%		
2003	60.1%	37.2%				

All the differences shown are statistically significant at  $p = 0.01$ , most have

$p \approx 10^{-5}$ .

## Comparison of cumulative dropout rate:

Year Admitted	2 year dropout rate		3 year dropout rate		4 year dropout rate	
	High	Low	High	Low	High	Low
1999	11.3%	19.2%	13.6%	23.0%	17.0%	26.2%
2000	10.8%	14.8%	11.7%	18.2%	14.6%	22.8%
2001	9.4%	18.9%	12.5%	22.3%	17.0%	26.1%
2002	9.5%	18.9%	12.5%	22.9%	13.7%	26.3%
2003	7.9%	18.5%	8.7%	21.5%	10.3%	25.1%

Year Admitted	5 year dropout rate		6 year dropout rate	
	High	Low	High	Low
1999	16.4%	28.6%	16.3%	27.9%
2000	15.3%	24.8%	14.8%	24.5%
2001	14.4%	27.8%	13.4%	27.5%
2002	13.5%	28.7%		
2003				

A student is counted as a dropout if the student is no longer enrolled but has not graduated.

All the differences shown are statistically significant at  $p = 0.01$ , most have  $p \cong 10^{-5}$ .

Charts and detailed enrollment patterns are available in the attached charts.

Comparison of mean grade point averages at graduation:

Year Admitted	Final GPA	
	High	Low
1999	3.24	2.71
2000	3.27	2.72
2001	3.30	2.70
2002	3.31	2.72
2003	3.43	2.76

Report 7: The Comparison of SAT Scores of Katy ISD Entrants to the University of Texas to Those of The Entire Entrant Pool

April 26, 2009

Prepared by W. H. Howland ([howland@stthom.edu](mailto:howland@stthom.edu).)

The purpose of this report is to compare the composite SAT scores of students from Katy ISD admitted to UT to the scores of all students admitted in the same year. The comparison includes minimum, maximum, median, and quartile scores. Data were available for students admitted in 1999 – 2004 and 2006. Due to FERPA regulations, high school designators were not provided by UT for students whose high schools sent five or fewer students to UT in that year, but those students' data is included in the aggregate.

The data concerns all students admitted to the University of Texas at Austin in the fall of years 1999 through 2004 and 2006. Data from "Scott Request 3" were copied to a working file and sorted by year of entry and composite SAT score (verbal + quantitative). Quartile scores were calculated and the data from each year of entry were sorted into groups by high school. The data manipulations and calculations were done with Excel 2003 and SPSS 14.0.

Expanded graphics are provided for Fall 1999 entrants and for those in Fall 2006, with tables for the years in between. The results are remarkably consistent.

Cinco Ranch HS graduated its first class in 2002, so it is not represented before then. Morton Ranch HS graduated its first class in 2007 and Seven Lakes HS had its first graduates in 2008, both well after our data period.

From the data, it is easy to conclude that students going to UT from KISD are as well prepared (as measured by the SAT Composite) as their UT classmates from elsewhere.



## Fall 1999 entrants

School	N	Min	25th	Median	75th	Max
All UT	6513	610	1120	1210	1310	1600
All KISD	165	970	1163	1260	1360	1560
Katy	37	1020	1140	1240	1355	1470
Mayde Creek	33	1010	1140	1230	1330	1560
Taylor	95	970	1180	1280	1370	1520

All UT N = 6513

Minimum	25 <sup>th</sup>	median	75 <sup>th</sup>	Maximum
+	1120	1210	1310	+
610				1600

All KISD N = 165

Minimum	25 <sup>th</sup>	median	75 <sup>th</sup>	Maximum
+	1163	1260	1360	+
970				1560

Katy HS N = 37

Minimum	25 <sup>th</sup>	median	75 <sup>th</sup>	Maximum
+	1140	1240	1355	+
1020				1470

Mayde Creek HS N = 33

Minimum	25 <sup>th</sup>	median	75 <sup>th</sup>	Maximum
+	1140	1230	1330	+
1010				1560

Taylor HS N = 95

Minimum	25 <sup>th</sup>	median	75 <sup>th</sup>	Maximum
+	1180	1280	1370	+
970				1520

## Fall 2000 entrants

School	N	Min	25th	Median	75th	Max
All UT	7040	650	1120	1210	1310	1600
All KISD	149	920	1169	1248	1364	1600
Katy	33	1010	1190	1240	1350	1590
Mayde Creek	30	930	1148	1210	1305	1530
Taylor	86	920	1168	1265	1390	1600

## Fall 2001 entrants

School	N	Min	25th	Median	75th	Max
All UT	6641	700	1120	1220	1320	1600
All KISD	162	1010	1205	1283	1370	1580
Katy	24	1090	1130	1240	1343	1400
Mayde Creek	30	1010	1140	1220	1318	1500
Taylor	108	1110	1240	1310	1390	1580

## Fall 2002 entrants

School	N	Min	25th	Median	75th	Max
All UT	7188	590	1120	1230	1330	1600
All KISD	176	960	1230	1312	1380	1560
Cinco Ranch	44	1100	1233	1310	1420	1550
Katy	30	960	1160	1265	1310	1500
Mayde Creek	27	1100	1190	1260	1370	1560
Taylor	75	990	1270	1350	1390	1550

## Fall 2003 entrants

School	N	Min	25th	Median	75th	Max
All UT	6045	660	1130	1240	1350	1600
All KISD	137	1050	1247	1332	1407	1600
Cinco Ranch	29	1120	1280	1390	1500	1600
Katy	31	1050	1220	1290	1350	1440
Mayde Creek	22	1010	1160	1270	1335	1420
Taylor	55	1120	1280	1350	1420	1520

## Fall 2004 entrants

School	N	Min	25th	Median	75th	Max
All UT	6355	690	1130	1240	1350	1600
All KISD	140	960	1255	1344	1411	1540
Cinco Ranch	52	960	1280	1365	1428	1540
Katy	10	1130	1163	1265	1345	1470
Mayde Creek	19	1020	1190	1280	1370	1470
Taylor	59	1160	1270	1360	1420	1590

Fall 2006 entrants

School	N	Min	25 <sup>th</sup>	Median	75 <sup>th</sup>	Max
All UT	6840	660	1120	1240	1350	1600
All KISD	139	930	1264	1357	1413	1590
Cinco Ranch	53	1120	1310	1400	1435	1590
Katy	16	980	1153	1280	1370	1450
Mayde Creek	26	930	1133	1270	1340	1480
Taylor	44	1180	1325	1385	1428	1590**

